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TO THE
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UNITED NATIONS

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The following abbreviations are used in this volume:

ACABQ — Advisory Committee on Administrative and Budgetary Questions
ACAST — Advisory Committee on the Application of Science and Technology to Development
ACC — Administrative Committee on Co-ordination
CIOMS — Council for International Organizations of Medical Sciences
DANIDA — Danish International Development Agency
ECA — Economic Commission for Africa
ECAFE — Economic Commission for Asia and the Far East
ECE — Economic Commission for Europe
ECLA — Economic Commission for Latin America
FAO — Food and Agriculture Organization of the United Nations
IAEA — International Atomic Energy Agency
IARC — International Agency for Research on Cancer
IBRD — International Bank for Reconstruction and Development
ICAO — International Civil Aviation Organization
ILO — International Labour Organisation (Office)
IMCO — Inter-Governmental Maritime Consultative Organization
ITU — International Telecommunication Union
OAU — Organization of African Unity
PAHO — Pan American Health Organization
PASB — Pan American Sanitary Bureau
SIDA — Swedish International Development Authority
UNCTAD — United Nations Conference on Trade and Development
UNDP — United Nations Development Programme
UNDP/SF — United Nations Development Programme, Special Fund component
UNDP/TA — United Nations Development Programme, Technical Assistance component
UNESCO — United Nations Educational, Scientific and Cultural Organization
UNESOBS — United Nations Economic and Social Office in Beirut
UNFPA — United Nations Fund for Population Activities
UNICEF — United Nations Children’s Fund
UNITAR — United Nations Institute for Training and Research
UNIDO — United Nations Industrial Development Organization
UNRWA — United Nations Relief and Works Agency for Palestine Refugees in the Near East
UNSCEAR — United Nations Scientific Committee on the Effects of Atomic Radiation
USAID — United States Agency for International Development
WHO — World Health Organization
WMO — World Meteorological Organization

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INTRODUCTION

Ten years ago I indicated in my annual report that the best hope for the future of the world's health lay in an intensification of medical research. Today it is more than ever clear that, for the effective worldwide control of some of the main diseases of public health importance, the filling of gaps in our knowledge is a no less urgent and vital requirement than the application of the knowledge that does exist and the strengthening of national health services. Throughout 1971, reports from the field in many parts of the world have confirmed that, unless new knowledge can be applied to the solution of some specific technical problems, the progress being made by many countries in their fight against disease will be slowed down and, in some areas, may even be halted. Similar conclusions have been reached by expert committees, scientific groups, and other meetings of experts convened to advise the Organization on future policy.

For many decades public health has been viewed as being concerned predominantly, if not exclusively, with the delivery of health services. However, both in national health programmes and in international health work the tendency nowadays is to regard research as an indispensable and integral component of public health activities. This relatively recent reorientation of public health thinking is evident throughout the pages of the present report, and has shown the need for a fresh approach to a number of important diseases and public health programmes. A few examples to illustrate this point may be drawn from quite unrelated fields of public health—iron deficiency anaemia, cardiovascular diseases, and a number of vector-borne parasitic diseases. Between them these diseases affect about half the population of the world.

* * *

It is sometimes forgotten that iron deficiency anaemia is prevalent not only in developing but also in developed countries, where it has been estimated that as many as 15-25% of women of childbearing age suffer from this condition. At a conservative estimate, 20% of the world's population—about 700 million people—may suffer from a degree of iron deficiency sufficient to affect their productive capacity.

Ten or fifteen years ago it was generally assumed that the prevention of iron deficiency in large population groups was a relatively straightforward matter, which could be accomplished mainly by providing a diet adequate in iron or, where this was impossible (as was often the case), by fortifying food with iron. Unfortunately, experience has shown that the fortification of food, while successful under certain conditions, remains largely ineffective under others.

In one of the most advanced countries, for example, where a programme of food fortification has been carried out for several years, the results have on the whole proved disappointing. It is now obvious that, apart from the traditional distribution of iron tablets to pregnant women and other vulnerable groups—an
obviously rather limited approach—there is at present no sure way of meeting the iron requirements of a population on a national scale. No further progress can be expected in the prevention of iron deficiency conditions until more has been learned about the absorption of iron from different diets and about the dietary factors regulating such absorption. There is thus an imperative need for extensive new studies on these two questions, and on possible ways of increasing the availability of iron from whole diets.

*  

If we now turn to cardiovascular diseases, we see that they can no longer be considered primarily as afflictions of the old. More and more frequently they are striking men and women of middle age and even young adults. Data collected and analysed by WHO for 29 technologically advanced countries show that in 1967 there were 1,136,000 deaths in men aged 25–64 years, and 443,000 of these, or 39% of, were due to cardiovascular diseases. Ischaemic heart disease accounted for a quarter of all deaths in this age-group, and there is no doubt that in advanced countries this disease is the most important single cause of mortality and disability among men at an age when their contribution to society is most valuable.

This heavy loss of human life is by no means inevitable; death and disablement from the two most deadly cardiovascular conditions in adults—ischaemic heart disease and cerebral stroke—could be substantially reduced if all the means now available were effectively applied on a massive scale. Such contributing factors as excessive food intake and smoking need to be vigorously combated, and the early diagnosis and treatment of hypertension and ischaemic heart disease must be extended to the entire population. However, even if these measures were applied with success, cardiovascular diseases would still remain the foremost public health problem in industrialized communities.

To uncover the principal underlying causes a much greater volume of concentrated research is needed. I believe that we shall make faster progress if we can intensify our co-operative and co-ordinated research programme. It is necessary to assess the importance of environmental factors in groups of people in whom the incidence of these conditions is different, investigating particularly their nutritional and dietary habits in relation to their physical and mental activity, and their adaptation to their social environment from childhood onwards. Investigations of the metabolism of lipids and carbohydrates should indicate where to intervene in order to prevent, arrest, or reverse the development of atherosclerosis.

*  

Several of the vector-borne, parasitic diseases, notably schistosomiasis, filariasis, onchocerciasis, and trypanosomiasis, likewise exemplify the need for a new approach. After many years of large-scale control programmes, they still constitute major public health problems, not so much because of failure to apply existing knowledge but more especially because many questions still remain unanswered.

Although it is estimated that some 200 million people are affected by schistosomiasis, it is not known how many of them are seriously ill or dying from the disease. This is a matter that needs to be clarified in order to determine the magnitude of the problem. There is a conflict of opinion on whether morbidity and mortality from schistosomiasis can be more effectively reduced by interrupting transmission through the application of molluscicides to kill the aquatic snails that harbour certain stages in the life-cycle of the
parasite or by applying chemotherapy on a vast scale, or whether it is better to combine these two approaches. In theory, destruction of the snails in water is the best way, but in practice it is fraught with immense difficulties. In one affected country, for example, 200 000 kilometres of canals would have to be treated during the brief season of transmission. This would require many thousands of skilled technicians, far more than could be made available even with massive international or bilateral assistance.

Chemotherapy is being applied in a few limited areas, but with agents that are far from ideal. Only if more funds can be made available from international, national and private sources to encourage research will it be possible to bring about a substantial reduction in the prevalence of schistosomiasis and the eventual interruption of the chain of transmission. Greater awareness of this problem on the part of Member States is imperative.

Similar problems face public health authorities in their attempts to control filariasis, onchocerciasis and trypanosomiasis. It has been estimated that some 200 million people suffer from filariasis, but it is not known even approximately what proportion are seriously affected. Measures for the control of the vectors are hampered by the high cost of the materials and lack of manpower. Research is needed to develop acceptable prophylactic and curative agents and also possible immunological approaches.

The need for a new drug to treat onchocerciasis is equally urgent. This disease affects some 30 million people, and in some areas more than 30% of those affected are partially or totally blind. Under hospital conditions, onchocerciasis can be treated effectively but the drugs available are of no practical use for mass treatment.

Trypanosomiasis still remains a major impediment to economic progress throughout Africa, and it has been estimated that more than double the present cattle population could be raised if the continent could be freed from the disease. Transmitted by the tsetse fly, it may suddenly flare up to reach devastating epidemic proportions, and the insecticides at present available are too expensive for application on the scale needed to control the vector. In the Americas, trypanosomiasis affects large parts of certain human populations and there are estimated to be some 7 million cases, many of them fatal. The reduviid bugs that transmit this form of the disease can be attacked by insecticides applied inside dwellings, but the larval forms are likely to escape destruction. Both in Africa and in the Americas, intensive research is needed not only on vector ecology and on the natural history of the disease but also in order to develop more effective insecticides and techniques for their application. An effective and non-toxic therapeutic agent is also urgently required. Here, too, there is reason to believe that advances in both diagnosis and treatment might result from more research on the immunology of the disease.

From this analysis of the situation it is clear that the control of these diseases—to which many other examples could be added—is unlikely to make much progress in the next 10 or even 20 years unless significant discoveries provide new means of attack. The best hope for the future, therefore, and the most rational long-term approach, lies in a vigorous intensification of the search for new knowledge through carefully planned and well co-ordinated research programmes aimed specifically at finding solutions to the difficulties at present confronting health authorities and public health workers. We know what needs to be done and what questions to ask, and we have the technical resources and the research skills to find...
the answers. Practically twenty-five years after the establishment of the World Health Organization—an institution set up to enable countries to exchange technical information on all matters concerning health and to pool their resources for the common good—the time has come to apply the lessons of the past and to devise new strategies for dealing with a number of fundamental public health problems.

* 

Important though it is for WHO to lay the foundations for the future through the stimulation and support of research, the immediate task facing Member States continues to be to make the maximum use of all existing means for improving the health and welfare of people throughout the world. Unfortunately, in most of the developing countries it has not yet proved possible to apply on an adequate scale the knowledge that exists regarding the control of diseases. If such knowledge were universally applied with efficiency and determination, dramatic reductions in morbidity and mortality would be achieved for a variety of diseases that take a heavy toll of life, especially in infancy and childhood, and that seriously impair the productive capacity of the adult population. Examples that spring to mind are tuberculosis, some nutritional deficiencies, diarrhoeal diseases, acute respiratory diseases, neonatal tetanus, and rheumatic heart disease.

A whole group of diseases could be speedily brought under control by means of the potent vaccines that are today available in sufficient quantities for mass administration to the susceptible age-groups in entire populations. The success of the global smallpox eradication programme, which I have had the pleasure to report during the past few years and which has continued during 1971, provides a striking example of what can be done. Similar results could be obtained in the control of measles, whooping-cough, diphtheria, and poliomyelitis. The systematic application of vaccination could lead to the virtual disappearance of these diseases within a few years, as has already happened in some countries where such programmes have been undertaken. The hard truth is, however, that with notable but rare exceptions, it has not been possible to implement adequate vaccination programmes in the developing countries. This inability to initiate and maintain immunization programmes for children has, in fact, been one of the most distressing failures of health services in tropical and subtropical areas.

It is true that the application of existing methods of disease control is not feasible in the absence of an adequate network of basic health services and is difficult or impossible as long as socio-economic conditions have not reached a certain minimum level. For many years to come, therefore, the most urgent task confronting many Member States of WHO will continue to be the strengthening of their national health services, with special emphasis on increased manpower—physicians, teachers of medicine, nurses, sanitary engineers, dentists, auxiliary health personnel, and other public health workers. Parallel with this will be the equally formidable task of providing everyone with safe drinking water and improving the disposal of liquid and solid wastes.

Member States have already made, and are continuing to make, considerable efforts in these fields, either alone or with international or bilateral help, and they have been able to record encouraging progress, which is reflected throughout the pages of the present report. As can be seen from the Project List in Part III of this report, no fewer than 1900 projects were completed or in operation between 1 December 1970 and
30 November 1971. This figure does not include projects for which the only assistance provided was advisory services by headquarters or regional office staff, or projects that are for staff training only.

It is encouraging to note that some of the developing countries are no longer concerned exclusively with the establishment and strengthening of basic health services and with the control of the major communicable diseases; they have recently felt able to turn their attention to problems—including research—that hitherto only the more developed countries were in a position to tackle. In fact, 226 new collaborative research projects were initiated during the year, bringing the total of such projects in operation during 1971 to 950. The general broadening of the scope of international health activities and the shifts in emphasis that are taking place emerge clearly from the following examples of projects in operation or under development in 1971 in the various Regions.

In the African Region, rapid economic development has created an urgent need for better occupational health services, more and more countries are becoming interested in setting up national pharmaceutical industries, and evaluation procedures are being developed for an increasing number of research projects.

The number of workers employed in the uranium, gold, copper, iron, manganese, diamond and bauxite mines is steadily growing, new industries are springing up (cement, potash, aluminium, petrochemicals, textiles, the processing of agricultural products), and such industrial crops as rubber, cotton, coffee, and cocoa are being cultivated on an ever-widening scale. Workers in agriculture, fisheries, forestry, stock-breeding and other occupations are exposed to new health hazards through the introduction of mechanization and the use of pesticides and chemical fertilizers. The health services of the countries where these changes are taking place are often insufficiently developed to deal effectively with the occupational health problems they are now facing, and an increasing number of them are turning to the Organization for help in this field. Accordingly, in response to requests from Liberia, Sierra Leone, and Togo, expert advice was provided on the development of their occupational health services; and Ghana was given assistance in organizing a course on the subject at the University of Ghana.

As their health services develop, a growing number of African countries are becoming interested in the production and quality control of pharmaceutical substances. Thus, during 1971, Kenya, Nigeria, Uganda, the United Republic of Tanzania, and Zambia addressed requests to the United Nations Industrial Development Organization for help with pre-investment studies for the establishment of national pharmaceutical industries. In the past few years WHO has sent missions to a number of African countries—notably Kenya, Nigeria, Senegal, Uganda, and the United Republic of Tanzania—to study the facilities available for the quality control of pharmaceutical substances produced locally. The Organization has also helped with preliminary studies for the establishment of a drug monitoring centre in the Central African Republic.

The research projects receiving WHO support in the African Region are essentially of a practical nature and cover the following fields: parasitic diseases, bacterial diseases, and zoonoses (25%); entomology, immunology, microbiology, endocrinology, and genetics (24%); health protection and promotion (17%); and environmental health (4%). During the past two years some 20 projects in Kenya, Madagascar, the People's Republic of the Congo, and the United Republic of Tanzania were evaluated in order to ascertain the extent to which the aims of each project had been met, to study the results and to consider future prospects. Similar evaluations will be carried out in the other countries of the Region over the next two or three years.

— XI —
Recent trends in the Americas may be illustrated by two contrasting programmes: the provision of medical textbooks, and smallpox eradication.

If medical manpower shortages are to be overcome, a readily available supply of up-to-date medical textbooks is essential. Yet, in many parts of the world medical students have to rely mainly on lecture notes and mimeographed lectures because they cannot afford the necessary books or obtain them easily from libraries. Until recently the problem was particularly acute in Latin America, where such medical textbooks as were available were often out of date or in foreign languages. It is now, however, being tackled on a massive scale by a programme that aims at providing reasonably priced textbooks for sale or loan against payment for some 100,000 students in more than 100 medical schools in the Region. Experts in the various branches of the medical curriculum select the most suitable textbooks on their particular subjects, and the Organization then negotiates contracts with publishers for the mass supply of these books at special prices. More than 62,000 of the first five books selected—on pathology, biochemistry, pharmacology, physiology, and paediatrics—have now been distributed to some 150 medical schools; of these, well over 35,000 copies have been sold, the proceeds from cash sales amounting to more than US$310,000. A further eight textbooks have been selected and their distribution will start in 1972, while other titles are under consideration. The cash proceeds are being used to establish a revolving fund, which will eventually make the programme self-financing; in the meantime, it is being operated with the aid of a US$2 million loan from the Inter-American Development Bank. It is to be hoped that this imaginative PAHO programme will lead to similar programmes in other WHO Regions that face the same type of problem.

No cases of smallpox were discovered in any of the countries of the Americas in the last eight months of 1971. Although the search for unrecognized foci of infection continues, it now appears that we may in the not too distant future be able to celebrate a major achievement in the history of medicine—the eradication of a disease from an entire hemisphere. For over 450 years, smallpox has devastated the Americas, causing untold deaths as well as blindness and disfigurement. Programmes of smallpox eradication begun in the 1950s and intensified in 1967 steadily reduced the extent and severity of the problem. Smallpox incidence declined sharply in 1970 to the lowest total of cases ever recorded by the Organization. In 1971, only a single, highly localized outbreak of 19 cases was detected—in Brazil—and no cases whatsoever were found after April. Since then, special area-wide surveys designed to detect cases have been and are being conducted in Brazil and its neighbouring countries and vaccination programmes are continuing.

In the Eastern Mediterranean Region, a vaccine trial of importance for dwellers in the African meningitis belt, which lies between the Sahara to the north and the equatorial forests to the south, was begun in Egypt towards the end of the year. The aim of this trial is to determine the protective capacity of a group A polysaccharide vaccine against meningococcal infections and diseases, both in carriers and in cases, and to assess the serological response to vaccination. There have already been extensive trials of the safety and effectiveness of polysaccharide vaccines for the prevention of the group C infections that, since 1964, have been the commonest cause of meningococcal disease in the USA. Recently efforts have been made to test vaccines against the group A strains that are mainly responsible for epidemic meningitis in other parts of the world and notably in Africa. The trials in Egypt are all the more timely in that sulfonamide resistance is developing among group A meningococci in various countries and threatens those African countries where cerebrospinal meningitis is particularly rife.

Two interesting projects that have been undertaken during the year in the Western Pacific Region concern the improvement of health laboratory services and the application of systems analysis to health planning.
As a result of changing disease patterns in some countries, the clinical diagnosis of certain diseases—for example, smallpox, rabies, and plague—is becoming increasingly difficult. Consequently, the need for health laboratory services is greater than ever. Yet, the organizational structure and the quality of national health laboratory services often leave much to be desired, despite continued efforts to improve them. WHO has just launched a long-term inter-country programme in the Western Pacific Region to complement the technical assistance it already gives individual countries in this field and to ensure that WHO-assisted projects carried out on a regional basis will have adequate laboratory support in each country. Special attention will be paid to diagnostic services and to refresher and advanced training for laboratory staff. Plans have been approved for the first three years of the programme (1972-1974). The first step will be to prepare a regional directory of health laboratory services. This will be followed by a seminar for bacteriologists specially concerned with laboratory work on tuberculosis, visits by consultants to the major biochemistry laboratories in the Region and to laboratories producing rabies vaccine for use in man, and the collection of information on the organization of blood transfusion services. A long-term programme for the production and control of biological substances in the Region has also been planned.

A new and promising approach to the complicated problem of health planning within the context of national socio-economic development—the use of systems analysis in the formulation of proposals for health projects—has been developed by the Organization. It is now being applied in the Western Pacific Region, notably in connexion with a project for the development of hospital services in the Philippines, where workshops, followed by practical demonstrations, have been organized to familiarize health workers with the concepts and procedures involved. It is planned to utilize the new approach in projects in Malaysia and Singapore and to introduce it to other Regions over the next three or four years.

The European Region is faced with a number of problems that are especially acute in the technologically advanced countries, such as the protection of river waters from pollution by industrial and other wastes and the rising toll of deaths from cardiovascular diseases. As a recent incident has shown, the accidental release of toxic materials into a major waterway such as the Rhine can have disastrous consequences affecting a number of countries. So far, however, few countries in Europe have adopted the automated methods that can now be used in place of manual sampling and analysis techniques to measure the quality of surface waters. The system of automatic water quality monitors established in the course of a programme for the control of saline and thermal water pollution in Upper Silesia, Poland, has therefore aroused considerable interest in the Region. Automatic monitoring stations are particularly valuable in establishing water quality baselines and trends, detecting sudden changes, and giving early warning of accidental pollution to water users downstream. Two basic systems are in use, one employing in situ electrochemical transducers or sensors, and the other automated repetitive wet analytical techniques. Telemetric linkage of the monitors with data processing stations makes it possible to evaluate the data rapidly and to keep a constant check on the functioning of the network. Only a small number of operators is required, but it is essential to have highly skilled maintenance staff to deal promptly with any failures in the system.

The programme for community control of cardiovascular diseases in the European Region, developed with the co-operation and support of national health administrations, will in 1972 enter the fifth and concluding year of its first phase. The programme hinges on 18 ischaemic heart disease registers established in 15 countries of the Region (and two registers outside the Region), which supply the necessary information for the planning and evaluation of services for the care of coronary patients and the organization of pilot projects in this field. Data on 4800 patients, collected through these registers, were reviewed during 1971
by a group of experts and found to be sufficiently reliable and comparable to form the basis for a full-scale international study. They are now being centrally analysed and the findings will be published in the course of the next two years.

Proposals for the second phase of the programme—to last from 1973 to 1977—were approved by the Regional Committee for Europe at its twenty-first session. Plans for this phase include the extension of the programme to include projects for the community control of stroke and hypertension, congenital heart diseases, chronic chest diseases leading to cor pulmonale, and rheumatic heart disease.

Three projects in the South-East Asia Region—the Tuberculosis Chemotherapy Centre in Madras, India, the Filariasis Research Unit in Rangoon, Burma, and the Aedes Research Unit in Bangkok, Thailand—provide excellent illustrations of the way in which a relatively modest research project planned and, at the outset, strongly supported by WHO with staff and equipment can make a considerable contribution to the solution of a health problem in a developing country. Projects of this kind also provide a training ground for national staff in dealing with the problems of research and organization involved, they contain the seeds for future national expansion of research and control to cover the entire country, and they are a source of legitimate pride within the country. Nor are their benefits limited to one country only; the lessons learned in the treatment of tuberculosis in Madras or in the control of Culex fatigans in Rangoon or of Aedes aegypti in Bangkok are widely applicable throughout the world.

Perhaps the outstanding example of a country project whose work is of far more than regional significance is the Tuberculosis Chemotherapy Centre, Madras. It was set up in 1956 under the joint auspices of the Indian Council of Medical Research, the Madras State Government, WHO, and the United Kingdom Medical Research Council, and its studies of methods of treating tuberculosis, conducted in accordance with a rigorous methodology, have received wide acclaim. One of the most important conclusions of these studies is that the domiciliary treatment of tuberculosis is as effective as sanatorium or hospital treatment and involves no increase in the risk for the patient's close contacts. Other extremely valuable studies have concentrated on the efficacy of different drug combinations and treatment regimens, including intermittent treatment. One of the most recent recent studies, for example, has shown that a twice-weekly regimen of para-aminosalicylic acid and isoniazid is therapeutically as effective as the standard daily regimen of these two compounds, besides being cheaper and less likely to have toxic effects.

At its inception, many of the staff of the Tuberculosis Chemotherapy Centre were non-Indian. Now the staff is entirely Indian, although WHO continues to give assistance with the purchase of supplies and equipment, as well as providing advice, and the other sponsoring bodies still provide occasional consultants.

But the project does not end with the study of methods of treating tuberculosis in populous urban areas of circumscribed size. It has been followed up by the National Tuberculosis Institute, Bangalore, which, among other important tasks, has studied how the findings of the Tuberculosis Chemotherapy Centre can be applied in the circumstances that prevail throughout most of India, in which the vast majority of the population live in rural areas, often at a considerable distance from the nearest health centre or hospital. This example well illustrates the remarkable fertilizing effect of a well-conceived and successful attack on a problem in the conditions obtaining in developing countries. Indeed, the findings of the trials carried out at the Tuberculosis Chemotherapy Centre, Madras, have revolutionized treatment in the developed countries also.
The Filariasis Research Unit, established by WHO in Rangoon in 1962, has met with similar success in expanding from modest beginnings. The sewage disposal system in Rangoon was greatly damaged during the Second World War, and the open drains of the city, intended merely to carry away water during the heavy monsoon rains, soon became the repository of much of the sewage of the rapidly expanding population. The open drains encouraged the breeding of Culex pipiens fatigans, the most important vector of Wuchereria bancrofti in urban areas throughout the world. The incidence of filariasis caused by W. bancrofti in Rangoon increased rapidly after the war, in spite of the periodic oiling of the drains by the Rangoon Municipality.

The Filariasis Research Unit at its establishment consisted of WHO staff and experts selected by the Burmese Government. The aim of the unit was to study the vector mosquito in a circumscribed area of the city with a view to its control, and this involved a large number of investigations—as, for example, of the types of filarial infections of animals living in proximity to man, the risk of infection in the Burmese, Indian, and Chinese population of Rangoon, mosquito breeding habits, and larvicides. The studies have shed considerable light on filariasis and on the vector mosquito, and the carefully developed mosquito control measures have proved so successful that they are now being applied to the whole city and will in due course be extended to the rest of the country where needed. The work of filariasis control has been taken over by national staff, with assistance from the Regional Office for South-East Asia, the research unit having been discontinued in 1969.

A similar project, the WHO Aedes Research Unit at Bangkok, was set up in 1966 to study the bionomics of Aedes, and in particular of Aedes aegypti, the principal vector of yellow fever, dengue, and the associated dengue haemorrhagic fever—the last-mentioned of which has in recent years occurred in South-East Asia in epidemic form. The valuable work of this unit is being taken over by a department in the Ministry of Health that will be concerned not only with Aedes but also with other insect vectors of disease in Thailand.

* It is an essential function of WHO to place health problems in their proper perspective and to discourage sensationalism. This is particularly important whenever public opinion has become unduly sensitive as a result of the sometimes misleading activities of pressure groups. During the year two health problems—cholera and the adverse effects of DDT—have been magnified out of proportion to the real hazards. It is true that in recent years cholera has spread from its endemic foci and has caused severe outbreaks in countries in West Africa as well as in India and Indonesia; and it is also true that in many countries where it has long been endemic it is a health problem of the first importance. But the isolated cases that have occurred in, for example, the European Region have at times been given a prominence that is not justifiable in the light of present knowledge of the disease, and unreasonable alarm has been aroused among members of the public. Through the press, radio, television and other mass media, WHO has played an outstanding role in calming public fears by explaining the steps that have been and are being taken to deal with cholera and by demonstrating the unlikelihood of a major outbreak occurring in countries with satisfactory sanitation systems and among populations that observe the basic principles of personal hygiene. At the same time, it has urged countries to maintain a strict observance of the International Health Regulations while refraining from excessive measures, and it has requested governments to adhere to their obligations in respect of the notification of cholera outbreaks. The great pandemics of cholera have left a legacy of fear that is
still far from being dissipated, and WHO is playing a major role in preventing panic and inculcating a rational approach to a disease that has lost many of its terrors.

WHO has also sought to preserve a sense of proportion—and to persuade governments to do likewise—on the subject of DDT. The Organization is fully alive to the danger of DDT to certain forms of wildlife, and it has devoted and is devoting considerable attention to the search for less hazardous insecticides and other ways of controlling insect vectors of disease. But recognition of the fact that DDT might carry with it certain hazards should not be allowed to obscure its immense advantages. In the quarter of a century during which it has been in extensive use it has conferred incalculable benefits on millions of people by reducing their burden of disease, improving their well-being, and opening up vast territories to economic development. Before DDT is condemned, these benefits should be carefully weighed against the risks, and only if it is clearly shown that the disadvantages outweigh the advantages should it be discarded. On the evidence available to WHO at present it would seem that, in spite of the adverse publicity DDT has received, there is at present no justification for abandoning this most valuable weapon in the fight against disease.

* *

For more than 20 years, in accordance with successive resolutions of the World Health Assembly, WHO has been responsible for the technical supervision and support of the health programme of the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA). This programme now caters for nearly 1.5 million Palestine refugees, most of whom continue to live in adverse economic and social circumstances. For several years, however, the financial situation of UNRWA has been steadily deteriorating, mainly because of the rising cost of providing education for more and more children of school age and the failure of income to keep pace with expenditure. This financial imbalance is a source of anxiety to all concerned with the health, education, and welfare of the refugees. Various appeals for donations have been made, including two by WHO, and many governments have responded generously. Nevertheless, the Agency’s small working capital is now virtually exhausted and it will no longer be possible to finance budgetary deficits from that source. The financial support for UNRWA for the year 1972, announced by contributing governments at the annual Pledging Conference during the twenty-sixth session of the United Nations General Assembly, is far from sufficient, and, if the shortfall is not made up from other sources, it will be impossible for the Agency to maintain even the minimum services it provides at present. In this event, the consequences for the refugees—and, in particular, for the health of the most vulnerable groups among them—will be indeed grave. It is therefore more than ever to be hoped that the international community will respond to the resolution on this question adopted by the Twenty-fourth World Health Assembly, by making generous financial contributions to WHO for the specific purpose of providing more support for UNRWA’s health programme, which may otherwise break down completely.

* *

From the financial point of view, the past year has been one of unusual difficulty for the Organization owing to the unsettled monetary situation. It is not necessary for me to discuss in detail here the repercussions that this has had on the Organization’s programmes. Inescapably, economies have had to be made and some activities planned for 1971 have had to be postponed.
In spite of these and other difficulties that have beset the work of the Organization over the past year, and although on many previous occasions I have had to report setbacks to various programmes, the overall picture of what has been accomplished by WHO since its foundation gives cause for satisfaction, though not for complacency, and justifies great hopes for the future.

It is evident, however, that if we are going to solve the most pressing problems in the foreseeable future increased funds will have to be set aside for an expanded programme of research, at both the national and international levels. There is a clear need for more effective communication between the health worker and the economist. Until now, it has not been sufficiently realized that an investment in health activities does not serve merely humanitarian ends but is also indispensable for the steady economic growth of any country. In this direction, I believe, lies the real challenge of the future, and a sustained effort will have to be made in the coming years to convince political leaders that a healthy population is one of the most precious assets of a country and that an adequate financial outlay on health is eminently to a country's advantage.

* * *

It is pleasing to be able to report that during the year, when Bahrain (previously an Associate Member), the Gambia and Oman became Members, the World Health Organization moved a little further towards that universality of membership so clearly written in its Constitution and so essential to the success of its work.

[Signature]

Director-General
PART I

GENERAL REVIEW
CHAPTER 1

COMMUNICABLE DISEASES

1.1 During 1971 the Organization continued to lay stress in its communicable diseases programme on strengthening national epidemiological services and epidemiological surveillance and to provide or promote training in the control and prevention of communicable diseases. Many of these activities were carried out through the WHO network of reference centres and collaborating laboratories, which have also greatly contributed to the global progress that has been made in research to provide the basic knowledge needed for communicable disease control and in the practical application of that knowledge. Particular emphasis was placed during the year on cholera control and smallpox eradication.

1.2 Further developments were made in the programme for the provision of emergency aid in epidemics; this type of assistance had to be provided on a large scale in view of the continuing spread of the cholera pandemic. This entailed, inter alia, visits to numerous countries by the WHO inter-regional cholera control team and other experts to advise on diagnosis, treatment, control and prevention, as well as the furnishing of emergency supplies—in Africa, largely through the special depots that the Organization has established for the purpose in Abidjan, Brazzaville and Nairobi. WHO also supplied cholera vaccines, rehydration fluids, antibiotics and vaccination equipment, as well as co-ordinating their supply from other sources, for the cholera-stricken refugees in West Bengal, India. In addition, vaccines and sera were provided against tetanus and diphtheria and various drugs for combating typhoid fever, shigellosis and intestinal infections of undetermined origin.

1.3 All these intestinal infections, which are commoner than is often realized not only in the developing countries but also in underprivileged areas of the more highly industrialized countries, are largely the consequence of low standards of living, and the only effective long-term remedy is improvement of sanitary facilities and personal hygiene. Specific short-term control measures such as immunization or chemoprophylaxis remain essential but they only complement long-range efforts to improve sanitation and health education; therefore, in addition to emphasis on research to develop more effective control measures, much of the Organization's efforts to combat these diseases have been directed towards environmental sanitation, food control and better personal hygiene.

1.4 Several communicable diseases, onchocerciasis and trachoma in particular, are important causes of blindness. The Organization's activities for their control, together with its work in nutrition, occupational health and accident prevention, do much to reduce the prevalence of blindness and visual impairment. Following the adoption in 1969 by the Twenty-second World Health Assembly of a resolution (WHA22.29) on the prevention of blindness, a questionnaire was sent to all Member States and Associate Members seeking information on the known burden of blindness in their countries and on its causes. The answers received and other available information are being analysed by the Organization, and a report will be submitted to the World Health Assembly. Since there are numerous concepts and definitions of the various degrees of blindness, and it is therefore difficult to obtain comparable information, definitions of blindness and visual impairment intended to be generally applicable have been prepared and will be included in the report.

1.5 The Organization has strengthened its collaboration with other international organizations and non-governmental organizations active in this field; among the latter are the International Association for Prevention of Blindness and the International Organization against Trachoma. Contact has also been maintained with the World Council for the Welfare of the Blind. In August, the Organization presented papers on its activities and on trends in the prevention of blindness and visual impairment at an international seminar on the subject, held in Jerusalem and attended by participants from 36 countries.

Epidemiological surveillance of communicable diseases

1.6 To many national health administrations and to much of the general public, the cholera pandemic continued in 1971 to be the most arresting international
public health problem. The age-old fear aroused by cholera caused unjustified and excessive protective measures to be taken, even in countries where the standards of community water supply and wastes disposal are such that any but very localized outbreaks of the disease can be largely discounted. For many other countries, especially on the African continent, cholera presented a very real threat to public safety and welfare. Given the present conditions of sanitation in much of the world, the current means of prevention and control may halt an outbreak of cholera but cannot prevent the disease from crossing national borders, in spite of any excessive measures that may be taken to that end. Realization of this fact has led to the strengthening of national surveillance of diarrhoeal diseases in many countries in order to ensure the earliest possible detection of the presence of the cholera vibrio, prompt reporting and adequate containment action. The spread of cholera has made health authorities more aware of the constant risk of dissemination of other infections as well (particularly enteric infections) through international traffic, and it may bring about more purposeful national epidemiological surveillance of communicable diseases in general. On the debit side, however, is the disturbing observation that some Member States still do not honour their obligation towards the international community and refrain from notifying the appearance of cholera in their countries, thus depriving threatened communities and neighbouring countries of the opportunity of making adequate preparations in good time and also preventing the Organization from fulfilling its own obligation to keep Member States continuously informed about the global epidemiological situation.

1.7 In January 1971, for the first time since the entry into force of the International Sanitary Regulations (1951), a meeting of a group of members of the Committee on International Surveillance of Communicable Diseases had to be convened under Article 112 of those Regulations to consider a dispute resulting from measures taken with regard to a Member State. The dispute was resolved to the satisfaction of the interested parties and a statement issued.1

1.8 After the meeting in September of the Regional Committee for Europe (see paragraph 18.4), WHO experts visited all countries in the Region in which cholera had been reported, in preparation for a conference on cholera control in Europe held in Copenhagen in mid-December in pursuance of resolution EUR/RC21/R6. Detailed recommendations concerning cholera control in the Region were made at the conference, which stressed, inter alia: the improvement of environmental sanitation as the only sure means of dealing with cholera as a communicable disease and the particular importance of this measure in relation to the health of tourists and migrant workers; the essential importance of prompt notification of all suspected and confirmed cases to WHO; and the negative and destructive effect of measures taken in excess of the International Health Regulations, unjustified epidemiologically and restricting the free movement of persons and trade.2 Cholera outbreaks occurred in the European Region in Algeria, Morocco, Portugal and Spain, with isolated imported cases known in France, Sweden, the United Kingdom and West Berlin.

1.9 Altogether, cholera was reported from 39 countries or territories in 1971, six of these having imported cases only. Although this total is not appreciably different from that for 1970, the overall number of cases reported was much greater—more than 148 000 up to 9 December 1971 as against some 46 500 in 1970. There was almost a six-fold increase in the number of cases reported from African countries (some 63 000 up to 9 December as against about 11 000 in 1970). The figure for Asian countries doubled, Indonesia reporting approximately 19 000 cases and India about 60 000, of which some 49 000 (with about 6000 deaths) were in West Bengal refugee camps.

1.10 Plague in human populations was largely confined to the Republic of Viet-Nam, from which over 3000 confirmed or suspected cases were reported during 1971. Some 180 cases were reported from Burma, the only other country in Asia from which cases were notified. Sporadic cases were notified in the Americas: 16 in Bolivia, 21 in Brazil, 8 in Ecuador, 12 in Peru, and 2 in the USA. As in 1970, Madagascar, with 26 cases, and Zaire, with 6 cases, were the only two countries to record cases in Africa. The world total for 1971—3432 cases—was less than the 4487 cases reported in 1970 and the disease did not pose a problem in international traffic.

1.11 Sporadic cases of jungle yellow fever occurred in Bolivia (5 cases), Brazil (9), and Colombia (9). In Africa, the only area in which the presence of the disease was reported in 1971 was Angola, where 65 cases and 42 deaths were recorded.

1.12 Smallpox showed an increase in recorded incidence, with some 50 000 cases reported throughout the world in 1971, compared with over 30 000 in 1970; 25 000 were in Ethiopia (see paragraph 1.24).

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However, there was further geographical limitation in the endemicity of this disease, which now is mainly confined to Ethiopia and Sudan (and perhaps Botswana) in Africa, and Afghanistan, India, Nepal and Pakistan in Asia.

1.13 With respect to malaria, which is dealt with in detail in Chapter 2, the global situation was very similar to that in 1970. In addition to the technical guide for a system of malaria surveillance mentioned below, a semestrial and an annual report on the status of malaria eradication during 1970 and accounts of cases imported into malaria-free countries were published in the Weekly Epidemiological Record.¹

1.14 Influenza due to the A2 virus caused few epidemics in temperate areas of the northern hemisphere in the earlier part of the year but was responsible for several outbreaks in other parts of the world. During the summer an unusual number of sporadic cases of A2 influenza were diagnosed in the northern hemisphere. Virus B also caused a number of outbreaks in both hemispheres (see also paragraph 1.42).

1.15 The reports made to the Organization do not indicate that either louse-borne typhus or louse-borne relapsing fever caused difficulties in international traffic. In Burundi and Rwanda, however, louse-borne typhus continued to be a communicable disease problem of some magnitude, although fewer cases were reported in 1971 than in the previous year. A number of cases were also reported from Ecuador and Peru.

1.16 In the Americas, two outbreaks of poliomyelitis were reported in January-February from the Province of Buenos Aires in Argentina; in one there were 95 paralytic cases, and in the other there were 104 cases but the number of paralytic cases is not known. In the Dominican Republic there were 99 cases, with 4 deaths, between January and July, the number paralytic again being unspecified. Outbreaks in Venezuela, in July and in September, caused 16 paralytic cases. In Asia, 1101 cases were reported from India (New Delhi) in the first half of the year; in this outbreak, too, it is not known how many paralytic cases occurred. In Europe, 18 of 35 cases reported from the Netherlands in February-March were paralytic.

1.17 The Salmonella serotypes specifically adapted to the human host (Salm. typhi, and Salm. paratyphi A, B and C) remain a problem, both in the developing countries, in many of which tourism is growing rapidly, and in the more developed countries. Data collected in the WHO surveillance programme have shown that, in some of the latter countries, such serotypes are among the most commonly isolated and may cause large, mainly water-borne, epidemics.

1.18 The development of a network of national centres co-operating with the WHO surveillance programme for outbreaks of salmonellosis and other food-borne infections has shown that, in all areas of the world, there is an increase in the variety of other Salmonella serotypes isolated, many of them for the first time in a given country. This is only partly due to greater interest in the question and must be attributed also to the growth in international trade in foods, animals and animal feeds and to the development of international travel. In some countries the data notified have made it possible to follow the development on a national scale of outbreaks associated with a certain serotype which has unexpectedly proliferated.

1.19 The increase in the number of Salmonella strains showing multiple resistance to antibiotics is also a matter for concern. A quantitative method for testing such resistance has been developed through WHO studies, and, as part of the Salmonella surveillance programme in Europe, the International Reference Centre for Salmonella, Paris, conducted a survey of resistant strains in several countries.

1.20 The International Health Regulations (1969) came into force on 1 January 1971. One of the main differences between these Regulations and the former International Sanitary Regulations (1951) is the concept of an "infected area"—based on epidemiological and demographic considerations—that replaces the concept of "infected local areas", defined according to administrative and geographical boundaries. In practice, however, experience during 1971 has shown that there is a disinclination on the part of Member States to make use of the new "infected area" concept, in spite of the fact that attention was repeatedly drawn to this change in the Weekly Epidemiological Record.

1.21 Vaccination certificate requirements in excess of the Regulations have been made by some Member States and continue to cause difficulties in international traffic because of a tendency to consider entire countries—even continents—infected rather than just the areas notified. Failure on the part of Member States to inform the Organization under Article 8 of the Regulations about measures they have decided to apply in respect of arrivals from an infected area and about the later rescinding of such measures have at times created confusion and unnecessary complications in international travel. Nevertheless, the Regula-
tions undoubtedly serve a useful purpose by restraining the adoption of so-called "disease-prevention" measures that interfere unnecessarily with international traffic, and—despite shortcomings in their application—they serve as an important source of worldwide information on plague, cholera, yellow fever and smallpox.

1.22 The broadening of the concept of international surveillance and its extension in 1969 by resolutions WHA22.47 and WHA22.48 of the Twenty-second World Health Assembly to other diseases of international importance discussed above—namely, paralytic poliomyelitis, louse-borne typhus, louse-borne relapsing fever, malaria, and viral influenza—have given added impetus to national surveillance of communicable diseases owing to the obligation to notify outbreaks of these diseases to WHO. In addition, technical guides for the surveillance of these diseases and those under the Regulations are being published in the *Weekly Epidemiological Record*. These are expected to strengthen local competence and gradually to bring about the adoption of more uniform surveillance methods, thus facilitating international comparison of epidemiological situations. The guides published in 1971 dealt with surveillance of influenza, poliomyelitis, louse-borne typhus, malaria, cholera, and yellow fever. Each of these is also available as a separate reprint.

1.23 Health laboratory services (see paragraph 6.23) are essential to any system of surveillance of communicable diseases and the Organization sought to promote their improvement, particularly in developing countries, and the more purposeful utilization of the abundant facilities that exist in some countries. Serological surveys are also important for adequate surveillance, providing as they do the basic information on the immune status of populations which is needed for rational planning of vaccination programmes and assessment of the results; during the year, the three WHO Serum Reference Banks (in Czechoslovakia, Japan, and the USA) continued to serve for the collection and examination of serum specimens.

Smallpox

1.24 During 1971, the fifth year of the intensified programme of smallpox eradication, the extent of the world's area in which smallpox was known still to be endemic decreased considerably. Brazil, most of Indonesia, and Zaire were thought to have become free of the disease by the end of the year, at which time the remaining endemic countries were considered to be Afghanistan, Ethiopia, India, Nepal, Pakistan and Sudan. Eradication programmes were in progress in each of the latter. It is not clear whether the cases occurring in Botswana represented endemicity or introductions. The annual total number of cases reported to the Organization showed a rise for the first time since 1967, increasing from somewhat more than 30,000 in 1970 to some 50,000 in 1971. This increase was principally accounted for by much more complete reporting from Ethiopia in consequence of an eradication campaign having been begun there; some 25,000 cases, or half the world total, were reported from that country in 1971, compared with 722 cases (final revised figure) in 1970. In the rest of the world the reported smallpox incidence declined by more than 25%, the fourth successive year in which a decrease of this order of magnitude has been noted.

1.25 The decline in incidence was associated with a continuing decrease in the frequency of introduction into non-endemic countries. During 1971, in fact, no cases occurred in either Europe or North America. Because of the decreased risk of smallpox imports, both the United Kingdom and the United States of America decided to discontinue routine vaccination in their countries, although stressing the importance of continuing vaccination programmes for high-risk medical personnel and travellers to endemic areas and of maintaining the greatest vigilance for any cases that might still be imported.

1.26 Progress in the eradication campaign since its inception in 1967 is illustrated in Fig. 1 and 2, which show, by country, the incidence per 100,000 population in that year and in 1971; imported cases have not been included in these two maps. That such progress has been possible is largely due to four factors. First, there is a vaccine of assured potency. Secondly, vaccination is both simply and rapidly done by either jet injector or bifurcated needle. The latter is now widely replacing the former, particularly in the field, as it is effective, easy to carry and use, economical in vaccine (requiring one-fifth as much vaccine as the conventional method) and quick (in one programme it permitted the vaccination of as many as 1000 persons per vaccinator per day). Thirdly, effective and continuing field supervision at all administrative levels has usually been ensured in national programmes. Fourthly, much emphasis in these programmes has been placed on surveillance and containment measures as key elements of strategy, and these measures have, on the whole, been effectively applied.
1. COMMUNICABLE DISEASES

Fig. 1. Recorded smallpox incidence per 100 000 population in 1967 (excluding countries with imported cases only)

Fig. 2. Recorded smallpox incidence per 100 000 population in 1971 (excluding countries with imported cases only)

\[ \text{CASES / 100000} \]

- \( \geq 5.0 \)
- 0.5-4.9
- 0.0-0.49
- 0.0

\[ ^1 \text{In this and the following figure, the countries in which smallpox was recorded during the year have been shaded.} \]
\[ \text{The shadings do not necessarily reflect the incidence or endemicity of the disease throughout the territory of those countries.} \]
1.27 In South America, smallpox transmission now seems to have been reduced to very low levels or interrupted (interruption of transmission may be broadly defined as meaning that no cases of smallpox have been reported in a country in which an adequate surveillance system is operating). However, continuing programmes of surveillance and vaccination are being maintained. Since the discovery and containment in April of a very localized outbreak, involving 20 cases in an area of lower socio-economic status in Rio de Janeiro, Brazil, no further cases have been detected in South America. WHO-assisted systematic vaccination campaigns both in Brazil and in adjacent countries continued but no cases were discovered in the course of their activities. In Argentina, Brazil and Paraguay special programmes were organized to seek out possible residual foci of infection in areas where cases had last occurred and in areas where surveillance was felt not to be entirely satisfactory; no cases were found, however.

1.28 In western and central Africa, no case of smallpox has been discovered since May 1970. In countries in this area, smallpox programmes are now being transformed into communicable disease control, surveillance and immunization programmes dealing with a number of additional important diseases, and activities have been extended to include cholera, measles and yellow fever in addition to smallpox.

1.29 In eastern Africa, smallpox was considered to be endemic in only two countries, Sudan and Ethiopia, by December 1971. However, WHO-assisted programmes continued in 12 countries. In August, Zaire concluded its programme of systematic vaccination, during which 24.3 million of the estimated population of 24.9 million were vaccinated against smallpox and 11.3 million children were given BCG vaccine. The last cases of smallpox detected in 1971 occurred early in September. During the year, outbreaks in Kenya (fewer than 50 cases) and Uganda (fewer than 20 cases), which had resulted from introductions from Ethiopia and Sudan, were detected and rapidly contained. In southern Africa, seven cases were reported by South Africa in January and, subsequently, a focus was discovered in bordering areas of Botswana, which was continuing to report cases in December. In the course of continuing surveillance activities and vaccination programmes in the other African countries, no cases were detected except, as noted above, in Ethiopia and Sudan. An eradication programme commenced in five provinces in Ethiopia late in 1970 and early in 1971 and was extended throughout the country by mid-year. Priority was given to the development of a reporting network and surveillance activities; however, in the course of these activities, more than 2.7 million of the country's 25.5 million population were vaccinated by surveillance teams and co-operating health services. In Sudan, where an eradication programme has been under way for more than three years, the smallpox incidence remained at the same rather high level as in 1970 and the southern provinces continued to be heavily infected; as reported for 1970, the vaccination programme has made disappointing progress and surveillance has been limited.

1.30 In Asia smallpox appeared to persist in an endemic state in Afghanistan, India, Nepal and West Pakistan, and possibly in a limited area of Indonesia. In West Pakistan intensified surveillance activities resulted in a higher incidence being reported than in 1970. Containment was effective in two of the four provinces, but endemic areas in Sind and North-West Frontier Province served as foci of infection for the rest of West Pakistan and constituted a potential risk for neighbouring Afghanistan. No cases have been detected in East Pakistan since August 1970, and, although the recent disturbances have disrupted surveillance and reporting, there has been no evidence to suggest continued transmission since 1970, nor was smallpox demonstrated in the refugee camps in West Bengal up to the beginning of December. In Afghanistan, smallpox incidence declined significantly during the year, and the systematic vaccination programme was virtually completed by the end of the year. Intensified surveillance programmes in India made for a somewhat higher reported incidence in 1971 than in 1970. In Nepal, a number of outbreaks occurred, principally as a result of introductions from Bihar and Uttar Pradesh in India, where smallpox is still heavily endemic. In Indonesia, a country of previously high smallpox endemicity, no cases were detected after September—little more than three years after the beginning of the eradication campaign—except in Sulawesi and a small area in West Java; active surveillance is continuing there to detect remaining foci in remote areas.

1.31 In addition to providing assistance in the execution of more than 40 eradication programmes, the Organization continued to provide both advice and material assistance to smallpox vaccine production laboratories. The WHO International and Regional Reference Centres for Smallpox Vaccine in Utrecht, Netherlands, and Toronto, Canada, respectively, tested more than 260 lots of vaccine and provided consultation and training for producers from laboratories in the endemic areas. All vaccine in use in the en-

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demic countries, whether locally produced or received through donations, now meets the standards of potency, stability and purity prescribed by the WHO Expert Committee on Biological Standardization. During 1971 donations to the Special Account for Smallpox Eradication, principally in the form of vaccine, were received from Belgium, Canada, Finland, Greece, Hungary, Kenya, Netherlands, New Zealand, Sweden, Switzerland, Thailand, USSR, and Yugoslavia. More than 41 million doses of vaccine were distributed. In addition, substantial quantities were provided through bilateral assistance by the USSR and the USA to programmes in Asia and Africa.

1.32 Of considerable scientific interest was the discovery in Africa, between August 1970 and April 1971, of seven cases of a disease which closely resembled smallpox in its clinical manifestations but was found to be caused by the related monkeypox virus. Single cases occurred in Nigeria, Sierra Leone, and Zaire and four cases in Liberia. Although infection in captive monkey populations had been described as early as 1958, these were the first recognized cases in man. Most of the persons infected lived in areas heavily populated by monkeys and where monkeys are consumed as food, although no illnesses were recognized to be occurring in monkeys at the time. None of the persons infected transmitted infection to others. No cases have been detected since April despite intensive surveillance in the infected areas, although some evidence has been found suggesting the involvement of animals other than monkeys. Seven WHO reference centres and collaborating laboratories are actively engaged in study of the viruses isolated. From the studies conducted so far, it is felt that the observations are more of scientific interest than practical concern and they seem not to imply the presence of a potential animal reservoir of smallpox.

1.33 Apart from the investigations of monkeypox, the Organization also encouraged research into the epidemiology of smallpox in Africa and Asia. The WHO International Reference Centre for Smallpox, Moscow, continued its identification and characterization of vaccinia virus strains as part of research into the development of smallpox vaccine of reduced pathogenicity and increased immunogenicity and maintained constant surveillance of variola viruses isolated from patients in Africa and Asia. It also provided training in smallpox virology and diagnosis. The Regional Reference Centre for Smallpox, in Atlanta, Ga., USA, performed similar functions for the Region of the Americas and evaluated field tech-

iques used in that Region for the rapid laboratory identification of smallpox and chickenpox infections.

1.34 In November, a WHO expert committee on smallpox met in Geneva to assess the progress made in the first five years of the programme and to advise on future strategy to be followed in order to interrupt smallpox transmission in the shortest possible time. There was considerable discussion on the expansion of surveillance activities, particularly in those countries where transmission is thought to have been interrupted, and on the effect of the decreasing global incidence of the disease on national vaccination policies.

1.35 The teaching material prepared by WHO in 1969 and 1970 to assist in the clinical diagnosis of smallpox in African and in Asian patients remained much in demand in 1971; more than 100 000 copies of diagnostic wall charts, smallpox recognition cards or teaching slides were distributed. In addition, a teaching exercise was produced for the classroom instruction of national surveillance officers responsible for the investigation of smallpox cases and for containment activities. The text presents a number of practical problems, their solutions, and discussion of the factors involved; it is accompanied by colour plates to illustrate features important for differential diagnosis. More than 2000 copies of this text were distributed during the year.

1.36 The illustrated guide to the laboratory diagnosis of smallpox that was published in 1969 also continued to be requested by a number of laboratories, and WHO collaborating laboratories continued to supply national diagnostic laboratories in the endemic areas with the standard reagents needed for the tests described in the guide.

1.37 As in previous years information was published at intervals on the progress of the programme and related epidemiological matters in the Weekly Epidemiological Record and a review covering the first six months of the year was presented in the WHO Chronicle.

1.38 The Organization maintained close collaboration with countries providing bilateral assistance, and with UNICEF, the League of Red Cross Societies and other organizations assisting the programme.

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Virus and rickettsial diseases

Virus reference centres

1.39 The work of the WHO virus reference centres continued in 1971, and the basic services they offer were provided to national virus laboratories in all parts of the world. Their contribution to the preparation, testing and distribution of the reagents that are necessary to the efficient work of all virus laboratories, and without which authoritative comparisons of the findings of different laboratories cannot be made, was described in some detail in the Annual Report for 1970.1 WHO encourages national virus laboratories to make the widest use of the services available to them through the WHO virus reference centres and fosters close contact between directors of these centres and directors of national virus laboratories. Within countries personal contact and consultation between the staff of the national laboratories and clinicians, medical officers of health and others submitting virus specimens is essential for the proper use of laboratory services and for the proper functioning of the international virus disease programme. To help to ensure the best use of laboratory services, a guide to the collection and transport of specimens has been prepared by WHO and sent in unpublished form to the virus reference centres and other bodies for peripheral distribution. Since it cannot take all possible conditions into account, it gives principles which may be adapted to suit local circumstances and deals with the kinds of specimens required for investigation of different virus diseases and with the collection, storage and transport of specimens.

Team for special studies in virology in Africa

1.40 At the East African Virus Research Institute, Entebbe, Uganda, the laboratory built with funds from the Wellcome Trust to house the WHO team for special studies in virology was completed and largely equipped at the end of 1970. At the beginning of 1971 the laboratory began to function effectively and its formal inauguration took place in March. Also in March the first meeting was held of a scientific advisory committee appointed to guide the development of the team's programme of work in consultation with the leader of the team and the director of the institute. A programme practicable within the limitations of staff and resources was prepared; it includes a detailed investigation of the problem of poor serological responses to live poliovirus vaccines in children living in warm climates, a study in children of severe respiratory infections presumed to be due to viruses, a serological investigation of the incidence and types of rickettsial infections, and a serological-virological investigation into the etiology of encephalitis. Together with the staff of the institute, the team also has responsibility for teaching virology at Makerere University. Thus the stage is set for the realization of the objectives of this team—namely, to assist the institute in providing the countries of the East African Community and neighbouring countries with information on the virus diseases of public health significance, to carry out applied research, and to provide training.

Influenza

1.41 In striking contrast to the preceding three years, there was little influenza due to virus A2 in the temperate-climate regions of the northern hemisphere, apart from an epidemic of moderate severity in the Republic of Korea during the period February-April and a small outbreak in Spain in June. However, in Australia, China (Taiwan), Hong Kong, Malaysia, Singapore and South Africa, outbreaks due to the Hong Kong strain of virus A2 were reported between February and June. They were not very extensive and the disease was in general mild. The strains isolated were antigenically similar to those of 1970.

1.42 Between January and April outbreaks small to moderate in extent and due to virus B were reported first from France, the eastern United States of America and Japan, and later from other countries in western and central Europe and Scandinavia. The cases occurred mainly in schoolchildren. In those countries from which information was obtained there were no "excess deaths" (see paragraph 1.45) during the usual influenza season.

1.43 Work on animal strains of influenza viruses (see also paragraph 1.232) continues to expand and information on the antigenic relationship between strains of animal and human origin is rapidly increasing. The system of nomenclature at present in use for strains of human origin was not designed to show these relationships and a group of consultants met in Geneva in September to prepare a revised system that shows not only the antigenic type of ribonucleoprotein (i.e., influenza types A, B or C) but also the character of the haemagglutinin and neuraminidase antigens of A-type strains. The new system makes it possible to express succinctly the kind and degree of antigenic relationship between any of the A viruses, whether of human or of non-human origin. This nomenclature was published in the Bulletin of the World Health Organization.8

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1.44 In the past few years efforts have been made to improve the protective power of killed influenza vaccines by purifying the whole virus, by using concentrated fractions of the virus, and by employing more effective adjuvants. None of these methods has raised the level of protection very significantly above that provided by the killed vaccines of earlier years. This—together with the development of (still experimental) methods for attenuating live strains of the virus, for producing mutants, and for "recombining" strains with different antigenic characteristics to produce hybrids with desirable properties so far as vaccine production is concerned—has led to an increased interest in the potential value of live vaccines. In October a consultation was arranged in Geneva between research workers from laboratories in North America, Australia, western Europe, Japan and the USSR to exchange information on the progress of their work and on the preparation of strains potentially suitable for live vaccines, and to define areas of common interest in which WHO collaborative studies might be established. As a result of this meeting, arrangements have been made for an exchange of candidate strains for live vaccines between laboratories where they will undergo comparative testing, for the establishment of standardized techniques for the identification of strains, and for exchange of research workers.

Use of "excess mortality" from respiratory diseases in the study of influenza

1.45 In contrast to the precise information obtainable about the influenza virus itself, the quantity and quality of the epidemiological information on influenza is variable. In most countries, influenza is not a notifiable disease; and rarely are morbidity figures published, except sometimes during or after epidemics.

1.46 Statistics on mortality attributed to influenza include a number of deaths not due to infections with the influenza virus, and, conversely, some deaths certified as due to bronchitis, pneumonia and possibly other causes are in fact primarily due to influenza. A practical and generally useful tool for assessing the severity of influenza epidemics in countries with temperate climates has been found to be the "excess mortality" from all acute respiratory diseases, i.e., the greater number of deaths actually recorded than the seasonal number expected on the basis of previous experience. The advantage of these mortality statistics is that they are readily available, at least for large administrative divisions, in many countries both during and between epidemics.

1.47 WHO has organized a collaborative study of "excess mortality" from respiratory diseases to test whether it is of value for making comparisons between countries and to assess its applicability outside the temperate zone. Eleven countries with different climates and in different parts of the world are participating by providing the necessary statistical information. In WHO a computer programme has been written to construct the normal seasonal mortality curve expected in the light of data from the preceding decade; on to this curve are superimposed the current weekly or other returns to allow for ready comparison. The study is expected to last for a number of years, but the results already obtained during the 1970-1971 epidemic season are promising.

The virus reporting system

1.48 In 1963, WHO initiated a system for the collection and distribution of information on viral infections, other than influenza and arboviruses, diagnosed either by virus isolation or serologically. As can be seen from the following tabulation, the number of participating laboratories has since steadily increased from 11 in 1963 to 95 in 1971 in 33 countries (3 in the African Region, 6 in the Americas, 2 in South-East Asia, 18 in Europe, and 4 in the Western Pacific):

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of countries</th>
<th>No. of laboratories</th>
<th>No. of reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1963</td>
<td>7</td>
<td>11</td>
<td>7,825</td>
</tr>
<tr>
<td>1965</td>
<td>24</td>
<td>31</td>
<td>16,086</td>
</tr>
<tr>
<td>1967</td>
<td>28</td>
<td>65</td>
<td>20,478</td>
</tr>
<tr>
<td>1969</td>
<td>31</td>
<td>91</td>
<td>30,667</td>
</tr>
<tr>
<td>1971</td>
<td>33</td>
<td>95</td>
<td>36,000 (estimated)</td>
</tr>
</tbody>
</table>

1.49 Together with the increasing number of reports of virus isolations, an increasing amount of epidemiological and clinical information related to laboratory findings is being received by the Organization through this scheme. The information is processed, analysed and circulated quarterly and annually to all reporting laboratories. Since 1967 use has been made of the Organization's computer facilities for handling the data. The computer programme allows WHO to provide information on, for example, the occurrence of a specified virus type in the reporting countries in recent years and this information has already been found of considerable value to investigators.

1.50 In 1970 electronic data-processing was also used to provide each reporting laboratory with a detailed analysis of the information it had reported during 1969. The same was done in 1971 for the 1970 information. These analyses have been found very useful by the reporting laboratories and are being continued on a regular basis.
There are many variables that affect the comparability of data from different laboratories: level of technical performance, state of development of facilities for laboratory work, interest or lack of interest in certain groups of viruses, public health importance of certain virus diseases in relation to others in a given country, etc. Notwithstanding this, the analysis of the vast amount of data received can give some valid indications of the time trends in viral infections on a global basis, although a complete picture cannot yet be drawn. A study carried out in 1971 of the nearly 24,000 reports made to WHO on enteroviruses other than poliovirus—i.e., the coxsackieviruses of groups A and B and the echoviruses—during the four-year period 1967-1970 has yielded valuable information and is being prepared for publication.

**Viral hepatitis**

Viral hepatitis is a problem of public health importance in all parts of the world and a review of the epidemiology of the disease, with special reference to the tropics, was presented at a seminar on viral hepatitis organized by the International Children's Centre, Paris, in June.\(^1\) Nearly every Member State of WHO provides some information on the incidence of this disease and on death rates, but the amount and nature of the information are very variable. Most countries give the total number of cases notified and the total number of deaths but only about two-thirds give the seasonal distribution and one-third or fewer give cases and deaths by age and by sex.

Some of the earliest recorded outbreaks, in the eighteenth century, of what must have been viral hepatitis occurred in the tropics and all the evidence obtained since that time indicates that this disease is, indeed, as common in warm as in temperate climates or even commoner and seems to be more severe there and to have a higher death rate. Recent work with the Australia (or hepatitis-associated) antigen, which is associated with so-called serum hepatitis but not with infectious hepatitis,\(^8\) indicates that serum hepatitis is considerably commoner in the tropics than in temperate climates. This higher incidence has not yet been explained but it is of very practical significance in relation to blood donors and blood products, since the incidence of hepatitis after the transfusion of blood that contains Australia antigen may be up to 10 times greater than after the use of blood that does not.

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In the first 12 months of the study 72 cases (by no means all of which are vaccine-related) have been investigated. Detailed records of the clinical, epidemiological and laboratory findings have been sent by the collaborators to WHO, where the data are being analysed.

1.58 The WHO collaborative study on the intratypic differentiation of poliovirus strains (essential for the reliable monitoring of the presence of natural and vaccine strains in communities) that also began in 1970 has been further developed and is now in progress in six laboratories in different parts of the world, including the Entebbe laboratory of the WHO team for special studies in virology. Strain-specific antisera are in the course of preparation and strains of poliovirus isolated from the cases of acute paralysis mentioned above are being examined by different tests with the object of improving the specificity and sensitivity of the tests and of ensuring that they can be used successfully by different laboratories.

Arboviruses

1.59 In Africa an outbreak of yellow fever transmitted by *Aedes aegypti* occurred in Angola during the first quarter of 1971, although fortunately it did not extend to neighbouring countries; in parts of the Americas jungle yellow fever remained endemic.

1.60 In March a WHO expert committee on yellow fever met in Entebbe to review current knowledge of the disease in Africa and the Americas and to make recommendations for future action and research. In its consideration of prevention and control the committee pointed out that the two components are vaccination and vector control and that the relative importance of each component varies with the ecological and epidemiological conditions in the area concerned. In the Americas reliance should continue to be placed on the control or eradication of *Ae. aegypti* to prevent urban epidemics, and on vaccination to control infections in persons in contact with forest areas where yellow fever is or may be endemic. In Africa, where the natural history of the disease is even more complex, reliance must be placed primarily on vaccination and surveillance, accompanied by efforts to reduce to the lowest level practicable the vector populations in urban areas. In the prevention of large epidemics the great importance of recognizing the earliest cases was stressed, and the committee urged that the development of virus laboratories in areas of risk should be given more support and that the already established system of sentinel posts and hospitals, and provision of emergency aid teams, should be further developed. Expansion of basic and applied research on the virus and its vectors, and the development of close collaboration between different groups of investigators was recommended. Recommendations were also made about the further purification of the 17D vaccine and the study of methods to improve its thermostability.

1.61 Also in March WHO and the Organization for Co-ordination and Co-operation in the Control of Major Endemic Diseases (OCCGE) arranged a consultation in Bobo Dioulasso, Upper Volta, between many of the leading epidemiologists and entomologists familiar with yellow fever in Africa to discuss practical preventive and control measures that are based on the most recent technical developments and suited to African conditions, and to delimit those areas of epidemiology, surveillance and control in which basic and applied research is most urgently needed. Among the measures they envisaged were the conduct of serological surveys outside epidemic periods in order to define the degree of receptivity of populations and the activity of the yellow fever virus, and the vaccination of all receptive population groups. Intensification of the present surveillance system was also urged, particular emphasis being placed upon arousing the attention of all categories of health personnel at the peripheral level. WHO continues to maintain depots of yellow fever vaccine and of supplies and equipment for yellow fever control for use in emergencies. Its epidemiological surveillance centres in Abidjan and Nairobi centralize and disseminate information on yellow fever and can organize, on request, epidemiological surveys and emergency action in the event of an epidemic.

1.62 In a WHO-supported serological survey for yellow fever in Ethiopia, co-ordinated by the Imperial Central Laboratory and Research Institute, Addis Ababa, more than 4000 human sera have been collected along the Awash valley and from Assab to Lake Abaya. The serum examinations have revealed that in some places up to 23% of young children have antibodies to yellow fever virus. This may be evidence of a serious potential threat of yellow fever epidemics in an area where none has so far been reported and that is undergoing development and urbanization. Some 2000 animal sera collected in the same survey are also being examined. In a related study, also supported by the Organization, a team from the Institut Pasteur, Paris, has collected 2000 human sera in the Omo valley in south-western Ethiopia; this is a follow-up of a very thorough international collaborative investigation of a yellow fever epidemic that
occurred in that area in 1960-1962.\textsuperscript{1,5,3} Other serological surveys in man are under way in the Ivory Coast, Senegal and Sierra Leone.

1.63 Studies of the animal reservoir of yellow fever conducted with WHO assistance by the Institut Pasteur, Dakar, have shown that a high percentage of monkeys from the Ivory Coast have arbovirus group B antibodies, some of these clearly indicating recent yellow fever infection. In the Ivory Coast and in Upper Volta studies of the natural history of yellow fever and other arboviruses are being made jointly by the Organization for Co-ordination and Co-operation in the Control of Major Endemic Diseases (OCCGE), the Office de la Recherche scientifique et technique outre-mer (ORSTOM), and WHO. Monkeys are also under serological investigation in connexion with yellow fever in East Africa (by the East African Virus Research Institute, Entebbe) and in the Caribbean (by the Trinidad Regional Virus Laboratory, Faculty of Medicine, University of the West Indies).

1.64 Dengue continues to be a serious epidemiological threat in the South-East Asia and Western Pacific Regions. During the year there was, notably, a reappearance of dengue in epidemic form in Fiji, and an epidemic also occurred in Tahiti; however, it is not yet clear to what extent these outbreaks involved haemorrhagic manifestations. In large cities of South-East Asia dengue haemorrhagic fever is acquiring endemic status and also seems to be moving into rural areas. An example of the type of collaborative study that WHO is uniquely able to co-ordinate is afforded by an immunological and virological investigation of the immunopathogenicity of the haemorrhagic shock syndrome in this disease among children in Bangkok. This study began in 1971 with the joint participation of scientists from Thailand and the USA (see paragraph 4.17).

1.65 Japanese encephalitis is another matter of public health concern in South-East Asia and the Western Pacific. An inactivated vaccine has been available for several years and has apparently proved effective in Japan. This vaccine (which is now highly purified) has been used in a WHO-assisted field trial, which began in 1969,\textsuperscript{4,6} in the Republic of Korea. The serological responses to the vaccine are good after both primary and reinforcing doses. The low incidence of the disease in the Republic of Korea since the investigation was established does not yet permit an evaluation of the protective potency of the vaccine.

1.66 The recent invasion of the southern United States of America by the virus of Venezuelan equine encephalitis, referred to in paragraphs 1.236 and 16.8, is an example of the need for constant vigilance against the spread of arbovirus infections in areas at risk.

Trachoma

1.67 The revised methods and criteria for the control of trachoma and associated infections in endemic areas that were embodied in a field guide in 1970\textsuperscript{4} were gradually introduced during 1971 in the nine trachoma control programmes that received direct WHO assistance in the form of personnel, supplies or opportunities for training. In addition, advisory services were provided in two countries where trachoma control activities are under consideration.

1.68 In all the trachoma control programmes emphasis continues to be laid by the Organization on the integration of activities for trachoma control into the general health services, the training and optimum utilization of appropriate national personnel, expansion of coverage, and a strict and continuing evaluation of the results achieved. Although the treatment of trachoma must be continued for a long time to be fully effective, it is becoming increasingly evident that control programmes based upon the topical administration of antibiotic preparations accompanied by well-conceived health education measures have as a first effect a significant reduction in the severity of the disease, with the gradual disappearance of the complications that lead to loss of vision; this is followed by a reduction in the number of new cases, leading to a lowered prevalence. Even though, in the first phase, the disease may not be extirpated, it becomes a relatively mild, self-limited condition, involving practically no risk for the individual or the community.

1.69 WHO assistance for trachoma research was given during the year to laboratories in Denmark, France, Israel, Tunisia, the United Kingdom, the USA, and the USSR. This research is essentially aimed at developing more effective diagnostic and therapeutic methods, and it includes studies on the basic metabolism and molecular biology of the

\textsuperscript{3} Neri, P. et al. (1968) Bull. Wld Hlth Org., 38, 863-872.
trachoma agent. Included in the research on therapy is a study into the sensitivity of the trachoma agent to antibiotics of the rifamycin group, in which the mechanism of action differs from that of the currently used antibiotics. The results achieved so far in the laboratory show promise, but extensive pharmacological investigation is required before these antibiotics can be recommended for use against trachoma in the field. WHO is also supporting research on long-acting antibiotics which might ease the problems raised by the necessity for repeated applications. Collaborative studies are being pursued by the WHO International Reference Centre for Trachoma, in San Francisco, Calif., USA, into diagnostic methodology. In one such study the international reference centre and collaborating laboratories in Australia, Denmark and Tunisia are investigating whether a uniform correlation can be established between the proportion of positive findings and the endemicity level, using the complement-fixation test and a technique for the microscopic study of conjunctival scrapings in the different laboratories on specimens from areas with different levels of trachoma endemicity. The ultimate objective is to devise a test system sufficiently sensitive to indicate changes in endemicity as a result of control measures. In another collaborative study the reliability of clinical diagnosis, when made according to a strict definition of signs and with a controlled accuracy of recording, is being matched against the performance of newly developed laboratory techniques (including immunofluorescence tests and primary isolation of the trachoma agent in irradiated cell cultures).

Other chlamydial infections and rickettsial diseases

1.70 In September the Organization held a consultation on the public health significance of chlamydial diseases (other than trachoma) and of the rickettsioses and to consider what collaborative or other studies might most usefully be undertaken in respect of this broad group of diseases that has recently aroused a Renewal of interest.

1.71 In the more developed countries this interest centres particularly upon tick-borne infections and the ornithoses; in developing countries it has been stimulated largely by the presence of louse-borne typhus in several areas. The persistence of louse-borne typhus as an endemic disease in the highlands of central and eastern Africa and of parts of South America continues to represent a serious public health problem because of its complexity and of the limited resources for dealing with it. During the year the Organization made a study of louse-borne typhus in Burundi. In Rwanda, following an outbreak in February, WHO responded to a request from the Government for advice on control measures. A study on control measures in Bolivia is described in paragraph 16.10.

1.72 A collaborative study on the laboratory diagnosis of rickettsial diseases, with special emphasis on louse-borne typhus, was initiated in five laboratories in Belgium, Burundi, Czechoslovakia (at the WHO Regional Reference Centre for Human Rickettsioses, Bratislava), Rwanda and Uganda (at the laboratory of the WHO team for special studies in virology at Entebbe). The centre in Bratislava and the WHO team also set up a survey for the presence of antibodies to other rickettsial infections in a number of African countries.

Venereal diseases and treponematoses

Endemic treponematoses

1.73 The prevalence of the infectious endemic treponematoses has dropped dramatically in several countries as a result of WHO/UNICEF-assisted mass treatment campaigns in the last two decades. The most spectacular decrease was achieved in Haiti, where the prevalence of yaws was reduced from about 50% in 1951 to a fraction of 1% in 1959 (see also paragraph 16.14). Since 1949, in the course of such campaigns, more than 46 million persons in 45 countries have been treated with long-acting penicillin preparations against yaws, bejel, pinta and endemic syphilis. However, despite these excellent immediate results, the endemic treponematoses remain a long-term public health problem. Active clinical cases have been observed even in areas from which one or another of these diseases had been virtually eliminated by mass campaigns, and it is clear that epidemiological surveillance and control measures for the endemic treponematoses will have to be tightened. Moreover, a new generation of children now approaching puberty—most of whom are seronegative and free from endemic treponematoses—do not possess the cross-immunity against venereal syphilis that earlier generations acquired from previous treponemal infection. This, and the social, economic and behavioural changes that are taking place in several developing countries—particularly changes related to migrant population groups—are creating a new epidemiological situation demanding a reorientation of control and surveillance activities for both the endemic and the venereal treponematoses. These activities can be most effectively carried out if they are integrated into the general health services of the
countries concerned, and WHO assistance therefore continues to be directed mainly towards such a reorientation.

1.74 The WHO-assisted sero-epidemiological survey in Niger, begun in 1969, progressed in 1971 after arrangements had been made to overcome difficulties due, *inter alia*, to the nomadism of the population. Seropositivity was found to occur more frequently in nomads than in village dwellers and the children and young adults among the nomads showed a higher seropositivity rate than the elderly, whereas the reverse was true of the villagers. Furthermore, while there were some clinical or suspected cases among the nomads, hardly any were found in the village population. These sporadic cases may have been left over from the mass treatment campaign carried out 10-15 years previously, the infection having been transmitted to children born after the campaign took place.

1.75 In Senegal and Mauritania, mass treatment campaigns along the Senegal River delta during the years 1956-1965 reduced the rate of active clinical cases among those examined from 32% to 1.4%, and seroreactivity from more than 55% to less than 10%. However, a sporadic recrudescence of the infection has been observed recently in children. Consequently, plans are being made for a multipurpose study, to begin first in Senegal in 1972, of which treponematoses will be the main concern. The study will include an investigation of endemic syphilis as a dying disease in regions previously covered by mass campaigns and in adjoining regions where mass treatment has not been applied. In the same zones, sero-epidemiological experiments on non-human primates will be undertaken to determine possible epidemiological associations, in view of the finding of seropositivity and yaws-like lesions in certain monkeys in Senegal (see paragraph 1.94). The occurrence of venereal syphilis and gonorrhoea in man will also be covered by the study. In addition, advantage will be taken of the serum collections made for the treponematoses study to investigate other infections of epidemiological, immunological and public health interest. Finally, ecological, biological and epidemiological research on yaws is being carried out in the formerly meso-endemic zone of Senegal.

1.76 Some 15 years ago, a mass treatment campaign against endemic syphilis was undertaken among seminomads in the Oudalan region of Upper Volta. The campaign was not followed up by seroclinical surveillance until the end of 1970, when a national survey was begun in co-operation with WHO and its international reference centres. The results, reported in 1971, showed that 10% of the children examined had infectious early lesions; 4.1% of the adults also showed lesions, but only a few of these were of the early infectious type. This reservoir of infection may have resulted from insufficient coverage of the population by the original mass treatment campaign and also from inadequate penicillin treatment schedules after that campaign. Genital chancreas constituted 7% of the early lesions observed, indicating a loss of cross-immunity as a result of previous treatment in the mass campaign. Some of the penicillin and equipment for this and other campaigns were donated by the Canadian Students’ War Against Yaws, whose initiative and interest were commended in a resolution of the Executive Board at its forty-seventh session, in January.

1.77 During the year, WHO assisted the Government of Upper Volta in conducting a serological and clinical survey among a random population sample of approximately 3000 persons in the Gaoua district, one of the areas where mass treatment had earlier been carried out. Late cases of yaws—active and inactive—were found in 0.4% of the population examined and new infectious lesions, indicative of a reservoir of yaws, among 1.4% of the children. These findings suggest that there may have been insufficient coverage in the original campaign and inadequate surveillance subsequently.

1.78 In Indonesia, the surveillance phase of a mass campaign against yaws is nearing completion in Madura and Kalimantan and in many areas of Java; in some other parts of Java, however, sero-epidemiological surveys are still in progress and some infectious cases have been reported. Clinical surveys of selected villages in other islands of Indonesia are at the planning stage.

1.79 The WHO inter-regional treponematoses team completed a sero-epidemiological study of endemic syphilis in Bosnia-Hercegovina, Yugoslavia, where a mass treatment campaign was conducted 20 years ago. The results confirm that the transmission of endemic syphilis was completely interrupted by the mass campaign, which was carried out at a time of rapid socio-economic and public health development in the affected area.

**Venereal infections**

1.80 Countries all over the world reported a marked and continued increase in gonorrhoea in 1970. Thus, in Canada, the incidence rate per 100 000 of the population was 150—the highest since 1947 and twice the rate for 1969. In the United States of America, the rate given in official reports was 285.2, surpassing
the peak of 1947. This figure, although it fell far short of an estimate made in 1970, represents an increase of 16% since 1969 and was the highest reported since 1919; the lowest rate was that of 129.3 recorded in 1958. In Denmark, Norway and Sweden the rates per 100 000 for 1970 were 318.7, 203.4 and 513.7 respectively—an increase over the previous year of 14% in Denmark and Sweden and of 23% in Norway. The rise in incidence seems to have continued in 1971 also. In England and Wales, for example, 21% more cases were reported during the first quarter of 1971 than in the same period of the previous year; in France, the increase for the same quarter was 53%, and in Norway and Sweden, 16% and 8.5% respectively. A similar trend in gonorrhoea incidence is apparent also in some eastern European countries and in the developing countries from which reports are available.

1.81 As regards infectious syphilis, the trend in incidence was more varied, and where there has been an increase it has generally been less marked than that of gonorrhoea. Among the exceptions are Belgium, with an increase of 42% from 1969 to 1970, and the USA, with an average increase of 8%, but reaching 50% in some cities. In other countries, the incidence has actually declined in recent years—e.g., in Canada, Denmark and Sweden. A continuation of this downward trend during the first quarter of 1971 was reported from England and Wales, France, and the Scandinavian countries.

1.82 Young people of both sexes are still the major risk group. In Canada the incidence of gonorrhoea per 100 000 population aged 15-20 years rose by 28% from 1969 to 1970. The younger age-groups account for an increasingly larger proportion of the total population, and particularly of the urban population and of itinerant groups—such as seafarers, tourists and migrant workers—who are especially important risk groups. To this age factor new social and behavioural attitudes among the young should be added. The influence of the changing environment on the epidemiology of venereal diseases was stressed at a WHO seminar held in Copenhagen in December to consider the inter-country spread of venereal diseases in Europe, and a WHO seminar on the epidemiology and control of venereal diseases in the South-East Asia Region that was convened, also in December, in Chiangmai, Thailand.

1.83 The activities of the WHO-assisted pilot project for venereal disease surveillance in France and Sweden, which was set up in 1969, were intensified during the year. Data made available in 1971 showed that medical practitioners in the pilot area in France reported 65% more cases to the health authorities in 1970 than in the previous year—an increase reflecting not only the rising incidence of venereal diseases, but also the introduction of an improved reporting system and closer co-operation between physicians and the public health authorities. A similar trend emerged from the reports for the first half of 1971.

1.84 The results of a co-operative study by WHO and the International Radio-Medical Centre, Rome (which is financially supported by the Italian Government), on the frequency and management of venereal diseases on Italian merchant ships, and on the utilization of the Brussels Agreement on the treatment of venereal diseases among seafarers, were assessed. During a 12-month period, the number of cases diagnosed among 3851 crew members on board the Italian ships investigated was 227, or 5.9% (this is a lower percentage than has been observed in the rather few previous surveys undertaken among western European and North American seafarers 1). There was 1 case per tanker and 2.6 per freighter on the average; among the reasons for this disparity are that freighters have relatively larger crews and call at more ports. Although most of the affected men were first treated on board, more than three-quarters of them were referred to a physician—generally a private practitioner—at the next port of call for checking and additional treatment. Gonorrhoea accounted for more than 80% of these cases. A questionnaire completed by the masters of the ships revealed a fairly good knowledge of venereal disease symptoms and treatment schedules. Practically all the masters thought that professional prostitutes were the main source of infection.

1.85 There has been growing evidence of a changing epidemiological pattern of venereal infection in the Western Pacific Region. Towards the end of the year the Organization therefore began an investigation of the causes and extent of these changes in China (Taiwan), Hong Kong, Papua New Guinea, the Philippines, the Republic of Korea, and Singapore.

1.86 In an effort to impress the dangers of venereal disease on young people, a special long-playing record and cassette were produced at the Institut Alfred-Fournier, Paris, on behalf of the International Union against the Venereal Diseases and the Treponematoses, in co-operation with WHO. Both are available in Arabic, English and French; German, Italian and Spanish versions are in preparation.

Research

1.87 Gonorrhoea. One of the difficulties in serological testing for gonorrhoea has been the lack of a stable antigen. During the year such an antigen, which is undergoing further tests, was developed at the WHO International Reference Centre for Gonococci, in Copenhagen. Serological examination by the delayed immunofluorescence technique was adopted by the centre as its routine method for the identification of gonococci from clinical material. However, as the strong serological cross-reaction between meningococci and gonococci may result in diagnostic errors where persons carrying meningococci are concerned, specimens of pathological material from lesions occurring at rare sites such as the tonsils are also subjected to conventional bacteriological examination. At this reference centre, the technique of culturing gonococci was improved by adding an antimicrobial agent, trimethoprim, to the culture medium. It was also confirmed that strains of gonococci with decreased sensitivity to penicillin were more frequent in the older age-groups than in the younger, and that resistance to several antibiotics was more frequent in men than in women and also more frequent in infections acquired outside than within Denmark.

1.88 A specific serological test for the diagnosis of gonorrhoea that is based on examination of a single blood specimen is being investigated at the Wright-Fleming Institute of Microbiology, London, with WHO support, and at the Center for Disease Control, Atlanta, Ga., USA. The preliminary results have been sufficiently promising to justify the field trials now being carried out on a limited scale. If the test proves sufficiently sensitive, its use might significantly reduce the silent reservoir of gonorrhoeal infection among females that is held to be largely responsible for the present outbreaks of the disease.

1.89 An epidemiological study of gonorrhoea in a large city (Paris), carried out with WHO support at the Faculty of Medicine of the University of Paris, has shown that it is becoming increasingly common for infection to be acquired in the suburbs rather than in the city centre, thus providing further evidence of the changing epidemiological pattern to which control measures must be constantly adapted.

1.90 Treponematoses. At Copenhagen studies on serodiagnostic methods were undertaken by the WHO International Reference Centre for the Serology of Treponematoses there, with particular reference to the simplification and standardization of the egg-lecithin component in the VDRL antigen. The centre and a number of other collaborating laboratories also took part in a proficiency testing study to compare their performance of the Treponema pallidum immobilization (TPI) test. This study is co-ordinated by the other WHO International Reference Centre for the Serology of Treponematoses, at Atlanta, Ga., USA.

1.91 At the Venereal Diseases Reference Laboratory of the London Hospital Research Laboratories WHO-supported research was concentrated on investigation of the persistence of treponeme-like forms in the body fluids and tissues of patients with treated and untreated syphilis. The discovery, in several countries, of such organisms in previously treated patients with persistent seropositivity has aroused new interest in the immune mechanism of persistent sero-reactivity and in the assessment of cure. However, opinions still differ regarding the nature of these treponeme-like structures. Further research performed at the same laboratory on serodiagnostic methods has resulted in an improvement in techniques, which may acquire practical importance.

1.92 The WHO International Reference Centre for Endemic Treponematoses at the Institut Alfred-Fournier, Paris, continued its comparative serological studies on serum samples from different field surveillance projects. Attempts to identify the nature of treponemes isolated from the glands of African monkeys failed. Experimental animal studies to elucidate the problem of "truly" penicillin-resistant treponemes in cases of persistent seropositivity after treatment are still being pursued at this centre.

1.93 At the WHO International Treponematoses Laboratory Centre, Johns Hopkins University, Baltimore, Md., USA, much effort has been devoted to research to improve diagnostic techniques, especially the TPI test, and immunostaining procedures. In another study, the presence of spiral organisms in the aqueous humour was investigated in patients with ocular lesions of syphilis or with other eye diseases, but the identity of the organisms found is still in doubt.

1.94 WHO-supported studies by the Faculty of Medicine, Dakar, have revealed the presence of treponemal infection and active yaws-like lesions in baboons captured in the Casamance area of Senegal and in chimpanzees from other areas of western Africa. At the WHO International Reference Centre for the Serology of Treponematoses, Atlanta, it has been shown that material from treponemal lesions in man can be successfully inoculated into chimpanzees, causing seropositivity in the cerebrospinal fluid and skin lesions. Although the Dakar studies have not yet yielded any evidence that the natural infection in simians is transmissible to man, these two related
investigations raise interesting immunological questions concerning the treponematoses and epidemiological questions about the possible role of reservoirs of treponemal infection in animals in the tropics. The latter might be of particular interest in connexion with endemic yaws among Pygmies in central Africa who, being hunters, are in particularly close contact with wild animals.

1.95 In accordance with the recommendations of the WHO Scientific Group on Treponematosis Research that met in 1969,1 one of the main concerns of WHO-sponsored research on these diseases is to improve knowledge of the factors affecting in vitro survival and cultivation of treponemes—and particularly of the pathogenic treponemes, which it has not yet been possible to cultivate outside the living body. During the year research sponsored by the Organization yielded a synthetic medium capable of maintaining pathogenic treponemes for a certain length of time; and a non-synthetic medium permitting maximum growth of non-pathogenic strains is being tried for the cultivation of virulent treponemes.

1.96 WHO-assisted research aimed at the ultimate development of a vaccine against T. pallidum infection achieved encouraging results in the laboratory in 1971. At the Ludwik Hirszfeld Institute of Immunology and Experimental Therapy, Wroclaw, Poland, it was found possible to immunize rabbits artificially against a challenge inoculation by giving them a single injection of a large dose of killed or otherwise non-viable treponemes. In the USA, protection of rabbits for at least one year against experimental syphilis has been achieved at the University of California, Los Angeles, as a result of immunization induced by a gamma-irradiated T. pallidum vaccine. It must be stressed, however, that very much more basic research on all aspects of treponemal infection must be carried out before there can be any expectation of similarly encouraging results from a vaccine intended for use in human beings.

Tuberculosis

1.97 Despite many years of effort by governmental and voluntary health organizations, tuberculosis still ranks high as a public health problem, not only in the developing countries, where the majority of the world's population lives, but also in several technically advanced countries. WHO is greatly concerned that the existing technical knowledge on tuberculosis control is still not being applied to the best advantage. This apparent inertia is due largely to poor communication between members of the medical profession concerned with tuberculosis, who must co-operate if control programmes are to be carried out with efficiency. It was in order to foster such communication and cooperation that the XXI International Tuberculosis Conference was held in Moscow in July. Organized jointly by the International Union against Tuberculosis and the Society of Soviet Phtthisiologists, the conference was attended by more than 2000 specialists, physicians, and scientists from 80 countries. WHO took this excellent opportunity of reiterating the principles of national and international tuberculosis control. To plan and carry out national tuberculosis programmes which benefit not only the individual patient but also the community as a whole, remains the most urgent task.

Training

1.98 Antituberculosis programmes cannot be implemented efficiently without knowledge of the latest control techniques and of modern planning and management methods. WHO is therefore continuing to hold inter-regional and regional training courses for those key national health officers—especially from developing countries—who will be responsible for such programmes.

1.99 For the tenth successive year, an international English-language course in the epidemiology and control of tuberculosis took place in Prague. The participants came from Argentina, Chile, Costa Rica, Hong Kong, India, Indonesia, Iraq, Japan, Kuwait, the Philippines, Poland, Thailand, and Uganda. The fellowships awarded to them by WHO were all financed through UNDP/TA. The total number of English-speaking WHO fellows trained at the Prague course so far is 137, and the number of countries that have benefited from their training is 50. For the first time in 11 years, however, the equivalent international course in Rome for French-speaking fellows did not take place. The organizers had decided that there were not enough candidates to warrant holding the course, and it was postponed until the beginning of 1972.

1.100 As in previous years, similar training in tuberculosis control was provided through regional courses. For the sixth year running, a course for the Western Pacific Region was organized in Tokyo with the cooperation of the Japanese Antituberculosis Association; the course, which took place from May through September, was attended also by fellows from other WHO Regions. In Caracas, the fifth international
training course on the bacteriology of tuberculosis was held for trainees from the Americas.

1.101 The National Tuberculosis Register, Oslo, which is co-operating in a WHO-assisted programme of research into the application of systems analysis to tuberculosis control, organized a sixth inter-regional seminar in advanced techniques for programming in tuberculosis. The programme included selective mass X-ray screening, mass BCG vaccination as an integral part of the national health programme, the establishment and utilization of central tuberculosis registers, the operational and epidemiological evaluation of mass antituberculosis measures, and the theory and application to tuberculosis control of epidemetric models.

1.102 A European regional meeting, in Paris in April, reviewed experience on the integration of tuberculosis control into the general health services—reflecting a change of thinking in some European countries where, for historical reasons, the traditional specialized tuberculosis services persist. The realization is growing that, even in technologically advanced countries, integration is essential for permanent country-wide control of the disease, although how fast and to what extent it is introduced will vary with each country's administrative and personnel structure and the standards of technical efficiency.

1.103 At a Western Pacific regional seminar in Seoul in October national tuberculosis control programmes in the Region were reviewed in the light of the recommendations made in 1964 by a WHO expert committee on tuberculosis.1 There were 31 participants from 26 countries or territories in the Region, and those who had participated in the Tokyo course referred to above also attended as observers. After the seminar, the recommendations that had been made were followed up by WHO with many of the national authorities in the Region.

1.104 As BCG vaccination is the backbone of tuberculosis control, it is imperative that sufficient vaccine of adequate quality should be produced. It has long been a major concern of WHO to perfect BCG production techniques, and at last—after much research into different aspects of the problem—it is possible to produce, from any of the strains in current use, a freeze-dried vaccine with a high survival rate of bacilli and satisfactory heat stability. Thus it is no longer necessary, as formerly, to take into account whether a strain happens to have properties that suit it to the process of vaccine production: the choice of a strain now depends on its in vivo properties, as revealed by animal experiments and studies of allergenicity in man. Guided by these criteria, WHO has recommended certain BCG strains for production of the vaccine that is supplied by UNICEF. The technical complexity of producing vaccine of high quality is such that very few laboratories are competent to apply the latest techniques. WHO therefore discourages the continuation of BCG production laboratories that are inadequately equipped and staffed, and so cannot satisfy present quality requirements, as also the creation of new laboratories that would not be an economically sound proposition. The WHO International Reference Centre for BCG Seed Lots and Control of BCG Products, Copenhagen, and its collaborating laboratories, which routinely check the quality of the BCG vaccines supplied to WHO/UNICEF-assisted projects, also performed quality assays of vaccines made in Argentina, Brazil, the Federal Republic of Germany, France, Indonesia, the Republic of Korea, Senegal, Turkey and Yugoslavia. Thanks to a DANIDA contribution to the WHO Voluntary Fund for Health Promotion, the reference centre also gave three months' training in BCG vaccine production to three candidates selected by WHO. Since 1970, when this training programme was instituted, WHO fellows from Colombia, India, Iran, Romania, Senegal and Turkey have benefited from it. BCG production laboratories in China (Taiwan), Indonesia, Mexico, the Philippines, the Republic of Korea, the Republic of Viet-Nam, and Romania also received advice from the Organization.

1.105 During the year, WHO arranged for tuberculosis research workers and laboratories in various parts of the world to be supplied with mycobacterial antigens, mycobacteriophages, immune sera, and other biological reagents by laboratories that receive a WHO grant for tuberculosis research.

Research

1.106 One of the problems in tuberculosis research that received special attention during the year was that of standardizing the methods usually applied in tuberculosis control programmes. Standardization greatly facilitates the training and supervision of the numerous general health workers who may take part in integrated tuberculosis control programmes.

1.107 The therapeutic efficacy of certain standard drug regimens, which has already been demonstrated in controlled trials, is inducing more and more health administrations to adopt such regimens for nation-
wide use. Other WHO-assisted trials, in operation or at the planning stage, aim to achieve further simplification—e.g., by shortening the duration of the entire treatment, and possibly also the initial phase of intensive therapy. In this way, ambulatory chemotherapy can be made more acceptable from both the operational and economic points of view. In collaboration with the Medical Research Council of the United Kingdom, the Tuberculosis Chemotherapy Centre (Madras, India) further investigated the efficacy of intermittent treatment regimens that can be fully supervised and yet be acceptable and convenient to both the patient and the health services. The results of a recent controlled trial showed that a supervised, twice-weekly, oral regimen of para-aminosalicylic acid (PAS) and high-dose isoniazid was therapeutically as effective as the standard daily regimen of PAS plus isoniazid. Since the total amount of PAS given weekly with the intermittent regimen is less than one-third of that with the daily regimen, the former not only has less toxic effect but is also much cheaper. This supervisable regimen could be applied whenever facilities for injecting streptomycin are not available. Another study carried out at the Madras centre concerned a urine test for differentiating between slow and rapid inactivators of isoniazid. The test consists in examining the ratio of acetylated isoniazid to isoniazid in the urine excreted a few hours after an intramuscular test dose of isoniazid has been given. The question of isoniazid inactivation has a bearing on the practicability of the operationally convenient once-weekly intermittent regimens containing that drug.

1.108 WHO and the Medical Research Council of the United Kingdom are lending their support to a series of chemotherapy trials in Czechoslovakia. In the first trial, now completed, patients were treated institutionally for 3 or 6 months and then given daily or intermittent treatment as out-patients for the remainder of the year. Clearly, the longer course of in-patient treatment did not offer any therapeutic advantage over the shorter. The trial has confirmed, moreover, that an intermittent regimen is as effective in a developed country as it proved to be in India.

1.109 Whereas controlled trials have brought the chemotherapy of tuberculosis to a high degree of technical efficacy, laboratory diagnostic methods are still far from perfect. There is little information about the extent to which different methods and intensities of bacteriological examination can contribute to the case yield, and several WHO-assisted laboratories are at present attempting to clarify this complex problem. It is evident that the controlled-trial method, together with operational research, could be applied also to the bacteriological diagnosis of tuberculosis, with a view to defining quantitatively the importance of each step in the case-finding methods used in control programmes and to attaining greater uniformity of methodology. This would make it easier to train technicians and to assess the results of the programmes. The value of studies such as those being undertaken—especially to the persons who decide how funds are to be allocated to various health programmes—is apparent from a WHO-assisted comparison of diagnostic techniques that was carried out during the year at the Tan Tok Seng Hospital, in Singapore. This study showed the effectiveness of examination by microscopy of smears from two sputum specimens, which can be made at a fraction of the cost of multiple examinations by microscopy and culture.

1.110 A similar need for standardization exists in the field of epidemiology. The annual infection risk of tuberculosis can be reliably estimated by an analytical method based on standard tuberculin testing of representative population groups. The development of this method by the WHO-assisted Tuberculosis Surveillance Research Unit of the International Union against Tuberculosis led to the creation in 1971 of the International Tuberculosis Surveillance Centre (ITSC) under the sponsorship of the Union, the Organization for Health Research in the Netherlands, and WHO. At the request of governments, ITSC will conduct or support epidemiological surveys to estimate the extent and the trend of the tuberculosis problem in the countries concerned. Another important function will be to train tuberculin testers from institutions that request such assistance. For this purpose, ITSC will maintain specialized staff whose performance in tuberculin testing and reading will serve as a standard.

1.111 A supplement to the Bulletin of the World Health Organization 1 was devoted to a study instigated by WHO and carried out between 1961 and 1966 by the tuberculosis and respiratory diseases section of the National Institute of Health and Medical Research, Paris, into the prevalence and trend of tuberculosis among schoolchildren in four countries. This study, which covered more than 230 000 children in 15 centres, in France (4 centres), Poland (4), Switzerland (1) and Yugoslavia (6), revealed weaknesses in the tuberculosis control measures taken in these countries. Thus, at the outset of the study, many children were found not to have been vaccinated.

with BCG, even in a country where such vaccination is compulsory. However, the investigation itself helped to increase the proportions of children tested with tuberculin and vaccinated with BCG.

1.112 The WHO-assisted tuberculosis prevention trial in India, which started in 1968, made good progress during 1971: the controlled BCG vaccination study covering approximately 400 000 persons living in an area near Madras entered its follow-up phase after the entire population of the area had been subjected to an initial examination. In this area, the prevalence of tuberculosis infection and disease is high: 30% of the population are infected by the age of 15 years. During the intake phase, 2200 infectious cases were found among those persons examined. As in most tropical areas, the majority of the population, young and old, were found to be sensitized by atypical mycobacteria, as evidenced by their reactions to a sensitin prepared from the Battey bacillus. Since infection with atypical mycobacteria is known to provide limited protection in experimental animals which is enhanced by BCG, although not above the level attained with BCG alone, the aim of the trial is to determine to what degree this phenomenon applies in man. The findings would need to be confirmed by means of a parallel trial in which the same BCG vaccines were used in a population with little or no sensitization to atypical mycobacteria. A suitable study population—i.e., one that has a high prevalence of tuberculosis but has not been covered systematically by BCG vaccination (a rare combination of circumstances nowadays)—is being sought for such a parallel trial, either in northern India or elsewhere in a subtropical or temperate area.

1.113 The Indian trial confirmed once again that many patients are motivated by their symptoms to seek treatment at out-patient services. A large proportion of infectious cases can be detected by this passive case-finding, which makes the least demands on the health services. A house-to-house case-finding operation using cough as the screening symptom had to be abandoned in the follow-up phase of the trial because it had proved to be a failure from the point of view of cost-effectiveness, i.e., of the number of cases found in relation to the efforts exerted. It is planned to undertake the re-examination, by X-ray, of the entire study population within the next two years. All who show abnormalities in their lungs will undergo bacteriological examination by sputum culture. Sputum-positive patients will be put on treatment immediately; those who are radiologically suspect but culture-negative will not be treated at once but will be re-examined after six months. Since the total study population was given direct BCG vaccination without regard to tuberculin sensitivity at the time of intake, any adverse effect that BCG vaccination may have on persons already infected with tuberculosis should soon become apparent.

1.114 In preparation for the ninth revision of the International Classification of Diseases, WHO requested the International Union against Tuberculosis to review the classification of pulmonary tuberculosis, especially for epidemiological purposes. At a joint meeting between the Union's scientific committees on diagnostic methods and on epidemiology and statistics, in which WHO took part, two-thirds of the participants recommended the principle of a primary bacteriological classification.

Leprosy

1.115 In the absence of any striking advance in the therapy and prevention of leprosy, only limited progress can be made in its control. This is illustrated by the fact that estimates based on the best information available to WHO indicate that the number of persons suffering from leprosy was much the same in 1970 as it had been in 1965 (about 11 million). The data available for 1971 do not suggest any substantial change in the situation.1

1.116 Active case-finding continued in a number of countries. In many instances a great effort was made to treat at least 75% of lepromatous patients regularly. The number of inactive cases and of patients released from control is increasing substantially in several countries. The level of infectiousness is being reduced in areas where case-finding and case-holding are satisfactory, but it still remains high enough for endemicity to persist. The epidemiological impact of the control programme has not been spectacular and indeed could scarcely be so in view of the chronic nature of the disease, its long incubation period and the inadequacy of the tools available to deal with it.

1.117 The Organization continued to provide assistance to various country and inter-country leprosy projects and to give technical guidance in connexion with programmes assisted by UNICEF. The number of specific leprosy control projects, is, however, decreasing owing to the present tendency to make control of the disease an integral part of the work of the general health services.

1.118 Through the WHO Special Account for the Leprosy Programme, financial contributions towards

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control or research projects were made during the year by the Emmaüs-Suisse (Aide aux Lépreux), the Order of Malta (Comité international de l'Ordre de Malte pour l'Assistance aux Lépreux), Deutsches Aussätzigen Hilfswerk e.V., Fondations Raoul Follereau (Luxembourg), and the Junta a Favor de los Leprosos de Venezuela.

1.119 Substantial progress has been made in several fields of leprosy research, but so far with little immediate impact on control of the disease. For that reason the leprosy research programme co-ordinated by WHO is being intensified, with special emphasis on studies relating to Mycobacterium leprae. Research on chemotherapy, prevention and epidemiological and genetic aspects is also included in the programme, and the work is being carried out in 20 different countries, representing the majority of centres engaged in leprosy research. Fourteen papers dealing with WHO-assisted research on the disease were published during the year.

Research

1.120 Four research centres—in India, Mali, Somalia and Venezuela—are co-operating in a trial of the therapeutic effects of conventional and lower doses of dapsone in two groups of lepromatous patients. The results will be analysed and studied after each cohort of patients has completed four or five years of treatment.

1.121 In the continuing WHO-assisted trial of chemoprophylaxis with dapsone at Culion Sanitarium, Palawan, Philippines, 17 of the 252 children in the group treated with dapsone have developed leprosy lesions (a rate of 67.5 per 1000); among the 244 children in the control group, there have been 38 cases of the disease (156 per 1000). The protection conferred on the dapsone-treated group in the first five years of the project amounts to 55.4%. This confirms the findings of another WHO-assisted trial, carried out at the Central Leprosy Teaching and Research Institute, Chingleput, Madras, India, in which the reduction in the number of new cases as a result of chemoprophylaxis with dapsone was estimated at 52.5%. A study to determine the prophylactic value of doses of dapsone lower than those used in the initial trial was started at Chingleput in 1970 and is still in progress. The effects of thalidomide on recurrent lepra reactions in male lepromatous patients are being investigated at the same institute.

1.122 In a pilot study at the Institut Marchoux, Bamako, 22 lepromatous patients were divided into three groups and treated with rifampicin for one year. Different daily dosage schedules—900 mg, 600 mg and 300 mg—were used for each group. Clinical improvement was observed in all three groups, being most evident among the patients receiving the highest dose. The bacteriological index did not appear to be markedly affected, and the reduction in the morphological index was reported to be similar to that obtained with dapsone.

1.123 The double-blind trial organized by WHO in Burma in 1964 to study the effectiveness of BCG in leprosy prevention will continue until the end of 1974. No definite conclusions can be reached until then, but the data collected during 1971 would seem to confirm the view that the best results may be obtained by vaccinating children under 4 years of age rather than older children.

1.124 WHO continued to support a number of studies on the cultivation and experimental transmission of Myco. leprae. At the National Institute of Arthritis and Metabolic Diseases, Bethesda, Md., USA, human leprosy bacilli from 11 patients were inoculated into mouse-bone macrophages, using a medium containing chick-embryo extract; no growth of Myco. leprae was observed. At the same institute, studies of the growth of Myco. lepraemurium in macrophage cultures have yielded further evidence in support of the hypothesis that non-solid bacilli are growing forms.

1.125 Attempts to cultivate Myco. leprae in cell-free, semisynthetic soft agar media were continued at the Department of Tuberculosis, National Institute of Health, Tokyo. The identification of acid-fast strains from second, third and fourth suspensions was undertaken, and the relevant bacterial suspensions were tested in tuberculoid and lepromatous patients. The results were found to be comparable with those obtained using Dharmendra antigen.

1.126 The cultivation of Myco. leprae in soft agar media was also attempted, but without success, at three other research centres in Japan (the National Institute for Leprosy Research, Tokyo; the Research Institute for Microbial Diseases, Osaka; and Aomori Central Hospital).

1.127 Investigators at the Tata Department of Plastic Surgery, Bombay, India, are trying to cultivate Myco. leprae from human lepromatous nodules on cell-free medium and on substrates derived from human spinal ganglia and from human amnion. Growth in the presence of human amnion cells was double that obtained in cell-free medium. Furthermore, growth reached a maximum at 25 days in the latter medium, whereas in the presence of cells it was still climbing steeply on the 25th day.
The Johns Hopkins–Leonard Wood Memorial Leprosy Research Laboratory, Baltimore, Md., USA, is developing biochemical tools capable of measuring gains and losses in growth potential in small numbers of cells of *Mycobacterium leprae* and *Mycobacterium lepraemurium*. Highly sensitive methods of measuring adenosine triphosphate (ATP) have been developed in aerospace research, and attention is accordingly being focused on this indicator of growth potential. The work has two objectives: (a) to achieve even greater sensitivity in the detection of ATP, and (b) to develop methods for the quantitative extraction of ATP from cells of mycobacterial pathogens. It is already possible to quantitate ATP in the range of $10^{-5}$ to $10^{-8}$ µg per 0.1 ml.

At the National Institute for Leprosy Research, Tokyo, a method of maintaining cell cultures phagocytizing *Mycobacterium leprae* for as long as possible without transfer was investigated, but no bacillary proliferation could be observed. Studies on cultured cells of strains isolated from skin fragments of lepromatous and tuberculoid patients revealed apparently higher lysosomal activity in lepromatous than in tuberculoid cells. During attempts to cultivate *Mycobacterium leprae* at the same institute, colonial growths were observed fairly frequently on the media used. Though most of these were merely contaminants, one group that showed a remarkable pleomorphism was reported to contain factors capable of accelerating the growth of leprosy bacilli in the cultivation medium. The bacterial forms were morphologically indistinguishable from *Mycobacterium leprae*.

At the Hiroshima University School of Medicine, Japan, cells for *Mycobacterium leprae* were used for the cultivation of *Mycobacterium leprae*. Bacillary increases were observed for 135 days up to the second ary culture, but substantial decrease ensued during two further passages. After 135 days’ incubation, the organisms were non-viable in the footpads of C3H mice.

The promising results obtained in the cultivation of *Mycobacterium lepraemurium* in cell cultures at the Research Institute for Microbial Diseases, Osaka, Japan, suggest that the large-scale cultivation of this organism is feasible and might pave the way for the cultivation of *Mycobacterium leprae*. The Tuberculosis Research Institute, Prague, reported a definite multiplication of *Mycobacterium lepraemurium* in placental liquid media.

At Aomori Central Hospital, Japan, some growth of *Mycobacterium leprae* was observed after 41 days’ culture in Ogawa egg-yolk medium, implanted with triturated leproma particles, on silicone-coated glass-slide cultures. After six to eight weeks, the slides were covered with acid-fast bacilli. Viability and identification tests are in progress. In the Institute of Leprology, Rio de Janeiro, Brazil, further attempts were made to cultivate *Mycobacterium leprae* in Olitzki synthetic medium before and after enrichment with iron in different concentrations. Slight multiplication of *Mycobacterium leprae* was observed, but only in the first six months.

A number of institutes continued to cooperate with WHO on the transmission of *Mycobacterium leprae* in mice and hamsters and—at the Department of Leprosy, Central Institute for Research on Skin and Venereal Diseases, Moscow—in chimpanzees. At the WHO Regional Reference Centre for *Mycobacterium leprae*, Atlanta, Ga., USA, the preliminary results of investigations into the rejection of skin allografts in thymectomized-irradiated mice indicate an extensive return of cellular immunological function a few months after irradiation. Immunosuppression is also being investigated by means of grafting experiments using normal, thymectomized, and thymectomized-irradiated mice. Preliminary results suggest that long-term immunological suppression can be induced by means of minor shifts in the antilymphocyte serum schedule, but such shifts would have little meaning in mycobacterial infections, in which exposure cannot be timed with precision.

In the same centre, isolates from 18 untreated and 32 treated patients have been tested in mice for dapsone sensitivity. Eighteen patients had bacilli resistant to dapsone and all of them had been under treatment for at least seven years. The findings suggest that resistance of *Mycobacterium leprae* to 0.0001% dapsone (given in the diet of the mice) is rare in untreated patients, and that in treated patients its emergence to this concentration is slow but increases rapidly from 0.0001% to higher concentrations.

In the WHO Regional Reference Centre for *Mycobacterium leprae*, National Institute for Medical Research, London, *Mycobacterium leprae* infections in mice have been used to study the evolution and pathogenesis of leprosy neuropathy. From studies on the morphology and biochemistry of mycobacteria, it appears that pathogenic mycobacteria that are capable of surviving and multiplying intracellularly accumulate surface materials known chemically as mycosides. Investigations of dapsone-resistant strains of *Mycobacterium leprae* showed that dapsone resistance takes at least six years to emerge. In a pilot chemotherapeutic trial, the finding that rifampicin reduces the morphological index of skin smears from patients much more rapidly than treatment with dapsone or streptomycin was substantiated. Another investigation
at the centre showed that, in all forms of leprosy, *Myco. leprae* is frequently found within striated muscle fibres and also in smooth muscles within the skin of the testis.

1.136 The effect of dapsone, clofazimine and clofazimine derivative (B.1912) in mouse footpad infection with *Myco. leprae* was investigated at the National Institute of Arthritis and Metabolic Diseases, Bethesda, Md., USA. All three drugs showed suppressive activity, but individual variations among the control animals were marked and the investigators failed to obtain statistically significant results. This study has raised doubts about the reliability of the present footpad screening technique and the suppressive activity of doses of less than 0.01% dapsone in the mouse diet.

1.137 At the National Institute for Leprosy Research, Tokyo, a limited multiplication of bacilli was observed 6-14 months after the footpads of golden hamsters and mice had been inoculated with *Myco. leprae*. In thymectomized golden hamsters, which in addition received antilymphocyte serum and testosterone propionate, the number of bacilli in tissue from one footpad was between 50 and 1000 times higher than in untreated controls. The same laboratory reported that the use of mice thymectomized at birth could be of considerable help in experimental leprosy.

1.138 At the Scientific Research Institute for the Study of Leprosy, Astrakhan, USSR, tamarisk gerbils on an ordinary diet were inoculated with doses of 1.5 million *Myco. leprae*. The bacilli gradually multiplied, reaching a peak after 5.5-9 months, and disappeared altogether from the site of infection after 18-22.5 months. Susceptibility to infection was apparently influenced by the use of an immunodepressant (cyclophosphane), antilymphocyte serum or staphylococcal exotoxin, or by adrenalectomy.

1.139 The influence of temperature on the growth of *Myco. leprae* in the mouse footpad was studied at the Hiroshima University School of Medicine, Japan. Bacilli multiplied appreciably more slowly in mice kept at uncontrolled environmental temperatures than in those kept at 20°C; this confirms the observation that 20°C is the optimal temperature for the growth of *Myco. leprae*. Fluctuations of temperature in animal quarters appear to have had no significant influence on the viability of *Myco. leprae* in mice. The effect of rifampicin against *Myco. leprae* in mice was also studied; the drug was highly active, the estimated minimum inhibitory concentration being between 0.1 mg and 0.01 mg.

1.140 At the Department of Leprosy, Central Institute for Research on Skin and Venereal Diseases, Moscow, studies are in progress on the identification of mycobacteria from infected mice by means of mouse-lepromin testing, histological investigations and cytochemical methods. Other means of identifying *Myco. leprae* were studied at the National Institute of Arthritis and Metabolic Diseases, Bethesda, Md., USA, where it was found that the acid-fastness of *Myco. leprae* could be eliminated after pyridine extraction, whereas that of *Myco. lepraemurium* remained unchanged.

1.141 Attempts have been made at the Research Institute for Microbial Diseases, Osaka, Japan, to obtain a readily reproducible mouse-adapted strain of the human leprosy bacillus. Only temporary proliferation could be obtained beyond the fifth or sixth generation. At the same institute it was found that an injection of 0.2 mg of lyophilized BCG vaccine failed to give mice sufficient cellular immunity against *Myco. lepraemurium*.

1.142 At the Leonard Wood Memorial, Eversley Child Sanitarium, Cebu, Philippines, studies of the lepromin activity of *Myco. leprae* have been undertaken to ascertain whether, after continuous passage in the mouse footpad, the bacillus is still suitable for use as an experimental organism in investigating problems of human leprosy.

1.143 WHO-co-ordinated studies with the aim of standardizing lepromin continued during the year. The value of bacterial counts and the preservation of lepromin were investigated at the WHO Regional Reference Centre for the Standardization of Lepromin, Baltimore, Md., USA. Because of the significant difference between the yield and the staining quality of *Myco. leprae* cells in blender-type and chloroform-type lepromins, studies to assess the adequacy of bacillary counts as predictors of skin-test potency were undertaken. It was concluded that such counts are fundamental to the standardization of lepromin, the concentration of stainable bacilli being the actual determinant of Mitsuda reactivity.

1.144 The other WHO Regional Reference Centre for the Standardization of Lepromin, in Tokyo, reported the successful separation of at least two antigens from a crude extract of lepromatous nODULES. One of these—a protein with a high molecular weight—caused a specific precipitation with rabbit antisera as well as Fernandez-like reactions in leprosy patients. The other antigen, which was separated by gel filtration, produced reactions similar to tuberculin reactions in leprosy patients and positive reactions in guinea-pigs sensitized with BCG.
1.145 At the Institute of Leprology, Rio de Janeiro, attempts were made to obtain an improved lepromin by preparing an antigen completely free of tissue debris; the chloroform extraction method was used to increase the yield of bacilli and lipids. From the chloroform extract a suspension of lipids and bacilli was made in saline phenicated solution. This antigen is stable at room temperature for many months.

1.146 At the same institute, a bacillus-free lipid extract of Myco. leprae was compared with conventional lepromin. Skin reactions with both antigens were practically the same in leprosy patients, 90% agreement being observed in lepromatous patients and 100% in tuberculoid patients. However, there was only 53% concordance in healthy controls.

1.147 At the All India Institute of Medical Sciences, New Delhi, cell-mediated immunity, as assessed by blast transformation with suboptimal doses of phytohaemagglutinin (PHA), was apparently diminished in a few patients with lepromatous leprosy. Mitogenic response to PHA was normal and unimpaired in dapsone-treated lepromatous patients and in tuberculoid patients. Though the defect was manifest at the cellular level, the contributory role of serum factors could not be excluded. The problem is being investigated in the field at Aska and Pogiri, two project areas of the WHO-assisted leprosy control programme in India.

1.148 At the Division of Dermatology, Ministry of Health and Social Welfare, Caracas, thalidomide was found ineffective both in generating and in treating experimental allergic encephalitis, allergic neuritis and non-specific granuloma formation in guinea-pigs. This investigation was undertaken in view of the beneficial but unexplained action of thalidomide against lepra reactions.

1.149 At the Faculty of Medical and Biological Sciences, Botucatu, Brazil, lepromin and tuberculin reactivity were investigated in 863 children, 7-12 years old, having no signs of leprosy. The non-reactors to both lepromin and PPD (purified protein derivative) were divided into three groups. BCG vaccine was administered intradermally in the first group and orally in the second; the third was used as a control group. Lepromin reactivity developed more rapidly in the BCG-vaccinated groups. Intradermal vaccination proved twice as effective as oral vaccination. In 46 children with moderate to strong late lepromin reactions (some BCG-vaccinated, others not), the ability of macrophages to lyse Myco. leprae was studied; in every instance, the bacteria were destroyed in less than 20 days.

1.150 At the Institute of Clinical Medicine, Bari, Italy, investigations of 306 blood serum samples from patients with different forms of leprosy showed increased levels of IgG, IgA and IgM in lepromatous leprosy. Instances of secondary macroglobulinaemia, paraproteinaemia and hypoglobulinaemia were detected. From this study, it appears that cryoglobulinaemia in lepromatous patients is an immune complex phenomenon of leprosy, being due to an interaction of IgM and IgG immunoglobulins.

1.151 At the WHO International Reference Centre for the Serology of Leprosy, Ribeirão Prêto, Brazil, sera from lepromatous patients presenting erythema nodosum leprosum (ENL) were submitted to several serological tests. After being kept under refrigeration for two or three days, active sera became anti-complementary, but this effect disappeared when the sera were inactivated. The level of haemolytic complement was within normal limits, and the contents of the second component (C2) of the complement system did not show any significant fall in titre. The hypothesis that circulating immune complexes are responsible for the ENL was not borne out by these findings. Cryoglobulins were present in only 5 out of 25 sera, and the Rubino test was positive in 13 of the 25 ENL sera. Electrophoretic analysis demonstrated a low albumin/globulin ratio and significant alterations in the globulins, either as proteins or as glycoproteins and lipoproteins. Immunoelectrophoresis demonstrated a high level of IgM and a marked increase in IgG in all sera. Fluorescent antibody detection in leproma sera and the lytic capacity of macrophages are also being investigated at this reference centre.

1.152 At the National School of Biological Sciences, Department of Immunology, Mexico City, it was found that monocytes from lepromatous patients and healthy controls do not exhibit any of the enzymatic activities characteristic of mouse peritoneal macrophages. The sera of lepromatous patients were tested with antigens from Myco. leprae and Myco. lepraeaurium. Positive reactions were obtained in 19-27% of leproma sera according to the method employed, whereas the sera of healthy persons gave negative results. These results indicated either that the method used was not sensitive enough to detect antibodies at low levels or that the antibodies formed part of Ag-Ab complexes. The presence of Ag-Ab complexes in the sera of lepromatous patients was confirmed by an immunodiffusion test.

1.153 Studies on cell-mediated immunity are in progress at the Kahlberg Research Laboratory, Taipei, and at the Institute of Leprology, Rio de
January. In the latter institute, work has started on the stimulation of cell-mediated response in lepromatous patients by means of the passive transfer of extract of human lymphocytes.

1.154 At the Department of Medical Genetics, Faculty of Medicine, University of Campinas, Brazil, the in vitro reactions of macrophages against killed leprosy bacilli were studied by the Beigelman technique (modified) in a sample of 54 leprosy patients. In general, the macrophages of lepromatous patients were unable to digest leprosy bacilli, whereas the inoculum disappeared in all tuberculoid cases after 20 days. In the dimorphous cases, the in vitro reactions of the blood macrophages were the same as in tuberculoid patients, except that the rate of phagocytosis and lysis of the leprosy bacilli was lower. Of 17 indeterminate patients, four had reactions similar to those of lepromatous patients. The reactions of healthy controls are now being studied.

1.155 The hypothesis that susceptibility to lepromatous leprosy is inherited as an autosomal recessive trait is being investigated at the Institute for Cancer Research, Philadelphia, Pa., USA, on the basis of family data on leprosy incidence from the island of Mactan, Philippines. The results of four years’ study in the Philippines confirmed the existence of a significant association of Australia antigen with lepromatous leprosy. A comparison of the levels of Australia antigen in various disease entities is nearing completion; the level in lepromatous patients differs from the levels found in the other disease groups studied.

1.156 Studies on the pathology of leprosy, carried out at the Department of Leprosy, Central Institute for Research on Skin and Venereal Diseases, Moscow, suggest that, in mice, the disease develops in the form of a chronic infection with a symptom-free incubation period of 3-4 months or longer, during which a small number of bacilli occur at the site of inoculation and single bacilli are occasionally found in internal organs. Following primary infection, the disease usually becomes generalized after about two years; lepra-like cells, with massive intracellular aggregation of leprosy bacilli and compact globi, are found in the lesions. Lipids are present and the protoplasm is vacuolated. Different types of tissue reaction were observed in inoculated mice: simple inflammatory infiltration, and tuberculoid and lepromatous-like granulomata. Both degenerative and regenerative changes were found in the peripheral nervous system, not only near the site of inoculation but also at distal sites such as the ear, nose and upper lip, and mycobacteria were present in neural structures.

1.157 At the Scientific Research Institute for the Study of Leprosy, Astrakhan, USSR, mechanisms underlying the development of the leprous process were studied by means of electron-microscopy, histochemical techniques and the biochemical determination of different enzymes. The results suggest that the lysosomes determine the nature of the relationship between the lepra cells and Myco. leprae. Disturbances in the ultrastructure of the lepra-cell mitochondria were found in lepromatous patients. In active tuberculoid and lepromatous granulomas, particularly the latter, certain enzymes showed a high degree of activity.

1.158 A WHO International Reference Centre for Histological Identification and Classification of Leprosy was designated in 1971 at the Division of Dermatology, Ministry of Health and Social Welfare, Caracas. In collaboration with other centres, the new reference centre will seek to establish internationally acceptable criteria for the histological classification of leprosy. It will also promote the teaching and practice of histopathology in leprosy.

**Bacterial diseases**

1.159 The programme of the Organization in regard to bacterial diseases was primarily focused once again on the control of cholera in order to meet the epidemiological situation created by the continued spread of the seventh pandemic.

**Cholera**

1.160 Cholera was once more one of the dominant public health problems in the world. A major outbreak occurred in West Bengal, India, among the refugees from East Pakistan. In addition to isolated and imported cases in a number of countries, 13 countries reported cholera for the first time: six in East and West Africa (Cameroon, Chad, Kenya, Mauritania, Senegal and Uganda), two in North Africa (Algeria and Morocco), three in the Arabian peninsula (Oman, People’s Democratic Republic of Yemen, and Yemen), and two in continental Europe (Portugal and Spain). Altogether, 33 countries reported cholera outbreaks up to 9 December 1971 (excluding six with isolated or imported cases only) as compared with 36 in 1970, but the total number of cases reported to the Organization was the highest since 1953 (see Fig. 3); about one-third of these cases were reported to have occurred in the refugee camps in West Bengal (see also paragraph 1.9).
Fig. 3. Reported incidence of cholera and number of countries reporting cases (other than imported cases), 1951-1971

1.161 Most cholera-affected countries assisted the Organization in fulfilling its obligations by promptly notifying cases, but WHO did not obtain confirmation of unofficial reports of the occurrence of cholera in several other countries. From the available figures, it is apparent that cholera has become at least temporarily endemic in many of the newly invaded territories, although the reporting was in many instances incomplete and did not permit analysis of the influence of seasonal changes and other environmental factors.

1.162 West and North Africa were infected by the Ogawa serotype of the El Tor vibrio in 1970 and this continued to be the predominating serotype in 1971 in most of the affected countries; however, some Inaba-serotype strains of El Tor vibrio were reported from Cameroon, Liberia and Niger. A similar change in serotype has been noticed in several Asian countries in past years. In East Africa, Kenya, which was invaded from the north-east by the Inaba serotype of the El Tor vibrio, also had some El Tor Ogawa cases in the Lake Rudolf area; El Tor Ogawa was also isolated from cases in the northern part of Uganda. In the outbreak in the refugee camps in West Bengal, both the Inaba and Ogawa serotypes of the classical and of the El Tor biotypes of V. cholerae were isolated. This is the first time all four types have been seen together in one outbreak, and it is presumed to be due to their having been carried by different population groups.

1.163 In most of the cholera-affected countries in West Africa, particularly in areas with no reliable water supply, the disease caused explosive outbreaks. Clinically, the cases were more severe than those generally seen in Asia and—particularly in the early stages of the epidemics—there was sometimes a high proportion of deaths, amounting in some outbreaks to 40-50%. However, as soon as treatment facilities were organized, the case fatality rates were reduced to less than 10%. The outbreaks in areas with safer water supplies were reported to be of a protracted type with sporadic cases.

1.164 In Asia, in addition to the epidemic in the refugee camps in West Bengal, a severe outbreak of both Inaba and Ogawa El Tor cholera, with an unusually high case fatality rate for Asia of about 16%, was reported by Indonesia. This outbreak involved the inhabitants of islands from which no cholera has been reported for many years.

1.165 Emergency assistance (see also paragraphs 14.30-14.32) was provided by the Organization to numerous countries in the African, South-East Asia, European and Eastern Mediterranean Regions in the form of supplies of intravenous rehydration fluid, antibiotics, vaccine, vaccination equipment, laboratory media and diagnostic antisera. Generous contributions to the Special Account for the Cholera Programme, in the Voluntary Fund for Health Promotion (see paragraph 14.16), pledged by 16 countries, helped the Organization to meet the requests for assistance. WHO depots were established in Abidjan, Brazzaville and Nairobi to ensure the speedy dispatch of rehydration fluid and antibiotics in cases of urgent need.

1.166 Several institutions in different countries undertook production of rehydration fluid and cholera vaccine. The Organization assisted these activities by providing the required expert advice and basic supplies, in collaboration with multilateral and bilateral aid agencies.

1.167 The simple and inexpensive oral glucose-electrolyte solution for maintenance of rehydration in both adults and children, described in the recent WHO publication, Principles and Practice of Cholera Control, was widely adopted during the year and saved many lives, notably in West Bengal. The use of this oral rehydration fluid also resulted in considerable

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1. Based on data in World Health Statistics Reports and Weekly Epidemiological Record. The figures for 1971 include notifications received up to 9 December 1971.
1.168 Members of the WHO inter-regional cholera control team or other advisers visited Afghanistan, Central African Republic, Congo, Egypt, Federal Republic of Germany, Hungary, Ghana, India, Indonesia, Iraq, Italy, Kenya, Malaysia, Nigeria, Pakistan, Philippines, Portugal, Saudi Arabia, Senegal, Spain, Switzerland, Thailand, and Yugoslavia, to organize the training of medical and paramedical personnel and to assist in the surveillance, treatment and control of cholera or in the local production of oral or intravenous rehydration fluid and cholera vaccine. The WHO International Reference Centre for Vibrios, Calcutta, India, assisted national laboratories in the African, South-East Asia, Eastern Mediterranean and Western Pacific Regions by training laboratory workers, typing and characterizing strains and providing diagnostic reagents and phages.

1.169 In May the Twenty-fourth World Health Assembly adopted a resolution (WHA24.26) concerning the cholera pandemic, in which, *inter alia*, it requested that further studies be made on cholera vaccine prophylaxis and treatment. Accordingly, two consultations on these subjects were held later in the year. At the first of these, it was concluded that there is no immediate prospect of the development of a new immunizing agent to replace the present vaccine, which is of limited efficacy. The need to ensure the quality of the present vaccine was stressed, as many countries are using vaccine of very low potency and this is worsening the situation. Cholera vaccine with aluminium hydroxide has shown promise and will be tested in a controlled field trial.

1.170 At the second consultation the present methods of treatment were reviewed and it was suggested that a single intravenous rehydration fluid with multiple electrolytes, suitable for both adults and children, be locally produced wherever laboratories with the requisite facilities are available. The use of tetracycline to treat both cases and carriers was recommended. It was also suggested that, although the long-acting sulphonamides involve a certain risk, their efficacy for the treatment of carriers should be investigated as it is much easier to ensure their proper administration. In addition, research to find a pharmacological compound that would neutralize the action of cholera toxin in the gut and prevent fluid loss was suggested; some work on this is already in progress (see paragraph 1.178).

1.171 In December a conference on cholera control in the European Region was held in Copenhagen in accordance with a resolution adopted by the Regional Committee for Europe. This conference has been described in paragraph 1.8.

1.172 A travelling inter-regional training course for public health administrators was held in October in Malaysia and the Philippines. Different cholera control projects were demonstrated and modern methods for the planning and evaluation of cholera control programmes were discussed. Assistance was also given to a national training course (in Spain) and a European Region inter-country training course (in Italy).

1.173 In the Philippines, a controlled field trial with monovalent Inaba and Ogawa parenteral vaccines was undertaken. The Inaba vaccine, which had been found in East Pakistan to afford about 93% protection for three months against homologous infection (at the end of that period the epidemic subsided), was found to confer about 60% protection against Ogawa infection for some six months. The Ogawa vaccine, which had conferred practically no protection against Inaba infection in East Pakistan, showed about 71% protection against infection with the Ogawa serotype in the Philippines. Although the difference in protection conferred by the Inaba and Ogawa vaccines in the Philippines was not statistically significant, the vaccine-induced immunity appears on the whole to be type-specific. This has also been shown in WHO-supported studies conducted by the University of Maryland, Baltimore, Md., USA, where a human model for cholera studies has been developed which has clarified some facets of the pathogenesis of cholera in man. A relationship between gastric acidity and infective dose has been demonstrated; homologous immunity after clinical cholera following a challenge has been found to be more effective than heterologous immunity in preventing clinical disease after a second challenge.

1.174 Laboratory studies in experimental animals carried out with WHO participation at the University of Texas Medical Branch, Galveston, Texas, USA, have shown promising results with intradermal, as compared with the usual subcutaneous, cholera vaccination. A field trial of intradermal cholera vaccination (with one-fifth of the usual dose) is therefore being undertaken in the Philippines as part of the joint Philippines/Japan/WHO cholera research project. If this procedure proves effective, the amount of vaccine needed for immunization programmes will be reduced.

1.175 WHO-supported and other laboratory studies on the preparation and purification of cholera enterotoxin are described in paragraph 1.8.  

toxin with a view to developing a toxoid or toxoid-cum-bacterial vaccine continued in 1971. Dogs immunized with 30 μg of enterotoxin with adjuvant developed a high serum antitoxin titre with little or no rise in vibriocidal antibody titre in studies conducted with WHO support at Johns Hopkins University, Baltimore, Md., USA. Significant protection against both vibrio and toxin challenge was observed during about 300 post-immunization days, although by then the antitoxin titre in serum had declined to less than 10% of the peak titre. The nature of this toxin-neutralizing antibody in the fluid collected from the jejunum has not yet been elucidated though it has been ascertained that the neutralizing activity in experimentally immunized dogs or in cholera convalescents is not due to IgA immunoglobulin.

1.176 At the same university parenteral administration of large doses of cholera toxin in experimental animals has been found to be lethal, indicating a need to inactivate the toxin in such a way as to prevent its reactivation and yet retain its antigenicity before it is taken up for immunization of man. Laboratory studies in this respect are in progress in several institutions in Japan, Switzerland and the USA in collaboration with laboratories in India and Pakistan, but development of a stable and safe but antigenically potent formalinized cholera toxoid is proving difficult.

1.177 The availability of purified cholera toxin has made possible a significant advance in unravelling the pathogenesis of diarrhoea in cholera. In a WHO-supported investigation, again at Johns Hopkins University, cholera toxin, like other stimulators of tissue adenyl cyclase, has been found to enhance the adenyl cyclase activity of the gut mucosal cells and the mucosal cell content of cyclic adenosine 3',5'-monophosphate. The latter has been shown to cause inhibition of sodium absorption and to stimulate active secretion of chloride by the intestinal mucosa.

1.178 This knowledge of the biological effects of cholera exotoxin has raised hopes of developing a pharmacological agent for rapidly reversing the process of fluid and electrolyte loss. Several compounds have already been screened in the course of WHO-supported studies at the National Institute of Health in Tokyo and at Johns Hopkins University, and research continues in this field. Treatment of cholera, though it is effective in well-organized treatment centres, is still a difficult logistic problem in many cholera-affected countries. Development of a compound to counteract the underlying biochemical process will certainly be a great help and studies in this direction are being stimulated. Meanwhile, the Organization is supporting the investigation—at the

Delta Primate Research Center, Covington, La., USA—of a compound derived from milk protein which has been stated to absorb the toxin in the gut; this experimental study is being conducted in animals.

1.179 The Organization gathers and disseminates information on the development of drug-resistance in cholera vibrios. A few strains of V. cholerae resistant to chloramphenicol and tetracycline were found in some countries in 1971, but resistance to the commonly used antibiotics was not a serious problem. Multiple drug resistance due to the resistance transfer factor was detected in some strains but found to be unstable.

1.180 Studies on gut-associated immunity have been supported in laboratories at the University of Florida and the University of Chicago, in the USA and at the WHO International Reference Centre for Vibrios, Calcutta, India. Anti-vibrio and antitoxin activities have been demonstrated in gut-washings and cell extracts from the intestinal mucosa of immunized rabbits; the activity was significantly greater in the tissue extracts. A live attenuated laboratory strain of V. cholerae found to be non-pathogenic for man is being tried as an oral immunizing agent at the University of Maryland, Baltimore, Md., USA, with assistance from WHO. Streptomycin-dependent strains developed at that university for the same purpose will need further study to eliminate the possibility of reversion before being tried in man. WHO-assisted genetic studies on vibrios at the Central Drug Research Institute, Lucknow, India, have led to the development of hybrid strains by recombination between V. cholerae and non-cholera vibrios; these strains will be used to elucidate the role of antibacterial and antitoxin immunity in cholera. Laboratory techniques are being developed—in collaboration with the Indian Council of Medical Research, the Cholera Research Centre in Calcutta, India, and the University of Florida, USA—to demonstrate the biological activity of different immunoglobulins found in the intestinal secretions of cholera convalescents and of persons immunized by the oral route.

1.181 Laboratory and field studies of the non-cholera vibrios have also been supported by WHO to develop techniques for their isolation and identification and also to define their pathogenicity for man. Preliminary studies at Kyushu University in Japan indicate that some members of this extremely heterogeneous group produce a diarrhoea-causing toxin like that of V. cholerae, though in much smaller quantities. Similar diarrhoea-inducing toxin has also been demonstrated from strains of E. coli isolated from cases of diarrhoea in Calcutta. The antigenic
Leprosy

The electronmicrograph of the inner structure of a human lepra cell (picture below) was taken at a magnification of 50 000 ×. It shows a group of leprosy bacilli (centre), foamy structures encountered in lepra cells (upper right) and extracellular fluid (bottom right). The picture on the right, taken at 95 000 ×, shows a single leprosy bacillus, Mycobacterium leprae, with band structures. Both pictures were made by Professor M. Nishiura at a WHO collaborating laboratory at Kyoto University, Japan.
Smallpox

Afghanistan (upper left) and Ethiopia (lower left) are among the countries where WHO is assisting in smallpox eradication campaigns. Vaccination teams inoculate persons of all age-groups and all population groups, from city dwellers to villagers and nomadic tribesmen. The bifurcated needle (shown in detail at right) is now widely adopted for vaccination as it is quick, effective, easy to use, and economical in vaccine. Old and ineffective ways die hard, however; in some places, variolation (below) is still practised, although it causes more smallpox than it prevents. This consists in applying scab material from a diseased person to a scratch in the skin of a healthy person.
Cholera

Rehydration therapy is essential in combating cholera.

Above: Indian nurses prepare to give rehydration treatment to a cholera patient newly arrived at an emergency reception centre.

Below: Plastic containers being filled with intravenous rehydration fluid in Switzerland.
similarity of these toxins to that of *V. cholerae* is being investigated in the USA at the University of Oregon to determine the possibility of developing a single immunizing agent.

1.182 Studies to evaluate the effectiveness of simple and inexpensive sanitary measures supplemented by health education for cholera control have now been in progress for three years in the Philippines as a part of the joint Philippines/Japan/WHO cholera research project. In Negros Occidental Province, the incidence of cholera in villages provided with simple sanitary facilities has been reduced by about 70% in three years.

1.183 Cost-benefit analysis during the year (based partly upon an epidemiological model for cholera developed by WHO) has confirmed that the provision of treatment facilities and the adoption of simple sanitation measures are economically more advantageous than mass vaccination against cholera. The protection afforded by the present cholera vaccine is of short duration; vaccination is therefore best used among exposed population groups in the face of an epidemic in areas with poor sanitation. In areas with good sanitation vaccination offers hardly any additional advantages.

**Plague**

1.184 In 1971, human cases of plague were reported from Bolivia, Brazil, Burma, Ecuador, Madagascar, Peru, the Republic of Viet-Nam, the USA, and Zaire. The total number of confirmed cases was 797 as compared with 852 in 1970; suspected and confirmed cases together numbered 4487 in 1970 and 3432 in 1971, the great majority of the unconfirmed cases occurring in the Republic of Viet-Nam (see also paragraph 1.10).

1.185 The global incidence of plague, as assessed from the numbers of cases reported to WHO, has varied from year to year over the past decade without showing a downward trend, largely as a consequence of the recrudescence and persistence of the disease in the conditions caused by the hostilities in the Republic of Viet-Nam. Most of the plague foci, as defined and mapped by a recent WHO expert committee on plague, seem still to be active and a period of relative quiescence, such as is now being experienced, can always be disrupted by small or large outbreaks when favourable conditions arise.

1.186 WHO provided assistance for studies of plague and its control in Indonesia and the Republic of Viet-Nam in 1971. In Burma and Indonesia, national long-term plague surveillance programmes were established with help from the Organization.

1.187 The WHO International Reference Centre for Plague, Alma-Ata, USSR, prepared Fraction 1 antigen for use in serological surveys of plague in the countries of the Western Pacific Region.

**Cerebrospinal meningitis**

1.188 Outbreaks of cerebrospinal meningitis in the "meningitis belt" of Africa were generally of lesser intensity than in previous years. Microbiological investigations, carried out mainly by the WHO International Reference Centre for Meningococci, Marseilles, France, have again shown an increasing *in vitro* resistance to sulfonamides in *Neisseria meningitidis* isolated in Africa. However, it seems that, *in vivo*, most cases react well and promptly to treatment with sulfonamides. Nevertheless as an extra safeguard, the Organization, with UNICEF assistance, added chloramphenicol to the WHO stores of sulfonamides for use against cerebrospinal meningitis that are maintained in Niamey and Brazzaville.

1.189 Studies of the relation of microclimate, crowding and airborne bacteria to the incidence of meningococcal meningitis continued in Mali and Upper Volta in collaboration with the International Reference Centre for Meningococci. In corroboration of epidemiological experience that cerebrospinal meningitis epidemics tend to abate with the onset of the rains, it was found that the total number of airborne bacteria is greater during the dry than the rainy season. It was also found that the number of airborne bacteria—including *Streptococcus salivarius*, an indicator of bacteria of buccal origin—is higher in crowded premises, where meningitis is common. A correlation could be established between the number of airborne bacteria and the incidence of cerebrospinal meningitis.

1.190 Further laboratory and field studies of meningococcal vaccines were sponsored and assisted by WHO during the year. Polysaccharide group A antigen of heavy molecular weight was prepared as a WHO-sponsored co-operative undertaking by French and American research workers, and is being used in serological studies in Senegal and Upper Volta and in large-scale controlled field trials on 66,000 vaccinees in Northern Nigeria (see also paragraph 19.15). The first results showed that, while the seroconversion rate was excellent, the vaccine failed to prevent the spread

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of infection in the trial population. Exposure to tropical heat is suspected of causing degradation of the vaccine by breaking up the heavy molecules of the antigen, thus rendering the vaccine non-immunogenic. The studies are being pursued further and it is expected that a new vaccine will be available for testing in a field trial shortly. In the meantime, while vaccines are being developed and studied, cerebral spinal meningitis is being combated by immediate treatment with sulfonamides and chloramphenicol, available from the WHO stores.

1.191 The WHO International Reference Centre for Meningococci has also continued to distribute typing sera to national laboratories to assist in the identification, typing and testing of resistance of N. meningitidis.

Enteric infections (other than cholera)

1.192 Enteric infections and diarrhoeal diseases other than cholera continued to be a major cause of infant morbidity and mortality and an important public health problem, in particular in developing countries.

1.193 Studies on the improvement of enteric vaccines continued. A second field trial of oral killed typhoid vaccine was completed in India under the sponsorship of the Indian Council of Medical Research in collaboration with WHO. While the results of the first trial,¹ as well as of WHO-supported studies by the University of Maryland in the USA, had shown that this vaccine protected some persons, in the second trial no protection was observed. Oral killed typhoid vaccine seems therefore to be greatly inferior to the established parenteral vaccines (acetone-inactivated and heat-phenol-inactivated), which give 70-90% protection.

1.194 A scientific group was convened in November to review progress in oral immunization against enteric infections with both killed and live vaccines and to recommend further avenues for research. The group considered that, although oral prophylaxis of enteric infections would have many advantages and could in time become the most satisfactory means of protection (along with improved public and personal hygiene), much more information on basic questions of immunization by the intestinal mucosal route is required before oral vaccines are likely to prove as effective as parenteral ones in most enteric diseases (see also paragraph 4.20).

1.195 Studies of streptomycin-dependent Salmonella typhi which, as reported for 1970,² had given promising results in experimental animals were pursued and a vaccine is now being studied in Yugoslavia by the Army Medical Academy, Belgrade, in a small-scale field trial supported by WHO. Similarly, further WHO-assisted studies with streptomycin-dependent shigellae are being carried out at the Delta Primate Research Center, Covington, La., USA, and by the Army Medical Academy, Belgrade; additional proof of their effectiveness as vaccine has been obtained. WHO is also supporting studies at the Delta Primate Research Center aimed at the eventual preparation of live vaccine against infantile gastroenteritis from streptomycin-dependent Escherichia coli. Temperature sensitive strains of shigellae, salmonellae and vibrios that are non-pathogenic but retain their antigenicity have been developed by bacterial geneticists at the University of New South Wales, Australia, with the Organization's assistance. Further genetic studies on enteropathogens and laboratory and field investigations were recommended by the above-mentioned scientific group on oral enteric vaccines.

1.196 Studies organized by the National Institute of Health, Tokyo, in collaboration with WHO and begun in 1970 revealed a notably high degree of resistance to antibiotics among many Shigella strains in the South-East Asia and the Western Pacific Regions.

1.197 The WHO International Reference Centre for Enteric Phage-Typing, London, drew public attention in 1971 to the problems created by the increasing number of Salmonella strains in Europe that are showing multiple drug resistance, probably partly owing to the use of antibiotics in animal foods. Continuing the international surveillance programme, this centre and the WHO International Reference Centres for Salmonella (in Paris), Shigella (in Atlanta, Ga., USA, and London), Escherichia (in Copenhagen) gave further assistance to national laboratories in the typing of Enterobacteriaceae.

Streptococcal and staphylococcal infections

1.198 Streptococcal infections cause concern in many developed and developing countries, particularly in view of their sequelae (e.g., rheumatic fever, rheumatic heart disease and glomerulonephritis) but the true extent of the problem is not known. Pilot studies to develop an effective and practical public health programme for control of these infections and their sequelae were set up by the national laboratory for streptococcal infections in Singapore in collaboration with the WHO International Reference Centre for Streptococcus Typing, Prague. Further studies are being planned in several other countries in tropical

and temperate zones as part of a programme of international collaborative studies aimed at determining the relative importance of these infections in various areas of the world and finding means for their control. In support of these studies, the WHO International Reference Centre for Streptococcus Typing also helped national laboratories by training laboratory workers and providing diagnostic sera.

1.199 Staphylococcal infections and the role of staphylococci in cross-infections are being studied in many parts of the world, and particularly in several of the more developed countries, in which special committees concerned with nosocomial infections have been established. The WHO International Reference Centre for Staphylococcal Phage-typing, London, assisted a number of such studies by helping national laboratories in phage-typing for the identification of the staphylococci involved.

Diphtheria, tetanus and pertussis

1.200 The promotion of diphtheria, tetanus and pertussis control was pursued with UNICEF assistance during the year by the implementation of immunization programmes in a number of developing and other countries. The Organization also kept in close touch with laboratories in Czechoslovakia, the Netherlands and the USSR, among others, where studies are being carried out in an effort to improve pertussis vaccine as well as tetanus and diphtheria toxoids.

1.201 Preliminary WHO-co-ordinated trials have been carried out in two communities with different conditions of life and climate (in Tonga and Yugoslavia) with a combined vaccine against diphtheria, pertussis, tetanus and typhoid fever, the components being prepared according to the respective WHO minimum requirements and then mixed. These trials have shown that the vaccine does not cause serious reactions and induces a good serological response; further controlled trials of their effectiveness will be undertaken.

Veterinary public health

1.202 In many parts of the world veterinarians are undertaking a wider range of public health tasks. In addition to ensuring the health of animals and the safety and wholesomeness of foods of animal origin, they are increasingly active in the control of zoonoses, the monitoring of environmental hazards, and health laboratory work. In collaboration with FAO, WHO has continued to assist countries in these activities and also in training veterinarians and veterinary auxiliaries for public health work.

1.203 Recent trends in the zoonoses have been causing much concern. Diseases such as wildlife rabies in Europe and Venezuelan equine encephalitis in North and Central America are continuing to spread to uninfected areas by natural means. The incidence of certain zoonoses—for example, brucellosis—is rising as a result of the greater production of domestic animals. In some areas, notably in Africa, the prevalence of zoonoses in livestock is seriously impeding economic development.

1.204 The need for new approaches to certain aspects of zoonoses control is reflected in the FAO/WHO programme. In both field activities and research, special attention is being paid to wildlife rabies, brucellosis, the socio-economic aspects of the zoonoses, and food hygiene. Comparative medical research and laboratory animal medicine (with special reference to primates) are also part of the programme.

Rabies

1.205 The Organization continued to place particular emphasis on the development of safer and more potent rabies vaccines for man and of methods for the surveillance and control of wildlife rabies. In addition, assistance was given to programmes for the control of canine rabies.

1.206 The highly concentrated and purified tissue-culture vaccine developed by the WHO International Reference Centre for Rabies, Wistar Institute of Anatomy and Biology, Philadelphia, Pa., USA, is now being tested in non-exposed human volunteers. The trials are being carried out under the auspices of the Michigan State Department of Health, USA, and in accordance with the conditions outlined in the Declaration of Helsinki.

1.207 The FAO/WHO co-ordinated research programme on wildlife rabies in Central Europe was the subject of a consultation held in Geneva in February 1971. The results of epidemiological studies in wild rodent populations were reviewed, and plans were made for collaborative research on the viruses isolated from rodents. Strains of these from Bohemia (Czechoslovakia) and Bavaria (Federal Republic of Germany)

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were found to be antigenically closely related to rabies virus, but their biological properties differed from those of common rabies virus strains (of fox origin, fixed virus, avianized virus) in several ways, and they were less readily adaptable to the brain tissue of laboratory mice. General features of all the rodent isolates include pathogenicity for laboratory mice and low infectivity. In addition, the antigen content of the organs from which the viruses are isolated (salivary glands and/or brain tissue) is sparse. Whether or not there is a link between rodent viruses and the rabies epizootic in foxes remains an open question.

1.208 Even when bounties were given, the intensified hunting of foxes in the Federal Republic of Germany, as in other parts of Europe, has had little effect on the recorded number of foxes killed and the overall epidemiological situation. The bag records provide relatively reliable figures on the density of the fox population, if data are evaluated for areas large enough (more than 1000 km²) to rule out variations in the reporting methods used by individual hunters. A close correlation was observed between the relative density of foxes and the incidence of rabies.

1.209 The State Veterinary Service, Tübingen, Federal Republic of Germany, which is collaborating in the FAO/WHO wildlife rabies programme, reported on the effect of gassing of dens on fox populations and the course of the rabies epizootic. The gassing operations do not affect the environment since the action of the gas is transient and restricted to the interior of the fox dens, which are sealed off after the introduction of the gas cartridge. In areas where the initial numbers of foxes were moderate or high (more than 0.9 foxes shot per km² per year), gassing, combined with the action of rabies itself, reduced the density of the fox population by about 75 %, i.e., to a level at which there were too few animals to maintain the chain of infection. Where the initial density was low (less than 0.7), it was not reduced quite so drastically; in such conditions, however, a reduction of less than 50 % is considered sufficient to eliminate wildlife rabies. The disease could not be eliminated from areas with steeply sloping ground or cuttings in rocky mountain chains or from limestone regions, in all of which the topography made the location of fox lairs difficult and hindered gassing. Other means of control have to be developed for use in such areas. Public health services should bear in mind that a continuous check on the density of the fox population is essential to the surveillance and control of wildlife rabies in areas where the fox is the principal vector.

1.210 Further efforts were made to develop a live vaccine for foxes. During the year, the WHO Regional Reference Centre for Rabies in the Americas, at the Center for Disease Control, Atlanta, Ga., USA, reported on the oral vaccination of foxes with live ERA rabies vaccine virus grown in tissue culture.¹ In an initial trial, a relatively high dose—of about 10⁸.⁶ LD₅₀ for mice, as measured by intracerebral inoculation—was given to five foxes; these animals did not develop any symptoms and resisted challenge, whereas four out of five unvaccinated controls died.

1.211 The Pan American Zoonoses Centre, Buenos Aires, has been helping to co-ordinate and develop programmes for canine rabies control in Latin American cities. About 90 % coverage was achieved in vaccination campaigns carried out in the Lima-Callao area by the Ministry of Health of Peru, with assistance from this centre. In this area, vaccinated dogs are identified by inexpensive plastic collars, which are irremovable and issued in a different colour every year. To encourage owners to vaccinate their dogs, arrangements are being made to impound and destroy dogs not wearing the appropriate collars.

1.212 The programme of rabies surveillance initiated in the Americas in 1969 has been extended to take in data from Canada and the USA. The scope of the rabies epidemiological service at the Pan American Zoonoses Centre is being widened, and it now issues a monthly report, of which 1000 copies are distributed in Spanish and 550 in English. An evaluation by the centre of the data available for 1970 gave the following monthly mean values (estimated) for the Americas: about 20 000 persons treated after exposure; 2 persons suffering from postvaccinal neuroparalytic complications; 21 rabies cases in human beings; 1555 cases in animals.

1.213 The Pan American Zoonoses Centre has recently started to provide control and reference services for rabies vaccines. The need for these services is indicated by the fact that in 1969 only 27 out of 42 vaccines from South American countries were satisfactory in potency tests.

1.214 The WHO International Reference Centre for Rabies, Philadelphia, Pa., USA, has tried out a radio-immune assay procedure for the detection and evaluation of rabies-specific antibodies according to their binding capacity to rabies virus antigen labelled with iodine-125. This method appears to be more sensitive for the detection of rabies antibody than any other at present in use.

**Brucellosis**

1.215 Because of its ravages in livestock and its incapacitating effects in man, brucellosis continues to cause concern in various parts of the world. FAO and WHO provide technical assistance in the control of the disease through their Brucellosis Centres, the Pan American Zoonoses Centre and various collaborating laboratories. The Organization helped the Government of Mongolia with the preparation of a request to UNDP/SF for financial assistance in developing the large-scale manufacture and use of brucella vaccines. This request was approved, and FAO and WHO will act as executing agencies for the project.

1.216 The research work carried out at the FAO/WHO Brucellosis Centres and collaborating laboratories, such as those mentioned below, has been along the lines proposed in the recently published fifth report of the Joint FAO/WHO Expert Committee on Brucellosis, being mainly concerned with improving methods of diagnosis and epidemiological investigation, developing better immunizing agents and obtaining a more accurate characterization of brucella strains. The WHO Brucellosis Centre at the Gamaleja Institute of Epidemiology and Microbiology, Moscow, in collaboration with the Laboratory of Immunology, Faculty of Medicine, Tours, France, has developed a rapid and sensitive passive haemagglutination test for the diagnosis of the disease in man and animals. From *Brucella melitensis* endotoxin, the WHO centre has isolated a lipopolysaccharide which is the active component sensitizing sheep erythrocytes in the test. The investigators at Tours, using an antigen isolated from *B. abortus* and combined with chromium chloride, found that the haemagglutination test was always positive when other tests (bacterial agglutination, complement-fixture) were positive. Moreover, it was often positive when other tests were negative—for example, in two cases of the neuropsychiatric form of brucellosis which were successfully treated with antibiotics. This test gave negative results in city-dwellers unexposed to the disease. In cattle, the passive haemagglutination reaction becomes positive within the first week of infection and, in animals that are going to abort, shows a high titre some two weeks before abortion occurs. Observations on mixed infections also indicate that the test is highly specific and sensitive.

1.217 The vaccination of human beings with live strain 19-BA has been undertaken with some success in the USSR, where a further fall in morbidity was reported by the WHO centre. However, this vaccine sometimes produces untoward reactions in sensitized persons, who may be numerous in endemic areas. The search for a safer vaccine—possibly an immunogenic fraction or an inactivated antigen—is therefore being continued. At the Department of Bacteriology, School of Public Health, University of California at Berkeley, USA, Professor S. S. Elberg has compared the effects of a fractionated antigen derived from the Rev. 1 strain of *Br. melitensis* and of live strain Rev. 1 in monkeys (*Macaca irus*). The fraction alone did not protect against brucellosis but caused serological conversion; live strain Rev. 1 prevented most manifestations of disease, although bacteraemia did occur. However, when monkeys that had been given repeated doses of the fractionated antigen were inoculated with live strain Rev. 1, they developed solid immunity without showing bacteraemia or any other important reaction. This combined method may make it possible to develop a safe and efficient vaccine suitable for use in man.

1.218 Both live and inactivated animal vaccines are now available and have proved satisfactory in bringing down rates of infection and reducing economic loss in areas of high endemicity where the radical method of slaughtering infected animals immediately is impracticable. These vaccines, however, cause serological conversion, especially in adult animals and after revaccination; this limits the application of control measures based on the elimination of animals identified by serological survey methods as being infected. The development of non-agglutinogenic vaccines is receiving particular attention. At the FAO/WHO Brucellosis Centre, Central Veterinary Laboratory, Ministry of Agriculture, Fisheries and Food, Weybridge, England, trials in goats of the 45/20 adjuvant vaccine hitherto used in cattle continued; three and a half years after vaccination, a significant degree of protection against *Br. melitensis* was observed, but the immunity was still not as strong as that conferred by Rev. 1 strain. At the time of challenge, some animals showed low-grade reactions in the agglutination and complement-fixture tests. Professor Ch. Pilet, National Veterinary School, Alfort, France, and his co-workers have developed a vaccine in which superficial antigenic sites of killed strain 19 are saturated with anti-*Brucella* serum. The latest experimental studies suggest that this vaccine may be suitable for the immunization of young adult animals and for revaccination.

1.219 Rev. 1 *Br. melitensis* vaccine has been further studied at the Pan American Zoonoses Centre, Buenos Aires, and at the National Institute for Livestock Research, Palo Alto, D.F., Mexico; the results have confirmed the earlier finding that the vaccine is effective.

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in protecting goats against *Br. melitensis* infection. In Buenos Aires, it was shown that reduced doses also gave protection and that it might be safer to use them when a full dose is contra-indicated. As large quantities of the vaccine are needed in a number of countries, batches obtained by continuous culture—a highly productive method—were compared with those produced on solid medium in Roux flasks. Vaccine produced by continuous culture and freeze-dried or frozen in liquid nitrogen was as immunogenic as vaccine produced on solid medium.

1.220 Epidemiological studies carried out by the WHO Brucellosis Centre in Moscow indicated a shift in the epidemiological pattern of the infection in the USSR, i.e., occupational exposure is giving way to food-borne infection, especially among individual cattle-owners. In some republics, however, foci of infection still exist in flocks of sheep and goats.

1.221 Professor G. Renoux, Faculty of Medicine, Tours, France, and collaborating workers have confirmed that *Br. abortus* infection can be passed on by infected cows to heifers in the succeeding generation and shown that the latter may be latent carriers without presenting any serological reactions or symptoms until the first pregnancy. This adds weight to the view that all animals in an infected herd should be considered as suspect and should not be added to a clean herd or used for restocking.

**Leptospirosis**

1.222 At the WHO/FAO Leptospirosis Reference Laboratory, London School of Hygiene and Tropical Medicine, it was found that the complement-fixation test using the Patoc antigen (derived from a saprophytic strain) could be more effective in the screening of leptospiral infections in man if some parasitic strains were added. This is especially indicated where leptospire serotypes of the *Hebdomadis, Autumnalis* (Phytic strain) could be more effective in the screening test using the Patoc antigen (derived from a saprophytic strain). Laboratories, London School of Hygiene and Tropical Medicine, used for restocking.

1.223 Water contaminated with infected rodent urine is a common source of leptospiral infections in man and animals. The WHO Leptospirosis Reference Laboratory, Gamaleja Institute of Epidemiology and Microbiology, Moscow, studied the viability of leptospires in rodent urine added to natural fresh water collected in a focus of the disease. The leptospires apparently increased in this medium during the first 48 hours, but did not survive beyond five days.

1.224 Proposals for the standardization of the agglutinin absorption test, which is the basic test used for serotyping in leptospirosis, were put forward from the WHO/FAO Leptospirosis Reference Laboratory, Istituto Superiore di Sanità, Rome, in a paper published in the *Bulletin of the World Health Organization*.1

**Parasitic zoonoses**

1.225 *Toxoplasmosis*. The WHO-assisted studies at the Department of Biology, University of Strathclyde, Scotland, and the Statens Seruminstitut, Copenhagen, that led to the elucidation of the life-cycle of *Toxoplasma gondii* and the identification of the parasite as a coccidium were followed up and extended. It was found that the gametogeny of the parasite resulting in the formation of the highly resistant oocysts occurs in cats and wild felines.

1.226 In an experiment undertaken by the above-mentioned institutes (in collaboration with the Ross Institute, London School of Hygiene and Tropical Medicine, and the Department of Zoology and Applied Entomology, Imperial College, Ascot, England) to shed light on the possible cycle of the parasite in man, large numbers of viable oocysts of *T. gondii* were given orally to two chimpanzees, one of which was immune (dye-test positive) and the other susceptible (dye-test negative). Only the susceptible animal became infected, its blood, lymph nodes and muscle being infective to mice. Its serum became dye-test positive but it did not pass any cysts in the faeces. Gametogeny does not seem to occur in the chimpanzee—nor, apparently, in man since oocysts have not been found in the stools of infected persons. Schizogony occurs in primates and other hosts, including cats.

1.227 *Echinococcosis* (hydatidosis). Work in echinococcosis continues to concentrate on field control studies and on methods of epidemiological surveillance. The viability and resistance of *Echinococcus* ova are important factors in both human and animal infections. Workers at the Pan American Zoonoses Centre, Buenos Aires, studied the effects on the ova of temperature, ionizing radiation and an anthelmintic. The eggs can survive at 30 °C for 24 hours without suffering any damage, and a small proportion survive at 50 °C for the same length of time, but their activity is significantly reduced; none survive at 70 °C. After five minutes at 55 °C there is a significant reduction of viability, and after five minutes at 60 °C the eggs are no longer infective. X-ray irradiation at dose levels of 20 and 30 kR has an inhibiting effect on infectivity, but eggs stored for 60 days prior to exposure are less affected than

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those stored for only 15 days beforehand. Ultraviolet irradiation for 24 hours renders the ova non-infective. Eggs kept for two hours at +37 °C in bunamidine hydrochloride, a taeniacidal drug, in 0.5% aqueous solution are rendered non-infective.

1.228 A field programme, based on principles enunciated at an inter-regional FAO/WHO seminar on echinococcosis control, held in Buenos Aires in 1970, has been started in Cyprus with technical advice from WHO.

1.229 Cysticercosis-taeniasis. Work on the serological detection of cysticerci in cattle continued to be co-ordinated by the Organization. Dr I. C. Kagan, Center for Disease Control, Atlanta, Ga., USA, reported that the haemagglutination test was sensitive but not specific if the cattle tested had other helminthic infections as well. It is thus ineffective in village cattle, which usually have a heavy and varied worm burden. Preliminary results with a conglutination test were promising, but a more specific antigen is required. In a latex agglutination test, a fraction obtained from an extract of Taenia saginata was shown by Professor D. Grossklaus, Max von Pettenkofer Institute, Berlin, to be a specific antigen. This antigen will be tested in the field in East Africa.

1.230 In another WHO-assisted investigation, Dr L. W. Dewhurst, Department of Animal Pathology, University of Arizona, Tucson, Ariz., USA, found that T. saginata eggs, the viability of which has been reduced to 50% by ultraviolet irradiation, can suitably be used as a vaccine against cystercerosis in calves.

1.231 Trichinosis. Classical strains of Trichinella spiralis are known to infect rodents and swine. WHO-assisted studies carried out in Paris on a strain isolated in West Africa showed that it readily affects carnivores but is difficult to establish in swine and rats.

Animal influenza

1.232 The search for antibodies against influenza A in mammals and birds has continued to yield interesting results. In eight countries where WHO-assisted investigations were carried out in 1971, it was found that swine had been infected by the Hong Kong strain, but it remains to be seen whether this strain will become endemic in swine, as did the strain that was responsible for the 1918-1919 human pandemic. A recent report to WHO indicates that “classical” swine influenza, caused by the lineal descendant of the 1918-1919 strain, still persists in swine in Hawaii as well as in North America. Antibodies to influenza A were reported in migratory birds in Australia, Brazil, India, the USA and the USSR.

1.233 The complex interrelationships between avian, human and other mammalian influenza strains were the subject of WHO-assisted studies at the Institute of Epidemiology and Microbiology, Prague, the World Influenza Centre, London, St Jude Children’s Hospital, Memphis, Tenn., USA, and the John Curtin School of Medical Research, Canberra. It was found, inter alia, that the antigenic difference between the Hong Kong strain isolated in the summer of 1968 and the A2 strain isolated earlier in the same year is greater than had been realized. Using purified reagents, it was shown that both the haemagglutinins and the polypeptide patterns were quite different. In the light of these results, it seems unlikely that the Hong Kong strain arose by mutation from the pre-existing A2 strain. The hypothesis that it resulted from the hybridization of an animal strain with a human strain is thus strengthened.

1.234 The in vivo recombination experiments undertaken with WHO assistance at Plum Island Animal Disease Laboratory, US Department of Agriculture, Greenport, Long Island, N.Y., USA, were continued. In the first experiments, turkeys and pigs inoculated simultaneously with two strains of animal influenza viruses produced hybrid strains. In more recent experiments, following exposure to animals inoculated with one or the other of the two “parent” strains, indicator animals acquired a mixed infection and yielded hybrid strains. Hybridization can thus take place in circumstances that could occur in nature.

Other zoonoses

1.235 Human lymphocytic choriomeningitis. Twelve cases of human lymphocytic choriomeningitis (LCM) were reported from the Frankfurt-Cologne area, Federal Republic of Germany. The patients were children and adults who had been in contact with eight golden hamsters (Mesocricetus auratus) newly acquired as pets. LCM infection was demonstrated in all eight hamsters by the complement-fixation test or by virus isolation. A sampling of hamsters from three dealers in the area concerned revealed an LCM infection rate of 20-100%. It appears that, in hamsters, spontaneous infection with LCM virus probably occurs only in young animals and does not as a rule lead to

clinical illness. Further work on the role of pet hamsters as a source of LCM infection is being carried out, with WHO assistance, at the State Veterinary Laboratory, Frankfurt, Federal Republic of Germany.

1.236 **Venezuelan equine encephalitis** (see also paragraph 16.8). In the spring of 1971, Venezuelan equine encephalitis, which had been moving northwards through Central America since 1969, advanced along the Gulf coast of Mexico, causing some 10,000 deaths in horses and 12,000 human cases. In July, the disease spread rapidly into south-eastern and central Texas, USA, causing an estimated 1,500 deaths in horses and 60 cases in man. An intensive control programme was started by both countries with technical assistance from the Organization.

1.237 In September, a workshop-symposium was held by the Organization in Washington, D.C., to review scientific information on the disease. The vectors in the recent outbreaks were probably *Aedes sollicitans, Psorophora confiniss*, *P. discolor*, and *Deinocerites pseudes*. The subtype of Venezuelan equine encephalitis virus isolated differs antigenically and in virulence from the strains found in enzootic foci in Panama, Florida (USA) and coastal areas of Mexico since 1962. A live attenuated vaccine (strain TC-83) has proved effective in preventing the disease in horses and limiting transmission to man.

1.238 Earlier in the year, the epidemiological and control aspects of the disease were thoroughly reviewed at the IV Inter-American Meeting on Foot-and-Mouth Disease and Zoonoses Control (in Lima in April) and at a round-table discussion (in Mexico City in May). Both meetings were sponsored by the Organization.

**Socio-economic aspects of the zoonoses**

1.239 Further action was taken during the year in implementation of resolution WHA22.35 of the Twenty-second World Health Assembly in 1969, which called on WHO and FAO to elaborate methods and criteria to be used by Member States in assessing the importance of the zoonoses and determining the priority they should receive in national planning for socio-economic development. Consideration was given not only to the problem of the losses caused by these diseases but also to the need for selecting the most economical methods for their control or elimination.

1.240 Some of the models currently being developed for estimating the economic impact of non-zoonotic diseases by the United States Department of Agriculture and by the University of Melbourne, Australia, were examined with a view to their application to the zoonoses. In addition to arranging for the establishment in Latin America of pilot areas for the study of methods and criteria for the surveillance of zoonoses and the evaluation of control programmes, the Pan American Zoonoses Centre, Buenos Aires, instituted a course on the planning of animal health programmes with special reference to field projects for the control of foot-and-mouth disease in Rio Grande do Sul, Brazil, and brucellosis in Santa Fé, Argentina. Each of these field projects will include a limited cost-benefit analysis.

1.241 In co-operation with the health authorities of North Rhine-Westphalia, Federal Republic of Germany, the Organization is undertaking a programme for the study of the socio-economic effects of wildlife rabies; a similar programme on zoonoses derived from wildlife and from domestic animals is being prepared in Western Azerbaijan, Iran. In addition, WHO is keeping in close touch with the work of research groups in Australia, France, the United Kingdom and the USA that are studying various aspects of the socio-economic consequences of animal diseases and of their control.

**Veterinary education**

1.242 Schools for training animal health assistants have been set up in a number of countries, sometimes with multilateral or bilateral assistance. A joint FAO/WHO expert panel on veterinary education, which met in Rome in July, examined various aspects of the training and utilization of such assistants, including the teaching facilities required. It also considered problems relating to postgraduate veterinary education in developing countries, with special reference to Africa.

1.243 In the veterinary education programmes assisted by the Organization in the Americas, emphasis was placed on the strengthening of undergraduate teaching in preventive medicine, epidemiology, biostatistics, food hygiene and public health. Seminars for teachers in these subjects were arranged to enable them to discuss teaching methods and problems arising in the course of their work. Some schools were helped with equipment and loans of teachers.

1.244 In the South-East Asia Region, assistance was provided for setting up a postgraduate course in veterinary public health at the All India Institute of Hygiene and Public Health, Calcutta.

**Food hygiene**

1.245 Over the past few years, the Organization has been receiving a growing number of requests, parti-
cularly from developing countries, for advice on the development of food hygiene services. The danger of outbreaks of food-borne diseases is increasing for a number of reasons, including centralization of food production, the mass distribution and consumption of foodstuffs and their import and export on an ever larger scale. The spread of these diseases is also favoured by the rapid development of international travel, particularly tourist travel.

1.246 To improve assistance to Member States in the prevention and control of food-borne diseases, a consultation on the principles of organization and management of food hygiene programmes was held by WHO in Geneva in December. Special attention was paid to the newer management techniques and their application, technical and administrative relationships in the management of programmes, and the exchange of information.

1.247 The training of specialists in food hygiene continued; thus, for the sixth year in succession, an FAO/WHO course for meat inspectors was held in Kenya, with DANIDA support. An ad hoc meeting on education and training in meat production, handling, hygiene and marketing, convened by FAO in January 1971 in Rome with WHO participation, recommended that the FAO/WHO courses on meat hygiene and on abattoir development, which have been held in Roskilde, Denmark, since 1962 and 1965 respectively (also with DANIDA support), be merged with a meat production and industry development course. It was further recommended that a permanent FAO regional training centre, with courses provided jointly by FAO and WHO, be established in Africa. In the new courses special attention would be given to meat hygiene at the production stage, during processing, storage and transportation, and during retailing.

1.248 The codes of practice so far adopted by the FAO/WHO Codex Alimentarius Commission (see also paragraph 10.41) include a basic code of general principles of food hygiene, as well as more specialized codes of hygienic practice for the preparation of canned fruit and vegetable products, dehydrated fruits and vegetables (including edible fungi) and desiccated coconut. Codes of hygienic practice concerning quick frozen fruit and vegetable products, fresh meat, processed meat products, egg products and poultry and poultry parts are at an advanced stage of preparation, and preparatory work has started on codes for precooked frozen foods, including semi-cooked foods, and a great variety of fish and shellfish. In general, these codes deal with raw material requirements (including environmental hygiene in food growing and production areas, the hygienic harvesting and production of raw food and conditions during transport), plant facilities (including layout, equipment and utensils), hygienic processing requirements and practices (including laboratory control) and, when appropriate, end-product specifications.

1.249 At its eighth session, which was held in Geneva in June-July, the FAO/WHO Codex Alimentarius Commission agreed to establish a new FAO/WHO Codex Committee on Meat Hygiene to "elaborate worldwide standards and/or codes of practice as may seem appropriate for meat hygiene, including poultry meat". The new committee will finalize the draft code on hygienic practice concerning fresh meat and start work on a code for ante- and post-mortem inspection of animals. An FAO/WHO ad hoc group of experts, which met in Geneva in November, agreed upon a draft code for meat inspection which was submitted for further consideration to the FAO/WHO Codex Committee on Meat Hygiene.

1.250 Professor G. Sakaguchi, University of Osaka Prefecture, Japan, reported the results of a further WHO-assisted survey of the prevalence of type E Cl. botulinum antitoxin in the Japanese population. Of 1639 human sera collected from both endemic and non-endemic areas, 12 were found positive; this was assumed to be due to the repeated consumption of subclinical doses of the toxin in food. This study will be continued and extended to cover other heavily contaminated areas of the world.

1.251 At the same laboratory, further progress has been made in perfecting the reversed passive haemagglutination test for the detection of very small amounts of type E Cl. botulinum toxin in food. This test should prove a very useful means of detecting the presence of the toxin without using experimental animals. Steps have been taken to adapt it to the detection of types A, B and F Cl. botulinum toxins.

1.252 At WHO consultations on food virology held in Brno, Czechoslovakia, in June and in Geneva in July, further improvements in the collection of data on the presence of viruses in food were recommended. Two groups, one headed by Dr J. Menšík, Veterinary Research Institute, Brno, and the other by Professor D. O. Oliver, Food Research Institute, University of Wisconsin, Madison, Wis., USA, are collaborating with the Organization in this work. Dr Menšík and his collaborators reported data on herpesviruses, paramyxoviruses, adenoviruses and reoviruses with special reference to factors of concern to food hygiene, including natural hosts, localization in the animal body, routes of infection for man and the part played by pH
and temperature in the survival or destruction of the viruses during food handling. Similar data were reported for *Chlamydia ornithosis*, which, though not a virus, is included for convenience in the WHO food virology programme. Other aspects of chlamydial infections are dealt with in paragraph 1.70.

1.253 The Organization continued its collaboration with the International Commission (formerly Committee) on Microbiological Specifications for Food, which has completed draft statistical sampling plans for the most important foods in international trade and will shortly publish the final plans. WHO-assisted studies on the determination and enumeration of micro-organisms in food, using tests published by the Committee, were continued at laboratories in Canada, Denmark, France, Japan, Netherlands, Sweden, United Kingdom, USA and USSR. A second group of collaborating laboratories—in Belgium, Federal Republic of Germany, Italy, Luxembourg, Netherlands, Switzerland and the United Kingdom—was also assisted by the Organization. In addition, a laboratory at the Veterinary University, Copenhagen, is engaged in a WHO-assisted investigation of techniques for the handling and preparation of food samples for microbiological examination.

**Comparative medicine**

1.254 Studies comparing spontaneous neoplasms of animals with those of man have continued. At an informal meeting of investigators, held in Amsterdam in April, by the University of Amsterdam and WHO, agreement was reached on classifications of animal tumours of eight regions of the body. These classifications, which have been correlated as closely as possible with the WHO classifications of human tumours (see paragraph 3.47) and are also illustrated, are being prepared for publication.

1.255 WHO-assisted research in viral oncology has made rapid progress. Professor W. F. H. Jarrett, University of Glasgow Veterinary School, Scotland, found that the virus which causes leukaemia in cats produces three other lesions when inoculated into kittens—namely, anaemia, membranous glomerulonephritis and atrophy of the thymus. The last of these leads to an immunodeficiency disease which may prove to be a useful model for immunopathological studies. Fundamental studies on the feline leukaemia virus at the same institute have progressed sufficiently for the number and molecular weight of its protein constituents to be known.

1.256 In a WHO-assisted investigation, Dr L. N. Owen, Department of Animal Pathology, University of Cambridge, England, has developed methods of transplanting several spontaneous neoplasms in dogs. Canine lymphocytic leukaemia, which is similar to human lymphocytic leukaemia, was the most recent to be successfully transplanted, and it will now be possible to provide animal models of this condition for therapeutic and immunological studies.

1.257 Consultations on animal models of immunopathological conditions were held by the Organization in Geneva in September. There are several chronic diseases of animals—for example, equine infectious anaemia, lymphocytic choriomeningitis of mice, and Aleutian disease of mink—that have been shown in recent years to involve viruses associated with immunopathological lesions. The pathology of these diseases was compared with that of certain chronic human diseases that appear to be somewhat analogous. The concepts and techniques developed in studies of the animal diseases were reviewed and suggestions made for their application to the study of related conditions in human beings.

1.258 A number of laboratories are collaborating with the Organization in comparative studies of cardiovascular diseases. Following the finding in 1970 that congenital abnormalities of the heart and great vessels in dogs are not inherited as fully penetrant single-gene traits, Professor D. K. Detweiler, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., USA, conducted further breeding experiments to elucidate the genetics of these conditions and of essential hypertension in dogs. Dr G. A. Gresham, Department of Pathology, University of Cambridge, England, completed a long-term experiment on the effects of hard and soft drinking-water on the development of atherosclerosis in *Cebus* monkeys. No obvious effects were observed, but definite conclusions cannot be reached until the study of the tissues has been completed. Professor H. Luginbühl, Institute for Animal Diseases, Berne, and Dr H. L. Ratcliffe, Penrose Research Laboratory, Philadelphia, Pa., USA, continued studies on mechanisms leading to stenosing coronary and cerebral atherosclerosis in swine. In order to study the effect of specific factors in isolation, *in vitro* systems have been developed, including cultures of various cellular components of the aorta.

1.259 Congenital malformations are assuming increasing importance as a cause of death, invalidity and subnormal development both in animals and in man, for reasons related to shifts in morbidity and mortality patterns and to environmental factors. Epidemiological information on congenital malformations in animals is being collected by the Organization, and a bibliography on research in this field is in preparation.
1.260 Non-human primates are increasingly in demand as laboratory animals. A WHO scientific group on health aspects of the supply and use of non-human primates for biomedical purposes, whose report was published during the year,\(^1\) recommended, *inter alia*, the breeding in captivity of primates for laboratory use. An international symposium on the subject was held in Berne, in June, under the joint auspices of the University of Berne, the Swiss Serum and Vaccine Institute and WHO, with the participation of 73 experts on the practical breeding and reproductive physiology of animals from ten countries. The proceedings will be issued in book form. With WHO assistance, extensive surveys of monkey sera for antibodies against a wide range of viruses have been carried out by Dr S. S. Kalter at the Southwestern Foundation for Research and Education, San Antonio, Texas, USA, who is also participating in collaborative studies of the many simian herpesviruses, some of which have been found to be oncogenic in primates.


1.261 Within the framework of the WHO/FAO programme on comparative virology, international teams have been set up for animal coronaviruses and enveloped RNA viruses. Thirteen teams, representing more than 80 laboratories, are now co-operating in the programme.

1.262 The team for paramyxoviruses met in Bethesda, Md., USA, in November, to review research on the biological and physicochemical properties of these viruses and to plan collaborative studies that should eventually lead to a typing system based on reference reagents, standardized procedures and clear-cut criteria. A pilot programme for the collection and evaluation of data on human and animal coronaviruses and paramyxoviruses has been started by the teams concerned. This programme is being co-ordinated by Professor R. P. Hanson and Professor B. C. Easterday, University of Wisconsin, Madison, Wis., USA. Close links have been established between this programme and the WHO programme for the collection of data relating to food virology.
CHAPTER 2

COMMUNICABLE DISEASES

continued)

Malaria

2.1 As may be seen from Fig. 4 and Fig. 5, showing areas of malaria endemicity in 1961 and in 1971, considerable advances have been made during the past eleven years towards the eradication of this disease. The population in those areas freed from the risk of endemic malaria amounted to 1048 million in 1971 compared with 392 million in 1961. Although, as indicated below, progress was made in a number of programmes during 1971, the overall changes since 1970 have been few. This is largely due to many activities being in what are termed the "hard-core" areas where technical problems and serious administrative and operational difficulties have to be overcome before more rapid advances can be made. Much attention was paid during the year to the preparation or development of malaria control activities in such areas.

Progress of the antimalaria programme

2.2 On 30 September 1971, of the estimated 1844 million 1 people living in the originally malarious areas of the world, 1372 million (74%) were in areas where malaria had been eradicated or where eradication programmes were in progress. Of these, 739 million (40%) of the population of the originally malarious areas were living in areas in the maintenance phase, 309 million (17%) in areas in the consolidation phase, 319 million (17%) in areas in the attack phase, and 5 million (less than 1%) in areas in the preparatory phase. Of the 471 million people (26%) living in areas where eradication programmes were not yet in operation, 35 million were benefiting from malaria control measures, while governments were making an organized effort to ensure that antimalaria drugs were available as a control measure for a further 161 million.

2.3 The Organization assisted 42 malaria eradication projects and 27 projects for other types of antimalarial action during 1971. In Cuba, Mauritius and Yugoslavia visits were made to assess the progress of malaria eradication programmes and to determine whether the countries had reached a stage when they could apply to WHO for their inclusion in the WHO official register of areas where malaria has been eradicated. The considerations with respect to certification, after review by the regional offices concerned, will be presented to the next WHO expert committee on malaria. Reviews in connexion with the revised strategy of malaria eradication were undertaken by a WHO team in Iraq and in East Malaysia (Sarawak). In the former country the Government accepted the opinion of the team that malaria eradication was feasible and desirable and its recommendation that it should be carried out on a time-limited basis. In the latter country the Government has adopted a malaria control programme on the lines recommended by the review team.

2.4 In Africa, assistance in antimalaria operations was mainly given under the co-operative "umbrella" projects of basic health services development. Advisory services were provided to Sierra Leone in formulating plans for antimalarial activities in Freetown and to Zambia in standardizing antimalaria techniques and developing a training syllabus. A comparison of the frequency of malaria in schoolchildren receiving prophylactic chloroquine and in those not receiving that drug was undertaken in Cameroon. In the Comoro Archipelago and Guinea malaria surveys are being carried out. Statistics from Liberia indicate that 37% of hospital patients are suffering from malaria, thus confirming the general pattern in Africa. In Nigeria, WHO assisted the government malaria service to undertake surveys in a number of states; antimalaria operations were reintroduced in urban areas in Kaduna. In Senegal, WHO assisted in

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1 Figure not including mainland China, North Korea and North Viet-Nam.
2 A malaria eradication programme is divided into four phases: the preparatory phase, characterized principally by geographical reconnaissance and training of staff; the attack phase, during which total coverage house-spraying or other attack methods are applied; the consolidation phase, during which these attack measures have ceased and surveillance is carried out; and, lastly, the maintenance phase, during which vigilance operations aim at preventing the re-establishment of the disease.
making chloroquine available to the population throughout the country. In Togo, where a pilot project is being assisted, studies were undertaken on school absenteeism and morbidity in schoolchildren and on the registration of deaths due to malaria.

2.5 In the Region of the Americas, there were further reports of resistance of Plasmodium falciparum to chloroquine; this has now been confirmed in Panama. In Haiti, the same parasite was reported to be resistant to pyrimethamine and cycloguanil but still to be susceptible to chloroquine. Assisted by donations from the Federal Republic of Germany, a number of countries in Central America introduced wide-scale residual spraying with the carbamate insecticide propoxur in areas where the vector anophelines are resistant to chlorinated hydrocarbons. Recent reports indicated that this new insecticide was reducing transmission in Nicaragua and Guatemala, but the results from Honduras and El Salvador were less conclusive. Further progress was realized in the programmes in Argentina, Brazil, Costa Rica, Panama, Paraguay and Surinam. In Mexico increased funds were made available for antimalarial activities in the Gulf region and Yucatán.

2.6 In the South-East Asia Region, additional assistance was given to the programme in Burma and training of laboratory staff was undertaken. The situation in Ceylon, where a severe outbreak of malaria reached its peak in early 1970, now appears to be improving, especially in the epidemic areas. Following recommendations made in the annual assessment of the malaria eradication programme in India, areas with a population of 1.7 million were advanced from the attack to the consolidation phase. The total population of areas in the maintenance phase now amounts to more than 320 million. In a number of areas of the country, however, the situation is deteriorating, and an increase over the half million cases reported in 1970 is to be expected. Much of this deterioration was due to the failure to order and provide appropriate insecticides in time. The Government of Indonesia has increased its budget for the WHO-assisted antimalaria operations in that country. In the Maldives the antimalaria programme is being extended to cover all the islands of the country. Following the annual assessment of the Nepal programme, it was recommended that areas with a population of 300,000 in the attack phase be advanced to the consolidation phase. The cessation during the year of certain bilateral assistance for the malaria programme to the Government of Thailand is reported to have had an unfavourable effect on field operations and the incidence of malaria appears to be increasing; nevertheless the mortality from malaria dropped from over 200 per 100,000 in 1949 to about 10 per 100,000 in 1969, the lowest rate ever recorded.

2.7 In the European Region, additional areas in Greece passed from the consolidation phase into the maintenance phase. In Algeria the attack phase of the programme was expanded to cover a total population of two million. In Morocco a cooperative programme has been proposed to ascertain whether it is feasible to undertake a combined attack against the aquatic stages of the anopheline mosquito and the snail intermediate hosts of schistosomiasis. In Turkey, although the malaria situation is under control for the most part, outbreaks of the disease occurred in consolidation phase areas in the neighbourhoods of Ankara, Adana and İzph. The areas in the neighbourhood of Adana where Anopheles sacharovi is resistant to DDT and dieldrin were increasing and DDT resistance in An. hyrcanus was reported in the same area. Malathion was used for focal spraying in these three areas as well as in Edirne.

2.8 In the Eastern Mediterranean Region, the programme in Afghanistan has been revised. In Iraq the increased use of malathion proved most successful in areas where An. stephensi is resistant. It has been estimated that, in that country, the number of cases due to malaria was reduced from 750,000 in 1946 to 11,000 in 1970 and that the annual economic gain from antimalaria operations is about US $7.5 million. In spite of difficulties the programme in Jordan has steadily improved. In Pakistan, antimalaria measures were delayed because of shortage of funds and a noticeable increase in cases has resulted in most zones. Assistance to antimalaria activities continued in the People’s Democratic Republic of Yemen, Saudi Arabia, Somalia, and Sudan. A review of the last-mentioned programme was undertaken during the year, and it was recommended that the Government should extend its control activities and undertake the eradication of An. gambiae from the banks of the Nile and of the lake developing in the north of the country as a result of the Aswan dam. Resistance of An. gambiae species B to DDT was reported in Sennar. Although the epidemiological situation in the Syrian Arab Republic has much improved, the resistance of An. sacharovi to dieldrin may spread and that insecticide may no longer be able to prevent transmission from recurring. Most of the northern part of Tunisia is in the consolidation phase and the general situation is good despite the occurrence of a few focal outbreaks in the southern governorates.

2.9 In the Western Pacific Region, the malaria eradication programme in the British Solomon
Fig. 4. Epidemiological assessment of status of malaria, 31 December 1961
Fig. 5. Epidemiological assessment of status of malaria, 30 June 1971

- Areas in which malaria has disappeared, been eradicated, or never existed
- Areas in consolidation phase
- Areas where malaria transmission occurs or might occur

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Islands' Protectorate proceeded according to plan. The eradication programme in West Malaysia had good government support but encountered certain difficulties in national staffing; cases continued to be reported in areas in the late attack phase. In the Philippines, an assessment of the malaria situation was made. The strategy recommended in 1970 was endorsed and further integration of the malaria service into the general health service was proposed. There was a reduction in the funds available for antimalaria activities and an increase in the number of cases of malaria compared with 1970. The planning of the antimalaria programme in Papua New Guinea was amended in line with the recommendation of the WHO malaria strategy team. In the New Hebrides a malaria control programme is being instituted. Antimalaria projects were maintained in the Khmer Republic and Laos.

Research

2.10 Between January and November 1971, WHO concluded 37 new or renewed agreements on malaria research with national institutes to study the biology of the parasites, the epidemiology of the disease and its chemotherapy, the resistance of the parasites to drugs and the methodology of antimalaria operations. The following pages summarize some of the research activities that have been undertaken in collaboration with the Organization.

2.11 Biology of parasites. It is most important for progress in the development of immunization procedures to find methods of cultivating the malaria parasite through further stages than is at present possible. The ability to cultivate these parasites would facilitate antimalaria drug screening and would provide fundamental information on the biology of the organism. A short consultation on the subject was held in November to consider recent advances and lines of research to be followed. During the year, the Division of Parasitology of the National Institute of Medical Research, London, carried out studies on the nutritional requirements of the parasites in vitro and on the metabolic pathways leading to DNA and RNA synthesis.1 Using Plasmodium knowlesi, it was found that parasites grown in vitro had a markedly lower RNA content than those obtained directly from the host. Studies on the amounts of DNA in the parasite suggest that synthesis mainly occurs during the ring and trophozoite stages and that subsequent mitosis yielding the 16 nuclear schizonts occurs without further DNA synthesis. Other work on metabolic pathways in rodent malaria parasites was undertaken at the Department of Parasitology, Liverpool School of Tropical Medicine, Liverpool, England. 2, 3, 4

2.12 The complex picture of immunological responses to malaria parasites was discussed at a consultation on malaria immunization held in December 1970. Studies on rodents are being undertaken by the Institute of Immuno-Biology in Paris in collaboration with the Department of Parasitology, Instituto Superiore di Sanità, Rome, in an effort to elucidate the role of the spleen in the establishment of resistance to parasitaemia following vaccination.5 The Institute of Microbiology, Parasitology and Epidemiology in Bucharest is investigating the role of immunocompetent cells in the immunity mechanism of malaria; and the Department of Zoology, King's College, London, is studying the changes that occur in reticuloendothelial activity in malaria-infected rodents.

2.13 Studies have been continued on the mechanisms involved in the development of protection following the inoculation of irradiated sporozoites in the rodent malaria model at the New York Medical Center in the USA. The circum-sporozoite precipitin reaction, reported earlier from sera of protected animals, has been reconfirmed as a specific reaction. Preliminary results obtained with P. brasilianum on monkeys, applying the same procedure as in rodent malaria, indicate that protection is afforded. Consideration is therefore being given to undertaking human trials by inoculating irradiated human plasmodia, possibly P. falciparum, as a further step in the development of an antimalaria vaccine.

2.14 Investigations at the Laboratory of Cytology and Histology, University of Nijmegen, Netherlands, suggest that a cytophilic but non-cytotoxic antibody, presumably of the IgG class, appears during rodent malaria infection.6

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Virus Diseases

In Entebbe, Uganda, at the East African Virus Research Institute, WHO has established a team for special studies in virology. Its new laboratory (right), built with funds from the Wellcome Trust and equipped by WHO, was opened in 1971.
Malaria

More than 1000 million people in the world have been freed from the risk of endemic malaria since WHO’s malaria eradication programme began. The use of chemicals remains the basic measure for controlling the vector mosquitoes. Against the larval stage, this is done using oils or biodegradable compounds and against the adult stage by spraying residual insecticides indoors. Larvivorous fish such as Gambusia (right) are also used as they are insatiable devourers of mosquito larvae.
Constant research is needed to determine whether mosquitoes have acquired resistance to the insecticides used against them and to develop new and more readily degradable compounds. At the Anopheles Control Research Unit No. 1, Kaduna, Nigeria, mosquito larvae are collected for resistance testing (right) and bioassay tests are carried out on adult mosquitoes in an exposure chamber on a treated wall surface (inset). In the laboratory, insecticide residues are extracted from wall and roof materials (lower right).
Cardiology

Upper left: WHO is supporting studies of trace elements in the environment which may prove to be etiological factors in cardiovascular disease. Finland is one of the countries where the hardness and mineral content of water resources are being investigated. Water samples are taken from wells and streams and evaporated, and the residues are analysed (inset) at a laboratory in Helsinki.

Lower left: Measurement of blood pressure during a bicycle ergometry test in the course of collecting data for the ischaemic heart disease register in Budapest.

Below: Scene from a 10-minute animated colour film on prevention of heart disease produced in 1971 for WHO by Sovinfilm, Moscow.
2.15 At the WHO International Reference Centre for Avian Malaria Parasites, Department of Biology, Memorial University of Newfoundland, St John's, Canada, a system of records of birds found with malaria parasites has been built up and now covers over 850 species. A series of colour slides has been prepared for identification and teaching purposes.¹

2.16 Among the several interesting developments with practical applications in the field of rodent malaria reported from the Prince Leopold Institute of Tropical Medicine, Antwerp, Belgium,³ ⁴ are the cyclical transmission of *P. vinckei* in the laboratory, the selection of a strain of *An. labranchiae atroparvus* that gives an 80% mosquito infection rate with *P. berghei berghei* instead of 5%, and the observation that mice may be infected orally with sporozoites of *P. berghei*. The latter was reported also from the Department of Preventive Medicine of the New York University Medical Center, N.Y., USA.⁵

2.17 In Brazil, at the Department of Parasitology of the Federal University of Minas Gerais, Belo Horizonte, attempts are being made to see if the local monkey hosts of simian malaria can also act as hosts of human malaria. This is part of a search for simian hosts that might be more suitable and more easily obtainable than the owl monkey. In Ceylon, after some years of investigation, the Department of Parasitology of the University of Ceylon, Peradeniya, has confirmed that *An. elegans* is a natural vector of *P. shortii* in that country.⁶

2.18 In London, Dr F. E. G. Cox, Department of Zoology, King's College, in collaboration with Dr N. Wedderburn, Royal College of Surgeons, has observed an enhancement of parasitaemia by oncogenic viruses in rodents, thus confirming the association between viruses and malaria parasites that was suggested some years ago in connexion with o'nyong-nyong fever. An increase in the pathogenicity of virus diseases in *Aotus* monkeys suffering from malaria was observed at the Nuffield Institute of Comparative Medicine, London. A publication from the Ross Institute of Tropical Hygiene, London, describes a cytoplasmic polyhedrosis virus found in the sporogonic stages of *P. berghei yoelii*.⁷ These associations have considerable research significance and may have some practical applications.

2.19 Epidemiology. In the field of epidemiology, priority has been given to the development of sero-diagnostic techniques applicable on a wide scale. A method for large-scale preparation of Teflon-coated antigen slides has been developed at the WHO collaborating laboratory for the development of malaria serological techniques, Nuffield Institute of Comparative Medicine, London.⁸ In a preliminary study at the same laboratory a fibre optic probe system has been used to analyse the intensity of fluorescent reaction. If found to be practical, this system could make it easier to compare the results of fluorescent antibody tests carried out in various laboratories and could possibly lead to automated methods of examination.⁹

2.20 Following his earlier work on the usefulness of the fluorescent antibody test (FAT) as an epidemiological tool¹⁰ ¹¹ ¹², Professor P. Ambroise-Thomas, who is now with the Laboratory of Parasitology and Exotic Pathology, University of Grenoble, France, has made longitudinal studies using the same technique in Tunisia in collaboration with the Government. The latter studies indicate that the fluorescent antibody test is likely to be of value in the study of the epidemiology of disappearing malaria as well as in surveys of hypoendemic and epidemic areas. They cast some doubt, however, on the degree of positivity obtained with the relatively low sensitivity of the heterologous antigen and suggest that homologous antigens should be employed in situations where malaria has almost disappeared. An investigation of the value of the fluorescent antibody test in detecting occult malaria in blood donors was carried out at the Parasitology Section of the Center for Disease Control, Atlanta, Ga., USA.¹³

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WHO has collaborated with this centre in surveys using the indirect haemagglutination test in the Philippines and in Ethiopia. In a WHO research project on the epidemiology and control of malaria in the African savanna (see paragraph 2.34), that is being carried out in Kano, Nigeria, trials of this test are being undertaken using a heterologous antigen prepared from *P. knowlesi*. Parallel studies at the above Center, the Ross Institute of Tropical Hygiene, London, and the Laboratory of Pathology and Exotic Pathology, University of Grenoble, France, have been undertaken on a series of sera from the United Republic of Tanzania; these showed that the fluorescent antibody test using homologous antigen was the most sensitive in respect of titre, followed first by the same test using heterologous antigen and then by the indirect haemagglutination test, for which so far only heterologous antigen has been used.

The investigations, reported in 1970, on the relationship between the incubation period of a North Korean strain of *P. vivax* and the number of sporozoites inoculated were pursued further in 1971. They have shown that all of the neurosyphilitic patients who, for therapeutic purposes, received small inocula of up to 100 sporozoites had had prolonged incubation periods varying from 262 to 628 days, whereas most of those receiving inocula of 1000 or more sporozoites developed the patent infection after the normal time of 13-16 days. These studies were carried out by the WHO Regional Reference Centre for Malaria, Epsom, England, in collaboration with the Dr J. Cantacuzino Institute of Microbiology, Parasitology and Entomology and the Marinescu Hospital, Bucharest, and with the Institute of Hygiene and Scientific Research and the Socola Hospital, Iaşi, Romania. The Reference Centre also undertook the identification of parasite species in doubtful cases and provided advanced training for WHO malaria staff.

In Thailand, the national malaria eradication programme has undertaken extensive studies of *Anopheles balabacensis balabacensis* which are beginning to give information that helps to explain the role of this vector in maintaining transmission in forest and forest-fringe areas.

With the purpose of redesigning the methodology of a control experiment carried out in 1968, in which sterile males of *Anopheles gambiae* were liberated in a village in Upper Volta, studies on the mating competitiveness of the related species of the *An. gambiae* complex have been undertaken by the WHO International Reference Centre for Maintenance and Distribution of Standardized Strains of *Anopheles*, Ross Institute of Tropical Hygiene, London. These indicate that a hybrid male of the cross species *A* \( \delta \times An. melas \) \( \varphi \) is likely to be more effective in allowing fewer of the species *A* females to be fertilized than the cross used in 1968. The centre is also undertaking work on species differentiation in the *An. punctulatus* complex in collaboration with the Institute of Parasitology of the University of Rome where Dr M. Coluzzi and his collaborators undertake work on chromosome manipulation of *Anopheles*. Dr Coluzzi suggests that there is a relationship between *An. stephensi* and *An. superpictus*, two morphologically and ecologically different vectors of the subgenus *Cellia*, series *Neocellia*; this phenomenon, if substantiated, may be of interest in genetic control.

Light traps have been used as a method of insect collection for a number of years. The catches obtained with the recently introduced "Monks Wood" light trap were compared with those obtained by other light traps. Since doubts have been cast on the validity of the anopheline samples obtained by this method, further studies on the variations encountered are being undertaken by the entomological mission of the Office de la Recherche scientifique et technique outre-mer, Centre Muraz, Bobo Déioulasso, Upper Volta.

Chemotherapy and drug resistance. In connexion with research on chemotherapy of malaria and the resistance of malaria parasites to drugs, a number of collaborators who are engaged in screening potential antimalaria compounds met informally in Geneva in October to assess the relative merits of the methods presently used in drug screening and to consider the basis for the uniform application of methods in different laboratories. The group proposed a simplified scheme to include all stages of the screening process that were considered essential.

In studies on the influence of dietary factors on the course of malaria infection in rodents carried out at the Laboratory of Protozoology, Institute of Tropical Medicine, University of Tübingen, Federal Republic of Germany, it was found that certain protein diets, as well as diets deficient in paraaminobenzoic acid, inhibited the growth of *P. vinckei*


whereas lack or excess of methionine or vitamins B6 and B12 appeared to have no effect on the parasite.

2.28 Work on the synthesis of diphenylsulfide and diphenylamine derivatives of biguanides and amidine ureas was pursued further at the Department of Chemistry, Institute of Technology, Warsaw. These compounds are being tested on rodent malaria parasites by the WHO Regional Reference Centre for Screening of Potential Antimalarial Compounds at the Department of Parasitology, Liverpool School of Tropical Medicine, England. That centre also trains WHO fellows in the techniques of maintenance of parasite strains and of drug screening.

2.29 Chemical work on the series of 6-aminoquinolines, reported in 1970,1 is being carried further at the Institute of Applied Chemistry, Friedrich-Alexander University, Erlangen, Federal Republic of Germany, to ascertain which is the most effective and least toxic among the derivatives of this group with antimalarial action; one of these, Ni 147-36, was tested against P. knowlesi in the African green vervet monkey (Cercopithecus aethiops) at the East African Institute of Malaria and other Vector-Borne Diseases, Amani, United Republic of Tanzania, and was found to be as effective as chloroquine. This compound and a related one are also being tested against P. falciparum in the Aotus monkey at the Southern Research Institute, Birmingham, Ala., USA. Preliminary results obtained by Dr L. H. Schmidt of this institute indicate that their schizontocidal activity is not promising but further tests are being made on their sporontocidal action.

2.30 At the Marcinovskij Institute of Medical Parasitology and Tropical Medicine, Moscow, the synthesis of potential antimalarials of benzo(g)-quinoline, benzo(g)-quinazoline and pyrido(3,2-g)-quinoline derivatives is being carried out. The antiparasitic activity of certain of these compounds is as great as that of chloroquine but their toxicity is higher.

2.31 An assessment of the effectiveness of chloroquine on falciparum malaria carried out at the Centre Muraz, Bobo Dioulasso, Upper Volta, demonstrated the sensitivity of the parasite to standard drug regimens of this kind.

2.32 An in vitro method for detecting the resistance of P. falciparum to chloroquine2 is being used also for screening potential antimalarial drugs in Brazil and the USA.

2.33 Further work has been carried out on the mode of action of chloroquine and the differences observed between chloroquine-sensitive and chloroquine-resistant strains of Plasmodium. For instance, at the Department of Internal Medicine, Saint Louis University, St Louis, Mo., USA, it has been shown that the erythrocytes of rodents infected with susceptible strains of P. falciparum normally bind chloroquine in vitro while those of rodents infected with resistant strains appear unable to take up chloroquine. No such significant difference was found with amodiaquine. It is suggested by the Department of Parasitology, Liverpool School of Tropical Medicine, England, that chloroquine is concentrated in certain areas of the parasite containing fluid of a higher pH and that the drug interrupts digestion of haemoglobin by the parasite, which then undergoes autolysis.3 The Department of Tropical Medicine at the same school reports that the in vitro uptake of certain amino acids and nucleosides by mouse erythrocytes infected with P. berghei is greatly reduced by chloroquine.4 These various biochemical and biophysical mechanisms lead some way to understanding the mode of action of the drug and the phenomenon of resistance, but many aspects remain unexplained.

2.34 Methodology of control. The WHO research project on the epidemiology and control of malaria in the African savanna (see also paragraph 11.16) was further developed during 1971 in close co-operation with the Nigerian Government. Immunological studies of special interest were developed during 1971 in close co-operation with the Nigerian Government. Immunological studies of special interest were developed during the year with the co-operation of various workers in Nigeria (at the Universities of Ibadan and Zaria), in the Gambia (the United Kingdom’s Medical Research Council Station, Fajara), in Switzerland (Institute of Biochemistry, University of Lausanne), in the United Kingdom (the Nuffield Institute of Comparative Medicine, London, which acts as the WHO collaborating laboratory for development of malaria serological techniques) and in the USA (the Center for Disease Control, Atlanta, Ga.). Diagnostic work using serum immunoglobulin estimations, fluorescent antibody, precipitin and indirect haemagglutination tests was initiated. Preliminary trials were made in a limited area to measure the length of time that residual propoxur on house walls remains effective against An. gambiae and An. funestus. The curative effect of single-dose drug administration

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was also investigated. The results of this work will be of value in planning the attack phase and in providing additional data for the mathematical model of the project. A comparative trial on the effects of sulfalene-pyrimethamine and chloroquine-pyrimethamine on the asexual forms of *P. falciparum* was completed in three villages of the area. A research centre and a field station built with the aid of funds provided by Kano State, Nigeria, were completed in May 1971 and fully equipped from funds provided by WHO. Facilities are being made available for workers, mainly from Africa, to be trained in the methods and techniques of research as applied in the project.

2.35 A report by the Benaki Phyto-Pathological Institute, Athens, on the use of larvivorous fish in Greece over the past 40 years has emphasized the effectiveness of *Gambusia* in suitable situations. It was also observed that this species can coexist with commercially valuable fish without exerting any apparent harmful effect on the latter.

2.36 It is known that in laboratory conditions acridine orange staining permits blood films with a low malaria parasite density to be picked out rapidly and accurately; studies are being undertaken at the International Malaria Eradication Training Centre in Manila to test the value of this method in the field. In Nigeria, the Organization is studying the most practical and economical means for the continuing protection against malaria of the population groups at greatest risk. In the Regions of the Americas and the Eastern Mediterranean, field testing of improved sprayers has been carried out and the economic aspects of spray nozzle-tip replacement have been investigated.

2.37 The Institute of Social Studies, University of Grenoble, France, has collaborated with WHO in a study in Ceylon and in the Syrian Arab Republic on the feasibility of developing a system to demonstrate the socio-economic effects of malaria and of its control and eradication.

Co-ordination

2.38 During 1971, the United Nations Development Programme (UNDP) assisted eight malaria eradication projects in the Regions of the Americas, the Eastern Mediterranean and the Western Pacific. UNICEF furnished supplies for 12 malaria eradication programmes in the Americas and two elsewhere, and, through its assistance to the development of rural health services, contributed to malaria control in Africa particularly. Bilateral assistance for malaria eradication programmes was provided by the Federal Republic of Germany in the form of insecticide supplies to four countries in Central America, and by the Union of Soviet Socialist Republics through advisory services to one country in the Eastern Mediterranean Region. The United States Agency for International Development (USAID) assisted nine malaria eradication programmes in the Region of the Americas, three in the Eastern Mediterranean Region and three in the Western Pacific Region. It also gave substantial assistance to the International Malaria Eradication Training Centre in Manila (see paragraph 20.12). The World Food Programme maintained its assistance to national malaria eradication staff in Turkey and gave support to the antimalarial programme in Indonesia.

2.39 Inter-country malaria meetings organized or sponsored by the Organization included those between the following groups of countries: Colombia and Ecuador; Colombia and Venezuela; Jordan, Lebanon and the Syrian Arab Republic; India and Nepal; Iraq, Jordan, Lebanon, the Syrian Arab Republic and Turkey; and Australia, British Solomon Islands Protectorate, Indonesia (West Irian), New Hebrides, Papua New Guinea, and Portuguese Timor.

2.40 A working group for the co-ordination of the malaria eradication programmes in Central America and Panama was held in Managua in May. Prior to a meeting of the directors of the national malaria eradication services of the Americas, an inter-American malaria research symposium was held in San Salvador in November, with the participation of the directors of malaria services and in collaboration with the Center for Disease Control, Atlanta, Ga., USA. The meeting was also attended by research workers from other continents.

Training in antimalaria operations

2.41 With the changing strategy of malaria eradication, the curricula of the courses provided by the International Malaria Eradication Training Centre in Manila have been reviewed and modified particularly in order to give more time to training in malaria control techniques. During the year, the centre organized two courses for senior professional staff in malaria eradication and advanced malaria epidemiology. In addition, a combined course in para-
sitology and epidemiology was provided for technical staff. A total of 81 participants from four WHO regions attended these three courses. A group educational activity was also organized at the Manila centre for public health administrators and senior health workers from the South-East Asia and Western Pacific Regions. The training centre in Maracay, Venezuela, continued to provide courses on malariology for staff from the Spanish-speaking countries of the Region of the Americas.

2.42 At the training centres for health personnel in Lomé and in Lagos, two seminars on the methodology of malaria control in the African Region were held during the year for 11 French-speaking and 11 English-speaking public health administrators working in 15 countries. At the Lagos centre a course was held for 23 malaria control technicians. Another seminar on malaria epidemiology was held in November in Damascus, in conjunction with an Eastern Mediterranean Region inter-country malaria co-ordination meeting. It was attended by senior nationals of eight countries in the Eastern Mediterranean and European Regions and by WHO epidemiologists from both Regions. Emphasis was laid on methods for the study of epidemiological situations and on the organization of epidemiological and surveillance services. A refresher course for 13 national entomologists from 10 countries in the Western Pacific and South-East Asia Regions was held at the Prabhudabat training centre, Thailand, in November also.

2.43 The Organization continued its support for national malaria training centres in Algeria, Ethiopia, West Malaysia, Mexico, Pakistan, the Philippines and Sudan; assistance was given also to the Ceylon centre, which was officially opened in February 1971.

2.44 Under the scheme for exchange of malaria workers, a certain number of key national professional personnel were enabled to study specific aspects or problems related to malaria eradication in other countries.

2.45 Sets of 54 case studies to be used for the teaching of malaria epidemiology have been distributed to over 200 training centres and health institutes throughout the world.

2.46 A large quantity of material intended as aids in malaria teaching has been distributed by the Organization to institutes and faculties of medicine in many countries. It includes sets of stained and unstained blood films containing malaria parasites and sets of projection slides and charts. In those countries where malaria has been eradicated or has never been endemic, this material is of particular value in assisting physicians, medical students and microbiological workers to recognize imported cases of the disease and to detect the causative organism in the blood film.

Other parasitic diseases

2.47 Some parasitic diseases, such as African trypanosomiasis and onchocerciasis, constitute serious obstacles to economic and social progress in certain parts of the world. Others may increase in prevalence as a result of programmes for the development of agriculture and water resources. For example, schistosomiasis tends to spread in newly irrigated areas and in the neighbourhood of man-made lakes; in some places filariasis has increased as a result of over-rapid urbanization. These considerations have predominated in shaping WHO's programme on parasitic diseases and its efforts to stimulate applied research in relation to projects for their control.

2.48 Among the matters reported in this section, the following may be given special mention: a research project on schistosomiasis in man-made lakes was initiated; a preparatory assistance mission was sent to seven countries in West Africa to set up an extended onchocerciasis control programme; and the operational research project on trypanosomiasis in Kenya came to an end after achieving substantial progress in the diagnosis, control and epidemiological understanding of the disease. However, research on parasitic diseases is not expanding at a pace consistent with increasing needs. The resources of modern technology need to be fully committed if parasitic diseases are to be effectively controlled in areas of rapid socio-economic development. With a view to stimulating training in parasitic diseases, a symposium was organized in London in November to allow heads of schools of tropical medicine to discuss means of improving and extending training in epidemiology and management of parasitic diseases.

2.49 The Organization further expanded its work on the relation of parasitic diseases to large-scale development projects in general and to those sponsored by UNDP in particular. A contribution was prepared and presented to the international symposium on man-made lakes organized jointly by the Scientific Committee on Water Research and the International Council of Scientific Unions in Knoxville, Tenn., USA, in May. More extensive consultations were held with UNDP, FAO, IBRD, the World Food Programme and other bodies concerned with large-scale programmes involving irrigation and hydroelectric power development. WHO assisted in the
evaluation of a schistosomiasis control project supported by the World Food Programme in the Philippines.

2.50 There is an urgent and increasing need for new drugs that are safe and reliable enough to be used for the mass chemotherapy of the major parasitic diseases. The Organization has tried to support and encourage both fundamental and applied research in this field.

Schistosomiasis

2.51 Schistosomiasis continued to spread in many developing countries, mainly as a result of the expansion of water utilization schemes and of uncontrolled resettlement. There is evidence that the construction of man-made lakes greatly increases the risk of the spread of the disease, but, unfortunately, little is known of the ecological conditions that favour its transmission in such lakes. Studies already made on natural lakes show that the aquatic environment in artificial lakes is suitable to the establishment of the snail intermediate hosts of schistosomes and their presence in a number of these lakes has been demonstrated as well as the transmission of both Schistosoma haematobium and S. mansoni infections in lakeshore populations. At the end of 1970, field investigations showed that the snail intermediate hosts of both types of schistosome were present in Kainji Lake, Nigeria, and provided evidence that the infections were being transmitted in the lake area, which is in a part of West Africa where the disease is highly endemic. Transmission of schistosomiasis has also been found to occur in two other man-made lakes in Africa, Lake Kariba and Lake Volta.

2.52 A project for research on the epidemiology of schistosomiasis and on effective and economical methods for its control in man-made lakes, financed by UNDP/SF with WHO as executing agency, was put into operation in May 1971. Its headquarters and main laboratory are located in Accra.

2.53 In 1971, a team working in the WHO interregional project for field investigations on schistosomiasis visited Cameroon and Gabon to carry out parasitological and malacological surveys in relation to human schistosomiasis with special reference to S. intercalatum. It was able to obtain confirmation that the eggs of this species are distinct from those of the two similar species, S. haematobium and S. bovis. This is significant as an indication that S. intercalatum, a fourth type of human schistosome, may be much more common in Africa than it was previously realized. The team's findings also confirmed that the snail intermediate host in both countries was most probably Bulinus forskali, an amphibious and not purely aquatic snail, resembling in this respect the intermediate host of S. japonicum. The same team visited Morocco to assist the Government in setting up a schistosomiasis control and research programme, with particular reference to irrigation projects. No schistosomiasis was observed in the Souss Valley of Morocco but the infection was found already established in the Massa Valley as well as in certain northern parts of the country.

2.54 The presence of schistosomiasis in certain foci in the Khmer Republic, Laos and Thailand where WHO had previously conducted surveys has been the subject of further investigation sponsored by the Smithsonian Institution, Washington, D.C., as a result of which the intermediate host is now known —although its precise taxonomic status is still being determined—and the transmission cycle has been determined. This is a finding of importance for WHO's schistosomiasis control programme.

2.55 To offset the generally upward trend of the disease, there is evidence that the prevalence of schistosomiasis is decreasing in certain parts of the world where the social and economic standards of the population have improved. Indeed such improvements, together with the will to combat the disease using specific and general public health measures, are fundamental to successful control of schistosomiasis. Although control methods such as the application of molluscicides and chemotherapy have been made more effective by the introduction of new techniques, their limitations are well recognized and it is now generally admitted that successful control of the infection can be achieved only by a carefully selected combination of measures based on knowledge of the complex ecological interrelationships between hosts, parasites and environment. Man, the true vector of the infection, cannot be disregarded when control efforts are contemplated and any campaign aimed at reducing schistosomiasis should be part of broader programmes of health and community development.

2.56 Emphasis in the WHO programme of molluscicide testing and evaluation was shifted from the development of new molluscicides to the improvement of formulations of existing compounds and the search for better methods for applying them. This change reflected the general agreement reached by a meeting of directors of laboratories collaborating in this programme, held in Washington, D.C., in 1970, that chemical compounds able to kill snails at very low concentrations had become available. It was emphasized that special attention should be paid to preventing pollution of water bodies and harmful effects to other organisms.
2.57 Past experience in the use of chemicals for snail control has shown that, whenever possible, the control of snail populations should be made at focal points rather than attempted throughout an area, a realistic and achievable goal being the interruption of transmission of the disease rather than systematic snail destruction. Among the interesting findings reported from WHO-supported research projects on the use of molluscicides conducted at the Tropical Pesticides Research Headquarters and Information Unit, London, is a new bioassay method for estimating small amounts of niclosamide in water; this seems to be applicable under field conditions. In another investigation at the same laboratory, the molluscicidal activity of niclosamide was observed to be dependent on the pH of the water and to fall significantly at a certain level of acidity. In the course of long-term studies carried out on sodium pentachlorophenate (NaPCP) at the Department of Parasitology, National Institute of Health, Tokyo, periodic checks and their yearly evaluation have not revealed any resistance to this molluscicide in Oncomelania nosophora, the snail intermediate host of S. japonicum, despite its regular use over 18 years.

2.58 In an attempt to improve the scientific basis of snail control, the Organization has continued to support investigations on several aspects of snail physiology and ecology.

2.59 In the chemotherapy of schistosomiasis, metrifonate, an organophosphorus compound, has proved very active against S. haematobium infection in Africa. In the clinical trial begun in 1970 at the Bilharziasis Chemotherapy Centre in Tanga, United Republic of Tanzania (the centre is co-sponsored by the Tanzanian Government, the United Kingdom Medical Research Council, and WHO) metrifonate was administered in three doses at 14-day intervals to schoolchildren with urinary schistosomiasis. The drug proved to be as efficacious as had been demonstrated in previous trials of other spaced-dose regimens and, although it is known to be a strong cholinesterase inhibitor, no important side-effects were observed in 1971.

2.60 The Organization has supported longitudinal and cross-sectional studies on the morbidity produced by schistosome infection in countries—such as Brazil and a number in Africa—where the public health importance of schistosomiasis is insufficiently well known. The research work sponsored in 1971 by the Organization with a view to clarifying this and other epidemiological problems included laboratory studies on animal hosts directed towards gaining a better understanding of the pathological and immunological aspects of schistosomiasis, an investigation on the mechanism of egg extrusion through the bowel wall of suitable and unsuitable hosts and immunological studies on human cases of schistosomiasis. In the course of immunological research carried out at the Institute of Biological Sciences, Federal University of Minas Gerais, Belo Horizonte, Brazil, on cases of S. mansoni infection, a new technique of reverse immunodiffusion was developed which appears to be a simple and reliable method for quantitative measurement of serum immunoglobulins.

Onchocerciasis

2.61 It is now about 45 years since it was discovered that Onchocerca volvulus is transmitted by Simulium flies. Although there have been some successful control projects in limited areas, notably in Kenya, Nigeria (Abuja), and western Uganda, onchocerciasis still prevails over the greater portion of its area of original endemicity in Africa. Even more meagre progress has been made in the American foci of the disease because less attention has been given to the control of its vector. Eradication may be a distant ideal, but if existing epidemiological and ecological knowledge were applied and operational research pursued on more efficient vector control methods, the intensity of transmission could be significantly reduced and many foci freed of the disease.

2.62 With the gradual extension and improvement of medical services in rural areas, many hitherto unknown foci of onchocerciasis have been discovered. While it is known that hundreds of thousands of individuals suffer from partial or total blindness as a consequence of onchocerciasis, many cases of onchocercal eye disease in the rural areas of tropical countries remain undiagnosed, especially in the early stages, because the few ophthalmologists in such countries are almost all to be found in urban centres. Throughout the world, indeed, no more than about a dozen scientists are devoting their major efforts to the study and control of this disease.

2.63 Fortunately, in recent years the economic and social importance of onchocerciasis has been increasingly recognized. WHO took the first steps to bring together scientists, economists, and others concerned in order to stimulate the development of large-scale vector control programmes which, when carried out over a long-term period, are considered to offer the best prospect for the eventual control of the disease. That prospect was also of interest to, for instance, UNDP, FAO, and IBRD, since onchocerciasis control could free vast fertile areas for agricultural and industrial development.
2.64 In Africa the ultimate objective is to develop a long-term programme with operations extended over the whole savanna region from Senegal to the Sudan and Ethiopia. At the present stage, efforts are being concentrated on the control programme in the Volta River Basin described in the Annual Report for 1970.1 Since July 1971, a preparatory assistance mission to governments, financed by UNDP/SF, has been collecting and analysing available epidemiological, entomological and vector control information in the seven countries directly concerned. This information will be used to prepare a plan of operation for implementation of a full-scale onchocerciasis control project. Special consideration is given to both technical and cost-benefit aspects of aerial larviciding, and to estimates of overall costs including those involved in providing basic training. As a participating agency, FAO, in collaboration with the IBRD Permanent Mission in West Africa, will assess the economic potential of areas suitable for resettlement and agricultural development schemes as well as the requisites for their economic development.

2.65 In conjunction with the above programme, a plan has been prepared by the Organization with the assistance of representatives of Ghana, Upper Volta and the Office de la Recherche scientifique et technique outre-mer (ORSTOM) for a research project on the methodology of control of the vector of onchocerciasis in West Africa. The project aims to develop an efficient, safe, and economical method for the control of Simulium damnosum by means of aerial application of insecticides to breeding sites under varying ecological conditions.

2.66 The control of onchocerciasis depends primarily upon control of the vector species of Simulium since no therapeutic agent sufficiently safe to be used for mass administration is yet available. The situation is due to some extent to insufficient research in drug testing for filarial infections in general.

2.67 A major factor that holds back experimental research on the chemotherapy of onchocerciasis and on other aspects of its control is the lack of a laboratory model in which the complete cycle of transmission from vector to definitive host to vector can be maintained. A significant step forward would be the successful rearing of S. damnosum in the laboratory. The Department of Entomology, Institute of Tropical Medicine, Tübingen, Federal Republic of Germany, has succeeded in rearing the European blackfly, Boophthora erythrocephala, a species which is anthropophilic and mates readily under laboratory conditions, and is undertaking field studies in Kumba, Cameroon, on the establishment of a self-sustaining colony of S. damnosum.

2.68 Another experimental model is being developed at the Department of Parasitology, London School of Hygiene and Tropical Medicine, England, using Onchocerca cervicalis of the horse which, because of the presence of microfilariae in the eyes, may cause ocular lesions comparable to those of O. volvulus in the human host. The vector Culicoides nubeculosus and a related species C. variipennis from North America have been colonized and infected by feeding on horses and by an artificial membrane feeding technique.

2.69 Other research activities sponsored or supported by WHO include field studies on the ecology of adult S. damnosum which have recently added to the very limited knowledge of the resting locations and behaviour of this vector in the period between the female fly's blood feedings. The newly emerged flies, male and female, were observed to alight on vegetation in the vicinity of the breeding site at a progressively greater height the greater the distance from the water. Gravid females were found to return to oviposit at identical resting places on vegetation. The appearance of these two groups on vegetation coincided with times of emergence and oviposition respectively. Since the flies landed on the upper surface of the vegetation and moved to the underside to rest for lengthy periods while feeding on plant juices, it may be possible to supplement conventional control at the larval stages by the application of adulticides in 100-foot (30-m) swaths on either side of the breeding site.

2.70 Studies on the S. damnosum complex conducted by the Department of Zoology, University of Western Ontario, London, Canada, have already shown that S. damnosum in East Africa can be divided into two subgroups in which 12 cytological categories are recognized. Similar studies are being conducted in West Africa and the evidence from the two areas shows the existence of 17 cytological categories, many of which may represent distinct species. These studies may not only cast light on ecological factors in the transmission of the parasite, but may also lead to a method of genetic control through cytoplasmic incompatibility.

2.71 Studies are being conducted at the Department of Zoology, Queen's University, Ontario, Canada, on the control of S. venustum by the use of males sterilized by an appropriate dosage of gamma-irradiation. Scientists in Canada are also investigating more conventional means of Simulium control, such as larviciding with methoxychlor and the use of

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1 Off. Rec. Wld Hlth Org., 1971, No. 188, p. 34.
particulate formulations of various larvicides. These studies seek to use non-persistent, biodegradable chemicals.

Filariasis

2.72 Filariasis caused by Wuchereria bancrofti or Brugia malayi already affects 250 million people in the world and is spreading as a result of the rapid development of urbanization in many of the developing countries of Africa and Asia. The lack of sanitation in shanty towns and peri-urban slums leads to an increase in breeding sites for the major vector, Culex pipiens fatigans, which thrives in foul water. Where people live in overcrowded conditions, water bodies may be so polluted that natural predators of this mosquito cannot survive.

2.73 Some years ago it was pointed out that C.p. fatigans was the mosquito that had profited most from increasing urbanization and industrialization. A survey in Kaduna, Nigeria, in 1942 failed to reveal a single mosquito of this species, whereas a survey in the same locality in 1958 noted as many as 760 per room. The significance of this rather spectacular development is that it occurred unrecognized. There seems little doubt that similar pullulations of vectors have gone on and are going on in other areas. In addition to its well-developed faculty for sheltering in houses, C.p. fatigans possesses considerable genetic adaptability, enabling it to resist insecticides; it was noted in Malaya that the urban strain of this species was about 20 times as efficient a vector of W. bancrofti as a rural strain.

2.74 The situation in African countries with endemic foci of filariasis reflects these current trends and demands the attention of all international agencies interested in assisting economic development. Bancroftian filariasis is especially widespread in the coastal areas and in the lowland savannas. It occurs mainly in rural areas where the classical vectors are Anopheles funestus and members of the An. gambiae complex, but the urban Tanga strain of W. bancrofti was found to be well adapted to development in C.p. fatigans populations from rural non-filarial areas. These and other observations suggest that C.p. fatigans is likely to be responsible for an increasing proportion of filaria transmission as East African towns continue to expand into adjacent rural areas where anopheline vectors have always played the principal role.

2.75 Member of the Aedes scutellaris group of mosquitoes of the subgenus Stegomyia serve as the primary vectors of subperiodic Wuchereria bancrofti infection in many islands in the South Pacific. These mosquitoes are particularly difficult to control, since the larvae breed in a variety of small, inconspicuous habitats such as artificial containers, tree holes, coconut husks and crab holes which, on most islands, it is impracticable to larvicide, remove or destroy. Distinct populations seem, however, to be evolving on different island groups. During the year, WHO therefore initiated a research project of approximately five years’ duration that is concerned principally with the A.e. scutellaris group and related vector species. The objectives of this project are a more precise identification of vectors of filariasis in the islands of the South Pacific, differentiation of the members of the A.e. scutellaris group as a prerequisite for control experiments using genetic mechanisms, and the investigation of the possible correlation between the taxonomically and genetically well-defined species on the one hand and their ecological characteristics on the other.

2.76 Scientists working on filariasis, with support from WHO, at the Tananarive centre of the Office de la Recherche scientifique et technique outre-mer have recently remarked on the social importance of this infection in Mayotte, Comoro Archipelago. They also confirmed the two main vectors in that island to be An. gambiae and C.p. fatigans. The area is a hyperendemic focus with 27% of males over 10 years of age showing clinical signs of filariasis. Infection was noted in 45% of the population over 1 year old.

2.77 WHO-supported work in West Africa, using strains of mosquitoes from the Gambia, Nigeria and Upper Volta, has shown An. gambiae species A and B and An. melas to be equally susceptible to W. bancrofti. An. gambiae species A may be slightly more dangerous because of its greater longevity, but all three species were similar in their ability to harbour filaria larvae up to the infective stage. Other studies by the Organization for Co-ordination and Co-operation in the Control of Major Endemic Diseases (OCCGE), at the Centre Muraz, Bobo Dioulasso, Upper Volta, showed that An. pharoensis and C. antenatus were possible secondary vectors of filariasis. Observations that four strains of C.p. fatigans from towns in Upper Volta could be infected with a rural strain of W. bancrofti and produce infective larvae pointed to the likelihood that W. bancrofti will adapt itself to C.p. fatigans and create new foci of urban filariasis.

2.78 For a number of years, WHO has assisted laboratory research on the mosquito-filaria relation-
The ideal filariasis control programme should combine the application of insecticides against the vector with a campaign of mass chemotherapy and planned improvement of sanitary facilities to eliminate the vector's breeding sites. In practice, this has rarely happened and control programmes have tended to emphasize either the first or the second of these three methods. After the successful demonstration by WHO of the use of fenthion to control the vector C.p. fatigans in Rangoon, the Government of Burma has launched an antifilarial programme including both vector control and chemotherapy with diethylcarbamazine. In the area of Ceylon where filariasis is endemic, mass chemotherapy with the same drug is also being combined with vector control.

Owing, in part, to the difficulty of controlling the vector species, certain filariasis control programmes are based primarily on mass chemotherapy with diethylcarbamazine, which is the only drug that can be safely employed for mass treatment of either W. bancrofti or B. malayi infections. The toxicity of this compound is negligible and, although its side-effects may be unpleasant, they are not serious. Mass chemotherapy campaigns have been undertaken in American Samoa, Fiji, French Polynesia, Japan, Western Samoa and other parts of the world and have been particularly successful in the Western Pacific Region, where the subperiodic form of W. bancrofti occurs.1,2

In an area in southern Thailand a programme to control infection with Brugia malayi was started in 1963 using diethylcarbamazine. One month after treatment the microfilaria rate had dropped from 21.1% to 2.2% and the mean microfilaria density from 4.8 to 0.5. Six years after the mass drug treatment the microfilaria rate was 0.5% and the mean microfilaria density was 0.02. Houses in the village were sprayed once or twice per year with DDT and persons with residual or with new infections were given treatment.

Periodic examinations of the vector Mansonia uniformis have been made since 1965 and have failed to reveal any filaria larvae.3 The results just mentioned suggest that under certain circumstances it may be possible to reduce filariasis by mass chemotherapy with diethylcarbamazine to a point where it ceases to be a significant public health problem. For this, it would be necessary to bring microfilaria rates down to less than 1% and the microfiliaria density to a mean of 1 or less. Mosquito surveys would have to show a reduction to 0.5% or less in the rate of filaria larvae at the infective stage and there should be a concomitant decline in clinical disease.

However, in mass chemotherapy programmes there occur some primary treatment failures evidenced by persistent microfilaraemia, some secondary failures in which microfilaraemia recurs, and some new infections. To obtain greater accuracy in the evaluation of the effects of mass chemotherapy, more sensitive techniques are needed for the examination of populations undergoing treatment. A study initiated in Fiji for that purpose resulted in the following findings:

(a) Both the counting chamber and the Millipore membrane filtration techniques are more sensitive and more efficient in detecting cases of microfilaraemia than the conventional 60-mm² stained thick blood film technique.
(b) Both techniques are easy to use under tropical field conditions. Both are easily mastered by field technicians, and as many people can be examined daily as by conventional methods.
(c) In both treated and untreated areas of subperiodic Bancroftian filariasis, microfilaria rates and microfilaria densities are very considerably higher than has been hitherto suspected. Considerable revision of current concepts of the transmission of filariasis will be necessary as a result of these observations.
(d) Microfilaraemia persists in some 20% of previously positive subjects treated with diethylcarbamazine. In about 70% of initially resistant cases that have been retreated, microfilaraemia persists after a second full course of treatment.

On the basis of these preliminary studies, it is planned in 1972 to mount a longitudinal community study in an area of high endemicity, starting before and continuing for several years after mass drug administration. Such a study would compare findings as obtained by the above techniques with those of immunological studies.

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Trypanosomiasis

2.84 An important event was the completion in 1971 of the project in Kenya on operational research on the eradication of human and animal trypanosomiasis financed by UNDP/SF. Much of the work accomplished has been recorded in a large number of technical memoranda covering a wide variety of aspects of trypanosomiasis, and arrangements for their publication have been made. A series of training manuals were prepared and are also to be published. That so much was achieved in the relatively short space of three years emphasizes the value of applied research when undertaken in the field in association with control operations.

2.85 A notable scientific advance made in the course of this project was the development, mentioned in the Annual Report for 1970, of a simple laboratory test to distinguish between Trypanosoma rhodesiense and T. brucei isolated from animals or from Glossina without being obliged to have recourse to a direct test of infectivity in a human volunteer. The validity of this test has now been established beyond reasonable doubt, especially when it is applied to freshly isolated strains. It has therefore become possible, for the first time, to make quantitative studies of the extent to which animals may act as a reservoir of T. rhodesiense. Out of 1686 cattle in part of the project area, 14 (0.8%) were found to be infected with T. rhodesiense. Other isolations were made from one of 208 sheep and one of 37 reedbuck (Redunca redunca), providing the first positive evidence from the field that these two species act as reservoir hosts of trypanosomes dangerous to man. In addition, detailed quantitative studies of the relation of game animal species to tsetse fly distribution have confirmed the vital importance of bushbuck (Tragelaphus scriptus) as a host of Glossina pallidipes; out of 10 bushbuck examined, 9 were found to be infected with trypanosomes pathogenic for domestic stock.

2.86 In the diagnosis of human trypanosomiasis, it was found in the course of the project that the capillary agglutination test and a more recently developed latex agglutination test both afforded consistently positive results in cases with low parasitaemia that are difficult to diagnose by other means, and uniformly negative results in 216 serum samples from a trypanosomiasis-free area. This latter finding is in marked contrast to the results of screening based on immunoglobulin M levels in the serum, which usually gives about 5% false positive results. The latex agglutination test has the two additional advantages that it requires a minimum of technical ability, thus facilitating its use in the field or a rural dispensary, and that it provides an immediate answer, thus avoiding the difficulty of tracing suspected patients some days after their attendance at a survey or dispensary.

2.87 As a result of improvements in the technique of parasitological diagnosis of animal trypanosomiasis, a 46% increase in positive diagnoses of T. vivax was obtained as compared with the results of examination of blood films from the same animals using standard techniques.

2.88 The project team carried out further experiments on the spraying of residual insecticides in invert (water-in-oil) emulsion from fixed-wing aircraft. The method was shown to achieve satisfactory control of Glossina, even in dense thicket. Refinements of technique have brought costs down to a level where they compare favourably with those of ground application of insecticide in similar terrain.

2.89 Studies were carried out on environmental contamination resulting from these spraying operations. Investigations showed that in the local conditions the active ingredient of dieldrin, HEOD, was converted to photo-isomers by ultraviolet light much more rapidly than had been previously believed, since nearly 50% conversion took place in less than 10 days on grass. These isomers, the ultra-violet conversion products of dieldrin (UVCPD), are more toxic than dieldrin but more biodegradable. Analyses for HEOD and UVCPD in the wild animals most exposed—namely, those grazing at the edge of the thicket and some carnivores—showed that in over 90% of the samples HEOD levels did not exceed 1 part per million and no detectable amounts of UVCPD could be found. This indicates that photoisomerization to more toxic compounds is unlikely to constitute any real danger, provided that dosages of HEOD are kept low in the first instance.

2.90 In collaboration with Zaire, strains of trypanosomes were collected during the year for research related to the control of human trypanosomiasis, which now affects many areas of the country. It is hoped to obtain information on such matters as drug-sensitivity or drug-resistance, particularly in relation to chemoprophylaxis, transmissibility by tsetse flies and virulence.

2.91 The WHO International Reference Centre for Trypanosomiasis at the East African Trypanosomiasis Research Organization (EATRO), Tororo, Uganda, has steadily expanded its bank of trypanosome strains and for the first time has achieved successful storage.

of *Trypanosoma simiae* at low temperature. Parallel to this expansion of the centre's bank, there has been during the year a fourfold increase in the use of the stored and fully documented strains by research workers at the East African Trypanosomiasis Research Organization and elsewhere, including Belgium, Kenya, Switzerland, the United Kingdom and the USA. The centre has also made a joint survey with the Government authorities of the United Republic of Tanzania and the Swiss Tropical Institute of trypanosome strains in tsetse flies, game animals, cattle and man in and around the Serengeti National Park, United Republic of Tanzania.

2.92 Research which may prove of value in understanding the fundamental mode of action of drugs in trypanosomes is being pursued with WHO support in three institutes—the Animal Morphology Laboratory, Université libre de Bruxelles, Belgium; the Molecular Pharmacology Unit, Institut Gustave Roussy, Villejuif, France; and the Molteno Institute of Biology and Parasitology, Cambridge, England. It is known that several trypanosomicidal drugs have a particular affinity for the deoxyribonucleic acid (DNA) which occurs in trypanosome kinetoplasts, and elucidation of their precise mode of action may make possible the rational design of new trypanosomicidal compounds. Further, work on the basic constitution of trypanosomal DNA may be of fundamental taxonomic importance.

2.93 This work applies both to the African pathogenic trypanosomes and to *Trypanosoma cruzi*, the cause of Chagas' disease, which occurs only in the Region of the Americas (see Chapter 16).

**Leishmaniasis**

2.94 Research on immunity in leishmaniasis was pursued at the WHO International Reference Centre for Immunoglobulins, Institute of Biochemistry, University of Lausanne, Switzerland, where the development of a culture medium without formed cells has made possible the harvesting of parasites without contamination by cellular debris. In other investigations (see also paragraph 4.5) attempting to assess cellular immunity, migration inhibition of immune macrophages was successfully demonstrated.

2.95 The WHO International Reference Centre for Leishmaniasis, Department of Parasitology, Hadassah Medical School, Jerusalem, continued to add to its collection of strains, for which an up-to-date catalogue is in preparation. It also rendered diagnostic and serological services on request for leishmaniasis research workers. The method for preparing living cultures of *Leishmania tropica* is being subjected to further study at the centre in order to obtain optimum quality control.

2.96 Work at the Gamaleja Institute of Epidemiology and Microbiology, Moscow, showed that the application of the immunoferritin technique to the identification of *Leishmania* species gives clear-cut positive results with homologous antiserum-antigen systems and equally clear negative results with heterologous systems. Thus, though the technique provides no information on affinity between different species of *Leishmania*, it may be of value in identifying strains of obscure taxonomic status.

**Amoebiasis**

2.97 Continuing support was given to efforts to improve the means of diagnosing amoebiasis. Some encouraging preliminary results were obtained at the Pathology Unit, Royal Free Hospital, London, on the staining of *Entamoeba histolytica* in tissues, using an indirect immunofluorescent technique which appears to be specific. In connexion with a continuing comparative study of serological tests used in amoebiasis, further confirmation was obtained of the value of the indirect haemagglutination test, using antigen prepared from an axenic culture of *E. histolytica*, for the detection of extra-intestinal invasive amoebiasis.

2.98 Data on autopsy findings in amoebiasis that have been collected by the Organization from widely separated geographical areas throughout the world are being processed by computer to assess geographical differences in the disease.

**Mycotic infections**

2.99 Among the research on mycotic infections that continued to receive support from the Organization were long-term investigations by the Mycotic Service of the Institut Pasteur, Paris, on the epidemiology and ecology of mycetoma agents and other fungi, in particular *Nocardia* and *Sporotrichum schenckii* in Central America and *Madurella* and *Neotestudina* in Senegal.

2.100 Further to an antimycotic campaign carried out in Yugoslavia from 1964 to 1969 by the Institute of Dermato-Venerology, Sarajevo, in the course of which 1882 villages were investigated, 631 504 persons surveyed and 16 529 patients treated for ringworm infection, more field work was begun in 1971 to collect additional data necessary for completing a full-scale statistical analysis and evaluation of the
results. This evaluation survey, which is being made on a sampling basis and involves the re-examination of 30,000 persons, was designed, with the assistance of WHO, in such a way that the information obtained can later serve for the planning of other antimycotic campaigns elsewhere.

Vector biology and control

2.101 The development of resistance to pesticides by disease vectors and the need to avoid environmental pollution are among the factors that have made it necessary in recent years for all concerned with vector control to review their strategies. The Organization is laying down the bases for standard methods of surveillance of vectors and of the diseases they carry, and it is seeking to develop methods of control—genetic, biological and environmental—that do not depend so greatly as hitherto on the organochlorine, organophosphorus and carbamate insecticides. However, chemical pesticides will probably never be entirely replaceable in public health use, particularly in times of threatened or actual epidemics.

WHO is therefore trying to determine what hazards the currently used pesticides really represent, to ensure that these products are used in such a way as not to constitute a significant risk to man or wildlife, and to encourage the development of more readily degradable compounds.

Applied ecology

2.102 In the WHO programme for collection and storage of data on the distribution and density of arbovirus vectors, more than 7000 records have been accumulated of seven species of Aedes (Stegomyia) vectors of yellow fever and dengue haemorrhagic fever, of which the most important are Aedes aegypti, Ae. simpsoni and Ae. albopictus. For Ae. aegypti, conversion factors have been worked out by which the most usual empirical indices of larval density—namely, house index, container index and Breteau index—can be given a common expression in the form of numbers from 1 to 9. This has made it possible to prepare a series of 32 computer printout maps (scale 1:5 million) showing the presence or absence,
and/or density, of these seven species throughout the eastern hemisphere from information obtained in special surveys or recorded in the literature. These maps show clearly the much greater density of *Ae. aegypti* in Asia than in Africa. An example of such a map is given in Fig. 6; this represents an early stage in the accumulation and plotting of data on *Ae. aegypti* in an area of western Africa and should not be taken as a complete picture of the vector situation there. Information is accumulating that will allow adult biting-rate and oviposition-trap data to be plotted using the same number sequence. The field data on density are obtained by institutions in the area concerned or by special surveys supervised by an expert sent to the area, and in 1971 Cameroon, the Central African Republic and Ghana received special attention for yellow fever vectors, and Brunei, Malaysia (Sabah and Sarawak) and the Republic of Viet-Nam for dengue haemorrhagic fever vectors. Information from this computer survey served as a basis of discussion at a consultation organized in March at Bobo Dioulasso, Upper Volta, jointly by WHO and the Organization for Co-ordination and Co-operation in the Control of Major Endemic Diseases (OCCGE) (see also paragraph 1.61). The participants agreed on the urgent necessity of accumulating basic data on the abundance and distribution of *Ae. aegypti*, which are lacking for many countries.

2.103 In a similar WHO computer survey of the distribution and density of ticks, more than 5200 records have been amassed of the vector species *Hyalomma anatolicum* and seven other species of hard ticks, as a result of the activities of the WHO Regional Reference Centres for the Biology and Distribution of Ticks, at the University of Maryland, USA, and in Cairo. The two other WHO regional reference centres with similar functions, at the Institute of Parasitology in Prague and at the Gamaleja Institute of Epidemiology and Microbiology, Moscow, are in the process of submitting a comparable volume of records on the encephalitis vectors *Ixodes persulcatus* and *I. ricinus*. Particular importance in this survey attaches to the habitat in which the ticks are found, in order to understand the epidemiology and control of the infections which they transmit. In August, at a meeting of the directors of the four regional reference centres held on the occasion of the Third International Congress of Acarology in Prague, a code was agreed upon that will permit information on habitats to be recorded in a uniform manner.

2.104 The importance of knowing what disease vectors are present in a given area, and in what numbers, was stressed by the Advisory Committee on Medical Research in June, when it reviewed the Organization's programme of research into the ecology and biology of vectors.

2.105 A significant contribution to such knowledge, with respect to yellow fever vectors, has been made by the WHO *Aedes* Research Units in Dar es Salaam and Bangkok. Intensive investigations reported earlier\(^1\) have elucidated a number of important ecological and biological features of *Ae. aegypti* and other *Stegomyia* species. These studies were further pursued in 1971. The WHO *Aedes* Research Unit in Dar es Salaam has determined the absolute densities of adult *Ae. aegypti* in several areas by means of mark-release-recapture experiments. It is attempting to define the relative contribution made to those densities by mosquitoes breeding in tree-holes (the classical situation with *Ae. aegypti* in its wild state in Africa), in discarded automobile tyres and other containers out of doors (a common habit of this species in centres of human population in the Americas and a growing tendency on its part in Africa), and in water-storage containers indoors (a situation that in East Africa is now frequent only in coastal Kenya and the south-eastern area of the United Republic of Tanzania). This information will prove valuable for chemical, biological and genetic control experiments to follow. Special attention is also being paid to *Ae. simpsoni*, a potential yellow fever vector which breeds abundantly in East Africa in the axils of banana and pineapple plants; surveys of its presence are being made in many localities, and an index by which to express its abundance is being worked out.

2.106 The WHO *Aedes* Research Unit at Bangkok has confirmed that *Ae. aegypti* breeds there only in man-made containers; this is in contrast to western India, where it is occasionally found in tree-holes, and to peninsular Thailand and Malaysia, where it occurs in rock-holes. It is abundant at Chiangmai in the far north of Thailand, but in villages in the neighbouring mountains at above 1000 m altitude it is completely replaced by *Ae. albopictus* in the artificial containers. In the small town of Khain Koi, 100 km north of Bangkok, where 49 cases of dengue haemorrhagic fever developed in a population of 8600 in a 6-week period in 1970, the *Ae. aegypti* indices were among the highest found anywhere in the world (96% of houses infested; 53% of water-filled containers infested; 590 positive containers per 100 houses).

2.107 During the year, further work by the WHO Japanese Encephalitis Vector Research Unit at Seoul has confirmed that the numbers of the vector *Culex*...\(^1\) Off. Rec. Wld Hlth Org., 1970, No. 180, p. 35; 1971, No. 188, p. 38.
**tritaeniorhynchus** are being drastically reduced by the increased use of insecticides in the rice-fields of the Republic of Korea for the control of agricultural pests. It is only when these applications are discontinued in September that the numbers recover, for a short period before the onset of winter. The principal places where breeding was found to occur throughout the summer were uncultivated swamps. Another source of breeding, which could be serious, is formerly agricultural lands on the outskirts of rapidly spreading cities such as Pusan; it is therefore on these latter areas that experiments in chemical control are being concentrated.

2.108 An example of the setbacks sometimes sustained in such experiments may be given from the year's experience. A trial near Pusan of ultra-low-volume application of insecticide from an aircraft was arranged for an evening when all operational conditions were expected to be right. However, owing to an undesirable wind direction and increase in its velocity, an unexpected decrease in the output of the spraying apparatus, and to the necessity to use a different insecticide from that originally envisaged, a small strip of the spray area was insufficiently covered and too low a dosage of a less effective compound was applied. Although larvae of *C. tritaeniorhynchus* were satisfactorily killed and there was 75% mortality among the caged adults exposed during the spraying, no significant difference could be found between the numbers of free-flying adults collected before and after spraying. This is presumed to be due not only to the factors enumerated above but also to an influx of wind-borne adults from outside the sprayed area as well as to many of the adults within that area having sought extra shelter as a result of a steady increase in the wind during and after spraying.

2.109 Attempts to discover overwintering adults of *C. tritaeniorhynchus* in the Seoul area, even utilizing artificial hibernation sites exposed as baits, again proved negative; this raises the possibility that recolonization of northern areas may be achieved only from populations further south, this mosquito having a considerable flight range.

2.110 On the other hand, the WHO Japanese Encephalitis Vector Research Unit at Taipei confirmed that adults of *C. tritaeniorhynchus* and *C. annulus* were present at all seasons of the year in Taiwan, falling to minimum numbers in February, when they could be found only in buffalo stables. Larvae of *C. annulus* were absent in February and March, and those of *C. tritaeniorhynchus* in March and April. Despite insecticidal applications in the rice-fields and the fact that the larvae were proved to remain susceptible to the insecticides applied, the populations rose rapidly in the spring so that by July a 10-minute collection from vegetation in the open with a specially adapted vacuum cleaner yielded more than 300 adults of these vectors. At that time of year most of the sentinel pigs exposed became positive for Japanese encephalitis antibodies. However, the virus is so infrequently found in these mosquitoes that only two field-collected "pools" of these vector species have yet proved positive for Japanese encephalitis virus. The number of human cases of the disease in the first six months of 1971 was less than during the same period in previous years. The biting rate of these species on man has proved to be less than one-fifth that on pigs and buffaloes.

2.111 Investigations of the biology and ecology of *An. gambiae* sibling species A and B have been carried out by the WHO *Anopheles* Control Research Unit No. II, near Kisumu, Kenya (see also paragraph 2.121), using characteristic bands of the chromosomes to identify the species, since they cannot be recognized by external morphological characteristics. It is becoming clear that species A more frequently feeds and rests in human habitations than elsewhere, whereas species B more frequently rests and feeds outdoors, particularly where animals are readily available. From those observations it would appear that sibling species A could be more easily controlled by indoor residual insecticides than species B. This information is of considerable value for the planning of antimalaria campaigns in areas where either or both sibling species may occur.

**Resistance to insecticides**

2.112 The resistance problem is continuing to affect the control of mosquitoes. Three species in particular may be mentioned: two are of direct public health significance—the malaria vector *Anopheles albimanus* in parts of Central America, and the encephalitis vector *Culex tarsalis* in California—and the third is the pest mosquito *Aedes nigromaculis*, also in California.

2.113 Tests on *An. albimanus* larvae have been carried out in three countries of Central America: El Salvador, Guatemala and Nicaragua. They have revealed that resistance to malathion, parathion and parathion methyl is now at a high level in the departments of Las Paz and La Libertad in coastal El Salvador, and at only a slightly lower level in the Department of Matagalpa in Nicaragua, where organophosphorus insecticides have been employed for some years. Moreover, all these populations appear to show some
degree of resistance to the carbamate insecticides propoxur and carbaryl. The former has been used since 1970 or 1971 on a small experimental scale for malaria control and the latter extensively for some years in agriculture. Decreased susceptibility to malathion and propoxur has been found in areas of intensive cotton cultivation in El Salvador; these areas are subjected during six months of the year at almost weekly intervals to heavy applications of several organophosphorus insecticides; carbamates are also applied but on a smaller scale. There is some evidence of resistance to malathion at Champerico, Guatemala, and at El Zapotal, El Salvador, but the An. albimanus populations there are evidently of normal susceptibility to propoxur. Colonies of some of these strains have been established in a WHO collaborating laboratory at the Department of Entomology, University of California, Riverside, Calif., USA, for further studies on the level of resistance and cross-resistance to other insecticides. Whether the degree of resistance found in the laboratory among larvae of these strains will have operational implications requires further field observations.

2.114 Another potentially serious situation may arise with Culex tarsalis, particularly in view of the possibility of the introduction of Venezuelan equine encephalitis into California. In many areas of California this species has now developed resistance to all the organochlorine and organophosphorus insecticides available, according to reports from the California State Department of Public Health and the WHO collaborating laboratory at Riverside. By the end of 1970, approximately twice the normal operational dosages of malathion, parathion, para-thion methyl, fenthion, EPN (O-ethyl O-p-nitrophenyl phenylphosphorothioate), Abate and Dursban had failed to give satisfactory control of C. tarsalis larvae. As a consequence, control of the adult mosquito by means of propoxur applied by the ultra-low-volume (ULV) airspray method has been adopted to meet emergencies involving this vector, together with source reduction through environmental control measures.

2.115 Aedes nigromaculis has also developed resistance to all available organochlorine and organophosphorus insecticides in certain mosquito-abatement districts in California. Moreover, this species shows some tolerance to carbamates: control failures have been encountered when adulticide sprays with propoxur have been applied. Therefore control may once again come to depend upon the use of petroleum oils, fortified oils and larvivorous fish.

2.116 The extent to which resistance may have developed to dieldrin and HCH in triatomid bugs in South America is still not clear, but a population of Rhodnius prolixus from the State of Trujillo, Venezuela, is definitely resistant to both dieldrin and gamma-HCH. Body lice taken in an area of Burundi where typhus is active proved, in laboratory tests, to be highly tolerant to malathion. A high level of tolerance to malathion has also been observed in several louse populations in Egypt.

Evaluation of new insecticides

2.117 New insecticides have been tested for their possible use in vector control, as in the past in collaboration with the six WHO International Reference Centres for the Evaluation and Testing of New Insecticides and five field research units. During 1971, 60 compounds were tested in Stage I (initial screening) and 20 in Stages II and III (laboratory and simulated fields tests) of the WHO insecticide evaluation programme. These tests resulted in only three compounds showing sufficient activity to be recommended for testing at Stage IV (initial field examinations). This rather low number of compounds showing adequate activity is due largely to the economic problems facing the pesticide manufacturing industry in developing new pesticides. The problem was among a number of questions considered by the directors of the laboratories collaborating in the evaluation programme at a meeting in Geneva in September. It was agreed that the emphasis of this programme should now shift from the sequential screening of many compounds to the intensive development of a few compounds by simultaneous laboratory and field tests. At the same time the means by which best to use the materials at present available should be determined.

2.118 The evaluation programme has now been in operation for 12 years and has resulted in several new insecticides being field-tested on a large scale or being recommended for operational use: notably malathion (OMS-1), propoxur (OMS-33) and fenitrothion (OMS-43) for adult anopheline mosquito control, and fenithion (OMS-2), Abate (OMS-786) and Dursban (OMS-971) for larval mosquito control. These have resulted from the exhaustive testing of 1349 compounds. How this screening developed for the above three adulticides for malaria control is depicted in Fig. 7.

2.119 Experimental huts (Stage IV) were used during 1971 to investigate better and more economical ways of utilizing propoxur, which has been found effective
in residual applications for the control of adult anopheline mosquitos but which is costly. Since this compound has an airborne effect which extends its insecticidal properties some distance from sprayed surfaces, an experiment was designed to compare its effectiveness, at two dosages, when sprayed only on the underside of roofs, including the eaves on the outside, and when sprayed on all the internal surfaces of huts. Preliminary findings indicate that the standard application of 2 g/m² on all internal surfaces gave slightly better results than 4 g/m² on roof and eaves only and much better results than 2 g/m² on roof and eaves. A second round of spraying is to be carried out to permit assessment of the cumulative effect. By contrast, selective band spraying (spraying of a relatively narrow strip around all inside walls) at 35-day intervals has been shown to be more economic and more effective epidemiologically than total coverage at 3-month intervals in Central America (see also paragraph 16.29).

2.120 Two insecticides which had met Stage IV criteria—\(\text{O-(2,5-dichloro-4-iodophenyl) O-methyl phosphor-amidothioate}\) (OMS-1028) and phoxim (OMS-1170)—were evaluated in village-scale trials (Stage V) against adult anophelines. Neither insecticide had as great a capacity for interrupting malaria transmission as propoxur and fenitrothion. Toxicological investigations of the former compounds are described in paragraph 2.135.

2.121 The large-scale operational evaluation (Stage VI) of fenitrothion that began in 1969 was completed by the WHO Anopheles Control Research Unit No. II in the Kisumu area of Kenya. The results show that this insecticide is very effective in interrupting contact between man and anophelines in houses; four successive applications of fenitrothion at 2 g/m² each gave effective control of \(\text{An. funestus}\) for more than 22 months. As stated above, \(\text{An. gambiae}\) sibling species A and B in the Kisumu area are difficult to control by residual sprays alone since there are components of their populations that rest out of doors and feed there (principally on cattle). Nevertheless the four spray rounds of fenitrothion were found very effective in controlling these species for just over 19 months.

2.122 Fenitrothion also has a valuable airborne effect by which mosquitos can be killed that rest on unsprayed articles (clothing, harness, etc.) which may be hung near sprayed surfaces. Total mortality of caged \(\text{An. gambiae}\) hung within 50 cm of sprayed surfaces was achieved for 28-77 days after spraying, and mortalities above 70% were recorded for 63-101 days after spraying.

2.123 The effectiveness of this insecticide against anopheline mosquitos has been well proved and plans are being made to evaluate it epidemiologically to determine its capacity to interrupt the transmission of malaria. With respect to its safety for man, toxicological studies reported for 1970 indicated that it can be applied to the interior of occupied houses with safety both for occupiers and for spraymen if the latter follow certain precautions.

2.124 The susceptibility of \(\text{An. gambiae}\) larvae to 10 larvicides was determined at the WHO Anopheles Control Research Unit No. I, in Kaduna, Nigeria. Three of these were found to be effective at very low dosages (LD_{50} of 0.0020-0.0024 ppm) and small-scale pilot trials (Stage IV) were carried out with two—OMS-1290 and Abate (OMS-786)—at various dosage levels. Both insecticides provided approximately 30 days of control when applied at the rate of 1.0 ppm in the form of emulsion concentrate or, in the case of Abate, also as 1% insecticidal granules of three different types.

2. \(\text{O-(2,5-dichloro-4-iodophenyl) O-methyl phosphor-amidothioate}\).

![Fig. 7. Steps in the screening of compounds for the control of adult mosquitos in malaria eradication in the course of the WHO insecticide evaluation programme](image)
2.125 Because of the very low mammalian toxicity of Abate, which permits its application to water that might be used for domestic purposes, a village-scale (Stage V) trial was undertaken using the various formulations of this insecticide. During the early part of the wet season, it was possible to keep the house-resting index for adult anophelines in the protected area down to approximately one-third that found in the un sprayed comparison area. It was concluded that, although good larval control was achieved, significant numbers of anophelines were crossing the 3-km barrier strip where the larvicide had been applied and were reaching the central protected area. However, the value of Abate for control of An. gambiae and An. funestus larvae has been well established and it can be utilized to protect supervised areas. Aedes Research and materials developed by the former WHO Filaria Research Unit, Bangkok, to assess—with appropriate precautions—their potential for use against Culex pipiens fatigans breeding in polluted water. Initial results with one of these show it to be one of the most effective larvicides screened at early stages of the WHO insecticide evaluation scheme, but its mammalian toxicity is such that it probably could not be considered for other than restricted use. C. p. fatigans is the main urban vector of filariasis, not only in South-East Asia, but in coastal East Africa as well; because of the concern of the Government of the United Republic of Tanzania about increasing C. p. fatigans populations and the possibility of increased urban transmission of filariasis, the East African Aedes Research Unit in Dar es Salaam has begun a study to determine how the successful methods and materials developed by the former WHO Filaria Research Unit in Rangoon can best be applied to East African conditions.

2.126 Five new compounds have undergone evaluation in the field in Thailand by the WHO Aedes Research Unit, Bangkok, to assess—with appropriate precautions—their potential for use against Culex pipiens fatigans breeding in polluted water. Initial results with one of these show it to be one of the most effective larvicides screened at early stages of the WHO insecticide evaluation scheme, but its mammalian toxicity is such that it probably could not be considered for other than restricted use. C. p. fatigans is the main urban vector of filariasis, not only in South-East Asia, but in coastal East Africa as well; because of the concern of the Government of the United Republic of Tanzania about increasing C. p. fatigans populations and the possibility of increased urban transmission of filariasis, the East African Aedes Research Unit in Dar es Salaam has begun a study to determine how the successful methods and materials developed by the former WHO Filaria Research Unit in Rangoon can best be applied to East African conditions.

2.127 As was mentioned in paragraph 2.64, a plan of operation is being prepared for a seven-country onchocerciasis control project in West Africa. It is already clear that in such a large-scale undertaking conventional treatment of large river systems from the ground will not be economically feasible and that only aerial applications of the insecticides will be able to cover the extensive areas involved with the necessary frequency and economy. An earlier preliminary trial has shown the feasibility of such aerial application under West African conditions but further research is essential before the full operational programme can be started. A three-year research programme has been started to develop an efficient, safe and economic method for the control of Simulium damnosum by means of aerial application of insecticides. Among other research, the project would test and carry out field trials on new biodegradable larvicides as alternatives to DDT, the long persistence of which in the aquatic biotope is considered undesirable.

2.128 Collaborative research co-ordinated by the WHO International Reference Centre for the Evaluation and Testing of New Insecticides, Savannah, Ga., USA, has been initiated to develop a formulation of Simulium larvicide suitable for application from aeroplanes, and an interim method is now available for assessing and adjusting the emulsifier content of the formulation to allow comparative trials to be made. The first test has been with a 20% methoxychlor floating formulation.

Vector control in emergencies

2.129 With the recent progressive geographical extension of the range of several important arboviruses, which has resulted in a number of major epidemic outbreaks, the Organization has been giving special attention to the development of vector control methods along two broad lines: the elaboration of long-term procedures which can be incorporated into routine municipal or rural vector control programmes, and the development of methods and materials for use in emergencies when epidemic outbreaks of such diseases as yellow fever, dengue haemorrhagic fever or Japanese encephalitis occur. In recent years a series of WHO trials of the aerial application of insecticides by the ultra-low-volume (ULV) method has shown that this form of application produces an immediate, if temporary, reduction in populations of Aedes aegypti—the vector of dengue haemorrhagic fever—in urban centres in South-East Asia and that it can be efficacious against Aedes simpsoni, one of the most important rural vectors of yellow fever in Africa.

2.130 Unfortunately, it is not always easy to obtain either the services of a pilot specially trained in making ULV applications or a suitably equipped aircraft at short notice when an epidemic occurs. To obviate these difficulties a series of trials was completed by the WHO Aedes Research Unit in Bangkok with new ground equipment by which non-thermal, ultra-low-volume fogs of insecticides are applied. The trials have shown that this equipment can be rapidly and effectively used to treat large urban areas; further trials are planned for rural areas. The method holds promise for the emergency control of the mosquito vectors of several arboviruses, particularly since the equipment can be used with a
minimum of training and can be quickly transported by air and mounted on to a locally available vehicle.

Rodents

2.131 The frequent recrudescence of bubonic plague in old foci shows that this disease remains an important public health problem, as do several other rodent-borne diseases. In some urban areas of the world there is such a density of rodents that, even aside from their importance as potential or actual reservoirs of human disease, the amount of stored food that they consume or render inedible represents a vast economic loss and causes severe problems in ensuring adequate nutrition for man. To control these rodents well-planned, long-term, integrated control operations are essential, for their reproductive potential is so great that they can rapidly outbreed any population losses brought about by inadequate or partial control measures.

2.132 Many extensive and very effective rat control programmes have been carried out that have been based entirely upon the use of the anticoagulant rodenticides. Unfortunately, the effective use of these compounds is being restricted by the increasing spread of high levels of resistance in rats to the entire group of anticoagulants, and particularly in the brown rat, Rattus norvegicus. This resistance, which was previously reported from Scotland, Wales and several other areas of the United Kingdom as well as from Denmark and the Netherlands, was newly reported in 1971 from the northern areas of the Federal Republic of Germany and from North Carolina, USA. In all cases this resistance has appeared in areas where intensive use has been made of the anticoagulants in rat control. In addition, resistance to anticoagulants on the part of the black or ship's rat, Rattus rattus, was reported for the first time from the Liverpool docks in the United Kingdom.\(^1\) Since the resistance is controlled by a single dominant or semi-dominant gene and the black rat is closely linked to shipping, there is a risk that resistance may spread to other parts of the world through seaports. The Organization is therefore supporting research to evaluate candidate rodenticides with different modes of action that might be used in both urban and rural rodent control programmes; this work is being carried out at the WHO International Reference Centre for the Evaluation and Testing of New Insecticides, Savannah, Ga., USA; the Pest Infestation Control Laboratory, Tolworth, England; and the Department of Animal Physiology, University of California, at Davis, Calif., USA. At the latter, research is also being carried out on the ecology and taste preferences of rats so as to enable available rodenticides to be used selectively and as efficiently as possible. The Organization is sponsoring similar studies at Bowling Green State University, Bowling Green, Ohio, USA, where, with FAO and WHO support, an annotated bibliography is being compiled on the public health and economic importance of rodents. WHO is also responsible, as a participating agency, for the public health aspects of a rodent research centre in Karachi, Pakistan, established during the year with UNDP/SF support, FAO being the executing agency.

2.133 In October WHO, in co-operation with the Government of Denmark and with DANIDA support, organized a two-week course in Dar es Salaam on the biology and control of rodents and of urban mosquitoes and other insects of public health importance. There were 15 participants from Botswana, the Gambia, Ghana, Liberia, Mauritius, Nigeria, Sierra Leone, Uganda, and the United Republic of Tanzania.

2.134 Rodents and their ectoparasites were also among the topics discussed at the third of a series of travelling seminars on vector biology and control that was held, with UNDP/SF financial assistance, in the USSR in July. The earlier seminars had dealt with entomological methods (in 1965) and with vector ecology (in 1969); the 1971 seminar dealt with methods and materials for the control of vectors. There were 20 participants from 16 countries in all the WHO Regions, who attended lectures and field demonstrations of vector control activities in Moscow, Kalinin, Krasnodar and Stavropol.

Safe use of pesticides

2.135 The toxicological aspects of newly developed pesticides for vector control programmes have remained under constant scrutiny in laboratory and field investigations during the year. In Stage V trials in WHO's insecticide evaluation and testing programme, the Anopheles Control Research Unit No. I, Kaduna, Nigeria, performed studies on the safety of two compounds applied indoors as residual insecticides for the control of adult anophelines on a village scale (see paragraph 2.120 above). Clinical observations carried out by a medical toxicologist were supported by biochemical tests to determine the degree of exposure of people applying or handling the insecticides as well as of those living in treated houses. These investigations showed that, while o-cyclopentylphenyl methylcarbamate (OMS-1028) was safe enough to be applied on a large scale, further

\(^1\) Wkly epidem. Rec., 1971, 46, 466.
investigations were required in the case of phoxim (OMS-1170), an organophosphorus compound. Additional information is required on the pain-producing effect of phoxim on the spraymen's skin (probably associated with the sunlight) and the possible liberation of minute traces of HCN vapours from the formulation. The latter, although probably too slight to be of significance for the safety of spraymen and villagers, might present some hazard to workers handling the concentrate.

2.136 WHO-supported surveys on the possible long-term effects of DDT are being carried out at the Biological Institute of São Paulo, Brazil, and by the Indian Council of Medical Research; in both countries spraymen engaged in the national malaria eradication campaigns are being examined. While in Brazil the long-term surveillance, now in its third year, is progressing according to plan, the protocol for the cross-sectional morbidity study in India, which began only in 1971, will require modification because of the unforeseen difficulty in obtaining the required number of spraymen meeting the criterion of previous exposure to DDT for at least five successive spraying seasons.

2.137 Two investigations carried out in parallel in two laboratories during the year—those of the International Agency for Research on Cancer (IARC), in Lyons, and of the National Institute for the Study and Treatment of Tumours, in Milan—using two different strains of mice, CF1 and BALB/c respectively, have indicated that the administration of DDT mixed into the diet for the life span of the animals is followed by an increased incidence of hepatomas in both female and male mice. This was most evident in mice receiving the highest dose of DDT (250 ppm). There was no significant difference in the incidence of hepatomas between mice exposed to DDT from 8 weeks of age for the remainder of their life span and their progeny exposed to DDT from intra-uterine life. These experiments have so far failed to confirm the multigeneration carcinogenic effect previously reported elsewhere. The significance of the experimental induction of hepatomas in mice by potential carcinogenic agents is controversial, especially as regards their relevance to man in relation to tumours of the liver and of extrahepatic sites. Accordingly a working party is planned for 1972 under the auspices of the IARC to review the significance of the experimental induction of murine hepatomas in relation to the potential human risk.

2.138 The evaluation of DDT storage levels in mouse and human tissues, also performed by IARC (see also paragraph 3.69), indicates a difference in storage levels and metabolic patterns between man and mouse. Investigations of the possible role of the main metabolites of DDT (p,p'-DDD and p,p'-DDE) in the induction of hepatomas in mice, as well as of the possibility that liver nodules may regress after suspension of exposure to DDT, are at present under way.

2.139 No clear relation between cancer patterns in different countries and the level of DDT in fat tissue has yet been demonstrated, although in certain areas the duration of human exposure is of the order of 25 years. The morbidity data for several geographical areas over a prolonged period that are available for examination are limited, but there appears to be no evidence of an increase of primary carcinoma in man during the past 25 years in North America or in western Europe—that is, from the time when DDT was massively introduced into the environment. Further, much evidence points to other factors as being important in the etiology of liver cancer. Similarly, changes in the incidence of cancer occurring at sites other than the liver cannot be equated with the use of DDT either. It is therefore intended to continue to monitor DDT levels in human body tissues in countries with different cancer incidences and different degrees of exposure to DDT in order to see if an association can later be demonstrated.

2.140 With the ever-increasing use of pesticides in agriculture and the growing tendency to replace the more persistent insecticides by compounds of greater biodegradability, but frequently of higher acute toxicity, the need for pesticide control on a national scale has become urgent in many developing countries. Consequently, the Organization provided assistance during the year to the health administrations of India, Indonesia and Thailand for developing national programmes for the safe use of pesticides in agriculture as well as in health programmes. It has been stressed that to achieve this it is essential to arrange for a regular exchange of views and information between agricultural and health authorities on pesticide use. Following inter-agency consultations between FAO and WHO during the year, the two organizations are envisaging the joint issue of data sheets on new and existing pesticides for the information of governments. Whenever possible arrangements will also be made for representatives of national health authorities to participate in FAO-organized seminars and other educational or training meetings and for representatives of agricultural authorities to participate in those organized by WHO. Such meetings would be an important way of bringing about the desired cooperation at a national level.
2.141 Also in co-operation with FAO (the executing agency), WHO continued to provide assistance in a UNDP/SF project in Brazil for the expansion of work on the safety of pesticides. This included the participation of WHO in a seminar on the safe and effective utilization of agricultural pesticides in Latin America organized by FAO at the site of the project. In a similar project in Egypt, financed in the same way, WHO has assumed responsibility as a participating agency for providing technical advice and assistance on project matters pertaining to the evaluation of human health hazards inherent in the use of pesticides. A number of projects similarly financed, which have an agricultural pesticide component, are at the planning stage. These can be valuable in promoting the safe use of pesticides and in training qualified staff, and close collaboration has been established with FAO in the early stages of planning.

2.142 An international conference was held in February 1971 in Atlanta, Ga., USA—under the joint sponsorship of Emory University; the Center for Disease Control of the US Department of Health, Education, and Welfare; and WHO—to permit research workers concerned with the synthesis and the toxicity of insecticides to discuss the development of safe, effective compounds that might replace those now in use to which resistance exists or is emerging, or for which substitutes may be required for other reasons. More than 50 scientists from 11 countries participated. The main part of the meeting was devoted to anticholinesterase insecticides, although pyrethroids, DDT analogues and insect hormones were also considered. The conference did much to clarify the limitations of the latter groups, particularly regarding the likelihood of their being operationally applied in the near future, and it brought out the importance—as well as the difficulties—of developing more satisfactory anticholinesterase compounds. WHO assumed responsibility for the technical aspects of the conference and for publishing the proceedings, which appeared in the Bulletin of the World Health Organization.¹

2.143 A European regional conference on the prevention of pesticide intoxication was held in Kiev, USSR, in June; this is described in paragraphs 18.68-18.74.

Application and dispersal of pesticides

2.144 The size of the droplets produced by insecticide spraying equipment is a critical factor determining the biological effectiveness of the compounds sprayed. In 1971 the Organization supported studies—at the WHO International Reference Centre for the Evaluation and Testing of New Insecticides, Savannah, Ga., USA, and at the Silwood Park Field Station of the Imperial College of Science and Technology, London—to determine droplet sizes and emission rates of certain newly developed items of equipment. Among these are a knapsack sprayer for ultra-low-volume spraying of insecticides from the ground and hand-carried equipment for spraying for Simulium control on small streams that cannot readily be treated from the air. The Silwood Park Field Station also tested samples of a new type of plastic nozzle for residual spray applications; they were found to produce exceptionally good spray patterns and to be erosion-resistant.

2.145 A formulation of fenithrothion has been found in field use to cause the gaskets and some other parts of hand compression sprayers to swell and become unusable in a short time. A co-operative investigation, conducted by the manufacturers of the equipment and of the insecticide and co-ordinated by WHO, was undertaken and resulted in the identification of several gasket materials with acceptable characteristics.

2.146 The WHO International Reference Centres for the Evaluation and Testing of New Insecticides at Savannah, Ga., USA, and at Salisbury, England, undertook a comparison of the biological effectiveness of insecticide residues applied with the standard nozzles and at the standard pressure used in malaria eradication operations and using a larger nozzle at a much lower pressure. At more than 26 weeks after spraying the biological results were equivalent. The purpose of using the lower pressure is to minimize the amount of insecticide that bounces from the wall upon impact during spraying in order to reduce insecticide wastage, the abrasion (and consequent replacement) of nozzle tips, and the exposure of spraymen to possible contamination.

Specifications for pesticides

2.147 Since 1953 the Organization has periodically issued specifications for pesticides used in public health, the last (third) edition of the manual containing them having been published in 1967.² These specifications have become the basis on which almost all pesticides are procured for national and international vector control programmes for public health purposes, and require revision from time to time as analytical


methods are refined and new pesticides come into use. In April a WHO expert committee on insecticides reviewed the existing specifications and methods and made certain changes and additions in the light of recent developments and of worldwide collaborative work—notably involving FAO, the Collaborative International Pesticides Analytical Council, and pesticide manufacturers. The principal items recommended for inclusion in a fourth edition of the manual are a change in the analytical methods in the malathion specifications and new specifications for propoxur and fenitrothion.

2.148 To ensure standard performance of many of the analytical procedures described in the manual, materials of known chemical purity are required. So that laboratories may calibrate their methods, WHO maintains stocks of samples of known purity of malathion, dichlorvos, p,p'-DDT, gamma-HCH, alpha-HCH, HEOD, warfarin, coumachlor, and deet. It supplied such samples in 1971 to laboratories in Ceylon, Czechoslovakia, India, Italy, Spain, the USA, and Venezuela.

Biological control

2.149 Significant progress was made during the year in the study and development of five actual or potential agents for the biological control of disease vectors.

2.150 The biology of the predacious mosquito Toxorhynchites brevipalpis has been characterized by the WHO East African Aedes Research Unit at Dar es Salaam, where its larvae prey on Ae. aegypti breeding in a multiplicity of small artificial and natural containers; the adults seek out these containers and lay their eggs in them, and their hatched larvae can destroy up to 100 Ae. aegypti larvae each. Methods of large-scale production of this predator have been developed by the research unit and in laboratories in the USA and, with WHO support, in Canada. A protocol has been drawn up for an experiment involving inundative releases of T. brevipalpis in a used-car dump near Dar es Salaam in which Ae. aegypti is abundant.

2.151 The microsporidian parasite Nosema stegotmyiae, which attacks the larvae of many mosquito species and is notorious for eliminating laboratory colonies of mosquitoes, is being investigated in Nigeria by the WHO Anopheles Control Research Unit No. I. This unit has shown that this parasite is naturally absent from the An. gambiae complex in the study area in Nigeria but will readily infect An. gambiae larvae if introduced.

2.152 The nematode Reesimermis nielseni, formerly considered to be a species of Romanomermis, has been a valuable agent of biological control of a wide range of culicine larvae in pools in Louisiana (USA) in which this nematode occurs. Studies performed in 1971 by the WHO Aedes Research Unit in Bangkok and the WHO Japanese Encephalitis Vector Research Unit in Taipei showed that R. nielseni readily parasitizes larvae of C.p. fatigans there, and both units have established laboratory colonies of it in order to produce sufficient microfilariae for field trials. However, it seems unlikely that this nematode will effectively parasitize C. tritaeniorhynchus and C. annulus, the vectors of Japanese encephalitis in Taiwan.

2.153 The parasitic insect Gryon is a minute chalcid wasp, the larvae of which parasitize the eggs of Triatoma. As a result of the WHO-supported efforts of the Commonwealth Institute of Biological Control, it was discovered by the University of Singapore to parasitize T. rubrofasciata, a species which has not become abundant or a vector of human trypanosomiasis, possibly for the very reason that it is well parasitized. A culture of Gryon has been developed at that university and foundation stock of this wasp has been sent to laboratories at Cochabamba, Bolivia, and at Caracas for assessment against South American triatomids. At the Caracas laboratory it will be compared with the indigenous parasite Telenomus fariae.

2.154 The fifth biological control agent referred to above is the guppy Poecilia reticulata, which has been a valuable predator of mosquito larvae in polluted waters, particularly of C.p. fatigans. In Bangkok this fish is found in many bodies of standing water as a result of its introduction in recent years. The WHO Aedes Research Unit there is studying the reason why in one quarter of the city the abundance of guppies is accompanied by a scarcity of C.p. fatigans larvae, whereas in another both predator and prey are abundant. WHO was instrumental in introducing Poecilia into Taiwan in 1967, and cooperative experiments on the use of larvivorous fish are being undertaken by the Taiwan Malaria Research Institute and the WHO Japanese Encephalitis Vector Research Unit in Taipei.

2.155 It is becoming evident that, with the steady rise in resistance of mosquito larvae to insecticides, larvivorous fish will come to play an increasing part in control measures, as is happening in California. In Hawaii a system of integrated control has been developed involving the use both of larvivorous fish and of non-residual insecticides. As this method
shows promise, the WHO Japanese Encephalitis Vector Research Unit at Seoul has determined the susceptibility levels of two species of larvivorous rice-field fish to the organophosphorus insecticides in common use, in an endeavour to ascertain what insecticides are compatible with the maintenance of populations of these fish.

2.156 During the year several laboratories have studied the development of the fungus *Coelomomyces* in mosquito larvae, and with WHO support the University of Otago, New Zealand, has obtained a thriving culture of one species in a laboratory colony of *Ae. australis*. In France the Cytopathology Station at Alès of the National Institute of Agronomic Research is carrying out WHO-assisted investigations of the infectivity for *Ae. detritus* of an iridescent virus found in that species in Tunisia and of the characteristics of an entomopox virus found in a laboratory culture of *An. albimanus* in Central America. Field experiments with viruses to control mosquitoes must, however, await further study of the general safety of insect viruses—a matter of concern to both WHO and FAO since they also have agricultural applications.

**Genetic control**

2.157 In 1971 the WHO Research Unit on the Genetic Control of Culicine Mosquitoes, in New Delhi, provided the first successful demonstration, using *C. p. fatigans*, that significant sterility can be introduced into a natural mosquito population by the release of gamma-irradiated males. These males were competitive with normal males in inseminating wild female mosquitoes, as were males sterilized with chemosterilants. The findings are of considerable significance as they show that the sterile-male-release technique (with males sterilized in either of these two ways) could be used in feasibility trials for the genetic control of *C. p. fatigans*.

2.158 Experiments are being carried out by the same research unit on the possibility of introducing genetically modified material into natural populations of *Ae. aegypti*. For this purpose males of a strain bearing a readily visible genetic marker and of another strain with a chromosomal translocation of partial sterility in males were released in two separate localities in Delhi. Not only the marker but also the partial sterility mutation were observed in individuals captured two generations later, providing the first evidence that it is possible to introduce into a natural *Aedes* population a genetic factor that is detrimental to its survival and yet to some extent self-propagating.

2.159 A similar approach to the genetic control of *C. p. fatigans* is being pursued at the WHO International Reference Centre for the Maintenance and Distribution of Standardized Strains of the *Culex pipiens* Complex, at the Institute of Genetics, Mainz, Federal Republic of Germany. There the possibility of introducing a strain with a cytoplasmic incompatibility and a chromosomal aberration is being investigated to determine whether the influence of two genetic factors can be brought to bear simultaneously on a natural population of this species.

**Vector control aspects of international air traffic**

2.160 It was reported in 1970 that certain technical problems concerning the use of dichlorvos in aircraft disinsection had been raised by the air industry. In view of these, the Twenty-third World Health Assembly recommended that the implementation of vapour disinsection be delayed until 31 December 1971, in order to provide time for the solution of these problems.

2.161 During 1971, ICAO and WHO developed a comprehensive programme of research into the safety of the vapour disinsection system in aircraft. As part of this, a series of studies was initiated by the Federal Aviation Administration in the USA, and the WHO International Reference Centre for the Evaluation and Testing of New Insecticides, Savannah, Ga., USA. While significant progress had been made in these investigations by the time of the Twenty-fourth World Health Assembly, in May 1971, the final conclusions were not available. The Health Assembly therefore decided that the effective date for the introduction of a vapour disinsection system should be further postponed until all tests had been completed and the technical problems resolved.

2.162 Since that time, all scheduled studies have been completed, including those related to the safety of dichlorvos and to the corrosion of metals, notably in respect of the effect of dichlorvos vapour on avionics equipment and the contamination of aircraft by residual chlorides. The investigations into the safety of dichlorvos for man confirm earlier findings of a WHO expert committee on insecticides that this compound is safe for disinsection of aircraft in the manner proposed. Regarding the possible hazard of dichlorvos to aircraft structural materials it has been demonstrated that in commercial aircraft the structural metals and other surfaces are in any event normally heavily contaminated with chlorides. The amount of dichlorvos used in the vapour disinsection system is not such that there is any likelihood that the

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use of this compound, which has chloride as one of its final decomposition products, would add significantly to the normal contamination of aircraft. A detailed report on the results of these investigations is to be considered by ICAO and the final report with ICAO's recommendation will be submitted to the Health Assembly as soon as possible thereafter.

2.163 In view of the delay in the general adoption of the vapour disinsection system, WHO initiated a series of tests of new formulations and improved techniques for the aerosol treatment of the larger aircraft now coming into operation. These tests were carried out in regularly scheduled international passenger flights throughout the world and have yielded a pyrethroid aerosol formulation that is biologically effective, acceptable to passengers and suitable for "blocks-away" disinsection of aircraft in international traffic.¹

CHAPTER 3

NON-COMMUNICABLE DISEASES

Cardiovascular diseases

3.1 Even the general public is now aware that diseases of the circulatory system are a leading cause of death in most countries. This is so even in adults well below the age of 65 years. For example, in 29 technologically advanced countries a total of 1,136,000 men, aged 25-64 years, died in 1967 according to statistics recently published by WHO.1 Of all these deaths, 443,000 were due to cardiovascular diseases. Deaths from ischaemic heart disease amounted to 290,000. Cardiovascular diseases accounted therefore for 39% of deaths from all causes among the most productive section of the population, and ischaemic heart disease for over 25%. The corresponding figures for two other major causes of death—malignant neoplasms of all types, and accidents, poisoning and violence—were 22% and 14% respectively (see Fig. 8).1 There are indications that death from ischaemic heart disease is now more frequent in younger subjects than it was 10-15 years ago. The manpower loss is higher still if account is taken of the numbers disabled by ischaemic heart disease, for whom statistics are generally not available.

3.2 The Organization is particularly concerned with atherosclerosis, ischaemic heart disease, arterial hypertension, cerebrovascular diseases, rheumatic fever and cardiomyopathies. A special place is given to developing preventive measures to reach the whole community. The studies on prevention are interrelated with epidemiological, clinical and experimental investigations designed to throw light on the etiology, development and course of cardiovascular diseases.2 A number of activities have been carried out jointly or in close co-operation with the International Society of Cardiology and with the relevant regional or national institutions.

3.3 In the majority of subjects with ischaemic heart disease, advanced atherosclerosis in coronary arteries is the predominant feature and occlusive coronary atherosclerosis with thrombosis a common precipitating cause of the acute stage of the disease. Acute myocardial infarction is often the first recognized clinical manifestation of ischaemic heart disease, and mortality from it is highest within the first hours

Fig. 8. Deaths due to cardiovascular diseases and two other major causes, as percentage of deaths from all causes in 29 countries in 1967.

![Figure 8](WHO 10861)

1 Data from World Health Statistics Annual, 1967. The countries concerned are Australia, Austria, Belgium, Bulgaria, Canada, Czechoslovakia, Denmark, Federal Republic of Germany, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, United Kingdom, United States of America, Yugoslavia.

2 Allied research on cardiovascular diseases in animals is described in paragraph 1.258.

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after the onset. Consequently, a multidisciplinary approach is needed both in preventing advanced coronary atherosclerosis and thrombosis, and in providing immediate treatment for all patients in the community suspected of having acute myocardial infarction or presenting symptoms indicating a high risk that it will develop in the near future.

3.4 Investigations were promoted and co-ordinated by the Organization to assess the distribution and severity of atherosclerosis in the aorta and in the coronary arteries from autopsy material of city populations in Czechoslovakia (Prague), Sweden (Malmö) and the USSR (Ryazan, Tallin and Yalta). Between 1963 and 1968, 17 455 specimens, together with relevant clinical and autopsy information, were collected and assessed. Analysis of the material was finished during 1971.

Fig. 9. Age distribution of atherosclerotic lesion in left anterior descending coronary artery among 17 455 autopsy specimens examined in a WHO collaborative study in Czechoslovakia, Sweden and the USSR

3.5 The type of lesions and their extent in coronary arteries did not differ much from place to place except in Ryazan, where the lesions on the whole were less frequent and less advanced. Fibrous plaques, complicated lesions (areas showing haemorrhage, ulceration, or thrombosis, with or without calcium deposits) and calcification—all together—appeared earlier in men than in women, regardless of the cause of death (see Fig. 9). They were found in more than 80% of men in the age-group 35-44 years and involved, on average, about 20% of the surface of the coronary artery. The frequency of complicated lesions begins to increase in the same age-group. In women a similar evolution of atherosclerosis begins a decade later. The extent of coronary atherosclerosis and frequency of ischaemic lesions in the myocardium are far greater than is indicated by the prevalence of clinically manifest ischaemic heart disease.

3.6 These results clearly indicate that in order to prevent the onset of ischaemic heart disease attention should be given first to young subjects, from 20 to 30 years of age, or even to children and adolescents. Predisposing factors such as elevated blood lipids, heavy smoking, unhealthy nutritional habits, sedentary life, or mental strain can be found in the 20-30-years age-group or earlier. A number of measures intended to discourage smoking habits, especially among the young, were recommended in May by the Twenty-fourth World Health Assembly (resolution WHA 24.48).

3.7 Increased levels of blood lipids appear to be the first biochemical abnormality in atherosclerosis. Since 1966, a double-blind preventive trial designed to investigate the effect of reducing blood cholesterol in adults without manifest ischaemic heart disease has been sponsored by WHO in Budapest, Edinburgh, London and Prague. The target of 15 000 subjects was reached in 1971 and it is expected that a final analysis of the results will be available in 1975.

3.8 The possibility of organizing trials in Europe to limit the effect of a number of predisposing factors simultaneously was discussed at WHO meetings held in Rome in November 1970, in London in March 1971 and in Brussels in November 1971. A study of the feasibility of such controlled multifactorial trials has now started in population groups of males in Belgium, Italy, Poland and the United Kingdom.

3.9 The role of sedentary life as a predisposing factor of coronary heart disease and the beneficial effects of regular moderate to strenuous physical activity are far from being clear. Since 1953, when low physical activity was first considered as a possible factor in the pathogenesis of ischaemic heart disease, a number of studies have been undertaken to discover whether the incidence of coronary heart disease can be reduced by improving physical fitness, for instance, by regular physical exercise. How much time should be given daily or weekly for such an activity, at what age it should be begun, and whether those people who were physically active in childhood and adolescence are better off than those who were more or less sedentary, are all questions awaiting an answer.

3.10 The evaluation of the effect of physical fitness and physical activity or inactivity on health depends primarily on the satisfactory measurement of habitual physical activity. A WHO meeting was held in Prague in August 1971 to review present knowledge
on this subject and to advise on suitable measurement techniques. It has been shown that several physiological parameters can be determined in an unobtrusive way without interfering with everyday activities. The equipment used should, however, be relatively inexpensive and socially acceptable. Daily recording of heart rate by a miniaturized tape recorder, a multidial wrist-watch type of heart-beat counter or other means, and estimating caloric expenditure by questionnaire, are methods that have been tested and proved suitable. These systems are not excessively costly and can be used either by individuals or in large-scale population studies. Additional useful information can be obtained by means of a daily activity questionnaire and a spot sampling of oxygen consumption and blood lactate level. Tests of some of these methods have been promoted by the Organization.

3.11 A good way to evaluate the cardiovascular status is by exercise tests. Physical exercise may reveal signs and symptoms of impending cardiovascular disease that would not manifest themselves under everyday sedentary conditions. Exercise tests may be of help in diagnosis and prognosis as well as in following the rehabilitation of cardiac patients, in assessing physical fitness for certain jobs or in estimating proper physical development in children. A WHO publication, *Fundamentals of Exercise Testing*, published during the year, describes the most commonly used tests, with emphasis on techniques suitable for use under field conditions. It also describes submaximal exercise tests which are more suitable for routine testing. They are less demanding than tests aiming at maximal performance but provide similar information.

3.12 Further progress has been made in testing the hypothesis that changes in the concentration of certain minerals in the body may be of etiological and pathogenic significance in atherosclerosis, ischaemic heart disease, hypertension and cardiomyopathies. In the initial phase of the study of this subject sponsored by WHO and carried out in co-operation with IAEA, autopsy specimens of the heart, brachial artery, aorta and diaphragm of subjects who died with or without myocardial infarction were collected in Chicago, Jerusalem, Manila and Prague. Red blood cells, sera, and finger-nail clippings were collected during population surveys in Jamaica, New Zealand, some South Pacific islands, the Philippines and the United States of America. Trace element analyses were done by IAEA in Vienna and by centres in Chicago and Manilla. The results obtained and the methods of collecting, transporting, storing and analysing the material were assessed at a WHO meeting of investigators held in Geneva in February 1971. Two working hypotheses were formulated to serve as a basis for international co-operative studies on a wider scale: (a) tissue levels of certain elements are affected by the geochemical environment; and (b) the occurrence of cardiovascular disease is associated with changes in the concentration of certain elements in the tissue.

3.13 Investigations on the relationship between water characteristics, such as hardness and mineral content, and cardiovascular diseases are being expanded to cover several population groups both in the developed and in the developing countries. They are now taking place in Finland, Iran, New Zealand, some of the Pacific islands and the United Kingdom.

3.14 A worldwide survey of cadmium concentration in kidneys and liver was initiated to obtain information about the alleged relationship of this trace element to hypertension.

3.15 Samples of sugar from all WHO Regions were analysed to ascertain their content of chromium, cadmium, copper and zinc. Preliminary analyses showed that more-purified sugars had a lower content of zinc and copper, but no difference in cadmium and chromium was found among the samples. The preliminary results of analyses of samples of rice from different areas were similar.

3.16 The above studies are carried out in co-operation with centres in Czechoslovakia (Prague), Finland (Helsinki), Israel (Jerusalem), Iran (Teheran), New Zealand (Wellington), Norway (Kjeller), the Philippines (Manila), the United Kingdom (London) and the USA (Columbia, Mo.; Hines, Ill.; and St Louis, Mo.).

3.17 Clinical, experimental and epidemiological studies on ischaemic heart disease and on cardiomyopathies have shown the need for much deeper investigations into the functional and morphological changes in the heart muscle. The present state of knowledge in this field was critically reviewed at three international meetings sponsored during the year by the International Society of Cardiology in co-operation with WHO. A symposium on myocardial blood flow in man was held in Pisa, Italy, in June to evaluate the methods currently used for measurements in healthy and in diseased hearts both in man and in experimental animals. At a symposium on the metabolism of the hypoxic and ischaemic heart held in Geneva later in the same month, metabolic changes

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such as protein synthesis, glycolysis, alteration in the lipid metabolism and changes in enzymatic reactions in hypoxia and ischaemia were discussed and related to structural and functional changes. At an international symposium in Stresa, Italy, in July, investigators from a number of specialties summarized the evidence of the role of neural and psychological mechanisms in the etiology of ischaemic heart disease and hypertension. Discussions took place on the improvement of methods of investigating psychic stimuli and their effects, and on the need to study behaviour in man, to apply modern physiological methods to studies of population groups, and to use epidemiological approaches in animal studies.

3.18 A co-operative study designed to improve diagnosis of acute ischaemic heart disease at autopsy is being conducted in departments of pathology in Belgium (Brussels), Czechoslovakia (Prague), Finland (Helsinki), Sweden (Göteborg) and Switzerland (Geneva). Its progress was assessed at a meeting of investigators held in Geneva in November 1971. Information was reviewed on 147 cases in persons suspected of having died from acute myocardial infarction. Detailed analysis of 60 of these, where death had occurred within 12 hours after the onset of clinical symptoms, revealed the importance of staining for enzymes to indicate areas for detailed histological examination. Analysis of 1746 slides from the 147 cases circulated showed that cytoplasmic alterations in the myocardial fibre were the most important single early histological feature. The results of the study will be available in 1972.

3.19 The majority of subjects with acute myocardial infarction appear to have experienced certain symptoms such as chest pain, arrhythmias or abnormal fatigue in the days or weeks preceding the acute attack. The possible importance of these symptoms for the early diagnosis of imminent myocardial infarction was discussed at a WHO meeting in Copenhagen in March of this year. It was recommended that co-operative investigations be undertaken by centres organizing myocardial infarction registers.

3.20 Encouraging results have been obtained in recent years from the active intensive care and rehabilitation of patients with acute myocardial infarction. In most countries, however, the facilities are available to only a fraction of the sick. There is often a striking contrast between highly developed research programmes and the treatment generally available in the community. Since 1968, WHO has promoted studies, particularly in Europe, of the frequency of acute myocardial infarction in the community, and of methods and facilities for early detection, care and rehabilitation. Registration in defined communities of all subjects suspected of having acute myocardial infarction was chosen as the appropriate tool. In 1971, 18 registers were in operation in the following European countries: Austria (Innsbruck), Bulgaria (Sofia), Czechoslovakia (Prague), Denmark (Copenhagen), Federal Republic of Germany (Heidelberg), Finland (Helsinki and Tampere), France (Boulogne-Billancourt), Hungary (Budapest), Ireland (Dublin), Netherlands (Nijmegen), Poland (Lublin and Warsaw), Romania (Bucharest), Sweden (Boden and Göteborg), United Kingdom (Tower Hamlets, London), and the USSR (Kaunas). There are also registers in Australia (Perth) and in Israel (Jaffa). The populations covered vary from 40 000 to 1 500 000 inhabitants. Information is collected in a uniform way, according to a standard protocol adopted after repeated testing, and the data are analysed by WHO. The records of 4800 patients had been evaluated by April 1971 when the annual meeting of principal investigators was held in Copenhagen, and by December 1971 nearly 12 000 patients had been registered. The pilot study will be finalized by 1973, and is expected to provide information of value in planning and evaluating services for the care of cardiac patients.

3.21 At a WHO meeting held in Prague in October 1971, a methodology for evaluating programmes in Europe for the rehabilitation of patients with myocardial infarction was discussed and controlled studies were proposed. WHO co-operated with the Council on Rehabilitation of the International Society of Cardiology in preparing a book, intended for practising physicians and general practitioners, on the principles and methods for rehabilitation of patients with ischæmic heart disease.

3.22 Arterial hypertension is a common condition in most populations of the world. Its impact on health cannot be judged solely on the basis of mortality statistics because, although hypertension contributes to mortality caused by cerebrovascular, renal and ischaemic heart disease, it does not appear very often as a cause of death. Moreover, general morbidity statistics, when available, may not reflect the true role of hypertension, as there is evidence that the condition is frequently not diagnosed even in countries with highly developed medical services.

3.23 During the past two decades several families of potent but relatively harmless hypotensive drugs have
been developed. Clinical observations demonstrate the improved prognosis of malignant hypertension, and the reduction in the frequency of hypertensive heart failure and stroke. Some community-based data show, however, that only a fraction of those who need it receive adequate treatment. Even in communities with advanced medical care this fraction may be less than 30%.

3.24 In preparation for the introduction of self-measurement of blood pressure in community studies, a trial was made among 100 WHO staff members who were asked to measure their own pressure twice a day for three weeks on a semi-automatic machine. Two readings were recorded at each session. At the end of the trial, three-quarters of the participants indicated that, when necessary in the future, they would prefer to take their own blood pressures. During the study period, there was a general decrease in the mean value of systolic and diastolic blood pressure levels and also in the difference between the first and second recordings in any one session. The magnitude of variations was not related to the absolute levels of pressure. Individual blood pressure levels were not related to subjective feelings at the time of measurement. One conclusion from the study was that a person’s fear of high blood pressure may be lessened by knowledge of the large variation of his pressure during the day. The method may become a routine check performed by the individual, similar to the measurement of body weight.

3.25 A WHO meeting on the control of stroke and hypertension in the community held in Geneva in February 1971 was attended by 17 participants from 14 countries. It was convened to advise on the implementation of two major recommendations made in 1970 by the first WHO meeting on prevention, treatment and rehabilitation in cerebrovascular diseases.1 The recommendations concerned the control of hypertension and the assessment of the problem of stroke in the community. The two are interrelated: proper treatment of hypertension contributes to the prevention of stroke, while the incidence of stroke is an indicator of the effectiveness of hypertension control.

3.26 The establishment of pilot co-operative programmes for the control of hypertension in various communities was discussed and guiding principles were outlined. The first aim of these programmes is to provide much-needed information on the number of hypertensive patients who are being treated in a community, the adequacy of their treatment and the number of undetected hypertensive subjects. If it appears that a hypertension control programme is needed, a pilot programme is established in the community concerned while a reference community is kept under observation without a control programme. The pilot programmes have a common operating protocol. A comprehensive information system and service is built into the programme for purposes of evaluation and of study of the epidemiology of hypertension.

3.27 The meeting also discussed the problem of stroke. The aim of a stroke control programme is to apply at a community level efficient measures to prevent stroke and to detect, treat and rehabilitate patients with stroke. Training of health personnel and the education of the public form an integral part of such a programme, which should be related to ongoing community health services. General guidelines for the establishment of stroke registers were agreed upon at the meeting. Pilot areas were selected and the requirements in personnel estimated. An operating protocol was drawn up, including a definition of stroke procedures for registration, follow-up and readmission of patients, reporting of deaths, and documentation. It was agreed that data should be analysed by WHO. The protocol was tested in an initial trial in Copenhagen (Denmark) and Göteborg (Sweden).

3.28 The pilot programmes for the control of hypertension and the protocol for the establishment of stroke registers were both reviewed at a WHO meeting held at the end of 1971 at Göteborg. Background information on hypertension is to be obtained in communities in Barbados, Belgium, Finland, France, Ireland, Israel, Italy, Japan, Mongolia, Nigeria, Sweden, Turkey, the United Kingdom and the USSR, and an agreed procedure for setting up pilot hypertension control programmes is to be tried out. As regards stroke registers, WHO will arrange for the central collection and analysis of data and will ensure communication between the co-operative centres and between them and other groups carrying out similar studies. Minimum obligatory items will be reported regularly to WHO on the common record forms, while any co-operating centre will be free to add further information of its own. Stroke registration should provide information on the diagnostic procedures used, the morbidity and mortality from cerebrovascular diseases, their natural history, the efficiency of various types of care, and the services and personnel needed to provide adequate care and rehabilitation. It will also be of value in evaluating hypertension control programmes.

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3.29 It is envisaged that, by 1972 or 1973, a number of areas with a myocardial infarction register, benefiting from the experience gained during this pilot study, would be able to make use of their existing registration facilities for stroke as well as coronary patients, thus gradually building up a more comprehensive cardiovascular control programme.

3.30 Due to the decline in the incidence of rheumatic fever in the more developed countries during the last decades, there has been a tendency to minimize the public health importance of this disease. However, such an attitude is not justifiable, particularly in a number of countries in the tropics and subtropics where there is evidence that rheumatic fever with crippling rheumatic heart disease is a serious problem.

3.31 Rheumatic heart disease is readily amenable to preventive measures, and the need for systematic and wide-scale prophylaxis has been pointed out repeatedly at meetings convened by WHO in past years. Nevertheless, organized and efficient community action has remained limited. This is partly due to a shortage of resources in manpower and funds. There are, however, two specific reasons why up-to-date knowledge on rheumatic heart disease prophylaxis has not been applied in developing countries: (a) heart disease in children is not a very salient, easily recognizable condition in the early stages and the extent of morbidity in the population has seldom been determined; and (b) it remains to be demonstrated that prophylactic methods, which are feasible at a community level in developed countries, are suitable for use in developing countries. The main operational problem is therefore to find ways of applying scientifically acquired experience in the prophylaxis of rheumatic fever and rheumatic heart disease in communities where it is needed. Moreover, investigations are still required into several aspects of rheumatic fever epidemiology, such as the role of various types of streptococcal infections in the causation of rheumatic fever, the development of immunity due to inapparent streptococcal infections, and, in particular, possible changes in the clinical pattern of rheumatic fever in time or according to the place of its occurrence. The latter study might lead to further refinement and redefinition of diagnostic criteria.

3.32 A number of countries have shown interest in a programme drawn up by WHO for the control of streptococcal infections, rheumatic fever and glomerulonephritis. The programme consists of three parts which may be implemented separately or jointly according to circumstances in a given country. Part I deals with the epidemiological and microbiological study of streptococcal infections, particularly skin infections, which are frequent in children in many developing areas and are an important factor in glomerulonephritis and other streptococcal sequelae. Part II consists of a protocol for the study and control of rheumatic fever and rheumatic heart disease in the community. Part III deals with the epidemiology and control of glomerulonephritis. The approach is comprehensive, combining a study of the epidemiological situation in a given city, area or country with the establishment of a pilot community control programme with multiple objectives. It will promote the health protection of children and youth; once its feasibility is proved, it will serve as a model to be followed in other parts of the country or in other countries; and it should yield reliable data on the true dimensions of the burden of rheumatic heart disease. Moreover, the introduction of community health programmes into the societies under study may be expected to provide new knowledge concerning motivation, programme adherence and various other operational problems. By integrating such programmes with existing maternal and child health services, impetus will be given to a general development of children's health protection in the area concerned.

3.33 In 1971, WHO-assisted programmes were in preparation or in operation in Barbados, Egypt, Iran, Nigeria and Senegal. In Barbados 5000 schoolchildren were screened for valvular heart disease in the Bridgetown area; those found to have rheumatic heart disease, as well as those discharged from hospital under this diagnosis, were put on a regular penicillin prophylaxis regimen. A similar programme in Egypt includes all school-age children of the Qalyub area, near Cairo; Qalyub hospital, the rural health services and the school health service in the study area are co-operating with the Rheumatic Fever Programme Centre. Both bacteriological and clinical examinations are made on a population of 10 000 schoolchildren annually. Another programme in Nigeria covers several thousands of school-age children in the Lagos metropolitan area. In Teheran the programme is conducted by the school of public health in co-operation with the social insurance medical service; the study area has a population of 100 000 made up of 26 000 socially insured workers and their families. A programme on the same lines has been prepared to include a population of similar size in the city of Abadan. A programme based largely on the existing school health services started in 1971 in co-operation with the University Hospital in Abidjan, Ivory Coast. In Senegal, the cardiology department and two other departments of the medical
school in Dakar and the school health services are co-operating in preparing a pilot programme of the same kind for schoolchildren.

3.34 In order to facilitate mass screening for rheumatic heart disease, cassette-type tapes with heart sounds and murmurs have been prepared. They are intended for use in training medical students and non-medical personnel to participate in large-scale screening activities in countries where physicians are scarce.

3.35 Clinical aspects of Chagas' disease were assessed at a meeting held at the end of the year in Caracas and attended by investigators from Argentina, Bolivia, Brazil, Chile, Panama, Peru and Venezuela. Prognosis was assessed from two longitudinal studies which have been under way for several years in one area in Brazil and two areas in Venezuela. It appears from these and from other reported studies that differences in the clinical manifestations in Chagas' disease are related to differences in the strains and virulence of the parasite. The participants agreed to use common criteria for serological and clinical diagnosis, including ECG. Further co-operative clinical as well as epidemiological population studies were outlined.

Cancer

3.36 The Organization's programme in cancer aims at determining and controlling the causes of the disease and promoting improvements in its detection and treatment; the basic and epidemiological research aspects are handled by the International Agency for Research in Cancer, which is primarily concerned with elucidating the role of environmental factors in the etiology of the disease.

3.37 Progress in technology has facilitated the detection of certain deeply seated tumours: for example, fibre optics and miniaturization techniques have made it possible to locate gastric tumours visually so that they can be removed by surgery at an earlier stage than in the past. The most notable advance in recent years has, however, been in the early detection of asymptomatic cancer of the uterine cervix (the most common form of cancer in women) through the use of exfoliative cytology by the Papanicolaou technique. By educating physicians and the general public on the usefulness of the technique and by training cytotechnicians, it has been possible to screen large numbers of women in many countries.

3.38 In various parts of the world, national family planning programmes offer a suitable framework for cytological cancer monitoring among women. However, there is a shortage of trained personnel, both medical and auxiliary, to carry out early detection programmes. With support from UNFPA, an inter-regional training programme in exfoliative cytology and obstetrical and gynaecological pathology is being started by WHO, in collaboration with the International Institute for the Study of Human Reproduction, Columbia University College of Physicians and Surgeons, New York, N.Y., USA. The aim is to develop a centre for training in the above-mentioned disciplines, which will operate in collaboration with inter-regional training centres. The trainees will be drawn primarily from countries in the Regions of the Americas, South-East Asia, the Eastern Mediterranean and the Western Pacific. During 1971, institutes in a number of countries in the South-East Asia and Western Pacific Regions were visited in order to assess their suitability as collaborating centres in the programme.

3.39 Early detection is a prominent feature of WHO-assisted cancer control projects, such as the hospital-based programme in Manila, which is particularly concerned with cervical cancer, and the pilot programme on cervical and oropharyngeal cancer being conducted near Madras, India, with support provided by the Norwegian Government through the Voluntary Fund for Health Promotion.

3.40 A group meeting on cancer control was held by WHO in Baghdad, in November-December, with the aim of promoting the organization of cancer control services in the countries of the Eastern Mediterranean Region. The need for early detection programmes, particularly for oesophageal cancer and cancers of the uterine cervix, bladder and skin, was stressed. The unification of hospital-based cancer registries and the use of the tumour classifications and nomenclatures prepared by WHO were also discussed.

3.41 The three current methods of treating cancer are surgery, radiation therapy and chemotherapy, and encouraging results have been achieved with combinations of these methods. The Organization has established four international reference centres for the evaluation of methods of diagnosis and treatment of different types of cancer, namely, melanoma and cancers of the stomach, breast and ovaries.

3.42 The International Reference Centre for Evaluation of Methods for Diagnosis and Treatment of Melanoma, Milan, Italy, and its collaborators held a meeting in Lyons, France, in June. The centre is undertaking a study on what is probably the largest number of melanoma cases ever assembled; this gives it the unique advantage of being able to draw on a sufficient number of cases to obtain statistically
significant results in controlled clinical treatment trials. A prophylactic lymph node dissection trial involving 321 cases was started at the centre in January 1971. A trial of combined treatments for metastases and malignant melanomas is also in progress; and in view of recent developments in immunological techniques, immunological studies will be begun.

3.43 The International Reference Centre for Evaluation of Methods of Diagnosis and Treatment of Breast Cancer, Villejuif, France, held a review meeting with its international collaborative group in Geneva in July. A series of clinical trials was planned, essentially to compare the effectiveness of radical and simply mastectomy. One of these trials will be concerned with tumour size, which is of prognostic significance and thus needs to be accurately estimated. Preliminary studies have led to the conclusion that, while correlation is poor between the clinical and the pathological or radiological assessment of tumour size, it is good between the radiological and the pathological assessment. Mammography is often capable of detecting tumours too small to be palpated by the examining physician and is important for the early detection of breast cancer. The clinical trial for the study of tumour size will accordingly use the new mammography techniques in conjunction with conventional methods of detection and measurement. The centre has also planned an inquiry into the economics and cost-effectiveness of mass screening programmes for the early detection of breast cancer.

3.44 Cancer chemotherapy has become a reality only in the past three decades. At first a palliative procedure, it was subsequently shown to be capable not merely of extending life but, in some cases and with certain forms of cancer, of saving it. Thus chemotherapy can produce cures or long remissions in many cases of, for example, chorioncarcinoma, Burkitt’s lymphoma, acute leukaemia of children and Hodgkin’s disease. Major improvements in the treatment of certain types of cancer have been achieved both by the use of several active drugs simultaneously and by the use of different drugs in sequence. In 1971, because of the importance of the many recent developments in this field, the Organization prepared a working manual on the drug therapy of cancer; it will be published in 1972.

3.45 In view of the rapid technological advances that have been made in the radiation therapy of cancer, the personnel concerned have constantly to be kept up to date with the latest developments. During the year, the Organization gave advice on the further education in this field of staff at the Oncological Dispensary, Ulan Bator, and provided assistance for the strengthening of the radiation therapy facilities there. It also advised on cancer chemotherapy at the Oncological Dispensary.

3.46 A special effort is being made by the Organization to improve the quality of hospital-based cancer registries. Preliminary studies of the data available from existing registries in a number of countries have shown that, unless the data are collected and recorded in a standardized manner, they are almost useless as a basis for international comparison and for assessing the results of treatment. Studies on the standardization of hospital-based cancer registration have accordingly been undertaken in several WHO Regions.

3.47 A uniform system of nomenclature is essential if the results of cancer research—whether clinical trials, etiological investigations or epidemiological surveys—are to be comparable. In 1957, WHO accordingly initiated a programme for the development of a uniform, internationally acceptable morphological classification of tumours that would facilitate communication between pathologists, clinicians, epidemiologists and statisticians engaged in cancer studies. Over the years, 19 international reference centres, together with a number of collaborating laboratories, have been designated to deal with specific aspects of the programme, in which more than 200 pathologists in almost 50 countries have taken part. The subjects dealt with by these centres, their dates of establishment and the state of the work they are carrying out are given in Table 1. The institutes or other bodies at which they are located are shown in Annex 6. The centres organize periodic meetings with their collaborators to discuss problems of classification, nomenclature and diagnosis relating to pathological specimens that have been circulated among them. Clinical histories and follow-up data are analysed in order to relate morphological aspects of the tumours to their biological activity. The wide geographical distribution of the collaborators makes it possible to study tumours occurring in a variety of peoples and places.

3.48 During 1971, four of the centres held meetings with their collaborators. In April, those participating in the work of the International Reference Centre for Comparative Oncology met in Amsterdam to discuss the classification and nomenclature of tumours of domestic animals and relationships between these tumours and tumours seen in man. In October, the group working with the International Reference Centre for the Histopathological Nomenclature and Classification of Ovarian Tumours met in Geneva and finalized the classification for publication in the
3. NON-COMMUNICABLE DISEASES

Table 1. WHO International Reference Centres for the Histopathological Nomenclature and Classification of Tumours

<table>
<thead>
<tr>
<th>Subject</th>
<th>Date of establishment</th>
<th>State of work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung tumours</td>
<td>1958</td>
<td>Classification published in 1967</td>
</tr>
<tr>
<td>Mammary tumours</td>
<td>1958</td>
<td>Classification published in 1968</td>
</tr>
<tr>
<td>Soft tissue tumours</td>
<td>1958</td>
<td>Classification published in 1969</td>
</tr>
<tr>
<td>Leukaemias and other neoplastic conditions of haematopoietic cells</td>
<td>1962</td>
<td>Publication in preparation</td>
</tr>
<tr>
<td>Oropharyngeal tumours</td>
<td>1963</td>
<td>Classification published in 1971</td>
</tr>
<tr>
<td>Bone tumours</td>
<td>1963</td>
<td>Publication in preparation</td>
</tr>
<tr>
<td>Ovarian tumours</td>
<td>1963</td>
<td>Publication in preparation</td>
</tr>
<tr>
<td>Thyroid tumours</td>
<td>1964</td>
<td>Work in progress</td>
</tr>
<tr>
<td>Salivary gland tumours</td>
<td>1964</td>
<td>Publication in preparation</td>
</tr>
<tr>
<td>Skin tumours</td>
<td>1965</td>
<td>Publication in preparation</td>
</tr>
<tr>
<td>Male urogenital tract tumours a</td>
<td>1965</td>
<td>Work in progress</td>
</tr>
<tr>
<td>Odontogenic tumours</td>
<td>1966</td>
<td>Classification published in 1971</td>
</tr>
<tr>
<td>Comparative oncology b</td>
<td>1966</td>
<td>Work in progress</td>
</tr>
<tr>
<td>Uterine and placental tumours</td>
<td>1967</td>
<td>Work in progress</td>
</tr>
<tr>
<td>Oral precancerous conditions</td>
<td>1967</td>
<td>Work in progress</td>
</tr>
<tr>
<td>Gastro-oesophageal tumours</td>
<td>1968</td>
<td>Work in progress</td>
</tr>
<tr>
<td>Intestinal tumours</td>
<td>1968</td>
<td>Work in progress</td>
</tr>
<tr>
<td>Exfoliative cytology</td>
<td>1968</td>
<td>Publication in preparation c</td>
</tr>
<tr>
<td>Tumours of central nervous system</td>
<td>1970</td>
<td>Work in progress</td>
</tr>
</tbody>
</table>

* a Covers bladder, testis, prostate, kidney and related structures.
  b Covers tumours of domestic animals.
  c Nomenclature on female genital tract completed; work in progress on terminology applicable to cytology of extragenital sites.

International Histological Classification of Tumours series. In preparing this classification, the group has worked with over 500 cases.

3.49 A review meeting was held in October at the International Reference Centre for the Histopathological Nomenclature and Classification of Uterine and Placental Tumours, Copenhagen, to discuss the nomenclature of these lesions. The participants also considered the problem of the so-called "pre-cancerous" conditions or dysplasias; elucidation of the characteristics and significance of such conditions is vital to rational treatment and prognosis.

3.50 Finally, the International Reference Centre for the Histopathological Nomenclature and Classification of Intestinal Tumours held a meeting with its collaborators in London in December to review 150 case studies that have so far been circulated and considered. The following subjects received particular attention: the characterization of polypoid tumours of the large intestine; the terminology used in reporting malignant changes developing in benign epithelial tumours; and the definition of carcinoid tumours.

3.51 Two more volumes in the International Histological Classification of Tumours series appeared during the year. They were Histological Typing of Oral and Oropharyngeal Tumours (published in English, French and Spanish) and Histological Typing of Odontogenic Tumours, Jaw Cysts and Allied Lesions (published in English and French Spanish edition; in preparation). Like earlier publications in the series, both volumes contain illustrations in full colour and are accompanied by sets of colour transparencies. Their free distribution to departments of pathology in some 900 medical schools throughout the world will not only enrich teaching collections but also help to promote widespread acceptance of the classifications they contain.

International Agency for Research on Cancer

3.52 The International Agency for Research on Cancer (IARC) has concentrated its efforts on studies of the etiology of cancer in man with special reference to the determination of the cancer hazard in the

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2 Pindborg, J. J. et al. (1971) Histological typing of odontogenic tumours, jaw cysts and allied lesions, Geneva, World Health Organization (International Histological Classification of Tumours No. 5).
3 Further details of the Agency's work during the period under review are given in the Annual Reports of its Director for 1970 (published in 1971) and for 1971 (in press).
human environment. The Agency is attempting to collect and produce data that will permit the identification of carcinogens in the environment so that governments may have the necessary advice enabling them to take appropriate control action. Governments also need advance knowledge of what potential carcinogens new substances may contain so that they may take steps to control their introduction into the human environment.

3.53 Of the carcinogens that must at present be producing a hazard for man, only some will be found to be man-made. Others, either biological or physical, exist naturally in the environment and their control or removal may be out of the question, but a clear establishment of the etiology of any given form of cancer would undoubtedly be of great service to those seeking to prevent or treat cancer.

3.54 The Agency is focusing its attention primarily on forms of cancer that show an unusual geographical distribution, since their investigation is particularly suited to its international co-ordinating role; and it is attacking each problem by a combination of epidemiological and laboratory research methods. This multidisciplinary approach will, it is hoped, bring about a more rapid identification of the etiological agents involved.

3.55 Liver cancer. The IARC Regional Centre at Nairobi has carried its study of liver cancer to a point where an association between present levels of aflatoxin ingestion and primary liver cancer has been shown, but the etiological significance of this observation has yet to be established. In view of the profound economic importance of this result, the field study is being extended to other areas in Africa and Asia (in conjunction with the IARC Regional Centre in Singapore) to eliminate the effect of known statistical biases.

3.56 An important aspect of the liver cancer study has been the development of the sero-epidemiological technique of diagnosis. Immunological studies have now been sufficiently developed for positive results of tests for $\alpha_f$-fetoprotein in the serum of patients to be a very reliable indication of primary liver cancer. In the Ivory Coast, the development of the $\alpha_f$-fetoprotein testing technique as a diagnostic tool for a mass sero-epidemiological survey for primary liver cancer has continued, indicating to date a period-prevalence figure for liver cancer of 38 per 100 000 in the adult population under survey.

3.57 The possible role of the hepatitis-associated antigens (e.g., Australia antigen) in liver disease in Africa is under review. The Agency organized a symposium in Kampala, in July, jointly with the Chemotherapy Branch of the National Cancer Institute, Bethesda, Md., USA, to review the recent results of research in the etiology, diagnosis and therapy of liver cancer. It was agreed that, at this stage, priority should be given to the standardization of techniques used in determining the level of hepatitis-associated antigens in human sera.

3.58 The Agency published during the year the proceedings of a working conference organized in 1969 in co-operation with the Chester Beatty Research Institute, London. This is the first in the series IARC Scientific Publications, which are intended to contribute to the dissemination of authoritative information on cancer research.

3.59 Prostate cancer. Cancer of the prostate is an increasingly important cause of death in certain parts of the world. Furthermore, its incidence varies widely among different ethnic groups. A study has been started to determine the trends in prostate cancer incidence from data collected from centres in Africa, Asia, the Caribbean and Europe. The natural history of the tumour will be investigated in order to establish whether there is any relationship between the latent form of the tumour, which is frequently seen in post-mortem examination, and the malignant form, which is less often encountered.

3.60 Colon and rectum cancer. Data have been collected from North and Central America, Asia, Australasia and Europe in order to compare the differential incidence of cancer of the colon and cancer of the rectum. The results so far show that whether the overall incidence for large bowel cancer is high or low, the relative proportions of cancers appearing in the two subsites are similar throughout the world. A surprising local difference, however, was found in the colorectal cancer mortality statistics in Scandinavia and further studies are now planned to verify the reported differences and seek their origins.

3.61 Nasopharyngeal cancer. The study of nasopharyngeal cancer, which has a higher prevalence among southern Chinese in Hong Kong and Singapore than among the other populations in these two areas is of special interest to the Agency because a herpesvirus is associated in some way with the tumour. Sera from nasopharyngeal cancer patients seem to have higher antibody activity against herpesvirus infection than do sera from healthy members of the population. This difference is now being tested on

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some 4000 human serum samples collected in Hong Kong and titrated in the laboratory there and in the Agency's laboratory in Lyons. There are considerable problems of interlaboratory variability and the standardization of analytical methods is of prime importance.

3.62 This same technique of sero-epidemiological survey is also being applied to the study of Burkitt's lymphoma in African children. A large-scale study is being set up in West Nile District in Uganda to ascertain whether or not the herpesvirus associated with Burkitt's lymphoma is an etiological factor.

3.63 In June, the Agency organized a meeting in Cambridge, England, on oncogenesis and herpesviruses jointly with the Houghton Poultry Research Station in the United Kingdom, and with the support of the National Cancer Institute, Bethesda, Md., USA. It brought together experts from three different fields where herpesviruses are associated with oncogenesis—nasopharyngeal cancer and Burkitt's lymphoma in man, Marek's disease in poultry, and the Lücké renal tumour in frogs. It was hoped that comparative studies of the animal tumours would help the elucidation of the human problem. The proceedings of the meeting will be published by the Agency.

3.64 Oesophageal cancer. The Agency has now established a Regional Centre in Teheran and, with the Institute of Public Health Research and the Institute of Nutrition there, will intensify the studies of the very high local incidence of cancer of the oesophagus along part of the shore of the Caspian Sea. The objective of these studies will be to combine a survey of village and personal characteristics in the area with a nutritional survey in which the potential carcinogens sought in the diet would include polycyclic aromatic hydrocarbons, nitrosamines, nitrates, nitrites, and aflatoxin. Further studies in oesophageal cancer are nearing completion at the IARC Regional Centres in Singapore and Jamaica. It is not thought that cancer of the oesophagus will necessarily be found to have a common etiology in all these areas, but comparisons may provide important clues. In parallel laboratory studies the Agency is examining the conditions under which oesophageal cancer can be induced in experimental animals by some of the dietary ingredients common in the study areas.

3.65 The standardization of analytical methods in the nutritional survey is vital if the results are to be comparable. The Agency therefore organized a meeting in collaboration with the German Centre for Cancer Research in Heidelberg, Federal Republic of Germany, to examine the available methods of nitrosamine analysis and to make recommendations for methodological standardization and collaborative studies.

3.66 Monitoring the environment. Apart from the approaches directed to the study of specific cancers, the Agency is also concerned with studies in which the cancer hazard in the environment is being followed in more general ways. The Agency is systematically collecting data on cancer incidence from cancer registries (particularly population-based registries) in all parts of the world to provide material for studies on the etiology of cancer. An essential part of this programme is the standardization of classification and the Agency has prepared draft proposals for the cancer chapter of the ninth revision of the International Classification of Diseases.

3.67 It is hoped to analyse continuously the data received from registries using standard methods so that any significant increase in any form of cancer may be observed as early as possible. This monitoring of the data from cancer registries may provide an early-warning system to signal the introduction of a new carcinogen into the environment.

3.68 It has recently been reported 1 that an association could be shown between the taking of diethylstilboestrol by pregnant women and the appearance of adenocarcinoma of the vagina in their daughters 14-22 years later. This suggestive epidemiological finding adds to the significance of experimental investigations of transplacental carcinogenesis that are being carried out, including laboratory studies by the Agency in collaboration with the National Institute of Applied Sciences in France. In the latter studies, the carcinogen methylcholanthrene, labelled with radioactive carbon, has been given to pregnant mice and it has been possible to measure exactly the amount of the labelled carcinogen that has passed into the fetuses. In later life, the offspring have developed tumours significantly more frequently than the offspring of control animals. These studies are continuing. The Agency is also planning to register information from a limited number of centres on all forms of cancer in persons under 25 years of age. Continuous analysis of the data may help to demonstrate the risk of transplacental carcinogenesis resulting either from drugs or from other environmental factors.

3.69 Another kind of monitoring is represented by detailed studies related to substances known to be widespread in the population. Among these, pesticides present a problem and the Agency has been conducting

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a long-term study of the effect of DDT on rodents. It is now clear that at high dose levels, DDT produces hepatomas in rodents in numbers which increase with increasing dose. The Agency has also been collecting data on the levels of DDT stored in human fatty tissue, but no indication has been found of any obviously related changes in the cancer patterns of populations carrying high levels of stored DDT. Further details of these investigations are given starting at paragraph 2.137. Lead arsenate, another widely used pesticide, is also being studied.

3.70 Training programme. The Agency's fellowships programme continued on a slightly reduced scale in 1971 owing to financial limitations. Twelve one-year research training fellowships were awarded and 12 short-term travel fellowships. A course on epidemiology and biostatistics in cancer research was held in March at the Agency's Regional Centre in Singapore. Forty participants came from Asia and Australasia and for six days followed an intensive programme of lectures and seminars prepared and presented jointly by members of the Agency's staff and the International Epidemiological Association.

Mental health

3.71 It is becoming increasingly clear that, contrary to previous belief, there is a high prevalence of mental disorders in developing as well as developed countries. The heavy medical and socio-economic burden of psychiatric illness is becoming more and more apparent, and WHO is making every effort to assist governments in planning national mental health services as an integral part of their general health programmes.

3.72 During 1971 WHO provided assistance to 18 countries in the development of their mental health services. The various forms of aid included advice to governments on planning services, and assistance with the training of doctors, nurses and auxiliary health personnel, both through the organization of training programmes and through the provision of fellowships.

3.73 The current trend in the management of the mentally ill towards short periods of treatment at psychiatric units in general hospitals and psychiatric day hospitals was discussed at a European regional seminar held in Salzburg, Austria, in June (see paragraph 18.75). The participants—public health administrators, psychiatrists, social workers, nurses and occupational therapists—endorsed the new trends in psychiatric care and proposed measures to facilitate their development, taking into account the implications with regard to staff requirements and patients' needs. In addition, a working group met in Opatija, Yugoslavia, in May, to consider the organization of comprehensive community psychiatric services. Emphasis was laid on the importance of a co-ordinated effort on the part of medical, allied, and social organizations and authorities concerned with the care of the mentally ill in the community, and on the need for preventive measures, including mental health education, within the framework of the public health and social services.

3.74 The organization of mental health services was considered also during a seminar held in New Delhi in February, when psychiatrists, directors of health services and social workers from all over India met to assess the country's current and future needs for mental health care, to discuss alternative methods of meeting those needs, and to consider the facilities, personnel and administrative organization that would be best adapted to the development of the country's mental health services.

3.75 The improvement of mental health services and the development of research ultimately depend on the availability of well-trained staff, which is still very limited throughout the world. The Organization's activities in this field have been concerned with both undergraduate and postgraduate training of doctors, nurses and other types of health personnel. In order to further the development of mental health services as an integral part of national public health systems in countries where all professional manpower is limited, priority must be given to the provision of training through the medical and nursing schools, schools of public health, and all the usual educational channels. WHO regional seminars on the teaching of psychiatry in medical colleges, at which the existing situation is assessed and priorities for further development are defined, have resulted in considerable improvements in a number of countries. This is a continuing programme. In the South-East Asia Region, for example, the first of a series of such seminars was held in 1968; during 1971 preparations for another seminar in 1972 included a survey of the teaching of psychiatry in medical schools. In addition, fellowships or grants for training were provided to Afghanistan, Algeria, Argentina, Ceylon, China (Taiwan), Jamaica, New Zealand, Papua New Guinea, the Ryukyu Islands and Singapore, and assistance was given to a number of countries in the organization of mental health education programmes, the establishment of new departments of psychiatry, and the preparation of curricula for undergraduate and postgraduate training. Teachers of mental health and other experts were provided for medical schools and other
3.76 Dependence on alcohol and other drugs gives rise to major public health problems in many countries. As part of a long-term endeavour to promote the development of local and national programmes designed to meet these problems, an inter-regional course was held in September-October in the Netherlands, Poland and the United Kingdom, one week being spent in each country. Detailed reviews carried out previously in those three countries, as well as in Czechoslovakia, indicating the extent of the problems and the ways in which they are being met, served as a basis for the course. The participants—from four WHO Regions—were able to visit the facilities available in the host countries and also presented reviews of the situation in their own countries. The course provided an opportunity for the exchange of experience on practical aspects of the development of preventive measures and of treatment and rehabilitation services. Medical, psychological, sociological, economic, and juridical aspects of the problem were discussed, and emphasis was laid on the need for interdisciplinary and inter-agency collaboration in the planning of programmes.

3.77 According to recent estimates, 1-3% of the world's population are mentally retarded, and 0.4% of children between 10 and 14 years of age are moderately, severely or profoundly retarded. In a number of developing countries urbanization has given rise to difficulties in providing care for the mentally retarded, and over the years the Organization has received requests for help in this respect; during 1971 such assistance was given to Saudi Arabia, where recent developments in primary education have highlighted the extent of the problem.

3.78 WHO also continued to assist with preparations for a comparative study of severely retarded children in three small geographically defined areas—one in Denmark and two in the United Kingdom. The aim is to define each child's handicaps, skills and behaviour problems, and to assess how well the services provided have catered for the special needs of the child and his family. The findings will be used to plan individual educational programmes aimed at developing skills, compensating for handicaps and diminishing behaviour problems; the experience gained from the pilot studies should be of value in the planning of national programmes.

3.79 A report on the health aspects of mental retardation was submitted by WHO to the United Nations Commission for Social Development at its twenty-second session, when it considered a draft declaration on the rights of the mentally retarded.

3.80 The pilot study on methods of ascertaining and reporting cases of suicide started in 1970 in Denmark and the United Kingdom has now been extended to 10 other countries. The aims of this project are to establish the reasons for differences in published national suicide rates; to develop procedures for determining whether or not a death was the result of suicide, so as to improve international comparability of statistics; and to provide a sounder basis for research on the prevention of suicide.

3.81 On the basis of guidelines drawn up during a consultation held in Geneva in November 1970, attention is being given to the development of methods of evaluating mental health services, and to operational research. This work should have particular validity in the developing countries, where it is especially important to define the most effective and economical means of preventing mental illness and providing care for the greatest possible number of people in need.

3.82 Emphasis has been placed on improving methods of collecting and utilizing data as a basis for the planning and evaluation of mental health services. The WHO-assisted study on the facilities and manpower resources in the European Region, started in 10 countries in 1969 and extended to include 18 countries in 1970, was further extended in 1971 to cover the remaining Member States of the Region. Representatives of all the countries concerned reviewed the information collected, and discussed its utilization for programme planning, during a symposium held in Geneva in November. Data collection and classification specifically in relation to psychogeriatric services were discussed by a working group that met in October in Tübingen, Federal Republic of Germany.

3.83 WHO's work on the standardization or psychiatric diagnosis, classification and statistics has been intensified with a view to improving communication between psychiatrists and helping to overcome the difficulties involved in the reporting of information about mental disorders in different countries. This would facilitate comparative epidemiological studies so that the extent of the problems can be measured and new methods of prevention and control developed and tested. As part of a long-term programme, proposals have been drawn up for classifying psychiatric disorders according, not only to the clinical syndrome, but also to other important aspects of the condition. In child psychiatry, for example, these
include etiological factors, social and environmental influences and intelligence level. The proposals are being tested in a number of countries.

3.84 A draft international glossary of psychiatric terms was completed and tested in a number of countries for its suitability in everyday psychiatric practice and for its value in improving the reporting of psychiatric disorders. The experience obtained will be taken into consideration in the preparation of the final document.

3.85 The seventh in the series of annual seminars on the standardization of psychiatric diagnosis, classification and statistics was held in Tokyo in December. It dealt with personality disorders and drug dependence and was attended by the group of 12 experts (from nine countries) who have been collaborating in the programme since it began, as well as experts from 11 other countries in the South-East Asia and Western Pacific Regions. Written case-histories and videotaped recordings were assessed by the participants, as in previous years, and their diagnoses served as a basis for discussions. This programme, in addition to serving to produce an adequate standardized system of diagnosis and classification in psychiatry, is playing a valuable role in promoting collaboration for future work in this field. Moreover, medical schools are being encouraged to use the findings in this programme to improve undergraduate and postgraduate training in psychiatry and mental health.

3.86 As part of a programme of comparative research on specific mental disorders and, in particular, on their prevalence and natural history, an international pilot study on schizophrenia, one of the major problems in psychiatry, was started in 1966 with the support of the United States National Institute of Mental Health. This project, in which a detailed assessment has been made of more than 1200 patients in nine different countries, entered the follow-up phase during 1970 and by the end of 1971 some 80% of the patients had been re-examined. In all the nine countries—China (Taiwan), Colombia, Czechoslovakia, Denmark, India, Nigeria, the United Kingdom, the USA and the USSR—the patients are being assessed two years after the initial examination, with the use of standardized research procedures developed for this purpose. The first results obtained in this large-scale international study showed that groups of schizophrenic patients with similar characteristics exist in all nine countries in spite of the considerable social, cultural, economic and geographical differences. The fact that psychiatrists collaborating in this study were able to achieve a high degree of uniformity in assessing patients has made it possible to prepare the ground for further intensive international studies on schizophrenia. Standardized procedures are being developed for research on other types of functional psychosis, and the feasibility of similar long-term follow-up investigations in developing and other countries is being studied. Particular attention is being given to the development of methodological guidelines for the epidemiological assessment of geographically defined populations. The training of research workers in epidemiological methods in psychiatry and, in particular, in the practical application of simple research procedures, continued to form an essential part of these activities.

3.87 Over the past few years a series of meetings of WHO scientific groups have been held to consider the possibilities for research on various aspects of neurobiology. The genetic and biochemical correlates of mental illness, in particular, constitute promising areas of research, and projects have been developed in both these fields. Thus, a psychophysiological study is being made in Mauritius on children with a high risk of mental disorders. The aim of this project is not only to prevent mental breakdown but also to gain a better understanding of the role of genetic and environmental factors in the development of schizophrenia. The results of the study are being compared with those obtained earlier in Denmark. The second project—a study on the effects of malnutrition on mental development—is being carried out in the United Republic of Tanzania. A series of standardized psychological tests has been developed for use in that country in the evaluation of the psychological development of children suffering from various degrees of malnutrition, and work has been started on an analysis of reported cases of protein-calorie deficiency and other forms of malnutrition in children in various parts of the country.

3.88 Progress in neurobiological research is providing a better understanding of the structure and function of the central nervous system, but the vast amount of knowledge emerging from the behavioural and neuro-sciences needs to be integrated and applied in the study of pathological behaviour. WHO's continued collaboration with the International Brain Research Organization should produce valuable results in this field.

3.89 Epilepsy has the highest prevalence among the diseases of the nervous system. It poses a problem in both developed and developing countries, although the prevalence is higher in the latter and is nearly 10 times greater among children than among adults. WHO's main activity in this area has been the preparation of a glossary of terminology of epilepsy.
in four languages. Final drafts in English and French were completed during the year and circulated to various groups and specialists for testing in the field, and work on the preparation of the Russian and Spanish versions was at an advanced stage. It is hoped to use the glossary in a comparative study of care and rehabilitation of epileptics in various countries with different social, economic and cultural characteristics; the proposed study is planned to be carried out in close co-operation with the International League against Epilepsy and in conjunction with an epidemiological study of epilepsy in the Region of the Americas. WHO's work with regard to epilepsy will undoubtedly be extended as a result of the establishment early in 1971 of official relations with the League and the development of closer collaboration between the two organizations.

3.90 The therapeutic properties and adverse effects of psychotropic drugs need to be constantly evaluated on account of the increasing number of new and more powerful psychoactive compounds available and their more frequent use in the treatment of a large group of mental disorders.

3.91 The network of WHO reference centres, which has now been in operation for four years, has developed an active programme for the exchange of information on the efficacy and safety of psychotropic drugs; this programme was discussed in detail at a workshop organized in Zagreb, Yugoslavia, in June, with the financial support of the United States National Institute of Mental Health. The workshop—the first of its kind—was attended by the heads of the two international, three regional and 12 national or collaborating reference centres; they discussed the past, present and proposed activities of the network, and ways of improving the handling and collection of data. They emphasized that WHO's main responsibility in this programme on the pharmacological and therapeutic evaluation of psychotropic drugs—which is directly related to the important problems of drug dependence and abuse—is to co-ordinate activities and facilitate the work of the centres. However, it was felt that, in addition to the present scope of the programme, international participation in certain spheres of research in both clinical and experimental psychopharmacology would be valuable. Stress was also laid on the importance of courses, seminars and other forms of training in psychopharmacology, organized in collaboration with the centres, as a means of promoting joint research activities.

3.92 The second of five international symposia on society, stress and disease, sponsored by WHO and the University of Uppsala, was held in Stockholm during June and July. The psychosocial stresses of childhood and adolescence were discussed by some 50 participants, including research workers and administrators in various spheres, and representing such different fields as psychiatry, psychology, endocrinology, paediatrics, nursing, epidemiology, sociology, religion, and the basic sciences. The proceedings of these symposia—the object of which is to define stress and ascertain the intermediate etiological factors in biology and sociology linking stress to functional and organic illness—are being published.1, 2

3.93 The mental health aspects of human reproduction were discussed by a scientific group that met in October (see paragraph 8.51).

3.94 Despite the amount of study devoted to juvenile delinquency, a great many questions on the subject remain unanswered. Various aspects of the problem were discussed during the regional conference on the mental health of adolescents and young persons held in Stockholm in 1969, the report of which was published by the Organization in 1971.3

3.95 The Organization continued to co-operate with the United Nations Social Defence Research Institute. Plans were finalized for a comparative study of the treatment of the mentally abnormal offender, and work on this is due to start in 1972. Preparations were also made for a study on standardized evaluation of the diagnosis and classification of mentally ill offenders. An assessment was made during the year of priorities for future collaboration between the Institute and WHO. At the twenty-second session of the United Nations Commission for Social Development the Organization emphasized the health aspects of social defence and submitted a memorandum on various aspects of criminality and social change.

Dental health

3.96 WHO's activities in dental health during 1971 were concentrated in three main areas: international dental epidemiological studies; the organization and planning of national dental health programmes; and the training of personnel.

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3.97 An important aspect of the Organization's work on dental epidemiology over the past few years has been the development of an internationally acceptable methodology for field surveys. Guidelines on basic methods for oral health surveys, after being tested in the field since 1969, were published in the form of a manual during 1971.\(^1\) The manual includes detailed recommendations on the planning and organization of surveys, the selection of population samples, diagnostic criteria, and the recording and reporting of basic data concerning the prevalence of major dental and oral diseases and conditions (dental caries, periodontal diseases, oral mucosal diseases, dentofacial anomalies and some prosthetic needs). It is being used in WHO-assisted projects or activities in a number of countries and territories, including Mexico, Papua New Guinea, the Republic of Viet-Nam, Senegal, United Republic of Tanzania, and Western Samoa.

3.98 Although the data obtained since this programme of international studies in dental epidemiology was started in 1968 are not yet sufficient for definite conclusions to be drawn, they have already provided valuable information on the global distribution of major dental and oral diseases, and indicate some general trends. Together with the results of future similar surveys, this information will provide the basis for an objective assessment of the dental needs of various population groups in different countries, and for the development of dental health programmes.

3.99 Dental caries was already known to be one of the most widespread diseases of contemporary man, but recent epidemiological studies have consistently shown a general increase in prevalence; in many countries it affects almost the entire population, many already in early childhood. Surveys carried out in the most varied geographical and climatic zones—from the Arctic regions to the tropics—have all indicated these same general trends. Intensive studies have not yet elucidated the causes of dental caries, although they have indicated several areas for research which may lead to the development of practical preventive measures. The subject was discussed at the meeting of a WHO scientific group on the etiology and prevention of dental caries held in Geneva in December. The general opinion of the scientific group was that no single factor, but rather a combination of factors, is involved in the etiology of dental caries, and that these may be related to the environment, nutrition and genetics, as well as to the individual's systematic and oral conditions. Preventive programmes will therefore be developed combining the various measures needed according to the prevailing circumstances in different population groups.

3.100 The most important means of mass prevention of dental decay is the controlled fluoridation of water, recommended in 1969 by the Twenty-second World Health Assembly (resolution WHA22.30) as a practicable, safe and efficient public health measure. So far hardly any data have been available as to the effectiveness of water fluoridation in cold climates, but recent WHO-supported studies in the Arctic zone of the USSR have demonstrated its effectiveness in the most severe climatic conditions. Other ways of using fluorides for the prevention of dental caries have been investigated, and preparations have been made for studies in this connexion in the Western Pacific Region. The role of environmental factors—particularly trace elements in food and soil—in the etiology and, possibly, prevention of dental caries is being investigated in Papua New Guinea. This study,\(^2\) which is being supported by the United States National Institutes of Health, was expanded during 1971.

3.101 Periodontal diseases constitute another serious oral health problem, and in some countries and particular age-groups are even a major cause of loss of teeth. The criteria and indices for measurement of these pathological conditions are less developed than those for dental caries, but surveys have demonstrated the magnitude of the problem and its importance in relation to the planning of dental care services. Research has indicated the possibility of preventing and controlling periodontal diseases through the combined application of local oral hygiene techniques and some general measures to increase the resistance of periodontal tissues.

3.102 Malocclusion and dentofacial anomalies are also an important problem, but the identification and measurement of these conditions are still inadequate for the planning of dental public health programmes and there is an urgent need for a standardized methodology to be developed. The same may be said of the quantitative assessment of prosthetic needs in different population groups.

3.103 So far there have been no international epidemiological surveys of oral mucosal diseases, tumours or other less frequent pathological conditions of the oral and maxillo-facial region. To promote the standardization of recording and thus facilitate epidemiological studies on these conditions, a manual on the application of the eighth revision of the Inter-

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national Classification of Diseases to dentistry and stomatology was prepared by WHO in 1969 and widely distributed among the dental profession. On the basis of experience since gained in the field, work was started in 1971 on the preparation of a revised version of the manual for possible publication.

3.104 Many countries are giving increasing attention to the planning and organization of dental health services as an integral part of national health planning. The existing services and personnel in most of the developed as well as in the developing countries are inadequate to meet the growing needs and demands for dental care, and comprehensive planning of dental health services is essential so that they can function as effectively and economically as possible.

3.105 During 1971 WHO provided assistance in the planning and organization of dental health services in Burma, China (Taiwan), the Khmer Republic, the Libyan Arab Republic, the Republic of Korea, the Republic of Viet-Nam, Singapore, and Papua New Guinea, as well as many Latin American countries (see paragraph 16.37). As part of a study on the planning and evaluation of dental health services in the European Region, a comparison has been made between the systems of collecting data and the indices used in national dental health surveys in Czechoslovakia and the United Kingdom for assessing general dental services, and between the routine data used in the Federal Republic of Germany, Norway and Romania with regard to dental services for children. The information obtained provided background material for a working group that met in Oslo in June to discuss the present methods of planning and evaluation, the extent of the need and demand for dental treatment, and the effectiveness of the services provided. The group's report, which outlines epidemiological and other data of basic significance for the efficient planning and evaluation of dental care, will serve as a basis for forthcoming projects on the management of dental health services.

3.106 Preparations were made during 1971 for an international study to be carried out jointly by WHO and the United States Public Health Service Division of Dental Health to evaluate the effectiveness and efficiency of various dental care delivery systems and their structural characteristics. A research protocol was prepared and methods of measurement were selected for use in the study.

3.107 In the Western Pacific Region WHO and the South Pacific Commission jointly sponsored the third regional seminar on dental health services, held in Noumea, New Caledonia, in January. Participants reviewed epidemiological data obtained in WHO-assisted inter-country dental health projects in the Region, considered their implications for dental public health services, assessed various patterns of dental staffing and training requirements, and made recommendations concerning the role of school and basic health services, particularly with regard to dental health education.

3.108 In the European Region there has been a series of WHO courses—in the English, French and Russian languages—on the organization of dental health services and the epidemiology and prevention of oral diseases. The third in the series—a one-month Russian-language course held in Moscow in April 1971—also dealt with research on dental health and new methods of treatment.

3.109 The education and training of personnel continues to be one of the main aspects of the dental health programme. Particular attention is being given to bringing the curricula of dental schools into line with new scientific and technological developments and preparing future dentists for work in the public health services, account being taken of the specific needs of different population groups in various communities. A recent development is the acceptance by an increasing number of countries of the need to establish training programmes for operating dental auxiliaries to assist dentists in providing dental care to broader sections of the population—particularly schoolchildren and rural populations—through the basic health services. The principle of teamwork by the various categories of dental personnel is also being more widely accepted as a basis for comprehensive programmes of dental health care. WHO provided assistance to dental schools in more than 20 countries and helped to promote the development of training programmes for various types of dental auxiliaries in Ceylon, Indonesia, Jamaica, the Khmer Republic, Papua New Guinea, the Republic of Viet-Nam, Senegal, and Uganda.

3.110 In the development and implementation of its dental health programme WHO has continued to work in close collaboration with the International Dental Federation, which represents professional dental associations in 66 countries.
CHAPTER 4

IMMUNOLOGY

4.1 Recent progress in research in immunology has greatly increased understanding of the basic processes of adaptive immunity, and even more rapid advances seem likely in the immediate future. WHO is faced with the challenge of relating this flood of new knowledge to the practical problems of disease diagnosis, prevention and cure, for the impact of modern immunology is universal. The advanced countries require more immunologists and more training in immunology so that the new concepts and methods may be widely and effectively applied to disease problems. However, the greatest impact is in developing countries, where the application of immunology holds out hope for the control of the major communicable diseases to which many of them are subject, such as cholera and the protozoal and helminthic infections. In 1971 the Organization sought especially to develop applied clinical research in immunology in conjunction with its programmes against a variety of diseases and to raise the standards of training in this branch of biomedicine, particularly through the immunology research and training centres.

Research and training centres for immunology
(see Fig. 10)

4.2 These centres have been established in Ibadan, Nigeria, for Africa; in São Paulo, Brazil, and in Mexico City for Latin America; in Singapore for South-East Asia and the Western Pacific; and in Beirut for the Mediterranean area. A centre in Europe—at Lausanne, Switzerland—acts as a co-ordinating centre and also provides more advanced training. In 1971 a new centre for advanced studies was designated at the Weizmann Institute of Science, Rehovot, Israel. The establishment of an additional research and training centre in New Delhi, as well as of one for advanced studies in Basle, Switzerland, is in preparation.

4.3 The Lausanne centre is distinctive in functioning both as an advanced research and training centre and as the WHO International Reference Centre for Immunoglobulins. The centre has been instrumental in developing, and it distributes throughout the world, reagents for all known classes and subclasses of human immunoglobulins and quantitative research standards for several immunoglobulins. One of these preparations was established in 1970 by the WHO Expert Committee on Biological Standardization as the International Reference Preparation of Human Immunoglobulins IgG, IgA and IgM, and collaborative studies were pursued in 1971 on preparations of IgD and IgE to determine whether they were suitable to serve as International Reference Preparations. The centre, together with WHO, is working in close collaboration with the standardization committee set up during the year by the International Union of Immunological Societies to develop standards for a number of other immunological prepa- rations.

4.4 The research programme of the centre is principally concerned with two topics of great importance in connexion with protective immunity. The first is the special mechanisms known to operate in the immune responses of mucosal surfaces, research being focused especially on the gastrointestinal, respiratory and genital tracts. Research on immunoglobulin and antibody production in the intestinal secretions of patients with cholera is referred to in paragraph 1.180. In research on the respiratory tract, an experimental model developed in the guinea-pig during the year has shown that locally applied antigen results in the appearance not only of locally produced antibody but also of lymphocytes active in cell-mediated immunity in the secretions of the respiratory tract. This finding raises questions about the role of cell-mediated immunity in local protection. Further experimental studies have been started with a view to their application to investigations of both enteric and respiratory disease in man.

4.5 The second main topic is the mechanism of protective immunity in the "tropical sore" variety

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1 This was reviewed by the WHO Scientific Group on Factors Regulating the Immune Response (1970) Wld Hlth Org. techn. Rep. Ser., No. 448.

2 The establishment of an additional research and training centre in New Delhi, as well as of one for advanced studies in Basle, Switzerland, is in preparation.

of leishmaniasis. The resolution of lesions in man and guinea-pigs appears to be mediated by specifically reactive lymphocytes which interfere with the development of parasites in macrophages. Research undertaken in 1971 sought to elucidate the mode of interaction between these two types of cell and its relation to the resolution of lesions and subsequent immunity. This work, supported by the Wellcome Trust and conducted in collaboration with clinical immunologists working in Addis Ababa and elsewhere, is of potentially broad significance since the mechanisms of cellular immunity involved may well be fundamentally similar in other infections involving intracellular pathogens, for example, tuberculosis and leprosy.

4.6 The centre also undertakes collaborative studies on serum immunoglobulins in man. Previous research on the relationship of high immunoglobulin levels to malaria parasitaemia in Africa led in 1971 to the development of a collaborative research project to investigate, among other things, the usefulness of immunoglobulin measurements for the recognition of infected individuals in a malaria control programme in Northern Nigeria. The immunologist working on this project received training at the Lausanne and Ibadan centres, which also prepared the reagents that are being used. Another study, carried out jointly by the Lausanne and Ibadan centres and the United Kingdom’s Medical Research Council Station in the Gambia, concerns the measurement of immunoglobulin M in neonatal serum as an index of intrauterine malaria infection. One object is to investigate the mechanism of protection against congenital malaria, a condition virtually unknown in hyperendemic malarious areas. If malaria constituted an antigenic stimulus to the fetus, elevated IgM levels in neonatal serum, as found in a variety of other congenital infections, would be expected. IgM levels were found not to be elevated in the infants of mothers with malaria parasitaemia; this indicates the absence of an immune response by the fetus and suggests that transferred maternal antibodies are of importance in suppressing that response (see also paragraph 2.34).

4.7 At the Ibadan centre, another malarialogical investigation concerns the nephritis associated with Plasmodium malariae infection, as mentioned in the Annual Report for 1970.¹ The immune complexes demonstrated next to the basement membrane of the vessel wall of glomeruli from renal biopsies of children with the nephrotic syndrome were the subject of detailed analysis in 1971, and it was shown that they include IgG and IgM activity against P. malariae antigen. This work was discussed at a WHO meeting of investigators on the pathogenesis of nephritis in Africa, which reviewed and summarized the results of studies in West and East Africa.²

4.8 In July, a refresher seminar emphasizing new developments in cellular immunity was held at the Ibadan centre for a number of its former students. The success of the courses that have been given by this centre and the consequent increased interest in immunological research have stimulated the University of Ibadan to include immunology in its undergraduate medical curriculum. In 1971 the University set up a subdepartment of immunology, under a senior lecturer who is a graduate of the centre and who is now relieving the head of the centre of many of his teaching responsibilities. Students have been encouraged to work towards master’s degrees or doctorates in immunology at the centre. Graduates of the centre were instrumental in forming a Nigerian Society for Immunology in 1971.

4.9 The course given in 1971 by the São Paulo centre was of four months’ duration and was attended by three students from Argentina, three from Brazil, one from Chile, two from Peru and one from Uruguay. This centre conducts research on the mechanism of production of the reaginic antibodies responsible for allergic reactions, the anticomplement action of snake venom, and the neutralization of snake venom by antibodies. The close link between the centre and local education facilities is shown by the fact that the head of the centre helps in the teaching of a two-year graduate course in immunology held in the Department of Microbiology and Immunology, University of Campinas, and teachers from the University of Campinas lecture at the centre.


² The report will be published in the Bulletin of the World Health Organization.
4.10 The annual course in immunology in 1971 at the Singapore centre included students from Burma, Ceylon, Fiji, India, Indonesia, Malaysia, Philippines, the Republic of Viet-Nam, and Thailand. Research being carried out by this centre includes work on the immunology of filariasis; on cell-mediated immunity in leprosy; on nasopharyngeal cancer (with support from the International Agency for Research on Cancer); on immunological parameters of fertility and pregnancy; and on histocompatibility antigens as genetic markers in the study of possible links of disease patterns with genetics. The centre also carries out Australia antigen determinations for the university hospital, using several different tests in order to ascertain which methods are of the greatest sensitivity and specificity.

4.11 The formal designation in 1969 of the Mexico City centre as a PAHO/WHO Immunology Research and Training Centre represented international recognition of the success of six closely collaborating laboratories (in six different institutions) in developing a unique three-year course leading to a Ph.D. degree in immunology. In 1971, two additional laboratories began to participate in the activities of the centre. Whereas in most universities immunologists receive their doctorates after training in microbiology, chemistry or pathology with some specialized training in immunology, in the Mexico City centre immunology is the main subject taught. The Mexican centre also offers shorter periods of post-doctoral training and will accept laboratory technicians for training in specialized techniques. In 1971 a two-week course on clinical immunology was held in Spanish. The 13 participants were from the following countries: Argentina, Chile, Colombia, Costa Rica, Cuba, Panama, Paraguay, Peru, the Philippines, Spain, Uruguay, and Venezuela.

4.12 Research at this centre includes immunochemical analysis of carbohydrate antigens in mycobacteria, investigation of the relationship of Escherichia coli antigens to infantile diarrhoea, and studies of complement and regulation of the immune response. Both this centre and the Beirut centre are also engaged in immunobiological investigations of the effects of malnutrition on the immune response, as part of an international collaborative study, to which further reference is made in paragraph 4.16.

4.13 In addition to the work on malnutrition, the Beirut centre carries out immunochemical studies on the specificity of myeloma proteins with a view to gaining a better understanding of antibody structure and function. In collaboration with the Ibadan centre, it is planning research into the immunological basis of nephropathies in schistosomiasis. The Beirut centre held its first course in basic and applied immunology for students of the Eastern Mediterranean Region in August-September 1971.

Other training activities

4.14 A course was held in July at the WHO Regional Reference Centre for the Serology of Autoimmune Disorders at Buffalo, N.Y., USA, to bring the latest developments in immunology to the knowledge of those engaged in research in this subject and of persons responsible for teaching immunology. An increasing number of medical schools now include immunology in their undergraduate curricula and many more medical schools and science faculties include it in their postgraduate curricula. At a similar course organized jointly with the British Society for Immunology in Edinburgh, Scotland, in September, WHO provided support for a number of participants, particularly from countries in which immunology is less advanced. In addition, a seminar on the most recent findings on the structure and synthesis of antibodies, and also providing advanced training in other aspects of immunology, was held in Moscow in October with 20 participants from all WHO Regions. The staff of the International Reference Centre for Tumour-Specific Antigens, which is located in Moscow, took an active part in the seminar.

Applied immunology and public health

4.15 Apart from the training and research aspects described, the Organization's immunology programme is also designed to make available the specialized knowledge of the basic immunologist to those working on practical disease problems, both within WHO's disease control programmes and in research and public health activities outside the Organization.

4.16 It is widely held, for instance, that malnutrition and infectious diseases tend to act synergistically, creating a vicious circle. At a consultation of experts held in June to consider this and other possible interrelationships between nutritional states and immunological function, an international collaborative study was designed for field investigations in many parts of the world. A number of these have already begun; as mentioned above, the research and training centres in Beirut and Mexico City are participating. This study will yield large numbers of sera needing immunochemical measurement; the laboratories of the London School of Hygiene and Tropical Medicine are collaborating in the antitoxin determinations.
4.17 Some reference has been made in paragraph 1.64 to the studies that began in 1971 on the immunopathogenicity of the shock syndrome in dengue haemorrhagic fever. Immunologists, virologists, clinicians and pathologists from Thailand and the USA have been working together in hospital and research laboratories in Bangkok to determine whether antigen-antibody complexes and changes in serum complement levels are the mediators of the shock syndrome. The aim of these studies is to develop therapeutic and prophylactic measures against this condition of growing importance.

4.18 A serious problem confronting immunologists is the transport of lymphocytes from the site of collection to laboratories where they can be studied for the diagnostic and other aspects of cellular immunology. In collaboration with the laboratories of the Netherlands Red Cross Blood Transfusion Service, a study is being made of the metabolic, functional and immunological changes of frozen human lymphocytes during transport. It is hoped that the optimal conditions for their carriage from field sites at which they have been collected to regional laboratories can be defined.

4.19 A barrier to progress in immunological research has been the previously extraordinarily confused terminology in the subject. WHO has done much to achieve international agreement on this by publication in the Bulletin of the World Health Organization of unified nomenclatures for immunoglobulins, histocompatibility antigens and complement. However, as new advances are made, agreement on new terms is needed. The Organization will work in close collaboration with the nomenclature committee that was established by the International Union of Immunological Societies during the year. The first project, begun this year, is to bring the immunoglobulin nomenclature up to date.

4.20 As understanding of the basic principles of the regulation of the immune response has improved, the main outlines of both the humoral and the cellular aspects of immunity have been defined and it has become clear that the site of response may be critical. For example, the control of gut (and of respiratory tract) infections may be more readily achieved by local administration of vaccine causing a local response than by parenteral administration causing a systemic response. A scientific group on oral enteric vaccines that met in November reviewed evidence of the effectiveness of attenuated strains used for these vaccines and made a number of recommendations for research and for collaborative studies to increase knowledge of humoral and cellular immunity at the mucosal surfaces (see also paragraph 1.194).

4.21 Just as the site of the immune response may be critical, so, too, may the mode of the response and the time at which it occurs. Research into the means by which the appropriate response may be stimulated and measured holds out exciting prospects for the control of many diseases. A phenomenon well established in cancer immunology, for instance, is the antagonism that may appear between humoral and cellular effectors. In the experimental animal, humoral antibodies can actually block the activity of lymphocytes in the cellular attack on tumour cells, thus annulling the protection they give. Studies show that apparently similar mechanisms may operate in certain forms of cancer in man. This blocking-antibody phenomenon is being investigated at Lausanne, Switzerland, in collaboration with the International Reference Centre for Immunoglobulins and the International Agency for Research on Cancer.

4.22 In some cases, suppression rather than stimulation of immunity is required. In this case, the blocking-antibody phenomenon referred to above is turned to advantage, since the injection of specific antibody blocks the formation of antibody of the same specificity. One of the most striking public health applications of this principle is described in the report of the WHO Scientific Group on the Prevention of Rh Sensitization, published in 1971. Primary maternal sensitization to fetal Rh antigen—which may lead to haemolytic disease of the fetus and the newborn—can be prevented if an Rh-negative mother receives an intramuscular injection of anti-Rh antibodies at the time of delivery of an Rh-positive child. The scientific group, in addition to making recommendations for research on the practical application of new techniques for the prevention of Rh sensitization, pointed out that treatment with anti-Rh of all Rh-negative women at risk could be expected to bring about a drastic reduction in the overall death rate from haemolytic disease of the fetus and newborn and in the number of exchange transfusions required for affected infants. The Advisory Committee for Medical Research, reviewing the group's report in June, recommended the wide adoption of passive immunization by administration of anti-Rh immunoglobulin because of its efficacy and of the relative ease with which infants at risk can be detected. The WHO International Reference Centre for the Use of Immunoglobulin Anti-D in the Prevention of Rh Sensitization, in London, has begun potency testing on a number of national immunoglobulin preparations intended for this prophylactic use.

4.23 Several "cancer-associated" antigens have been described as occurring in tumours and in sera

from cancer patients but their significance is by no means clear. Examples are α-fetoprotein in primary hepatoma and carcino-embryonic antigen in intestinal cancers. Tests for α-fetoprotein in serum are currently regarded as diagnostic for primary hepatoma although, unfortunately, the protein is not detected in all patients with the disease. The value of tests for carcino-embryonic antigen is at present being intensively investigated. WHO and the International Agency for Cancer Research (see paragraph 3.56) are closely concerned with this research, and, in the case of α-fetoprotein, have sought to accelerate progress by the organization of international meetings and exchange of information and by the provision of standard reagents for this protein.

4.24 A meeting was co-sponsored in July by WHO and the Fogarty International Center at the National Institutes of Health, Bethesda, Md., USA, at which the biological significance of histocompatibility antigens was discussed. Evidence from research on experimental animals and from clinical studies in man was compared and contrasted. Histocompatibility antigens, by the great number of alleles determining them, are a striking feature of human genetic polymorphism and may provide a valuable tool for epidemiological studies to identify population groups at particular risk from certain diseases, for example, acute lymphoblastic anaemia, Hodgkin’s disease and systemic lupus erythematosus. They have been fairly well studied in laboratory animals, in which they have been shown to be related to the ability to mount varying immune responses, but have been far less extensively investigated in man. However, they may be of prime importance in determining the degree of an individual’s resistance to different diseases and the type of his antibody response to different antigenic stimuli.

4.25 Clinical immunology has emerged as a distinctive specialty encompassing the diseases characterized by abnormal function of lymphoid tissue as well as disorders in which immune functions play a major role. Following a preparatory meeting in 1970 on this subject, and particularly on the immunological techniques that can be carried out in hospital laboratories generally and in specialist centres, a scientific group that met in October 1971 summarized the application of immunology in clinical medicine and proposed various ways in which immunological services could be developed under different conditions. The group also made suggestions about the training of clinical immunologists in the future.

4.26 Other immunological aspects of WHO programmes are dealt with in, for instance, the sections on bacterial diseases, leprosy, comparative medicine, parasitic diseases, human reproduction, and biological standardization.

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CHAPTER 5

ENVIRONMENTAL HEALTH

Growth of worldwide concern about the human environment

5.1 Recent years have witnessed a remarkable change in public opinion in relation to pollution of the environment. Rather than a minor and necessary evil, it is now being regarded as a major threat to social and economic development and even to man's survival. Concern for the human environment has fostered the concept of environmental control as one of the most effective means of improving health. The objectives of environmental control are often similar to those of social and economic development and, especially through environmental sanitation and the control of pollution, of action to eliminate poverty and disease.

5.2 The aims of the WHO programme in environmental health, as stated at the Twenty-fourth World Health Assembly, are:

(1) to improve health in all countries through environmental control;
(2) to enlarge knowledge of the adverse effects on health of components of the environment;
(3) to determine as rapidly as possible the permissible levels for man of pollutants and other adverse environmental influences; and
(4) to provide Member States with a system for early warning of the onset of a deterioration in community health or well-being.

5.3 In developing countries the absence of basic sanitation is responsible for preventable diseases that originate in the environment in which millions of people live. Particular stress is laid by WHO on the improvement of basic environmental health and sanitation in all countries, but notably in the developing countries, with special emphasis on the provision of adequate quantities of potable water and the sanitary disposal of wastes. A prerequisite to efficient environmental control programmes is the establishment of international criteria, guides and codes of practice in relation to known environmental influences on health, particularly water, food, air, wastes, and occupational exposure. Other requirements are the development and co-ordination of epidemiological health surveillance on a national and international scale and increased knowledge of the effects of environmental factors on human health.

5.4 An indication of the importance now attached to environmental control is the United Nations Conference on the Human Environment, to be held in Stockholm in June 1972. This conference will deal with problems of human settlement, resources management, pollution, the environment in development, education and research, and institutional aspects. It will be the first world conference of governments on the problems of the human environment. Emphasizing the specific health problems related to the environment, WHO has provided documentation for the conference on the environmental aspects of community water supply and wastes disposal, the health and welfare factors involved, criteria, standards and guides on permissible levels of human exposure to contamination, and the identification and evaluation of the principal effects of environmental agents on man's health. WHO has collaborated in preparation for the conference with the United Nations, the specialized agencies and IAEA in providing material on health factors in urban planning, housing, resources management, and the training of sanitary engineers. Suggestions have been made for, inter alia, the improvement of basic environmental sanitation (especially in developing countries), the monitoring of environmental pollutants and of their effects on man's health and welfare, and further research.

5.5 The long-term WHO programme includes measures for the provision of basic sanitation in rural and urban areas to help prevent and control communicable diseases, the control of environmental pollutants, the improvement of urban-industrial environmental health to prevent or overcome some of the noxious effects of urbanization and industrialization, and the creation of institutions and services able to plan and manage environmental health programmes and integrate them into health and general development planning and programmes. The programme provides

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for direct assistance to governments in environmental health matters, the development of environmental health criteria and of guidelines for preventive measures, and the collection and assessment of data.

5.6 Direct assistance in environmental health included 245 field projects carried out in collaboration with 90 governments of Member States. The help ranged from the provision of advisers to the execution of the large-scale projects carried out by WHO as executing agency for UNDP. In relation to environmental health criteria, guidelines and standards, high priority was given to quality criteria for water and community water supplies, the ambient air, noise, urban planning, occupational radiation health, and environmental health measures in disasters. Data on environmental and sanitary conditions continued to be collected, mainly through the WHO system of international reference centres and collaborating institutions.

Effects of environmental pollution and other hazards

Programme aims

5.7 As a consequence of industrialization and urbanization, increasing amounts of pollutants are discharged into the environment. Some are converted to normal environmental constituents by degradation; others accumulate in the environment. In the food chain the major sources of man's intake of pesticide residues, radionuclides, and metals such as mercury are industrial or agricultural processes.

5.8 The aim of the WHO programme is to reduce pollution of the air, water and land—including nuisances, noises and radiation—to levels not constituting a hazard to health yet not impeding social, economic and technological development. In addition to studies of the health effects of pollutants, WHO is therefore concerned with sampling and measurement methodology, control technology, and the administrative and legal prerequisites for pollution control.

5.9 The programme depends on facilities for the monitoring and surveillance of pollutants and nuisances. A number of countries have well-defined systems for measuring the quality of environmental pollutants. WHO has strengthened them by the designation of collaborating laboratories and national institutions and the co-ordination of the work through regional and international reference centres. This network not only assists Member States but also makes it possible to assess regional and world levels and trends. Emphasis is also put on the creation of systems for sampling and analysing the common air pollutants in rivers, other natural waterways, and coastal waters and for evaluating other selected physical factors in the environment.

5.10 Annoyance reactions (for example, to odours and noise, or eye irritation) are a problem in environmental health, affecting especially the health and well-being of people living in urban communities. Various indices using different methodologies have been established to evaluate annoyance and damage from noise. In December, a consultation was held in Geneva to examine the validity and comparability of these indices and methods in the field of both occupational and urban noise, including noise from aircraft. The possibility of a general agreement on the international use of simple and comparable indices was discussed, as well as the early detection of disturbances of the auditory apparatus or other organs because of noise.

5.11 More and more countries are engaging in studies of environmental pollution. WHO carried out surveys in five Regions in order to define the nature and extent of the pollution and the priority that governments should give to remedial measures. The institutional and legislative structures in the field of environmental control were examined, especially in countries where significant control is being exercised.

Air pollution

5.12 A preliminary consultation of experts was held in November to review the health effects of exposure to particulate matter in the air, oxides of sulfur and nitrogen, carbon monoxide, and oxidants. Its findings will be considered by an expert committee, planned for early in 1972, whose task will be to draw up internationally acceptable guides and criteria for air quality.

5.13 The WHO network of reference centres and laboratories concerned with air pollution now includes the two international reference centres, in London and in Rockville, Md., USA; three regional reference centres, in Moscow, Nagpur and Tokyo; seven national reference centres; and 30 collaborating laboratories (including those in the Pan American Air Pollution Sampling Network). These institutions—shown in Fig. 11—keep WHO informed of research in air pollution, provide consultant services, carry out specific investigations on request, advise on and assist in new research, ascertain urban air pollution levels and trends, and collate, evaluate and exchange scientific information.

5.14 The monitoring results for sulfur dioxide and suspended particulate matter now being received
Fig. 11. WHO network of air pollution reference centres and laboratories
regularly from the reference centres and collaborating laboratories show some interesting features. For example, the average smoke density in a number of cities in India is considerably higher than in many more highly industrialized cities elsewhere in the world. The average annual smoke concentrations in Delhi, Calcutta, and Kanpur in 1970 were 601, 341, and 544 µg/m³ respectively. However, the average annual sulfur dioxide concentrations for the same period were comparatively low (41, 33 and 12 µg/m³ respectively). This indicates the high contribution to smoke pollution made by domestic, low-sulfur sources in those cities. By contrast, the average annual smoke concentrations in many European and North American cities has been diminishing in recent years. For example, in the United Kingdom the average annual smoke density, calculated in a number of urban areas considered in the National Survey of Air Pollution, dropped from approximately 170 µg/m³ in 1958 to just over 60 µg/m³ in 1968.

5.15 With the aid of the WHO International Reference Centre for Clinical and Epidemiological Aspects of Air Pollution, London, methods for the routine measurement of sulfuric acid aerosol, sulfur dioxide, suspended particulate matter, carbon monoxide, and oxides of nitrogen were collated and tested and, after review, are being issued as a series of WHO documents. These provide a critical appraisal of most of the methods available and single out a number as suitable for special types of work. The methods are specifically intended for routine use in the field by people unfamiliar with air pollution monitoring and in most cases require simple equipment only.

5.16 The WHO International Reference Centre on Air Pollution Control, Rockville, Md., USA, is also working on the development of more precise methods for determining suspended particulate matter and sulfur dioxide. These are intended as laboratory reference methods against which the routine field methods can be tested and calibrated by the participating institutions.

5.17 A WHO working group on trends and developments in air pollution control, meeting in Copenhagen in January, discussed air pollution problems in the European Region and identified areas where assistance is needed for the development of programmes of immediate practical value. Advice was given by WHO on the development of air pollution research and control in São Paulo, Brazil; on the planning of a centre for research and abatement studies for the Cracow and Silesia area of Poland; on methods for the abatement of air pollution arising from industry, motor vehicles and domestic sources in Athens; and on a project for the study of the causes of air pollution in Venezuela.

Water pollution

5.18 A number of countries received assistance from WHO for water pollution control programmes financed by, or for which financing has been sought from, UNDP/SF. One of those countries is Romania, where industrial pollution of the Danube and other river systems has increased markedly in recent years; there a programme to determine the optimum design for an experimental waste water treatment station and to provide a statistical evaluation of data on the quality and quantity of waste waters in Bucharest has been completed. WHO also gave advice on the utilization of water quality data and on eutrophication studies in Romania.

5.19 WHO co-operated with the Government of Czechoslovakia in establishing, with UNDP/SF support, a federal research and development centre and two subcentres for environmental pollution control, which will prepare a national programme for water, air and soil pollution research and control.

5.20 The Organization is assisting the Government of Hungary in the establishment of two pilot zones for water quality management on the Danube and Sajo rivers, with a view to collecting data and developing a rational basis for a planned investment in water quality improvement. The project is also concerned with determining the most favourable conditions for waste water discharge and with the legal and administrative aspects of implementing water pollution control programmes.

5.21 A project in Poland giving particular attention to physicochemical treatment processes for combined wastes and to tertiary treatment and water renovation processes with a view to the reuse of the effluent by industry was extended. Further work is also being carried out on thermal pollution and on applied engineering in water desalination.

5.22 WHO's assistance in relation to water pollution included advice on ground water pollution problems in Lebanon; on pollution of the Singapore River; on coastal pollution in Lebanon and Singapore; and on the development of research and environmental control programmes in Brazil, Israel and Venezuela.

5.23 Following the first course held in August 1970, a second inter-regional training course on coastal water pollution was organized by WHO in July and
August, in co-operation with the Danish Government, at Copenhagen and Aarhus. The course was structured to meet the need for training personnel in the most up-to-date techniques for control of the pollution of coastal waters and coastal areas.

5.24 The public health implications of water pollution, criteria and guidelines for water quality, and the systems analysis approach to water management were among the subjects considered at an inter-regional seminar on public health aspects of water pollution held in Dübendorf, Switzerland, in November.

5.25 WHO participated in the third session of the Joint Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP) held in Rome in February; it co-sponsors that Group with the United Nations, FAO, UNESCO, WMO, IMCO and IAEA. The list of harmful chemical substances drawn up at the second session in 1970 and parameters for assessing water quality for bathing and for shellfish culture were discussed, as well as guides and criteria for the various uses of coastal waters.

5.26 The use of hydrological measurements for water quality surveys and the scientific aspects of water quality observation and forecasting networks were considered at the first meeting of the International Hydrological Decade working group on hydrological problems related to water quality, jointly organized by UNESCO and WHO, which met at Geneva in September. The group decided to prepare a practical guidebook on water surveillance, with particular reference to the hydrological aspects.

**Exposure to ionizing radiation**

5.27 Almost everyone today is affected by the growing use and application of ionizing radiation. Possible sources of radiation are the medical, industrial and research applications of radionuclides and of radiation-producing machines, as well as the fallout from nuclear weapon tests. At present, apart from natural radioactivity, radiation in medical use (in particular X-rays) contributes by far the largest part of the radiation dose to the world population. WHO is pursuing a programme (see paragraph 5.88) to reduce unnecessary exposure. The contribution from other peaceful uses of nuclear energy is small in comparison—although it is expected to increase with time.

5.28 Radiation protection involves the evaluation of radiation doses to man from medical and non-medical uses of radiation and of radioisotopes, and the improvement of radiation protection measures, particularly for patients during X-ray examinations. 5.29 The anticipated rapid growth of the nuclear energy industry will necessarily entail the production of radioactive wastes. It is expected that some of them will be released to the environment, so that the concentration of such biologically significant radioisotopes as tritium, krypton-85, strontium-90, iodine-129, cesium-137 and plutonium-239 will increase. WHO, in collaboration with IAEA, is pursuing a programme aimed at surveillance of the concentrations of significant radionuclides in the environment so as to provide the information needed to assess population exposure to radiation on a global scale and facilitate decisions on where and how a reduction in the levels of environmental contamination can be effected.

5.30 Preliminary estimates indicate that, of the various peaceful applications of nuclear energy, power production (including all aspects of the fuel cycle) is the largest potential source of radioactive environmental contamination, nuclear detonations and nuclear ship propulsion being small sources. Nuclear power plants either operate, or are under construction, in more than 20 countries. Because of the increasing demand for energy, however, the total world nuclear power production is expected to grow from its present 24 000 MWe to 345 000 MWe by the year 1980 and to 4 260 000 MWe by the year 2000. Nuclear power production in developing countries is expected to grow from its present 500 MWe to 22 500 MWe by the year 1980 and to 790 000 MWe by the year 2000. Fig. 12 represents the projected growth of nuclear electrical generating capacity for the world as compared with the growth of total electrical capacity.

5.31 Nuclear plants present advantages over fossil fuel plants from the point of view of environmental pollution, and the safety record of the nuclear industry has so far been very good. But the release of radionuclides into the environment needs to be kept under strict control, so that the levels of radioactive contamination are as low as practicable and the delicate ecological balance on which organized existence depends is not upset. WHO is therefore assisting in studies to evaluate the impact of the nuclear industry on man's health and environment, with emphasis on the recognition of problems and on action to solve them. An international network of services has been created, in consultation with IAEA, to collect data and assess radioactive contamination in the environment. WHO collaborates in IAEA studies on the

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Fig. 12. Projected growth of total electrical generating capacity and of nuclear electrical generating capacity to the year 2000 ¹


behaviour of radionuclides from radioactive waste in the environment, especially in the sea, and on the establishment of international guidelines and codes of practice for the siting, design, construction and operation of nuclear power plants and associated facilities.

5.32 Study of the public health implications of radioactive waste releases was continued. The present aim is to evaluate the public health implications of the sources, quantities and characteristics of the radioactive wastes produced and released to the environment. Some of these aspects were the subject or a report made in collaboration with IAEA to the 1971 United Nations Conference on the Peaceful Uses of Atomic Energy, in which the radiation dose to the world population that might be expected in the year 2000 from the nuclear power industry and from the radionuclides produced by it was estimated at about 1% of the average dose due to natural background radiation, with a factor of error of 10 or more.

5.33 Effective and economic solutions to radiation pollution depend on quantitative assessment of the problems involved. The primary function of the WHO International Reference Centre on Environmental Radiation, Le Vésinet, France, is to provide quantitative data on environmental radioactivity. It is also concerned with the promotion of accuracy and precision in environmental monitoring and the reproducibility of analyses of radioactivity in environmental samples so that the data collected are comparable. In collaboration with 10 selected laboratories through the world, samples of food and bone were analysed for strontium-90 and cesium-137 and their ratio to calcium and potassium. Some laboratories reported results significantly different from the mean values or from those of the reference centre. The variations in the results are being studied and a programme aimed at ensuring comparability is being developed. IAEA, where measurement techniques have been developed and used in its laboratories for a number of years, is being kept informed of this programme.

5.34 WHO has collaborated with IAEA in studying means, such as international registers, of determining radioactive waste releases into the environment.

5.35 An international survey of the effects of radioactive fallout from nuclear weapon tests and nuclear power stations was made by the United Nations Scientific Committee on the Effects of Atomic Radiation. WHO has been assisting the United Nations in this survey, which is estimating the level of strontium-90 in human bone on the basis of autopsy data from tropical countries obtained by a small worldwide monitoring system the Committee has set up; this has now been operating for three years with the participation of countries in Africa.

Occupational hazards

5.36 While the classical occupational risks remain important, new risks are appearing. Industry and agriculture are producing and utilizing more and more new chemicals, for example, some of which are hazardous not only to the worker but sometimes also to the general population. To increase knowledge of occupational hazards, WHO initiated a long-term study on the epidemiology of toxic hazards in industry in the European Region. This project will include
training of occupational toxicologists to enable them to undertake longitudinal surveys of human exposure to industrial toxic substances. Surveys carried out by major institutes of occupational health and large industries in nine European countries were discussed and methods of carrying out epidemiological studies and establishing cause-and-effect relationships in exposure to different toxic substances were examined at the National Institute of Occupational Health, Helsinki, Finland, and at the Institute of Occupational Health, Erlangen, Federal Republic of Germany.

5.37 A consultation was held in October to assess the problem of occupational cancer and prepare a provisional list of some of the chemical and physical factors considered or suspected to be carcinogenic, to review the requirements for laboratory and epidemiological investigations, and to consider the application of current knowledge to the prevention of occupational cancer and to the measures undertaken by different countries. This consultation was held in preparation for a long-term field investigation of workers’ exposure to carcinogenic substances with a view to assessing the magnitude of the problem and reducing exposure. ILO and IARC participated in the consultation and will co-operate in the study.

5.38 The safe use of pesticides is a matter of growing concern among those with responsibilities in occupational health. In addition to the activities reported starting at paragraph 2.135 and to the holding of a European regional conference on modern methods for preventing pesticide intoxication (see paragraph 18.68), WHO helped in the preparation of the ILO model code of practice on the safe use of pesticides.

5.39 The transport of dangerous goods in ships involves various kinds of risk. A guide to medical first aid at sea in case of poisoning was finalized by WHO jointly with IMCO, with ILO participation.

5.40 Occupational dermatoses, particularly those caused by cement, are the most frequent of occupational diseases and the most expensive to deal with. The Organization participated in an international symposium on occupational dermatoses in the construction industry, organized in Paris in May by the French National Group of Construction Industry and Public Works Physicians; and at sessions relating to this subject at an international conference in occupational health organized in Slanchev Bryag, Bulgaria, in September by the Permanent Commission and International Association on Occupational Health. Both meetings advocated studies on the components of cements and the mechanism of action of the cements on the skin, portable devices and creams to protect the skin, and better hygiene in places of work. In addition to dermatoses there are many other risks in the construction industry, such as vibration disease caused by the use of pneumatic tools and other equipment; an ergonomic study and approach were recommended.

5.41 Pneumoconiosis, among other important problems of occupational health, was discussed by the Twenty-fourth World Health Assembly, which called for expansion of research in the field of occupational health with particular reference to mining (resolution WHA24.27). WHO participated at an international conference on pneumoconiosis organized by ILO in September in Romania. Non-fibrotic pneumoconiosis, respiratory allergy and obstructive lung disease are also prevalent in developing countries among workers exposed to vegetable and other organic dusts. Epidemiological investigation of respiratory diseases resulting from the inhalation of these dusts was started, with WHO assistance, at the National Institute of Occupational Health and Industrial Hygiene in Indonesia; the Division of Environmental Health, Occupational Health Service, Mexico; and the Department of Occupational Health, Faculty of Public Health, Istanbul. The effects on health of exposure to a wide spectrum of vegetable dusts such as tobacco, wood, bagasse and rice are included in this investigation. (See also paragraph 5.77.)

5.42 In April a review of the efficiency and design of the personal respiratory protective devices now available was undertaken. A document was prepared giving guidance on the better design and more effective use of equipment, especially in the developing countries.

5.43 In relation to the monitoring of exposure to industrial toxic agents, collaborative research with WHO was undertaken by the Department of Occupational Health, Institute of Public Health, Alexandria, Egypt, to evaluate exposure to carbon disulfide, hydrogen disulfide, and sulfur dioxide in the production of viscose rayon and its effect on the health of workers, particularly in relation to the possibility of neurological disorders and cardiovascular disease. The medical department of the rayon industry in Kafr El Dawar, Alexandria, is participating in this research.

5.44 WHO was represented at the discussions on the convention and recommendation on benzene adopted by the fifty-sixth session of the International Labour Conference.
Accidents

5.45 In Copenhagen, in March, a working group prepared an outline long-term programme for road accident services, proposing, *inter alia*, the establishment of a standard medical reporting system for road accidents and epidemiological research in the European Region. WHO is co-operating in the ECE programme on medical fitness for driving and licensing, and is evaluating research, especially in relation to driver psychology and faulty vision. Also, in co-operation with the ECE working group on vehicle construction, it is reviewing ergonomic approaches to the design of safe motor vehicles.

5.46 The prevention of occupational accidents was discussed during the first African congress on the prevention of occupational risks, held in Algiers in April under the auspices of the International Social Security Association and the Government of Algeria, in collaboration with ILO and WHO. The congress reviewed occupational safety in African countries and emphasized the importance of training occupational health and safety personnel in accident prevention and of effectively utilizing existing professional and auxiliary personnel.

5.47 WHO took part in the International Symposium on Safety and Health in Shipbuilding and Ship Repairing organized by ILO in Helsinki in August-September. The conference emphasized the importance of maintaining the pilot health and safety centre set up in 1970 at Gdynia, Poland.

5.48 A report on emergency assistance in the event of nuclear accidents, prepared by IAEA, contains information furnished to ILO, FAO, WHO and IAEA by their Member States on the facilities, personnel and assistance they could provide on request to other governments in the event of radiation accidents.

Basic sanitary measures

Community water supply and wastes disposal

5.49 By and large, the more developed countries have attained the objective of providing a safe piped water supply to most of their population. In the Americas (excluding Canada and the USA), too, it is estimated that, at the end of 1971, approximately 75% of the urban population were receiving safe water. With regard to the rest of the developing world, in 1970 only 25% of the urban population were supplied with safe piped water in their houses or courtyards, with another 26% having access to public water supplies from street standpipes. But the rural populations were far worse off. In Latin America about 18% were supplied with safe water, in other developing countries less than 10%.

5.50 For the Second United Nations Development Decade WHO has proposed as a target the provision to all urban dwellers and 20% of rural inhabitants of a safe and abundant water supply either in their houses or courtyards or from public standpipes. This would mean that an additional urban population of 420 million and an additional rural population of 200 million would receive safe water during the decade. Through the sector studies and improved data collection initiated by WHO in 1971, national inventories are being established and targets and priorities set for the construction of new water supply systems. The total investment required to achieve these targets, with present construction costs, is of the order of US $7500 million for urban supplies and US $1600 million for rural supplies. Of this amount about one-quarter will come from international loans and grants and the remainder will have to be provided by the developing countries concerned. During 1971, international loans for new urban water supplies totalled some US $130 million. On this basis, the developing countries will need to increase the average rate at which new urban water systems are constructed by approximately 50% in order to meet the targets of the Second Development Decade.

5.51 In Latin America, some 62 million people—23% of the total population—had adequate sewerage systems in 1971. Of this number, some 60 million were urban and the remaining 2 million rural, i.e., 40% of urban inhabitants and 2% of rural inhabitants had adequate sewerage systems. In only one country in Latin America did more than half the inhabitants have adequate sewerage and in no country was more than half of the rural population adequately provided. In the remaining developing countries of the world it is estimated that, in 1971, 8% of urban families had access to a sanitary sewerage system. The goal proposed by WHO during the Second Development Decade is to increase the proportion of the urban population with sanitary sewerage in these countries from 8% to 27%. To do this will require providing sewer service each year to some 18 million people. Comparison of the figures for 1969 and 1970 in Latin America shows that an additional 1% of the urban population was provided with a sewerage system, while there was no significant increase in the population served in the rural areas. Comparable information from other regions is lacking, but the additional urban population served in them is on the average much lower even than 1%.
5.52 The spread of cholera in recent years has brought forcefully to the notice of the public the basic sanitary principle that human excreta must be disposed of in such a way as to prevent their contaminating food and water. The appearance of enteric diseases among tourists has, moreover, shown authorities that good sanitation is needed not only in tourist centres but also in adjacent areas that provide labour to those centres. These considerations are influencing public authorities to take urgent action to seek finance for and to construct sanitary sewerage systems.

5.53 Tables 2 and 3 summarize information collected by the Organization on populations served by safe water supply and waste water disposal systems in 1971 in certain countries in the African and Western Pacific Regions.

5.54 Pre-investment studies are needed to enable investment decisions to be made, and for this purpose many governments are seeking WHO assistance. New projects in water supply and wastes disposal financed by UNDP/SF, with WHO as executing agency, were started during 1971 in Afghanistan, Iraq, Kenya, Madagascar, and Mali, in addition to those already under way in the Central African Republic, Ceylon, Ghana, Iran, Ivory Coast, Khmer Republic, Malta, Morocco, Nepal, Nigeria, Senegal, Surinam, Uganda, and Yemen. The UNDP contribution to these new projects totalled over US $6 million, the government contributions US $3.5 million. Preparations were made during the year for projects in Burundi, Guyana, Ghana, Lebanon, Liberia, Libyan Arab Republic, Philippines, Rwanda, Sierra Leone, Syrian Arab Republic and Yugoslavia. Fig. 13 shows the UNDP/WHO-assisted pre-investment studies for community water supply and wastes disposal that were completed or in operation in 1971.

5.55 The interest of Member States in pre-investment activities was shown at two regional seminars held during the year—one on community water supply, in Brazzaville in April, and the other on the planning and financing of municipal water and sewerage works, in Manila in May (see paragraph 20.103). The seminar on community water supply placed emphasis on the training of personnel and the use of local materials and brought to light the deficiencies in the basic data. A scientific group on techniques for the collection and reporting of data on community water supply held in Geneva in August studied methods in use and recommended standard reporting techniques.

### Table 2. Community water supply systems in operation in some urban areas in the African Region in 1971

<table>
<thead>
<tr>
<th>Country</th>
<th>Total population (millions)</th>
<th>Population with water supply (millions)</th>
<th>Population with sewerage (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cameroon</td>
<td>5.7</td>
<td>0.86</td>
<td>0.14</td>
</tr>
<tr>
<td>Central African Republic</td>
<td>1.5</td>
<td>0.31</td>
<td>0.01</td>
</tr>
<tr>
<td>Dahomey</td>
<td>2.6</td>
<td>0.150</td>
<td>0.023</td>
</tr>
<tr>
<td>Kenya</td>
<td>10.7</td>
<td>0.61</td>
<td>0.36</td>
</tr>
<tr>
<td>Lesotho</td>
<td>0.93</td>
<td>0.034</td>
<td>0.012</td>
</tr>
<tr>
<td>Madagascar</td>
<td>6.7</td>
<td>0.66</td>
<td>0.20</td>
</tr>
<tr>
<td>Upper Volta</td>
<td>5.3</td>
<td>0.28</td>
<td>0.03</td>
</tr>
<tr>
<td>Zaire</td>
<td>17.3</td>
<td>2.09</td>
<td>0.90</td>
</tr>
</tbody>
</table>

1 Information from the African regional seminar on community water supply, held in April 1971 at Brazzaville.

### Table 3. Community water supply and sewerage systems in operation in some countries or territories in the Western Pacific Region in 1971

<table>
<thead>
<tr>
<th>Country or territory</th>
<th>Total population (millions)</th>
<th>Population with water supply (millions)</th>
<th>Population with sewerage (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia.</td>
<td>12.5</td>
<td>11.2</td>
<td>90</td>
</tr>
<tr>
<td>British Solomon Islands</td>
<td>0.2</td>
<td>0.02</td>
<td>13</td>
</tr>
<tr>
<td>Protectorate</td>
<td>0.2</td>
<td>0.02</td>
<td>13</td>
</tr>
<tr>
<td>China (Taiwan)</td>
<td>14.6</td>
<td>6.4</td>
<td>44</td>
</tr>
<tr>
<td>Fiji</td>
<td>0.5</td>
<td>0.2</td>
<td>36</td>
</tr>
<tr>
<td>Guam</td>
<td>0.1</td>
<td>0.1</td>
<td>99</td>
</tr>
<tr>
<td>Japan</td>
<td>103</td>
<td>79.3</td>
<td>77</td>
</tr>
<tr>
<td>Khmer Republic</td>
<td>7.5</td>
<td>0.2</td>
<td>3.3</td>
</tr>
<tr>
<td>Laos</td>
<td>2.9</td>
<td>0.2</td>
<td>5.7</td>
</tr>
<tr>
<td>Malaysia</td>
<td>10.5</td>
<td>3.8</td>
<td>36</td>
</tr>
<tr>
<td>Papua New Guinea</td>
<td>2.5</td>
<td>0.1</td>
<td>4.3</td>
</tr>
<tr>
<td>Philippines</td>
<td>38.1</td>
<td>16.4</td>
<td>43</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>31.5</td>
<td>10.1</td>
<td>32</td>
</tr>
<tr>
<td>Republic of Viet-Nam</td>
<td>17.9</td>
<td>4.3</td>
<td>24</td>
</tr>
<tr>
<td>Singapore</td>
<td>2.1</td>
<td>2.1</td>
<td>99</td>
</tr>
<tr>
<td>Trust Territory of the Pacific Islands</td>
<td>0.1</td>
<td>0.02</td>
<td>17</td>
</tr>
</tbody>
</table>

1 Information from the Western Pacific regional seminar on planning and financing of municipal water and sewerage works, held in May 1971 at Manila.
Fig. 13. Status in 1971 of UNDP/WHO-assisted pre-investment studies (completed or in active operation) for community water supply and wastes disposal.

Example:
Accra-Tema, population 800,000; water supply and sewerage pre-investment studies completed and recommended construction begun.
5.56 With the collaboration of the United Kingdom Water Research Association, WHO assisted the Government of India and the Central Public Health Engineering Research Institute to run a training course in Bombay on the maintenance of water distribution systems. It is planned that the training procedures and guidelines developed, including techniques developed in the United Kingdom and adapted to local conditions, should be used for similar courses in other cities of India and in other countries.

5.57 WHO has been intensifying its assistance to Member States in the improvement of rural water supplies. Basically, this assistance is provided by sanitary engineers and sanitarians assigned to Member States. WHO is at present directly assisting 83 countries or territories in rural water supply and sanitation programmes, in many in collaboration —now for the twelfth year—with UNICEF. UNICEF assistance in this field was given to 68 countries in 1971.

5.58 WHO's activities in the improvement of water supplies and in the sanitary disposal of excreta, although directed at all water-borne diseases, are of special relevance in the control of cholera (see paragraphs 1.182-1.183), and certain aspects of the Organization's work in environmental health have been intensified during the current cholera pandemic. WHO field engineers, sanitarians and sanitary chemists have participated in cholera control and preventive measures, and a roster of staff available for special arrangements in emergencies has been drawn up. Membrane filter kits for the bacteriological examination of water supplies in the field have been supplied to all regional offices for emergency use by teachers and consultants. A practical method for emergency disinfection of water supplies with iodine is being field-tested (see paragraph 5.66). In addition a number of WHO publications have recently been issued that have relevance to cholera prevention and control measures.1, 2, 3

5.59 Part of the small-scale project for the provision of water supplies to three villages in Kenya using equipment and supplies furnished by voluntary contributions from the WHO Staff Association at headquarters in Geneva has been completed. The supply serves the health centre and the market in one of the villages, and it is planned to extend it to a nearby school and provide more public taps. Work on the water supply schemes for the other two villages is in progress.

Research and technological developments in basic sanitary measures

5.60 New methods and improved techniques for the examination of drinking-water as well as changes in the concept of permissible quality levels necessitated a revised third edition of International Standards for Drinking-Water,4 the second edition of which had been published in 1963. The new edition reflects the recommendations of a WHO expert committee on health criteria for water supplies that met in April. It follows the format of and procedure used in the second edition of European Standards for Drinking-Water5 but is more concise, giving the standards and the criteria leading to the standards but containing references only to where the various methods of examination can be found.

5.61 Standards by themselves are of little avail if organizations for applying them do not exist. For this reason WHO has continued collaborative research on the procedures best suited to developing countries for the surveillance of drinking-water quality.

5.62 Some 700 kg of domestic refuse are now produced annually per person in industrialized countries, and industrial and agricultural solid wastes account for similar amounts. A WHO expert committee that met in June at the Federal Institute for Water Resources and Water Pollution Control, Dübendorf, Switzerland (the WHO International Reference Centre on Wastes Disposal) discussed the impact of solid wastes on health and welfare, including the social and economic aspects. It reviewed present knowledge and technology in the collection, treatment and disposal of solid wastes, and made recommendations for research and development. It also discussed the planning and operation of solid waste systems and the training of personnel, and set out a number of guidelines for policy and possible action at different levels. Data from developing countries are sorely needed as a basis for planning and for the establishment of uniform classifications, methods of analysis, and terminology.

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5.63 In the disposal of sewage and other liquid wastes, most developing countries have at present neither the facilities for the collection and disposal of waste waters nor the financial and organizational means to build and operate them. Waste stabilization ponds, on which a WHO monograph was published in 1971, are a useful method of waste-water treatment and disposal for growing communities where funds and trained personnel are in short supply, and are especially suited to countries with tropical and subtropical climates. Investigations were undertaken at the end of 1970 on interim measures for excreta disposal in urban areas of developing countries undergoing rapid expansion, while awaiting the introduction of sewerage systems; field investigations continued during 1971.

5.64 Close collaboration with UNICEF has been maintained and a draft guideline for national authorities on the development of rural water supply and sanitation programmes, including elements for which external assistance may be required, is in preparation. UNICEF is also interested in the field study of deep-well hand-pumps and the WHO contractual study at present in progress has been extended to cover these.

5.65 Collaboration was also maintained with UNESCO on the continuation of the International Hydrological Decade through a long-term programme from 1975 on, to be designated the International Hydrological Programme (see also paragraph 5.26). Co-operation with UNESCO in connexion with the Man and the Biosphere programme, especially its monitoring aspects, was also kept up during the year.

5.66 The work of the WHO international reference centres concerned with water supply and with wastes disposal gained momentum during 1971. Twenty-eight institutions have been designated as collaborating institutions in the WHO research and development programme in community water supply, with the WHO International Reference Centre on Community Water Supply at the Hague as the coordinating centre. During 1971 the centre issued a bulletin on the present and future research programmes of all the collaborating institutions. It also issued a bulletin on group training courses in community water supply offered by the collaborating institutions. It now publishes a regular newsletter in English and French, with a mailing list of over 1400 addresses.

WHO-sponsored collaborative research into the toxicity of plastic pipes used in the water industry and into coagulant aids for flocculation in water treatment was continued. A membrane dosing kit for the disinfection with iodine of dug wells and other similar rural water supply systems was tested in the field in India and Thailand, and the testing is being extended to Afghanistan and the Libyan Arab Republic. It is hoped that this research will lead to a practical dosing device using the excellent storage stability and disinfectant properties of iodine for emergency disinfection purposes.

5.67 Two important WHO-supported collaborative research projects in community water supply for developing countries continued in 1971. They are: an investigation of the best sanitary means of extracting water from village ponds (being conducted by the All India Institute of Hygiene and Public Health, Calcutta, and by the University of Khartoum); and an investigation of biological methods for the removal of nitrates and sulfates from water (being made in the United Kingdom by the Water Research Association).

5.68 The dissemination of technical and scientific information on solid and liquid wastes has been facilitated by the work of the WHO International Reference Centre on Wastes Disposal and the network of 41 collaborating institutions. The reference centre continued a study of the volume reduction of solid wastes in households. A thesaurus of terms in solid wastes that has been compiled by the centre will be useful in providing a comprehensive view of the widely different systems of regulation in existence. The centre issues a newsletter containing scientific and technical findings on wastes disposal and information from the collaborating institutions on, for example, current and planned research programmes, educational programmes and available facilities. A number of the collaborating institutions have been particularly active. The Central Public Health Engineering Research Institute, Nagpur, India, has carried out investigations on the treatment of industrial wastes, low-cost waste-water treatment by stabilization ponds, aeration lagoons,

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oxidation ditches, the utilization of treated and untreated sewage for irrigation, and related studies. Extensive work on advanced waste treatment is being carried out by the Robert A. Taft Water Research Center (National Environmental Research Center, Environmental Protection Agency), Cincinnati, Ohio, USA. The reuse of waste water for agricultural, industrial, recreational, and even domestic purposes has been reported for a number of countries.

5.69 The serious implications this may have for health prompted the Organization to hold a consultation on methods of waste-water treatment and health safeguards in relation to the reuse of effluents, in Geneva in November-December. The participants noted that rivers, lakes and underground waters serving as sources of drinking-water often contain more than 5% of waste-water discharges from municipalities and industries, and that in dry periods nearly the total flow may be waste-water. The chemical and microbial content of this water poses a threat to health. The meeting stressed the need for strict standards in relation to the discharge of contaminants and the upgrading of waterworks treatment practices to ensure that the water is safe and palatable. It pointed out that properly treated municipal and industrial waste-waters can be used beneficially for agriculture, industry and recreation. Such reuse of waste-waters also permits the cleanest supply to be reserved for drinking purposes.

5.70 A study of emergency sanitation measures applicable to the most frequent natural disasters resulted in the publication of a Guide to Sanitation in Natural Disasters.1 The League of Red Cross Societies actively collaborated in this work. The guide is intended primarily to assist health authorities and relief agencies in developing plans and programmes and in preparing themselves for sanitation problems caused by a disaster. It provides basic information on the principles of emergency sanitation and contains detailed instructions for carrying out the most essential tasks. A guide to the sanitation facilities that should be available for tourists in different types of establishments is in preparation. Study of this subject was recommended by the United Nations Conference on Tourism and International Travel in 1963. The guide is intended to assist health authorities to improve the environmental quality of tourist accommodation and to give advice to managers of tourist establishments on sanitation problems.

Improvement of the living and working environment

Residential environment

5.71 It is being increasingly recognized that the provision of housing is not an end in itself but a means of providing a healthy environment. Large-scale housing programmes must be integrated into health and urban planning and, within the framework of regional planning, become part of national socio-economic policy. Environmental health workers should work in close collaboration with urban planners and provide guidelines and standards based upon health considerations.

5.72 A scientific group on the development of environmental health criteria for urban planning met in Geneva in June. It reviewed environmental health factors of importance in city and regional planning, analysed existing standards used in urban planning, and proposed new criteria in some areas. It also made recommendations on the ways the criteria could be used in operational health and physical planning programmes. The group recommended further research and called for wider exchange of information between environmental health and city planning specialists. Among the major findings of the group, several may be mentioned. The criteria existing and to be developed must be made available to those responsible for planning urban areas; in general, this means educating persons employed in urban planning in matters of environmental health. Some of the criteria formulated through the evaluation of selected urban planning activities in the developed countries could be applied, within limits, in developing countries. Ample scientific and technical resources appear to be available to develop almost all the criteria needed; what is lacking is a method of alerting research workers to the urgent need for these criteria. The meeting was attended by representatives of the United Nations, the International Union of Architects, and the International Union of Local Authorities.

Occupational health

5.73 Workers are subject to the diseases prevailing in their communities and—in developing countries particularly—to malnutrition, and the diseases from which they suffer are aggravated by exposure at work to noxious environmental stimuli. The prevention of occupational diseases cannot therefore be separated from that of general disease, especially in developing countries. About half of the countries in the world have occupational health services at different stages of development. In many instances occupational health programmes are not fully co-ordinated with public

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health programmes and in others the health services for workers are separate from the general health services. Much of the great increase in knowledge of the medical and technical aspects of occupational health has not been applied in most countries because of the shortage of trained occupational health staff. The developing countries undergoing rapid industrialization also have their own specific problems owing to the differences in their working processes and environments. As a result, health conditions of workers in different parts of the world are poor. Most health authorities are aware of the need, stressed by the Twenty-fourth World Health Assembly, to promote occupational health programmes within the framework of general health services (resolution WHA24.30).

5.74 A consultation on organizational patterns of occupational health services at the national level was held in Geneva in September to review the role of public health services in occupational health at different stages of development. It outlined a number of guiding principles in establishing and promoting occupational health programmes within national health services and made proposals about responsibilities at different levels, training and education, research needs, and assistance to countries in establishing and developing occupational health programmes.

5.75 Along these general lines WHO implemented several projects in 1971. One was the development of a national institute of occupational health in Djakarta (a UNDP/SF project) which co-ordinates activities of the Ministry of Health and the Ministry of Manpower and also deals with research and training in occupational medicine, occupational hygiene engineering, and occupational health in agriculture. In addition, three other UNDP/SF occupational health centres were begun in Indonesia, WHO being executing agency and ILO participating. In Bulgaria, WHO is also providing assistance in the development of the National Institute of Occupational Health in Sofia and a centre of epidemiology and hygiene.

5.76 A joint ILO/WHO project in the Philippines concerned with the development and co-ordination of occupational health programmes (including occupational medicine, industrial hygiene, and safety) continued to provide training programmes and establish occupational health laboratories and educational sections at the ministries of health and labour and the University of the Philippines. WHO is participating in an ILO project started in Kuwait for the development of a programme of pollution control in the working environment and protection against respiratory allergy. In Ahmedabad, India, a national institute of occupational health, created in 1970, received assistance from WHO in developing its training activities and undertook research on health problems in small industries, with specific reference to exposure to vegetable dusts.

5.77 WHO also provided assistance for the development of a university department of occupational health in Singapore; an occupational health centre for industry in Malaysia; an occupational health centre for small industries in Thailand; a university department of occupational health in Lahore, Pakistan; a training programme in occupational health in Ghana; and a department of occupational health in the Ministry of Public Health, Sudan. The assistance consisted of furnishing experts, consultants, fellowships and laboratory equipment. In Botswana a special centre was set up, with assistance from WHO, to deal with the occupational health of miners, with special reference to the problem of pneumoconiosis.

5.78 Health and safety in small industries are a particular problem in developing countries. Agreements were concluded with the Central Foundation of Occupational Hygiene, São Paulo, Brazil, the Ministry of Health, Jamaica, the Department of Occupational Health, Lagos, and the Ministry of Health, Sudan, for field investigations of health problems among workers employed in small-scale industries. These investigations follow the same lines as the studies carried out with WHO assistance in the Republic of Korea, Singapore, and Thailand. Assistance was provided in the preparation of four seminars on the organization of occupational health services for small industries planned for 1972 in the Western Pacific Region.

5.79 The establishment of maximum permissible limits of hazardous airborne substances in the working environment was the subject of a special WHO study.

5.80 The relationship between food intake and work performance was discussed at the First International Symposium on Food and Work, held at Vittel, France, in May and then at a joint FAO/ILO/WHO consultation on workers’ feeding, in Rome (see paragraph 8.93).

5.81 Studies are sponsored by the Organization on the adaptation of workers to life and work at high altitude. During 1971 the enzymatic pattern involved in adaptation received special attention. A programme was set up, covering occupational health,
environmental physiology, cardiology, pneumology, genetics, biochemistry, and epidemiology. The studies include research on animals and are being carried out by WHO, in the framework of the International Biological Programme, by multidisciplinary teams in Bolivia, France and Switzerland.

5.82 Degenerative cardiovascular diseases of workers may be attributable to exposure to such toxic substances as carbon disulfide. This question was discussed during the Second International Symposium on Carbon Disulfide Toxicology in Belgrade in May, in which WHO participated; the symposium was organized by the Permanent Commission and International Association on Occupational Health. The matter is being studied at the Department of Occupational Health, Institute of Public Health, Alexandria, Egypt, with WHO support.

5.83 There is no international agreement on the classification of occupational diseases and accidents resulting from work or of handicaps in general. WHO is collaborating with ILO and the International Social Security Association in preparing proposals for the ninth revision of the International Classification of Diseases.

5.84 The best approach to fitting the job to the man is through ergonomics, which can also be used outside industry. A report was prepared under the auspices of WHO on the role of ergonomics in housing, safe vehicle design, and handicapped and vulnerable groups, and on the applications of ergonomics in developing countries.

5.85 In order to improve co-operation in the various interdependent fields of occupational health, WHO maintained a close relationship during 1971 with a number of occupational health institutes, centres, and laboratories. The establishment of a WHO international reference centre in occupational health is under way. It will assist WHO in the co-ordination and conduct of research and development in the collection, evaluation and dissemination of information on research, as well as in the organization of training programmes and services in occupational health.

5.86 The Organization also contributed to the Fourth International Symposium on Basic Environmental Problems of Man in Space, organized in Yerevan, USSR, in October by the International Academy of Astronautics; and it prepared a report on space medicine and research, which have applications in public health and medicine.

Medical uses of radiation and radioisotopes

5.87 Radioisotopes, introduced during the last 20 years, are now routinely employed in various fields of medicine, their use increasing annually by 10-15%. In the USA, radioisotope administrations increased from 1 1/2 million in 1966 to 2 1/2 million in 1970. In the same year, Australia carried out about 6 administrations of radioisotopes per 1000 population; Denmark 7, India 0.05, Japan 2, New Zealand 3, Sweden 6, and the USA 11.

5.88 In the more developed countries X-ray examinations are common, and the extension of X-ray services and departments in developing countries will lead to an increase in human exposure to radiation. More than 300 sources of irradiation are now used for the treatment of cancer. Promotion and improvement of the techniques employed continue to be important objectives of the WHO programme in medical radiology, which is conducted in collaboration with IAEA. The introduction of short-lived radioisotopes produced from radioactivity generators, accelerators and nuclear reactors has resulted in a decrease in the dose to patients to a level lower than that received after an X-ray examination. As well, there have been improvement and increase in the sensitivity of the equipment, and the personnel have higher qualifications and use the equipment more efficiently.

5.89 A joint WHO/IAEA expert committee met in Geneva in October-November to consider the role of the three branches of radiation medicine—X-ray diagnosis, radiotherapy and nuclear medicine—in preventive medicine and medical care. Taking into account the fact that ionizing radiation is an important factor in the human environment, the committee outlined the facilities needed for radiation medicine, recommended priorities for specific needs, particularly in the developing countries, and set out the requirements for training and for radiation protection services. An important prerequisite in implementing any plans is the training of both professional and auxiliary staff in the medical use of ionizing radiation. Training is also necessary to overcome the acute shortage of qualified staff, which has hitherto been a main obstacle in many countries.

5.90 The postal intercomparison programme with thermoluminescent dosimeters for cobalt-60 radiotherapy, which was started by IAEA in 1968 and joined by WHO in 1970, was greatly expanded in 1971. During the year 120 clinics participated in the programme for checking their dosimetry with the help of dosimeters provided by the two organizations, and by the end of 1971 more than 300 clinics in 58
countries had expressed interest in participating. Many institutes also expressed their interest in having the service extended to conventional X-ray therapy and high-voltage therapy, and such an extension is under consideration. The results obtained to date in this joint project and ways of increasing the dependability of inter-comparisons were among the subjects discussed by an IAEA/WHO panel on national and international dose intercomparisons that met in Vienna in December.

5.91 Guidelines for the setting up of secondary standard dosimetry laboratories were prepared by WHO during the year and sent to workers in radiation dosimetry and to governments interested in standardization and calibration facilities for radiological instrumentation and equipment in their countries. Late in the year a fourth Regional Reference Centre for Secondary Standards in Radiation Dosimetry was designated, at the Department of Radiotherapy, Institute of Oncology, National Medical Centre of the Mexican Social Security Institute, Mexico City.

Environmental health planning

Progress in national environmental health planning

5.92 Moving from ad hoc activities to long-term programmes, many national environmental health services are beginning to assemble data in order to establish needs, priorities and budgets. Links have been created in a number of countries between health authorities and other governmental agencies directly responsible for building and operating water supply and wastes disposal systems. Public works staff are becoming more health-oriented and public health staff more cost-oriented.

5.93 WHO assistance to national health agencies in planning, organizing and managing environmental programmes lays particular emphasis on the need to undertake studies of factors retarding the development of environmental health services, of the measures required for achieving realistic objectives, and of the integration of environmental programmes into national health and socio-economic development plans.

5.94 In accordance with the recommendation of an expert committee on national environmental health programmes, WHO began the preparation of an environmental health planning guide. The guide will identify the factors contributing to a healthful environ-

5.95 Occupational health programmes within national health services have been dealt with above (see paragraphs 5.73 and 5.74).

Radiation health in national health services

5.96 In accordance with resolution WHA24.31, adopted at the Twenty-fourth World Health Assembly in May, Member States are being invited to cooperate in the study of radiation exposure and to set up radiation protection services related to the medical and other uses of ionizing radiation. National radiation protection services would give advice on the proper use of radiation and radioisotopes, organize personnel and area monitoring services, and take measures against excessive radiation exposure. Often, however, they can be set up only if appropriate legislation exists. In collaboration with ILO and IAEA, and with the help of expert advisers, WHO studied the different aspects to be considered in the drafting of such legislation. Consultations are taking place between ILO, WHO and IAEA with a view to issuing the IAEA Basic Safety Standards as a joint document when revised and brought up to date.

5.97 To assist health authorities in developing and strengthening national programmes for the control of radiation health hazards, a second four-week training course on radiation protection, supervision and inspection was held at Holte, Denmark, in cooperation with the Danish Government and with DANIDA financial support. The purpose of these courses—the first of which was held in 1969 and which it is planned to hold every two years for English-speaking participants—is to train health officers in the radiation protection measures needed in hospitals and medical laboratories using ionizing radiation and radioisotopes. The training familiarizes participants with the biological, physical and technical problems of radiation protection, the administration of radiation protection measures (including the legislative aspects), and the measurements and inspections needed.

5.98 WHO continued to provide film-badge services for the monitoring of personnel occupationally exposed to ionizing radiation. A postal service of film badges to the Eastern Mediterranean Region has been operating for three years in co-operation with the Central Protection Service against Ionizing

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Radiations, in France, and in 1971 a similar service was established for the Western Pacific Region (covering the Gilbert and Ellice Islands, the Khmer Republic and Laos), in co-operation with the Society for Radiation Protection in the Federal Republic of Germany.

5.99 The implementation of recommendations of the International Commission on Radiological Protection and the International Commission on Radiological Units and Measurements in the field of health physics was the subject of an IAEA/WHO consultation on the practical application of quantities, units and measurement methods, held at Geneva in April. Much of the discussion centred upon definitions on which agreement on principle could lead to the improved comparability of health physics practice throughout the world.

Development of manpower resources

5.100 To meet the need for staff to operate environmental health programmes, WHO plans and organizes teaching courses ranging from postgraduate training to the basic training of sanitary aides.

5.101 The Sanitary Engineering Centre, jointly established in 1969 by the Government of Morocco and WHO at the Mohammadia School of Engineering, Rabat, was officially inaugurated in January. The first postgraduate course in sanitary engineering, which started in October 1970, was completed in 1971, with a summer field-training programme in Morocco, the Netherlands and Switzerland. Six sanitary engineers, five of whom were WHO fellows, graduated from this course. At the Mohammadia School of Engineering, 19 WHO fellows are attending a four-year course in civil engineering before they are admitted to the Sanitary Engineering Centre for specialization. During the academic year 1970-1971, WHO provided 10 visiting professors to support the permanent WHO staff and the local teaching faculty, as well as two advisers to assist in the planning and development of programmes. It has continued to supply laboratory equipment and materials, films, books and other documentation. The Government of Switzerland collaborates substantially in this project.

5.102 WHO assisted other sanitary engineering programmes in schools and universities, especially in the Region of the Americas, where 37 universities in 22 countries are currently receiving WHO technical assistance. At the Regional School of Sanitary Engineering, University of San Carlos, Guatemala, which serves all the countries of Central America, WHO is acting as co-ordinator and administrator of the assistance provided by the Government of Switzerland.

5.103 Other educational institutions assisted by WHO include the Engineering School of Lovanium University, Kinshasa; the Engineering School of University College, Nairobi; the School of Industrial Technology, University of Mauritius; the Middle East Technical University, Ankara; the Institute of Technology, Rangoon; the Victoria Jubilee Technical Institute, Bombay, India; the Engineering School of the Pahlavi University, Shiraz, Iran; the Engineering School and Institute of Public Health of the University of Kabul; and the West Pakistan University of Engineering and Technology, Lahore, Pakistan.

5.104 WHO and IAEA receive many requests for advice on the training of technical staff for X-ray diagnosis, radiotherapy and nuclear medicine. In order to assist in the development of practical and widely applicable training systems and the establishment of internationally acceptable curricula and training schemes, WHO, in collaboration with IAEA, held a seminar on the training of radiographers and other technical staff in the medical use of ionizing radiation and radioisotopes in Teheran in December. The seminar was attended by participants from the European, Eastern Mediterranean and South-East Asia Regions involved in the training of technical staff in their own countries. The recommendations should prove helpful in the establishment of training schemes and syllabuses, particularly in developing countries.

5.105 The training of medical physicists was considered at an IAEA/WHO consultation in Geneva in March attended by medical physicists from Canada, the Federal Republic of Germany, France, India, Sweden, Switzerland, and the United Kingdom involved in training programmes in their countries. An outline syllabus, a recommended time allocation and a list of experiments were prepared by the participants as basic working papers for a seminar on the same subject to be held in 1972.

5.106 An inter-regional travelling seminar on the health and sanitation aspects of city planning was held in the USSR in April, the working languages being French and Russian. The participants were medical officers, public health officials, sanitary and civil engineers, architects and town planners from 11 countries in five WHO Regions. They studied the principles and practice of public health and environmental sanitation as applied to the planning and construction of cities and rural communities in the USSR, and the co-operative approach used by health...
and planning agencies in Moscow, Tashkent and Samarkand. This is the second seminar on this subject, the first having been held in 1968 for English-speaking and Russian-speaking participants.

5.107 With UNDP financial support, a WHO inter-regional seminar on training for services in occupational health for developing countries was held in Djakarta, in November-December. The objectives of this seminar were to widen the knowledge of public health planners in occupational health, propose suitable training for developing countries, promote applied research and prepare guidelines for the practice of occupational health. It was attended by participants from 13 countries.

5.108 A WHO-assisted course on industrial hygiene, leading to the degree of Master of Industrial Hygiene, was held from October 1970 to July 1971 at the School of Public Health, Zagreb, Yugoslavia. It was attended by 10 participants from nine countries. This was the first course of its kind, being specially adapted to the occupational health conditions prevailing in countries undergoing industrialization.

Collaboration with other organizations

5.109 A formal agreement was concluded during the year with the International Bank for Reconstruction and Development (IBRD), providing, in relation to both international and national investment, for a collaborative programme in pre-investment activities including sector studies, the identification and preparation of pre-investment projects, active assistance in the execution of such projects, and advice on the follow-up.

5.110 At the fourteenth session of the ACC Working Group on Housing and Urbanization, held in Geneva in April, it was agreed that co-ordination of the activities of the United Nations and the specialized agencies should be improved. This has resulted in the collaboration of WHO and the Centre for Housing, Building and Planning in projects financed by UNDP/ SF. WHO also participated in the session of the Economic and Social Council's Committee on Housing, Building and Planning, in October. An important aspect of pre-investment planning is the development of local industries for the manufacture of various components of water supply and wastes disposal systems. Help in development can be given through FAO industry development programmes, and discussions were held with FAO during the year on the initiation of studies for such projects.

5.111 UNIDO consulted WHO and the WHO International Reference Centre on Wastes Disposal on several occasions during the year concerning industrial wastes problems. It has consulted WHO about the results of studies for the commercial processing of municipal solid wastes in Aden, Bujumbura, and Conakry. Long-term collaboration with UNIDO was discussed at a meeting in October, which covered joint planning and action to prevent environmental hazards both to the worker and to the community, joint studies on such subjects as reducing hazardous industrial wastes at source, and the sanitary aspects of wastes recycling.

5.112 Close co-operation in the field of occupational health was maintained with ILO and a number of joint activities and projects were undertaken, as described elsewhere in this chapter.

5.113 The International Solid Wastes and Public Cleansing Association and the International Association of Agricultural Medicine were brought into official relationship with WHO during the year. The Organization co-operated in matters of occupational cancer and maximum permissible concentrations of toxic substances with the Permanent Commission and International Association on Occupational Health.
Food Hygiene

The world can ill afford either the diseases that may be spread through food or the economic wastage and nutritional loss represented by food that is unfit to eat. Constant surveillance of food and food handling is imperative, and FAO and WHO are assisting many countries in training food hygiene specialists.

Right: At the Tokyo fish market daily inspections are made and samples of the fish offered for sale are examined at the Tokyo food inspection laboratory.

Below: Every carcass in this slaughterhouse in England is carefully inspected before being passed as fit for consumption.
Air Pollution

In Japan, as in other industrialized countries, city dwellers are menaced by air pollution caused principally by motor traffic and heavy industry. In densely populated industrial areas such as those of Chiba, near Tokyo, and Osaka, monitoring services are in continuous operation and steps are taken to prevent air pollution reaching unacceptable levels.

Right: Telemetering panel at the Air Pollution Research Centre, Chiba.

Lower right: Apparatus for measuring suspended particles in the atmosphere at one of the air sampling stations connected to the Osaka Environmental Pollution Control Centre.
Nursing

WHO has been giving assistance for the training of nurses and nurse-midwives in Afghanistan to help extend the basic health services to villages throughout the country.

Left: A WHO-trained nurse-midwife on her village rounds.

Below: This mother and her child attend the clinic at a rural health subcentre serving a population of some 10,000.
CHAPTER 6

ORGANIZATION OF HEALTH SERVICES

Community health services

6.1 One of WHO’s important roles is to give guidance to countries in developing their community health services and in adapting them to changing conditions. To fulfil this role effectively, it must be able to suggest solutions aimed at providing health services in a more comprehensive manner and avoiding the fragmented delivery of health care that has grown up for a variety of reasons in many countries, and it must base these suggestions upon general principles adaptable to particular situations. During the year, therefore, the Organization attempted to develop and consolidate concepts of community health services of general applicability. Definitions of the “community” were reconsidered; its size could range from the smallest village to a whole nation. Community health services should be interpreted very broadly to include the planning, organization and administration of the programmes, services and institutions required for the health care of communities of different sizes, with different patterns of social organization, and at various stages of development. For the long-term solution of health problems it is necessary to channel specific programmes, developed in response to particular problems, through the relevant components of general community health services; consideration was therefore given to methods of organizing these services in such a way that specific health campaigns and programmes might be more effectively integrated into comprehensive programmes.

6.2 The broadening of community health coverage and a balanced distribution of services, with particular emphasis on satisfying the needs of rural areas, are basic to this concept. In the development of national health plans attention must be paid to the potential conflict of interests between co-ordinated, comprehensive community services and broad community coverage on the one hand, and, on the other, the application of advances in science and technology which might tend to fragment services because of their requirements for greater specialization. Full account has to be taken of socio-economic problems and of current and future manpower resources and potentials. Health manpower planning is an essential element of national health planning. The strengthening and expansion of health services increase the need for health personnel, and it is becoming more and more difficult to meet the demands in terms of professional personnel alone; increased attention therefore needs to be given to the training and employment of auxiliary health workers.

6.3 The Organization reviewed the applicability of newer administrative and management techniques, and studied how best to encourage a better understanding of the potential value of these approaches at country level. The objectives of the application of these methods to community health services are: to establish effective functional links between the various programmes and components of the health services; to improve the efficiency of the health service delivery system; and to achieve the implementation of health plans within the limitation of available resources.

6.4 The community health status cannot be raised merely by the provision of services to passive recipients; it is essential to involve the community in the determination of its own health affairs. Moreover, community health programmes must be conducive to the development of other sectors of the community’s social, cultural and economic life. Recognition of these facts, and of the need for further knowledge of general and specific aspects of community health planning and organization led to a reappraisal of WHO’s research programme in these fields. Progress was made in studies on organizational patterns for the provision of health care in Belgium, Canada, Hungary, Israel, Malaysia and Yugoslavia. The WHO international collaborative study on medical care utilization, which is being conducted in Argentina, Canada, Finland, Poland, the United Kingdom, the USA, and Yugoslavia, entered its final phase. Good progress was also made in the studies on hospital utilization in Belgium, the Federal Republic of Germany, Finland, France, India, Sweden, the United Kingdom, and Yugoslavia. Manpower studies were also pursued, with the aim of developing training programmes leading to a better functional deployment of health personnel.
In many countries internal and external migration are increasing the difficulties of health manpower planning, especially in relation to doctors and nurses, and a framework was elaborated for studies on this problem. Over the years, various recommendations have been made regarding the functions of health centres, and the goals for their activities. Studies were therefore formulated to evaluate the extent to which these recommendations have been taken into account in activities that have been planned or are being carried out. A framework was prepared for broad analytical reviews of national networks of community health centres and for detailed studies of selected centres. In addition to studies on particular components of community health services—such as hospitals, health centres and other ambulatory-care services—plans were developed for the study of the aggregate of health services delivered to communities of different sizes, the distribution of resources, and the extent to which the services correspond to the pattern of demand.

6.5 Insufficient attention has been paid in the past to the planning and organization of the peripheral health services. A WHO expert committee was convened in October to consider the organization of local and intermediate health administrations, in particular that of comprehensive health services at these peripheral levels, and to review the problems arising in the implementation, co-ordination and integration of the various services, and collaboration with other community agencies. The committee stressed the value of regionalization within countries for the improvement of these services. Additional studies were required, and models of the regional organization of health services—a number of which were discussed—needed to be further elaborated. In considering the organization of a regionalized health system, the committee concentrated mainly on defining objectives, describing activities and listing the factors influencing administrative systems. It emphasized the importance of acquainting public health administrators with modern principles and techniques of administrative and personnel management, and drew attention to the value of incorporating in health systems mechanisms that would allow them to adapt to technical and environmental changes.

6.6 The Organization continued to provide assistance to countries for the strengthening of their health services and general health planning. Particular attention was given to the development of basic health services, often in co-operation with UNICEF, especially in rural areas; the introduction of social security measures for financing health care; and the organization of medical care services, including hospital planning and management. Special mention may be made of the following projects, in view of their scope and the fact that they are being carried out in collaboration with other organizations. In Malawi, a WHO inter-disciplinary team consisting of a health planner, epidemiologist, statistician, hospital administrator and sanitary engineer carried out preparatory work for a health plan that is to be drawn up as part of the country's overall national socio-economic plan; this work was financed from DANIDA funds. An IBRD-sponsored mission for the preparation of a comprehensive programme of pre-investment studies in Iran included a public health specialist recruited by WHO to advise on all health aspects of the country's social and economic development. In Venezuela, the UNDP/SF-supported project for improving the engineering and maintenance services of medical care institutions was continued; the aim is to upgrade the services through special studies, provision of advice, and training courses for managerial and technical personnel.

6.7 As indicated in the Fourth Report on the World Health Situation, which was published during the year,1 although the total health manpower available has increased during the past decade, the rate of growth has been unequal for different countries and health occupations. Whereas in some countries the increase between 1960 and 1967 barely managed to keep pace with population growth, significant increases were noted in others where there was already a relatively large number of health workers and where the main problems are a growing demand for more sophisticated technology and the rising costs of the health services. If this trend persists the present occupational imbalances and geographical maldistribution will inevitably be accentuated. However, the demand for additional health manpower is universal, and there is widespread interest among Member States in health manpower planning, development and utilization. WHO provided assistance in this field to a number of countries during the year, applying recommendations made by a scientific group in 1970.2 An interesting example is Ceylon, where the Organization is co-operating in a health manpower study that is being carried out as an integral part of the health planning process.

6.8 There is a general need to improve health manpower statistics. In the European Region a WHO working group met in Paris in June to consider the use of demographic analysis in examining the struc-

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ture, distribution and dynamics of health manpower. It reviewed the experience gained in a number of countries with the demographic method, and outlined means to assist Member States in this connexion. Consideration was given to the possibility of developing an international classification of the activities of health service personnel, the information needed for planning, and the methods available for projections.

6.9 A marked improvement in the field of health manpower statistics has been accomplished in the African Region, where data were collected and analysed in 1970 and studies were carried out on health personnel needs in certain countries. A document containing an analysis of the data obtained was used as background material at a regional seminar on the training of auxiliary health personnel, held in Brazzaville in October 1971. The situation with regard to health manpower statistics has also improved in the Western Pacific Region, where a considerable quantity of data was collected as background material for the technical discussions at the twenty-second session of the Regional Committee (see paragraph 20.30).

6.10 In response to a resolution (WHA24.59) of the Twenty-fourth World Health Assembly, the Organization undertook preparations for an international study of the movement of highly trained health manpower from developing to developed countries.

6.11 The increasing problem of unemployment and severe under-employment has given rise to the need for an analysis of the health sector’s contribution to employment strategies. In this connexion, WHO has co-operated with ILO in designing employment programmes for Ceylon and Colombia, to both of which the Organization also provided assistance for health manpower studies. For both these employment programmes the following elements were analysed: health and productivity, the health problems of the labour force, the health sector as an employment market, and the effects of an employment policy on the health sector. Other aspects of special concern to WHO that were taken into account were the ill-effects of unemployment on physical and mental health, and the effects of high fertility and declining mortality on the growth of the labour force and the demand for employment. Preparations were also made for an inter-agency mission, including WHO, to design an employment strategy for Kenya.

6.12 Although every country has to develop its own public health system and individual health planning techniques adapted to the prevailing social, economic and cultural conditions, experience in one country can be of value to others. The principles of health planning in the USSR, established in the light of several decades of experience in this field, are described in a publication that appeared in the Public Health Papers series during the year.¹

6.13 A number of WHO courses on various aspects of health planning were held in 1971. The course on health and manpower planning organized for countries of the Eastern Mediterranean Region by the School of Public Health of the University of Teheran and the Institute of National Planning in Cairo provides an example of the way in which WHO-assisted inter-regional activities are followed up by courses at the regional level, with curricula adapted to regional needs and levels of development. This followed a WHO inter-regional course organized in 1969, in association with these same two institutions, for public health administrators and planners.

6.14 To help strengthen the teaching of health planning, WHO organized in September-October an inter-regional course on health and manpower planning for teachers of the health professions—physicians, public health engineers, public health nurses, and economists and sociologists teaching in health institutions. It was designed to acquaint the participants with the framework, strategy and socio-economic indices of development; the role of health in development; the organization and administration of the planning machinery in general, and of the health planning machinery in particular; and to give them practical experience in developing a health and manpower curriculum for training health professionals at all levels of the health planning process. The theoretical part of this English-language course was held at the Andrija Štampar School of Public Health in Zagreb, Yugoslavia, and visits were made to selected areas in Yugoslavia and Poland.

6.15 In the Western Pacific Region WHO sponsored a seminar on hospital administration and planning in Manila in November. The participants reviewed and assessed the current situation, discussed modern concepts, formulated guidelines for adapting hospitals to meet the demand for medical care in countries at different stages of development, and considered the role of international agencies in improving the hospital services, particularly in developing countries.

6.16 During the year the report was published of a joint ILO/WHO committee that had met late in 1970; this report should prove helpful for countries seeking to introduce or rationalize social security services for the delivery of health care.

6.17 “Mass health examinations as a public health tool” was the subject of the technical discussions at the Twenty-fourth World Health Assembly. The 221 participants, from 57 countries, reviewed the factors involved in mass health examinations and those that determine when and how such examinations should be used, and outlined the types of research needed as well as future trends and problems. The proceedings were published in the Public Health Papers series.¹

6.18 The number of traffic and industrial accidents resulting from rapid urbanization and industrialization, as well as disabilities arising from chronic degenerative diseases and some communicable diseases for instance, have increased the importance of medical rehabilitation services. During 1971 WHO provided assistance in the fields of physical medicine, physiotherapy, occupational therapy, and prosthetic and orthotic services in Argentina, Chile, China (Taiwan), Colombia, Cuba, Egypt, India, Iran, Jordan, Laos, Lebanon, Mexico, Pakistan, Thailand, Venezuela and Zaire. The assistance was mainly related to the organization of medical rehabilitation services and the training of various categories of personnel.

6.19 In October an ad hoc inter-agency meeting on rehabilitation of the disabled was convened in Geneva by the ACC. WHO participated in this meeting, together with the United Nations, ILO, UNESCO, and the Council of World Organizations Interested in the Handicapped. The main subjects discussed were the future work programmes of the participating organizations and agencies; ways of attracting personnel, training them and keeping them working in the rehabilitation field; and the implementation of the conclusions of a United Nations meeting of experts (which had been held just previously in Geneva, with the participation of WHO) regarding the planning, organization and administration of national programmes for rehabilitation of the disabled in developing countries.

6.20 At the second meeting of rehabilitation officers of the United Nations and specialized agencies (including WHO) and representatives of the World Rehabilitation Fund, held in Geneva in March-April, recent developments in the participating agencies’ programmes and rehabilitation activities in selected countries were reviewed. Further developments in rehabilitation services were discussed at the third meeting, held in November in New York.

6.21 The Organization received replies from more than 40 countries to the medical rehabilitation section of the questionnaire prepared jointly by the United Nations, ILO and WHO for an inter-agency comparative study on the legislation, organization and administration of rehabilitation services for the disabled. Work was begun on an analysis of these replies.

6.22 Progress was made in the international collaborative study for the determination of diagnostic criteria for connective tissue diseases. Participating in this study are four WHO Regional Reference Centres that were designated during 1971—at the Johns Hopkins University School of Medicine, Baltimore, Md., USA; the Faculty of Medicine, Barcelona, Spain; the Faculty of Medicine, Montevideo; and the Institute of Rheumatology, Academy of Medical Sciences of the USSR, Moscow. They are investigating the epidemiology, etiology, diagnosis and treatment of connective tissue diseases. In all, 25 institutions are participating in this international study, which is being co-ordinated by the WHO International Reference Centre for the Study of Connective Tissue Diseases, in Paris.

Health laboratory services

6.23 A review was made during 1971 of the needs and priorities regarding health laboratory services in the various countries and Regions, as a basis for the future development of the Organization’s programme of assistance in this rapidly expanding field. It clearly indicated that, although the training of laboratory personnel of all categories is still a most urgent need, the following aspects should also be included in the programme: the integration of health laboratory services into the general health services, and the improvement of laboratory facilities, particularly at intermediate and peripheral levels; the co-ordination of the work of all laboratories involved in activities related to human health; the standardization of techniques and equipment; and the encouragement of more widespread use of a good methodology for quality control.

6.24 High priority continued to be given during 1971 to the training of all grades of laboratory staff. WHO-assisted courses or seminars were organized at country, regional and inter-regional levels, examples being a course on immuno-haematological procedures in the operation of blood banks, held in Bombay, India, in November, for countries of the South-East Asia Region; a three-month course in virology held in Cairo for countries of the Eastern Mediterranean Region; the fourth advanced inter-regional course in clinical chemistry, organized in Copenhagen by the Danish authorities and WHO, with DANIDA financial support; and a UNDP/TA-supported inter-regional

travelling seminar on the hospital and sanitary-epidemiological station laboratory services in the USSR. The Organization also assisted a number of countries in the training of laboratory technical staff and awarded fellowships and grants for studies abroad.

6.25 WHO continued to co-operate with the Council of Europe in work on the standardization of training and equivalence of qualifications of medical laboratory technicians. The study on the definition and training of level A (graduate) laboratory technicians and teaching technicians was completed during 1971, and a report was presented to the Council's Committee of Ministers for approval.

6.26 The planning and organization of health laboratory services were discussed by an expert committee that met in Geneva in November. It considered the different types of organization of laboratory services in countries that have attained independence during the past two decades, and the extent to which the general principles and guidelines laid down by previous expert committees need to be adapted or modified. Special attention was paid to the integration of health laboratory services into the general health services; recent advances, such as the use of automation, new methods of communication, and mass examination studies; and the impact of new developments on the organization of health laboratory services. The training of laboratory staff and the question of international collaboration were also considered. The committee recommended, inter alia, that the Organization should intensify laboratory activities in relation to quality control, encourage further studies on international standards in all branches of health laboratory sciences and continue to promote the training of different grades of laboratory staff.

6.27 At the regional level, the organization of laboratory services, training of laboratory staff and implementation of WHO programmes in relation to country needs were discussed at a seminar in Brazzaville (see also paragraphs 15.53 and 15.54), and a travelling seminar in the Eastern Mediterranean Region (see paragraph 19.53). Reference is made in paragraph 20.37 to the long-term inter-country programme on health laboratory services initiated in the Western Pacific Region.

6.28 Recent advances in laboratory technology, including the development of automatic equipment and of new methods of data processing, especially in the fields of clinical chemistry and haematology, present alluring prospects, but the equipment is often very costly and technical difficulties may be considerable. In countries without highly developed facilities and skilled staff, therefore, the application of these advances may often prove not to be advantageous from a cost-benefit point of view. The International Federation of Clinical Chemistry accordingly organized a meeting in Geneva in September, with the collaboration of WHO and the participation of scientists and senior laboratory staff from developing countries, to consider ways in which the two organizations could best assist such countries in the rational introduction of new techniques.

6.29 A WHO-sponsored collaborative study on standardization and quality control in relation to glucose and urea determination in blood is being carried out with the co-operation of the Center for Disease Control, Atlanta, Ga., USA, and is being extended to laboratories in a number of countries. The aim is to improve the consistency and accuracy of laboratory results and the comparability of data both between laboratories within any one country and internationally.

6.30 The International Committee on Laboratory Animals, which is supported by WHO, has expanded its programme of assistance and advice to countries on the handling and use of laboratory animals; during 1971 the Committee provided such assistance to Hong Kong, Pakistan, the Philippines, Thailand and Turkey. It also continued to award scholarships—mainly to nationals of developing countries—for training in laboratory animal technology.

6.31 The WHO International Blood Group Reference Laboratory, in London, strengthened its collaboration with the national centres designated in 1970 in India, Japan and Thailand. It also provided technical advice in these three countries and the Syrian Arab Republic on the organization and development of blood transfusion services.

6.32 In many developing countries blood transfusion services are still insufficiently organized or wholly lacking—a situation that is due mainly to a shortage of professional and technical staff. To help physicians and pathologists who are entrusted with the responsibility of establishing and developing transfusion services, WHO—in collaboration with the International Society of Blood Transfusion and the League of Red Cross Societies—published during the year English and French editions of a guide providing practical information on the organization of a service, the recruitment of donors, the collection, preservation and distribution of blood, and laboratory techniques.

Nursing

6.33 During 1971 WHO assisted more than 100 countries in the development of nursing services. Approximately 370 nurses and midwives were provided during the year for more than 200 projects, of which 33 were inter-country. As in previous years, the main emphasis was on education and training.

6.34 Although one of the determining factors in the setting of realistic health goals is the rate at which nursing personnel can be trained and nursing services developed and effectively utilized, for various reasons nurses have generally not been involved in the various stages of health planning, from the setting of policies and objectives to the selection of a final health plan. In some cases they have not received the necessary training to enable them to participate effectively in planning. To help nurses in this respect, WHO published during 1971 a guide to planning and programming for nursing services. This was used as background material for an inter-regional seminar held in Washington, D.C., in August, when nurse administrators from 18 countries considered the place of nursing in national health planning, the implications of different organizational structures and training programmes, and ways of collecting and utilizing information that will enable nurses to contribute to the planning of health services.

6.35 Courses in nursing administration were again held at two of the four post-basic training centres in the African Region, in Ghana and Kenya. The two WHO nurses assigned to the nursing education project in Mauritius participated in work on the preparation of a national 10-year health plan, and in Kenya WHO assisted in the organization of two seminars on nursing administration and education. In the Region of the Americas another in a series of regional seminars on planning for nursing was held, and in Colombia a national seminar was organized on planning for nursing within the general context of national health planning—the first of its kind in Colombia. In the South-East Asia Region assistance was given to Nepal in extending the national department of nursing; to Indonesia in the organization and development of nursing and midwifery services at all levels, in accordance with the national health plan; and to India with regard to nursing administration in the State of Gujarat and in Chandigarh. Most of the 19 national departments of nursing in the Western Pacific Region continued to receive WHO assistance. In Western Samoa the nursing department was extended with the establishment of 17 new posts, and in the Khmer Republic a new bureau of nursing and midwifery was established. Courses in nursing administration were held in Australia, Malaysia, New Zealand and Singapore.

6.36 The systematic collection of information on nursing and midwifery through research, studies and surveys, and the analysis, interpretation and utilization of the data obtained are major elements in the planning both of these services and of education for the profession. A number of studies, many of them WHO-assisted, have been carried out in several countries; while they are individually valuable, their aggregate contribution to comprehensive planning of the nursing component of health services is not yet sufficient. The Organization is therefore preparing to review the considerable amount of information available on research and studies related to nursing. Meanwhile, a guide has been prepared—which is now ready for field testing—on the introduction of research concepts and methodology into basic, post-basic and advanced nursing education programmes. Related activities in 1971 included the elaboration of technical guidelines on the principles and methodology for planning and evaluating educational programmes for nurses, and preparations for a study on the introduction of behavioural sciences and mental health into nursing and midwifery curricula.

6.37 WHO has assisted a number of countries with surveys of nursing needs and resources, studies on the utilization of various categories of nursing personnel, the assessment of education and training programmes, and the development of nurses' skills in research. An assessment was made of the health and nursing situation in three regions of the United Republic of Tanzania; studies of nursing needs and resources were undertaken in Togo and Tunisia; and in Kenya nurses took part in a study on the operation of rural health units. Studies have been completed or are under way regarding the more than 300 schools of nursing in Latin America. In the post-basic nursing education project in Iran (see paragraph 19.106), research is being undertaken on the use of teaching aids at various levels of nursing education. Studies on nursing resources and staffing patterns in countries of the European Region were continued (see paragraph 18.35). In Switzerland, where the third and final phase of a study of functions of nursing personnel was carried out, developments in the field of health services administration, health manpower research, and nursing education are an indication of how such a study can promote action with regard to the total system of health care. In the Western Pacific Region nursing manpower studies

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1 World Health Organization (1971) Planning and programming for nursing services, Geneva (Public Health Papers, No. 44).
were carried out in a number of countries and territories (see paragraph 20.43).

6.38 To achieve a more systematic development of nursing and health personnel systems it is necessary to establish a goal-oriented approach in educational planning. WHO's assistance with regard to education and training in this field has taken several forms. Priority has been given to the preparation of teachers of nursing, but assistance has also been provided for the development of country-wide systems of nursing education; the up-grading of schools of nursing to diploma level; the development of nursing education departments, for both basic and post-basic training, in universities; the evaluation of training programmes; the revision of entry requirements; the evaluation and revision of the system of examinations for qualification; the development of recruitment procedures; the coordination of education in the classroom with training in the practice area; and the adaptation of the latter for teaching purposes; and the promotion of research on nursing education.

6.39 Particular stress was laid on education and training in the African Region (where, by the end of 1971, some 160 students had qualified as nurse educators through the post-basic nursing education programmes in Ghana, Kenya, Nigeria and Senegal) and in the South-East Asia Region. Post-basic nursing education programmes were continued at five institutions in India and one in Thailand. In Egypt, 23 nurse educators from the High Institute of Nursing in Cairo participated in a workshop on teaching methods, and two short courses on the same subject were each attended by 20 diploma nurses.

6.40 The first directory of basic schools of nursing in the European Region was prepared (see paragraph 18.36). In the Western Pacific Region assistance was given to a number of countries for post-basic training, mainly in public health nursing, teaching, and administration. Of the 60 nurses who have completed the one-year post-basic course at the University of Malaysia since it was started in 1965, over 40 have specialized in teaching. In the Ryukyu Islands a programme leading to a B.Sc. degree in nursing was started at the newly established College of Health Sciences.

6.41 Much of WHO's assistance to countries in nursing has been given as part of projects for the development of the general health services. More than 100 public health nurses were provided by the Organization for such projects during 1971. It has been necessary to design educational programmes to meet the needs of these integrated services, taking into account the introduction of new elements, such as family planning.

6.42 In-service training, refresher courses and various forms of supplementary training for nursing and midwifery and other health personnel were prominent features of many of the projects in the 20 African countries to which 23 WHO nurses were assigned. In Kenya, for example, a total of 173 nursing personnel took part in eight in-service courses; a series of refresher courses was held in Niger; and multidisciplinary training was provided at the English- and French-language training centres for health personnel in Lagos and Lomé respectively. In addition, the first specialized course in public health nursing to be given in East Africa was started in Kenya, and 16 community health nurses were trained in Malawi. In Morocco, where a programme of in-service training for nursing personnel was started for the first time, guidelines are being prepared on in-service orientation for auxiliaries and tutors. In the South-East Asia Region WHO continued to assist a number of countries in the organization of short courses in various clinical fields. These included courses in Burma on the care of neurological patients, and the care of patients with eye, ear, nose and throat disorders; in India, on the organization of patient care; in Indonesia, on the management of hospital nursing services; and in Mongolia, on medical and surgical, paediatric, and general nursing. Regional courses were also held on rehabilitation, paediatrics and the care of neurological patients.

6.43 There are two main patterns in the training of midwives. In one, midwifery is regarded as a post-basic specialization for qualified nurses; in the other (more usual in countries where maternal and child health and family planning are not integrated in the general health services) a nursing qualification is not a prerequisite for midwifery training. In many countries, particularly in the South-East Asia and Western Pacific Regions, assistant or auxiliary midwives or nurse-midwives are trained, forming a two-level system of professional and auxiliary nursing personnel who can function more effectively as multi-purpose workers in integrated health services.

6.44 In the Region of the Americas a study was made of midwifery and nursing-midwifery personnel, using representative samples from one or two countries in each zone; the findings will serve as a basis for planning improvements in the organization and operation of nursing-midwifery services in the Region. The first course was begun in a new regional programme of training in child health and midwifery in the Eastern Mediterranean Region; this programme includes a one-year post-basic course in midwifery for qualified
nurses wishing to prepare for supervisory, administrative or teaching positions. In the Western Pacific Region emphasis is on the preparation of personnel for integrated community health service projects, the curricula including general nursing, midwifery and public health. Assistance for programmes of this kind was given to the Gilbert and Ellice Islands, Laos (see paragraph 20.95), the New Hebrides and Tonga.

6.45 WHO has continued to assist the development of training programmes for auxiliary nursing and midwifery personnel—key health workers in almost all countries. In the Region of the Americas, where most countries have such programmes, no fewer than 16 000 nursing auxiliaries have been trained during the past four years in courses held with the help of the Organization, and in the South-East Asia Region schools for assistant nurse-midwives are being developed in almost all countries. WHO-assisted studies on the work and influence of the traditional birth attendants or indigenous midwives, and on their registration and training, were carried out in a number of countries; in many parts of the world they are still an intrinsic part of rural life and the only attendants at more than 50% of all deliveries.

6.46 Since nurses, midwives and their auxiliaries are the health personnel having the closest contact with individuals and families, particularly mothers and children, it has become necessary to include family planning in training programmes for nursing and midwifery personnel. WHO has assisted in the integration of the relevant training in basic and post-basic nursing education programmes, and in the organization of orientation courses, seminars and other meetings at inter-regional, regional, country and local levels (see, for example, paragraphs 17.30, 20.49 and 20.50).

6.47 A collection of teaching materials was prepared for use in these training activities; it includes an extensive bibliography and literature on the health aspects of human reproduction, population dynamics and family planning. A consultation on the teaching of family planning and related subjects in nursing and midwifery education programmes was held in Geneva in October.

6.48 The development of formal post-basic programmes for the preparation of nurses in clinical specialties other than midwifery has received less priority in requests for assistance than courses in teaching, public health nursing and administration. In addition to the organization of short courses and the award of fellowships for training in clinical specialties such as paediatrics, orthopaedics, neurosurgery and cardiovascular nursing, particular mention might be made of psychiatric nursing, in view of the acute worldwide shortage of nurses specialized in this field.

6.49 An inter-regional training course on modern trends in the care of psychiatric patients, with special emphasis on psychiatric nursing care, was held in Denmark in September-October, with assistance from DANIDA. (See also paragraph 18.75.) In the African Region an intensive six-week course in psychiatric nursing was held for the first time in Mauritius, and psychiatric nursing was included in post-basic courses at the Universities of Nairobi (Kenya) and Ibadan (Nigeria).

6.50 In the European Region a three-week course for psychiatric nursing tutors was held at the International School of Advanced Nursing Education, in Edinburgh, Scotland; a particular feature of this course was the instruction given in the use of audiovisual equipment. Other countries receiving assistance in the field of psychiatric nursing included Argentina, Egypt, India, Jamaica, Malta, Mexico, Thailand and Venezuela.

Health education

6.51 While health policies may be adopted at national or other administrative levels, the use of health services and the maintenance of good health practices ultimately depend upon the individual, the family and the community. Governments are giving more recognition to the vital importance of health education as a means of involving the individual and the community in all stages of health programmes. The value of health education is particularly apparent with regard to family planning—which ultimately rests upon the couple's personal decision—but the individual and the family play an equally significant role in programmes of national health planning and environmental health which require the voluntary adoption of changes in living patterns.

6.52 In most countries considerable increases in manpower and other resources are required for the development of the educational aspects of health programmes in such priority fields as maternal and child health, family planning, school health, communicable diseases, cardiovascular diseases, nutrition and environmental health. In response to a growing number of requests from governments, the Organization has been providing personnel to deal with health education aspects of WHO-assisted programmes. It has also continued to advise and assist countries with the planning and development of health education services, promoting the training of personnel by granting fellowships and assisting in the organization of courses and seminars. Countries and territories
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receiving such assistance during 1971 included Argentina, Barbados, Bolivia, Brazil, the British Solomon Islands Protectorate, Burma, Ceylon, China (Taiwan), Ecuador, El Salvador, Ethiopia, India, Indonesia, Jamaica, Malawi, Malaysia, Mongolia, Nepal, Nigeria, Papua New Guinea, the Republic of Korea, the Republic of Viet-Nam, Singapore, Trinidad and Tobago, Uganda and Uruguay.

6.53 In Brazil a health education meeting was organized at which 150 health workers considered practical ways of improving health education activities in the country. At the regional level, a seminar on health education was held in Costa Rica for health education specialists and health administrators of countries of Central America.

6.54 The evaluation of health education programmes in the African Region was the subject of a seminar held in Brazzaville in June. Senior health administrators and health education workers discussed the status of health education programmes in the Region, on the basis of countries’ replies to a questionnaire, and reviewed the progress made since 1957, when the first African regional seminar on health education was held. Participants discussed the inclusion of an educational component in the planning of health service programmes, the training of health staff in health education, the provision of health information services for health workers and the general public, and the encouragement of operational research and of community participation in community services. It was found that, while there is great need for further systematic activity in health education, sound steps are being taken by a number of governments for the establishment of health education units within ministries of health, in order that health education activities might be planned on a more realistic basis. It was considered that health education was essential for enlisting the participation of the local population in health programmes, and should therefore be included in planning for the strengthening or extension of health services.

6.55 As has already been made clear, health education is of particular value in family health programmes, where the participation of the individual and the family is of vital importance. Education regarding the health aspects of family planning is concerned with fertility regulation in a manner that promotes positive health and lessens health-related pressures on the family and the community. The procedure will vary according to culture, socioeconomic status, parity, the accessibility and availability of health services in which people have confidence, and the nutritional status of the mother. The full utilization of these services requires education in depth, for in many instances it calls for a change in traditional beliefs, in outlook and in patterns of living. The role of WHO in this respect has been to provide advisory services and to assist governments at their request in enlisting the active and voluntary participation of the people in family and community health programmes. This requires the strengthening of health education services within ministries of health as a means of ensuring the inclusion of health education in family health programmes.

6.56 The Organization has assisted a wide range of programmes for the training of professional and auxiliary health workers in the health education aspects of family health. It has also prepared technical guidelines to assist those carrying out programmes in this field.

6.57 In the South-East Asia Region, an inter-country workshop on the development of health education media with particular reference to family health was organized in New Delhi in October. The main purpose was to discuss ways of strengthening co-operation among those concerned with the planning, production, utilization and evaluation of health education materials, and to develop realistic proposals for co-ordinating plans for the production of such materials.

6.58 With UNFPA support, WHO assisted India in strengthening family life education in schools, and Ceylon, Indonesia, Thailand and Tunisia in assessing their needs for health education in family health, and devising plans for meeting those needs.

6.59 Health education also plays an important role in environmental health, where man’s reaction and interaction with his environment and his cognizance of his role in the prevention of disease and promotion of health are of the utmost importance. For example, a lack of understanding by the individual, the family and the community of their roles in safeguarding health through proper use and maintenance of water supplies and refuse disposal facilities has been widely responsible for outbreaks of gastrointestinal diseases. The co-operation of health education personnel provided by WHO or attached to national health services has therefore been particularly valuable in environmental health programmes in these fields.

6.60 The authorities in Nigeria, for instance, realizing that the active collaboration of the people was essential for the success of the project for sewerage, drainage and solid wastes disposal systems in the city of Ibadan, requested WHO to assign a specialist in health education to this project, and he took up his duties in 1971. In the light of experience, it is hoped
to place more emphasis on health education in other projects in Nigeria in various fields of environmental health, including the training of environmental health workers, and to include environmental health in school health education programmes.

6.61 The role of health education in the limitation of smoking was stressed in a report \(^1\) prepared for the Twenty-fourth World Health Assembly, which, in its resolution WHA24.48, underlined the fact that a sustained effort was required by health and education authorities to reduce smoking and prevent the extension of the habit. The Assembly also requested the Organization to stimulate the strengthening of health education activities, including the production, dissemination and exchange of educational materials designed to discourage smoking. The recommendations contained in the above-mentioned report were supported by the Second World Conference on Smoking and Health, which was organized in London by the Health Education Council in September, and at which WHO was represented.

6.62 A UNESCO/WHO consultation on planning for health education in schools was held in Geneva in December to identify the main health problems affecting school-age children and youth and to suggest ways of stimulating and implementing more effective programmes for school health education through cooperative planning by educational, health and related agencies. The participants—who represented such fields as health planning and administration, health education, maternal and child health, educational planning and administration, teacher education, and educational studies and research—also proposed guidelines for future UNESCO/WHO activities, and outlined priorities for studies and operational research for the improvement of health education in the context of the school, the home and the community.

6.63 WHO also continued to co-operate with UNESCO regarding the health component of literacy programmes, and to assist the UNESCO-sponsored Arab States Functional Literacy Centre.

6.64 In the African Region, on the basis of experience gained in Nigeria, where WHO provided a health education specialist to assist in drawing up school curricula, an inter-country project is being established for the development of health education in primary and secondary schools and in vocational and teacher training institutions. Special emphasis is to be placed on family life education, as in the Region of the Americas, where considerable progress has been made in school health education programmes in Argentina, Brazil, Chile, Ecuador and El Salvador. In Nepal, where stress is also being laid on strengthening health education in schools and teacher training institutions, WHO assisted during 1971 in developing curricula and teaching aids for health education in primary schools, and a curriculum in health education for prospective primary-school teachers was outlined.

6.65 With regard to training, WHO has provided advice to a number of countries on the development of curricula and assisted in the organization of courses in health education for health personnel. In many countries—for example, Brazil, Ghana and Venezuela—an interdisciplinary approach was adopted. In Brazil, for instance, a programme of training that included health education and behavioural sciences, and was carried out by a school of public health, has now been extended to cover pre-service and in-service training of health personnel.

6.66 A noticeable trend during recent years has been the increase in the number of educational institutions that have added to their staff personnel qualified in health education and related behavioural sciences. In Chile, India and Japan, for example, health education specialists have joined the staff of some of the medical schools and of postgraduate centres for education and training in public health.

6.67 There has also been increased emphasis on the provision and up-grading of postgraduate training in health education for health personnel, including health education specialists. In India, over the past decade, two postgraduate centres have been established with WHO assistance for education and training of personnel in health education. A third centre is now being developed by the Central Health Education Bureau of the Ministry of Health and Family Planning, and is to be affiliated with the University of Delhi.

6.68 When a programme of health education is being drawn up, due consideration must be given to environmental, behavioural, cultural and other special factors. There can be no stereotyped approach, and research on behavioural patterns of individuals, families and communities is basic to more realistic planning of the health education aspects of public health programmes. WHO has therefore helped to encourage studies and research in various countries. In India, for instance, it is collaborating with the National Institute of Health Administration and Education in carrying out a study of health education in university hospitals and health centres. The aim is to identify health education opportunities in these institutions, so that all health workers, especially medical and nursing students, might receive prepa-
ration in health education as part of their basic training. The Central Health Education Bureau in India also received assistance from WHO for a study of the pattern of adoption of health measures by rural communities, with particular reference to the health aspects of family planning.

6.69 In the Region of the Americas an interdisciplinary team, using a methodology it had drawn up during 1970, assisted in evaluating the health education component of health programmes in Argentina, Brazil, Chile and countries of Central America.

6.70 Another study supported by the Organization was started by the Department of Social and Preventive Medicine of the University of the West Indies, in Jamaica, to explore the degree of impact of health education of mothers on reducing infant morbidity.

6.71 During 1971, WHO began the preparation of a series of monographs on published studies and research concerning health education practice. As in an earlier similar publication, produced in collaboration with WHO, the major areas being documented include: people’s attitudes, beliefs and health practices; psychosocial and cultural factors related to health education practice; communications methods and materials; patient education; programme planning and evaluation; health education in schools, colleges and universities. Particular emphasis in the current research reviews is being given to topics not highlighted in the previous publication—namely, family health and drug education.

Health legislation

6.72 The only source of systematic information on health legislation throughout the world is the International Digest of Health Legislation, published quarterly by WHO in English and French and containing, in full or in extract or summary form, a selection of laws and regulations adopted the world over on subjects of importance to all aspects of public health. Nearly 10 000 items of legislation have now been published, in translation from some 20 languages. Together with the extensive collection of codes and reference works, they place the Organization in a unique position to furnish information on specific aspects of health legislation, or to provide advisory services upon request. The Organization’s activities in this field were the subject of the programme review conducted in January 1971 by the Executive Board, which expressed its satisfaction with them in resolution EB47.R37.

6.73 From time to time, the Digest also publishes comparative surveys of health legislation. One such survey was prepared in 1971, on protection against ionizing radiations. An earlier survey on the subject had been published by WHO in 1964 but major legislative changes in many countries had made much of it out of date. The new survey covers some 20 countries and should prove useful to national health administrations wishing to compare the situation in their country with that existing elsewhere.

6.74 A number of major individual items of legislation dealing with radiation protection were also published in the Digest during the year. Among these were the Radiation Safety Standards of the USSR; the United States Atomic Energy Commission’s Standards for Protection against Radiation consolidated as of 31 December 1970; the United Kingdom Radiological Protection Act 1970; the Radioactive Substances Act, 1968, of Malaysia; the Radiation Protection Ordinance and the first regulations for its implementation (both dated 26 November 1969) of the German Democratic Republic; as well as significant legislative texts adopted in Hungary and Italy.

6.75 The major item of food legislation published in the Digest during the year was the United States Federal Food, Drug, and Cosmetic Act, consolidated as of January 1969. With regard to pharmaceutical preparations, Austrian and Hungarian texts dealing with the testing of new medicaments were published, as were a series of amendments to the Canadian Food and Drug Regulations.

6.76 The United States Comprehensive Drug Abuse Prevention and Control Act of 1970 and a French law dated 31 December 1970 were the principal enactments dealing with dependence-producing drugs covered by the Digest.

6.77 A trend noted in the Annual Report for 1970—namely, the increasing adoption of legislation dealing with environmental protection—has continued. Bulgaria, Canada, the German Democratic Republic, Japan and the United States of America are among the countries that have recently adopted new items of environmental legislation, sometimes dealing with protection of the environment as a whole, sometimes with more limited aspects such as ambient air quality standards, emission standards for motor vehicles, or the control of water pollution.

6.78 Two noteworthy items of legislation on transplantation were published: the District of Columbia Anatomical Gift Act (based on a model act drafted...
in the USA and known as the Uniform Anatomical Gift Act), and the Anatomical Donations and Post-Mortem Examinations Act, 1970, of South Africa. A new Indian law on abortion, enacted in August 1971, was also published.

6.79 Much of the recent health legislation in the African continent has been concerned with the training of various categories of health personnel and has received attention in the Digest. In Zambia, for example, a new Nurses and Midwives Act was enacted, while a series of regulations were promulgated governing the training and registration of registered midwives, enrolled midwives, enrolled psychiatric nurses, medical assistants, medical assistants (psychiatric), dental technicians, and dental assistants. Similar regulations concerning registered nurses and enrolled nurses had been promulgated earlier. The system of two categories of health personnel ("registered" and "enrolled") has also been adopted in Kenya for nurses, midwives and health visitors.

6.80 The Digest also reflected legislation in respect of specific auxiliary health professions that has been adopted by several European countries, including Austria, France, Malta and Portugal. Austria has also promulgated new professional rules for midwives. Legislation governing the practice of medicine has been enacted in Denmark and the Philippines, and Bulgaria has promulgated new regulations on the training of medical, dental and pharmaceutical specialists. Amendments have been made to the Portuguese legislation on the training and registration of general medical practitioners as well as specialists.

6.81 Numerous items of legislation have appeared in the 1971 issues of the Digest on communicable disease control, the organization of hospital services, public health administration, occupational health, maternal and child health, the control of various categories of poisons and hazardous substances (including pesticides), the admission of mental patients to hospital, and a wide range of other topics of interest to health authorities and the pharmaceutical and food industries.

6.82 The Organization also gives advice or direct assistance to governments that wish to draft new health legislation or revise existing laws or codes. Thus projects were in progress during the year to assist Afghanistan, Ethiopia and Zambia in the redrafting of their basic health legislation, and advice was given to one of the Canadian Provinces in connexion with draft legislation on the treatment of mental patients. In addition, WHO answered requests during the year for information on topics as diverse as abortion, transplantation, autopsies, medical ethics, pharmaceutical advertising, blood banks, radiation protection, medical specialization, equivalence of medical qualifications, environmental pollution, measures to combat smoking, venereal diseases, detergents, water fluoridation, and iodization of salt.

Project systems analysis

6.83 Over the years WHO's programme of assistance to Member States has grown both in the number of projects that it encompasses and in their complexity. This increased complexity has created new and difficult problems not only in the implementation of projects but also in their planning and formulation. New methods to meet these challenges were obviously needed. One such method—systems analysis, as applied to projects—has been under investigation in WHO since 1970 by a multidisciplinary group including medical, management and information systems staff.

6.84 In a first phase, involving the testing of a conceptual model in different country situations, the feasibility of the systems analysis approach to formulating projects in relation to a variety of health problems was successfully demonstrated. Emphasis is now being placed on accumulating sufficient practical experience to improve the model and to enable the systems analysis approach to be applied to project formulation in practice.

6.85 A manual of concepts and procedures involved in health project formulation was prepared in 1971, primarily for the use of national administrations. The formulation process that it outlines leads to a project proposal suitable for consideration and funding by national development planning ministries or other bodies within a country's socio-economic development programme, or by sources of external assistance. The format of the project proposal is also intended to be suitable for the purpose of selection, review, approval and evaluation by WHO and other organizations within the United Nations system.

6.86 As from 1972, a three- to four-year programme of inter-regional assistance is foreseen for the introduction of project systems analysis, starting with the Western Pacific Region. Workshops, followed by practical demonstrations at the country level, will be organized for WHO regional staff and national health officials in order to familiarize them with this methodology so that countries should be able to carry out their own developmental health project formulation. Periodically, inter-country seminars will be held to review the practical experience gained in order to improve the methodology.
CHAPTER 7

HEALTH STATISTICS

Collection and use of health statistics

7.1 Electronic data processing of the statistical information routinely collected from Member States was extended by the Organization during the year. Morbidity and mortality statistics for the past 20 years have been stored in the computer in order to develop data banks and permit requests for information from research workers and others to be answered promptly. Data banks on health personnel and hospital establishments are also being developed.

7.2 The availability in Member States of statistical information on accidents, mental health and environmental health was explored. The shortcomings of such information and the difficulties involved in its collection have been ascertained, and recommendations on how to deal with these problems are being transmitted to national health authorities.

7.3 Now that the data are processed by computer, the World Health Statistics Annual, containing statistics on mortality, morbidity and health manpower, can be published more promptly, and the first two volumes for 1968 have already appeared. Subjects of current interest and public health importance on which statistics were published in issues of World Health Statistics Report during 1971 include congenital malformations, fetal deaths by age of mother and by parity, health expenditure, asthma, hospital morbidity, infectious hepatitis and diabetes mellitus.

7.4 Studies in many countries have shown the public health importance of congenital malformations and some countries would like to have guidance from WHO on the collection of data on the subject. The practices and methods employed by different countries have accordingly been studied and the establishment of a clearing-house to gather and disseminate information on the frequency of congenital malformations in different areas and ethnic groups, and on other differentials of epidemiological significance, is under consideration. With this aim in view, the Organization is now collecting data from countries which have national registers on congenital malformations.

7.5 A meeting was held in Geneva in March-April, under the auspices of the Conference of European Statisticians and WHO, to study ways of co-ordinating health statistics systems with United Nations systems of demographic and social statistics and of national accounts and balances.

Population dynamics

7.6 The first part of a research project on patterns and differentials of infant and childhood mortality—a joint study by the United Nations and WHO on trends of infant and childhood mortality throughout the world in the years 1955-1968—was completed in January 1971. In addition, representatives of the United Nations and WHO held a meeting in Geneva in September to discuss the co-ordination of activities for the collection of data on early and intermediate fetal deaths.

7.7 The principal statistical problems involved in collecting and analysing data on fetal, infant and childhood mortality were discussed at a consultation held in Geneva in March. Major research needs were identified and recommendations made for further activities in this field. A comparative study of the possible influence of various biological and social factors on perinatal mortality in selected countries is in preparation.

7.8 In view of the frequent difficulty of obtaining adequate information on infant and childhood mortality, preliminary talks were held in the spring and summer with the Governments of Algeria, Indonesia and Sierra Leone with a view to organizing WHO-supported sample surveys on the subject in these three countries.

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3 Activities in connexion with the inter-American investigation of mortality in childhood are described in Chapter 16.
7.9 The applicability of the recently developed randomized response technique to the collection of data on topics in the field of population dynamics that are often difficult to elicit was considered at an informal meeting in Geneva in May. The various problems inherent in this approach were discussed, as well as its potential value in increasing the range of information on matters of public health concern. More intensive research on the subject was recommended, including limited pilot studies to assess the applicability of the technique in various socio-economic and cultural conditions.

7.10 At a consultation held by WHO in Geneva in September, the participants reviewed national experience in projecting health statistical trends, in which population dynamics play an important part. Recommendations were made for the further development of work in this field, with special attention to methodological research.

7.11 Because of the increasing emphasis now being placed on the family as a basic unit in health studies, the Organization held a consultation in Geneva in December 1971 to review the various approaches to family-oriented studies of health and disease and their implications for the work of the health statistician. Types of statistical studies that could shed further light on family health patterns were also discussed.

7.12 A training workshop on statistical methods in national family planning programmes was held by WHO in China (Taiwan) in October-November. The aim was to familiarize health statisticians with the new tasks and problems confronting them in connexion with family planning statistics and biostatistical research on human reproduction.

7.13 During the year preparatory work was undertaken on a series of manuals on population dynamics, including one on mortality analysis (covering, *inter alia*, the latest developments in the field of the "theory of competing risks"), another on fertility analysis and a third on family planning statistics.

**Assistance to governments in the development of health statistical services**

7.14 In view of continual changes in morbidity and mortality patterns, the growing need for health services and for their comprehensive planning and evaluation, and the introduction of management principles in everyday health administration, national health statistics of increasing variety and complexity are required. New statistical approaches, methods and techniques have to be used in order to study socio-economic, ecological and biological influences on health and provide guidance on the delivery of adequate health services. For the study of problems relating to the current health situation, a flexible and comprehensive system of vital and health statistics is essential. Routine reports and notifications have to be combined with *ad hoc* studies and surveys, and modern automated data-processing techniques must be employed. The statistical services of many countries are, however, not yet sufficiently highly developed to take full advantage of new techniques and approaches, partly because of the shortage of statistical personnel and of medical staff with training in statistics.

7.15 A particular effort is being made to help countries improve and develop their basic medical records and health statistical systems. In 1971, WHO provided advice and help for this purpose through statistical projects in 33 countries; in addition, it provided statistical advice through 27 inter-regional and other projects. To keep countries abreast of new developments in health statistics, the Organization operates an information service which since 1950 has circulated some 280 documents on international work in this field and on the activities of the various national committees on vital and health statistics. Priority was given in 1971 to material on statistics for national health planning, medical records, family planning statistics and training.

**Statistics for national health planning**

7.16 During the past few years, the Organization has sought to strengthen the links between national health planning and health statistics in both developing and developed countries. A travelling seminar on the collection and utilization of statistical information in the planning and evaluation of health services at the intermediate and local levels, held in Finland and the USSR in August, was attended by senior health administrators, health statisticians and national health planners from 19 countries in all six WHO Regions.

7.17 A WHO expert committee on health statistics, which met in December 1970 and whose report was published in 1971, recommended a critical examination of existing national statistical systems

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1 The "theory of competing risks" is concerned with the relative impact of different diseases on human longevity in a given population and with the theoretical effect on that population of removal of a specific disease as a cause of death. 

and of the use made in planning of the information they provide. It considered that countries should develop their information systems with the needs of the health planner in mind and gradually introduce the full range of components needed for producing integrated national, regional and local statistics. Particular stress was laid on the training of health and statistical personnel in the use of health statistics for health planning. In addition, the expert committee recommended that, to help promote the use of health information systems in health planning, each country should establish a national commission that would include representatives of agencies concerned with health planning and health statistics and of other bodies concerned with social, economic and other data having a bearing on health and health services. This recommendation was followed up during the above-mentioned travelling seminar, when the participants discussed the matter with administrators, doctors and statisticians working at various levels in the health administrations of both the countries visited.

**Education and training in health statistics**

7.18 Although since 1950 WHO has awarded more than 1400 fellowships, with an average duration of 5-6 months, for the study of vital and health statistics, there is still an urgent need for more people trained to work in this field. It is not only the increasing need for health statistics that makes the shortage so acute but also the fact that quite a number of trained personnel have left vital and health statistics for other types of statistical work. During the last decade there have been encouraging developments in the undergraduate and postgraduate teaching of statistics in several countries. However, in most countries the emphasis has been on statistical methods and their application in clinical medicine and medical research. The use of statistics for assessing the health of the population, evaluating and planning health services and operating specific health programmes has received little attention. Only rarely do the medical curricula cover population dynamics and methods of analysing patterns of reproductive behaviour. These subjects are also neglected in courses for statistical personnel. The scope of education and training in health statistics has therefore to be extended so as to encompass these hitherto neglected areas.

7.19 The increasingly acute shortage of adequately trained health statisticians and the need for more and better training facilities were stressed at a WHO consultation on the role of health statistics in studies of human reproduction and in family planning pro-

**International Classification of Diseases**

7.20 Preparations for the ninth revision of the International Classification of Diseases continued throughout the year. A meeting of the heads of the four WHO International Reference Centres for the Classification of Diseases, held in London in June, considered that the revision should aim at making the classification more suitable for a wide variety of applications, notably in multiple-condition analysis and diagnostic indexing. It recognized, however, the advantages of retaining some degree of continuity with the numbering system of the present revision and recommended that, wherever possible, the desired changes should be introduced as additional subdivisions of existing categories.

7.21 With the advice of experts from many countries, most of the chapters of the International Classification of Diseases were reviewed with the above-mentioned criteria in view and draft proposals for revision were prepared. A new section, classifying residual impairments, was also drafted. A study group on classification of diseases, which met in Geneva in November, considered these drafts and recommended that those chapters where rather considerable changes had been proposed, notably those for cardiovascular, maternal and perinatal conditions, should be subjected to trials in parallel with the existing classifications to test the validity and to justify the extent of the amendments. It noted that several different proposals, some of them radical, had been made for the classification of neoplasms and recommended that the Organization, in consultation with the authors of the proposals, should attempt to resolve the differences and prepare a single revised classification.

7.22 The draft international classification of surgical procedures was amended in the light of comments received from Member States, an attempt being made to embody the best features of two widely used national classifications. The draft classification of radiological procedures was expanded to a full three-digit code identifying the procedure (anatomical area, method of examination) with a
fourth digit for the technique employed (standard X-ray examination, radioscopy, etc.).

7.23 Following a trial of the procedure for multiple-condition coding and tabulation, an amended set of coding rules was drawn up and arrangements were made for a further trial to test the new rules, the aim being to establish an internationally agreed procedure for multiple-condition analysis.

7.24 During 1971, with the aid of UNFPA, a series of consultations was held in Geneva on problems connected with the collection and use of statistics on maternal and child health. One of these consultations investigated the possibility of the registration of pregnancies and their outcome in order to provide a better assessment of fetal wastage than is at present available; arrangements were made for pilot trials to be held in a small number of countries to test the practicability of such a system. At another consultation the WHO criteria for distinguishing between live birth and fetal death were reconsidered. These definitions had served a very useful purpose and in the interests of continuity it was not considered necessary to introduce changes, although there were some differences in interpretation of the definitions. A number of new definitions relative to the perinatal period were drawn up with the aim of standardizing the methods of calculating rates and ratios and thus improving comparability. A third meeting discussed the need for and design of a special form of medical certificate of cause of death for use in the perinatal period since the international form was not ideal in a situation where maternal conditions, as well as conditions of the fetus and infant, needed to be taken into account. An alternative form of certificate was suggested and proposals made for testing it. A fourth meeting, attended by members of the relevant committees of the International Federation of Gynecology and Obstetrics, reviewed and amended the revision proposals for the classification of maternal and perinatal morbidity and mortality.

Health statistical methodology

7.25 Routine vital and health statistics rarely meet the requirements of the health administrator for information on specific aspects of the health status of the population and on environmental factors. *Ad hoc* surveys and investigations are therefore frequently called for, in order to obtain information on such matters as disease prevalence, etiology and evolution, the effectiveness of a health care system, and the prophylactic and therapeutic value of specific health measures.

7.26 Such studies are generally restricted in scope, since they require trained personnel and elaborate techniques. To derive conclusions applicable to a larger population it is essential to ensure that the studies cover statistically representative groups. Furthermore, because of the variety of health and socio-economic data involved, the use of appropriate statistical methodology is of vital importance.

7.27 The question of statistical methodology has been given careful attention in WHO-assisted projects. For example, a number of surveys on subjects such as trachoma, treponematoses, nutrition, oral health and family planning were based on a standard statistical design and a uniform procedure was followed in analysing the data collected. The adoption of standard procedures not only facilitated the field work and data processing but also ensured a higher degree of comparability between data from different countries.

7.28 A pilot study of registration of acute ischaemic heart disease, which has been promoted since 1968 in 15 European and two non-European countries (see paragraph 3.20) is another example of a study employing a standardized protocol agreed upon by the investigators. It involves the registration and one-year follow-up of each suspected case occurring in a geographically defined population, and its success largely depends on completeness of coverage in both phases. Periodic statistical analysis has proved useful in verifying that the project is being conducted along the right lines. Projects on other cardiovascular diseases, using similar procedures, have been started on the basis of experience gained in the pilot study.

7.29 Statistical design facilitated the analysis during the year of data from WHO-assisted trials of BCG vaccine against leprosy in Burma and of investigations of the effect of thalidomide against lepra reactions in India, Mali, Somalia and Spain, by ensuring the comparability of treated groups with control groups.

7.30 In recent years theoretical work has been carried out by WHO on the development, by means of computer simulation, of epidemiological models, notably for communicable diseases such as tuberculosis, leprosy, tetanus and enteric infections. In these models populations are subdivided into epidemiological strata, e.g., susceptible, immune, incubating and sick, on the basis of the available statistical information. By following estimated rates of transition from one stratum to another, the dynamics of disease evolution over periods ranging from days to years are simulated on the computer. Interventions that would alter some of the basic parameters of a model are also taken into account. For instance,
vaccination would bring some of the susceptible group into the immune group, treatment would hasten transfers from the sick group, and sanitary measures would reduce the transmissibility of infection. These alterations to parameters are fed into the model, permitting their influence on the course of the disease to be studied. Useful information is thus obtained on the course of the disease as well as on the possible effects of various health measures.

7.31 The applications of electronic computers in other health fields, too, are developing rapidly, and a consultation was held in September at which problems of medical computing, and in particular those in health care, were reviewed and suggestions made as to the manner in which WHO could best furnish advisory and information services to Member States on medical computing, and promote training, standardization and research.
CHAPTER 8

FAMILY HEALTH

8.1 The Organization instituted a wide programme in family health in 1970 in order to focus on health problems of the family as a whole. In 1971, this programme was further broadened by inclusion within it of WHO's activities in nutrition, since it is recognized that among the priority requirements to ensure the health of the whole family and the optimum growth and development of children is promotion of the nutritional status of mothers and children along with early control of infections.

8.2 The section dealing with maternal and child health that follows stresses the importance of a comprehensive approach to the integration of maternal and child health activities, including family planning, into the general health services and reports on current programmes in this context, including activities in the social aspects of paediatrics and obstetrics, the maternity-centred approach to family planning, and—indicative of the range of human development factors dealt with—the problems of adolescents and young persons. A significant development in the field of human reproduction during the year was the establishment of a WHO expanded programme of research, development and research training in human reproduction, described below; this represents a major step forward in international collaborative efforts on this subject.

8.3 The family health programme is necessarily intimately linked with other WHO programmes that impinge on problems of the family and the community. These range more widely than might at first sight be apparent. For example, the current work on health statistics reported in Chapter 7 is basic, for all depends on the accuracy of collection and analysis of information. The developments in cancer research, such as the early detection of asymptomatic cancer of the uterine cervix, are also of importance to the health of the family. However, it is perhaps in matters of education and training of personnel and of health education of the community that the interconnexion of programmes is greatest. The promotion of health in the basic social unit, the family—as in the rest of the community—depends very largely on trained manpower and an educated public. The importance that the Organization attaches to this emerges clearly from the following pages as well as from Chapter 9 on education and training and from the sections on health education and nursing in Chapter 6. These disciplines are represented in a consultant team established by the Organization in 1970 and made up of a public health administrator, a nursing adviser and a health educator. The team's responsibility is to give guidance on the multidisciplinary approach required by family planning health services, and in 1971 much of its work was devoted to the education and training aspects. Its activities included advice on the organization of inter-regional and national seminars, preparations for and participation in WHO staff training courses and study groups on education and training for family planning in health services, and the preparation of bibliographies and background documentation. At the country level, the team also took part in a number of field activities related to the integration of family planning activities into the general health services.

8.4 At the fourth Annual Population Conference of the Organization for Economic Co-operation and Development (OECD) in October, and at the sixteenth session of the United Nations Population Commission in November, the Organization presented a comprehensive report on the assistance provided by it, during the period 1970-1971, to governments in the development of family planning activities, education and training programmes for all levels of health personnel concerned with one or another facet of family health, and research and reference services on various aspects of human reproduction. This report included a complete list of the more than 150 projects carried out in these fields during that period and of the research and research training supported.

8.5 In view of the variety of activities in family planning, population dynamics and human reproduction, and of the fact that they are the concern of many organizations, each according to its mandate, co-ordination of the work is essential. Every effort is made by WHO to ensure full co-ordination of its activities in this field, whether with the United Nations
and its subsidiary organs, including UNICEF and UNIDO; the specialized agencies, particularly ILO, FAO, UNESCO and IBRD; inter-governmental organizations such as OECD; non-governmental organizations such as the International Planned Parenthood Federation; or with national sources of bilateral assistance and private bodies such as the Population Council and Ford Foundation among many others. Formal co-ordination within the United Nations system is conducted through the appropriate machinery—for instance, through the ACC Sub-Committee on Population and the UNFPA Inter-Agency Consultative Committee. Much emphasis is also given to informal consultations among all concerned in order to promote the maximum collaboration.

Maternal and child health

8.6 A clearer awareness of the multifactorial nature of disease—of the association of such medical conditions of early childhood as diarrhoeal diseases, parasitic infestation and malnutrition with such social conditions as poverty, lack of education, overcrowding, bad housing, and poor environmental hygiene—is leading governments to seek to harmonize the efforts of their health and social services in a concerted attack on these problems. For this purpose WHO assistance was given during the year to, for instance, 15 integrated family health projects in the African Region that covered nutrition, communicable disease control, and education and training in addition to the activities more usually associated with maternal and child health; a variety of maternal and child health, school health, and family welfare projects in eight countries of the Western Pacific Region; and 27 projects related to maternal and child health in the South-East Asia Region.

Social aspects of paediatrics and obstetrics

8.7 During the past few years there has been a renewal of concern on the part of paediatricians, nutritionists and other maternal and child health workers regarding the problem of low birth-weight—a renewal partly stimulated by the interest aroused by publication in 1969 of the report of the special session of the PAHO Advisory Committee on Medical Research devoted to perinatal factors affecting human development. A WHO study carried out in 1960 indicated that many newborn infants in the developing countries were of normal gestational age but were of low birth-weight by international standards—i.e., less than 2500 g. These babies appeared to have few of the problems commonly encountered in low birth-weight babies born before term. However, recent research has cast new light on the data reported in 1960 and has revealed that the subsequent development of low-weight/normal-term babies may be impaired, leading in some to mental or physical retardation; faulty intrauterine nutrition has been implicated as a cause. The literature on fetal nutrition was recently reviewed in an article in the Bulletin of the World Health Organization, and in August-September 1971 the Organization presented the latest findings and the most recent interpretation of the accumulated data to the XIII International Congress of Paediatrics in Vienna.

8.8 WHO is currently supporting research by the Food Science and Applied Nutrition Unit at the University of Ibadan, in Nigeria, into maternal nutrition during pregnancy and its effect on the newborn child in order to determine whether supplementary feeding during the last trimester can improve the outcome of pregnancy.

8.9 Over the years there has been much research, to which WHO has contributed, into such subjects as perinatology, immunology, endocrinology, cardiology and nephrology, but only recently has attention been focused on applying the knowledge so gained to problems of human growth and development in relation to public health. WHO convened a scientific group in April to review the needs and opportunities for intervention by public health services during the sequence of stages and events that constitute human development. Experts in population dynamics, paediatrics, obstetrics and gynaecology, nutrition, human reproduction, and community medicine made recommendations for immediate action through public health programmes concerned with nutrition, infection and maternal care. The group emphasized the importance of bringing the holistic concept of human development into policy-making and planning at all levels of government and into the execution of programmes. Formulating recommendations for research, the group stressed the need for more scientific knowledge about the effect of the physical and social environment on human development and for systematic monitoring of changes in demographic, socio-economic and health factors in order to evaluate trends in human development.

Maternity-centred approach to family planning

8.10 WHO in collaboration with UNFPA, UNICEF and the Population Council, among others, continued...
the development of a maternity-centred family planning programme with the linked objectives of improving maternal and child health care and of providing family planning services, upon request, in relation to the maternity cycle. This approach is based on the finding that great potential exists for explaining the health aspects of family planning to women while they are being provided with the appropriate health and social services at all stages of the maternity cycle and during child health care.

8.11 At the regional level, much attention was paid to negotiations with governments on projects to strengthen national family planning administrative structures within the maternal and child health services and to the preparation of project agreements. By the end of the year 40 country programmes were in various stages of development or execution in the six Regions. The Organization also prepared preliminary guidelines for the development and operation of maternity-centred family planning programmes; these were given wide distribution, in unpublished form, to interested governments, health administrators, hospital directors, and schools of medicine and public health.

8.12 Perhaps the greatest administrative difficulty at the field level continues to lie in co-ordination. In most countries several government departments are involved in the national family planning programme; voluntary and private bodies within the country may also be active; bilateral aid may be received from several nations; and organizations within the United Nations system may offer assistance on particular aspects of the national programme. In order to co-ordinate these efforts at the national level a number of countries, Egypt and Indonesia for example, have set up national family planning advisory committees or councils, with which WHO works in a consultative capacity.

8.13 In the African Region, family planning activities are being undertaken primarily within the context of national maternal and child health services; programmes are being executed with WHO assistance in Mauritius and Nigeria. The family planning project developed in 1971 in Mauritius with assistance from UNICEF, UNFPA and WHO emphasizes the effectiveness of family planning care through the services of midwives and physicians. In the Region of the Americas, the Organization is assisting maternity-centred family planning programmes in a number of countries (see paragraph 16.82).

8.14 In the South-East Asia Region, WHO continued its assistance to India in the family planning aspects of maternal and child health care; stress is laid on integrating this with nursing services, education and training programmes, and health education activities. Advice was also given to the Government of Indonesia on the maternity-centred approach to family planning and on the inclusion of this subject in the curricula of medical schools. Particular consideration was given to the maternity-centred approach both by an inter-agency mission that evaluated family planning activities in Ceylon in the first quarter of 1971 and in an appraisal of maternal and child health and family planning in Thailand carried out jointly by the Thai Government and WHO in March.

8.15 In the European Region, the ministries of health in Algeria and Turkey received assistance from WHO on the development, within maternal and child health activities, of a programme for spacing births. In the Eastern Mediterranean Region, WHO provided assistance in 1971 to maternity-centred family planning activities in Egypt, Iran, Iraq, Pakistan, and Tunisia following evaluation missions. A comprehensive evaluation of the national family planning programme was carried out in Iran by a United Nations/WHO/UNESCO team of experts.

8.16 In the Western Pacific Region, a maternity-centred family planning project was outlined for the Philippines, and integrated projects for maternal and child health and family planning were developed in the Gilbert and Ellice Islands, Laos, Tonga, and Western Samoa. Assistance was also provided in China (Taiwan) in maternity-centred family planning.

8.17 The family planning programmes with which WHO is concerned are under continual review and evaluation. During the year, for instance, evaluation reports on family planning programmes in eight countries in the African, South-East Asia and Eastern Mediterranean Regions were scrutinized. Their study has once again confirmed that family planning activities are most effective when intimately linked with maternal and child health care of high quality; and that the delivery and supervision of clinical contraceptives should generally be the responsibility of the health services, which can provide an existing network of facilities in a country and the indispensable medical expertise. In the developing countries the family planning programme may depend upon the optimum use of rural midwives and traditional birth attendants, among others; they, as well as all higher echelons of personnel dealing with the mother and her child, require appropriate training in family planning and family health care.
8. FAMILY HEALTH

Children, adolescents and young persons

8.18 The International Development Strategy for the Second United Nations Development Decade calls for the full participation of youth in the development process. Since more than half the world population is under 25 years of age and since three-quarters of this age-group lives in the developing countries, the health needs and problems of children and young persons are necessarily of vital concern to WHO, whether within the broad framework of the Development Decade or within the even broader framework of man's health and well-being. Implicit in the work of the Organization is the principle that the health and welfare needs of this age-group are inseparable from those of the family and the community as a whole. Activities to promote the health of the young are integrated into the WHO programme, special attention being given to the needs and problems of this age-group in the areas of drug dependence, health education, maternal and child health, and mental health. A report on these activities was presented to the ACC Sub-Committee on Human Resources, Education and Training in June 1971 and to an ad hoc inter-agency meeting on youth, held in Geneva in December.

8.19 In June 1971, in Stockholm, the second of a series of symposia entitled “Society, Stress and Disease”, co-sponsored by WHO and the University of Uppsala, was devoted to the problems of childhood and adolescence (see also paragraph 3.92). The discussion ranged from consideration of the needs of the well-adapted child to an exploration of the manifestations of disease caused by psychosocial stress. Great importance was attached to the preventive work that could be accomplished through health services for mothers and children and through educational programmes.

8.20 The health of schoolchildren and university youth continued to receive attention from WHO, with emphasis placed on the contribution young persons can make to their own and their community’s health. A refresher course in school health, offered by the American University of Beirut with WHO assistance, was attended by educators, school doctors and other participants from the Eastern Mediterranean Region. WHO also sponsored a seminar on school health in Rangoon, which was attended by senior health officials from the South-East Asia Region. Advisory services on the development of school health programmes were provided to the Republic of Viet-Nam. The Organization was represented in August at the Sixth International Congress of the International Union for School and University Health and Medicine, held in Lisbon, at which the provision of health services at all levels of education was discussed; and in Hong Kong in July at the Fourth Asian Health Conference, sponsored by World University Service, at which education in health, nutrition and environmental matters was considered, as well as the role of preventive and social medicine in university health services.

Education and training in maternal and child health

8.21 Education and training curricula are undergoing drastic revision in many countries in order to prepare health personnel for their increasing involvement in the social aspects of medicine and to stress the interrelationship of the family and the community. WHO’s leadership in the modernization—especially in the developing countries—of education and training to bring in the social aspects of gynaecology, obstetrics and paediatrics and to teach these as a unified whole is generally recognized. The need to include the teaching of human reproduction in the training of all personnel working with families and to make the population aware of the health benefits of family planning has given new impetus to the education and training aspects of the maternal and child health programme.

8.22 A series of advanced courses in paediatrics has been given since 1964 in Warsaw by the National Institute of Mother and Child in collaboration with WHO and UNICEF. In all, 63 medical officers holding positions of responsibility in maternal and child health programmes in 26 developing countries have received advanced training in these courses, a critical evaluation of which was begun during the year. As part of this evaluation a survey was made of the current work of former participants from the African, South-East Asia and Eastern Mediterranean Regions in relation to the training needs there.

8.23 In 1965 WHO had convened a European seminar to consider how paediatric teaching could be reorganized to make for better integrated child care. A number of changes have been made since then; and in 1971 a study was undertaken of current undergraduate and postgraduate education in social paediatrics in the European Region. The findings of the study will form the basis for further collaboration between the Organization and the Association for Paediatric Education in Europe.

8.24 At an inter-regional conference held in November in Cairo, participants from four WHO Regions discussed the objectives to be attained by maternal and child health services, including family planning services, in developing countries, and the most effective
means of integrating those services into the basic health services.

8.25 Close collaboration was maintained with the International Children's Centre, Paris, particularly through WHO representation at the semi-annual meetings of the Technical Advisory Committee. This year the Centre provided some 20 courses in Africa, the Americas and Europe on various aspects of paediatrics for personnel working with children. WHO has emphasized the importance of including health education and the social aspects of paediatrics in these courses.

8.26 The eighth in a series of training courses for senior teachers of child health from developing countries, sponsored by UNICEF in association with WHO, was held during the year. Each of these courses, which last nine months, is conducted first at the Institute of Child Health, London, and later in Uganda and India. They have been evaluated regularly in an effort to make them as responsive as possible to the needs of developing countries. The course in 1971 was attended by participants from Afghanistan, China (Taiwan), India, Indonesia, the Philippines, the Republic of Korea, and Sudan.

**Human reproduction**

8.27 Only relatively recently has it become widely recognized that the solution to many problems relating to human reproduction, family planning and population dynamics lies in a better understanding of human reproductive processes in general, the development of safe, acceptable and effective methods of fertility regulation, and the devising of appropriate strategies for family planning programmes, as well as in a greatly increased effort at the operational level. To achieve these aims, a considerably larger research effort is required in the physiological, clinical, epidemiological and public health fields.

8.28 Accordingly, while remaining broadly based in its interest in all aspects of human reproduction (including sterility, embryonic development and lactation) and continuing to promote education and training programmes and provide advisory services to Member States for the planning, implementation and evaluation of family planning services, the Organization's human reproduction programme laid greater emphasis in 1971 on research. This included not only stimulation, guidance and support of research and research training, but the elaboration of a long-term research strategy on a world-wide basis. These programme developments were greatly assisted by the additional financial resources made available by the Swedish International Development Authority (SIDA), the Ford Foundation and the International Development Research Center, Ottawa. UNFPA continued to provide assistance for epidemiological research and training activities.

8.29 As was mentioned in the Annual Report for 1970, a feasibility study was begun in September 1970, with support from SIDA and the Ford Foundation, to explore means of expanding the research and training potential of institutions engaged in research into reproductive biomedicine, including fertility regulation. By April 1971 this study was completed. Teams of experts had visited 69 institutions in 23 countries in all WHO Regions; and with the assistance of other scientists and administrators their reports and recommendations were consolidated in a proposal for an expanded programme of research, development and research training in human reproduction. This proposed expanded programme was favourably reviewed in June by the Advisory Committee on Medical Research and in September at a meeting which included most of the agencies supporting reproduction research that had recommended in 1970 that WHO should undertake the feasibility study. Priorities were set for the programme, based on the recommendations of an advisory group. By the end of the year, commitments were made for contributions to the Voluntary Fund for Health Promotion by the Danish International Development Agency, the Norwegian Agency for International Development, the Swedish International Development Authority, the International Development Research Center, Ottawa, and the Ford Foundation. These pledges for the first year of operation of the programme amount to US $4.8 million.

8.30 The expanded programme follows five main lines of activity: the designation of a small number of existing centres as WHO research and training centres in human reproduction—in addition to that already designated in Stockholm—to conduct research with emphasis on reproductive processes susceptible to regulation and to train scientists in reproductive biomedicine; the setting up of a world-wide network of clinical collaborating centres, to evaluate new fertility-regulating agents and to undertake comparative trials of existing agents; the establishment of groups of scientists, known as "task forces", to provide collaborative research on specified problems; the creation of an international documentation centre, to compile and maintain a complete file of references to all published material on the biomedical aspects of human reproduction; and, finally, the expansion of existing programmes for, *inter alia*.

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research, training awards, and the provision of supplies and reagents for laboratory work.

8.31 In addition to developing this broad programme, the Organization continued to assist Member States in developing particular aspects of their research potential. The Governments of Egypt, Iran, Pakistan, and Turkey requested WHO assistance in this area. In Iran advice was given over a 6-month period on a plan for expanded research in reproductive biomedicine to be carried out at a central institute in Teheran and also at the universities of Shiraz, Tabriz, Isfahan and Meshed. Plans were also elaborated for strengthening research on human reproduction in Pakistan. In Egypt, assistance to research in reproductive biomedicine began in 10 laboratories in Cairo, Alexandria and Asyut, in the form of the provision of equipment and supplies as well as advice and assistance in the training of investigators. Help in developing an integrated plan of research support was also provided by WHO in Turkey. These projects were assisted with funds provided by UNFPA.

8.32 In recognition of the fact that appropriately trained manpower is one of the factors most severely limiting reproduction research, a workshop on research training in reproductive physiology was held in Geneva in September. The 14 participants reviewed existing programmes of research training and prepared guidelines for the training of various categories of scientists. They focused particularly on the special problems of scientists in less developed countries, including their need for training in research administration.

8.33 The additional UNFPA and SIDA funds that have been made available to the Organization permitted the award of 21 research training grants in 1971.

8.34 A recurring observation in the visits to research institutions during the feasibility study for expanded research mentioned above was that there is often a need for relatively small amounts of supplies and spare parts for laboratory equipment, lack of which frequently impedes research in progress. With SIDA support, the Organization has therefore constituted a small fund to assist scientists with such purchases. The usefulness of this fund may be gauged by the fact that, in the first three months of its operation, about 30 institutions in all parts of the world received aid from it. Another observation made during these and other site visits concerned the difficulty experienced in many developing countries in maintaining scientific equipment. A consultation was therefore held in December to review this problem and to formulate requirements that should be met when ordering such equipment and using it in countries where maintenance problems arise.

8.35 Further examples of services to research in reproductive biomedicine provided by the Organization relate to methodology. WHO collaborated in organizing the third and fourth Karolinska Symposia on Research Methods in Reproductive Endocrinology. The third symposium, held in Geneva in January, dealt with in vitro methods in reproductive cell biology; the fourth, held in New York in October, with perfusion techniques.

8.36 Two methodological studies were conducted with WHO assistance. The development at the University of Helsinki, Finland, of a micromethod for the determination of testosterone in human plasma has immediate clinical application in the evaluation of testicular function. In Amsterdam a study is under way to determine to what extent the techniques used for fixing and staining slides prepared from spermatozoa affect the number of abnormalities observed in the sperm.

8.37 A collaborative study of pregnancies and births resulting from the induction of ovulation with human gonadotrophins is being conducted by the WHO International Reference Centre for Fertility Promoting Agents, at the Tel-Hashomer Government Hospital in Israel. This centre has devised programmes for the computer processing and analysis of results of gonadotrophin treatment received from 10 collaborating centres in the Regions of the Americas, Europe and the Eastern Mediterranean.

8.38 Three meetings organized or supported by WHO during the year were concerned with fundamental knowledge of reproductive processes. In January, a WHO workshop was organized immediately preceding the Fourth Asia and Oceania Congress of Endocrinology, which was held in Auckland, New Zealand. The participants discussed the physiological and pharmacological control of ovulation and corpus luteum function, a subject of direct importance for the treatment of sterility and for methods of family planning.

8.39 WHO gave financial support for an international symposium held in August at the University of Edinburgh, Scotland, on the genetics of the spermatozoon. The topics covered research on the genetic basis of a variety of mechanisms, properties and processes involved in sperm development and sperm function.

8.40 Thirdly, a WHO symposium on the use of non-human primates for research on problems of human reproduction was held in December at the Primate
Research Centre, Sukhumi, Georgia, USSR. The symposium provided a comprehensive and critical synthesis of present knowledge on reproduction in non-human primates, and reviewed the applicability of such research to the understanding of reproduction in man. It also helped to define, since their value varies widely, which non-human primate species are most suited to the study of specific problems in human reproduction.

8.41 Several research projects concerned with the physiology of reproduction and prenatal development received WHO support. At the Institute of Experimental Endocrinology and Hormone Chemistry, USSR Academy of Medical Sciences, Moscow, a study is being conducted into the role of the hypothalamus in the endocrinology of human reproductive function in health and disease. A study in India at the All India Institute of Medical Sciences, New Delhi, is concerned with the influence of hormones on the secretory activity of the oviduct with the general aim of defining the optimal environment for fertilization of the ovum. Studies on the mechanism of implantation were carried out at the Latin American Institute of Reproductive Physiology, San Miguel, Buenos Aires; they relate to the mechanism of action of histamine in the process of nidation. At the Institute of Neurobiology in Buenos Aires studies are being conducted on the processes responsible for the initiation and maintenance of lactation. Studies on the immunology of reproduction continued at the Department of General Biology, Higher Medical Institute, Sofia. In Cambridge, England, investigations are under way at the Physiological Laboratory into the genetics and embryology of early mammalian and human development; they aim at studying the early differentiation of the trophoblast, the time of X-chromosome inactivation in development, and, by in vitro studies, the capacitation of spermatozoa and the fertilization of eggs. The interest of such research extends beyond the study of fundamental processes in early development; it may lead to a better understanding of sterility and malformations and may have applications to fertility control.

8.42 Of a more clinical orientation are the WHO-supported studies at the Faculty of Medicine, Montevideo, on fetal monitoring in relation to placental morphology, function and pathology; at the Hôpital de la Grave, Toulouse, France, on fetal monitoring during pregnancy and delivery, and treatment of fetal distress; and at the Institute of Obstetrics and Gynaecology of the Academy of Medical Sciences of the USSR, in Leningrad, that focus on the possibility of treating disturbances of intrauterine development.

8.43 In sponsoring research, one of the criteria adopted by WHO has been the relevance of the research to practical problems of local or regional importance. Infertility occurs as a public health problem of some magnitude in several parts of Africa, and its etiology is unclear. Research support is therefore being given to a study by the Department of Obstetrics and Gynaecology of the University of Ibadan, in Nigeria, of the prevalence of genital tuberculosis and its relation to infertility. Information is also lacking on hormone levels and hormone metabolism in African women; it is needed to detect pathological deviations from normal levels, and is becoming particularly necessary with the introduction of hormonal contraceptives. In some populations the incidence of genetically determined blood conditions, such as sickle-cell disease, is high, and their effect on the metabolism of sex hormones also requires study. These problems are being investigated with WHO support by the Department of Chemical Pathology of the University of Ibadan.

8.44 There is little likelihood of developing a single "ideal" fertility-regulating method that would be acceptable to populations living in different socio-cultural and economic conditions. Although oral contraceptives and intrauterine devices are highly effective, there are problems associated with their use that make it imperative to develop other methods. Considerably more attention has been given in recent years to contraceptive methods for women than for men; the only significant change in emphasis has been the increased facility in performing vasectomy and the greater utilization of this technique in some countries. At a consultation on research strategies for the control of male fertility held in May it was pointed out that, although there was a need for modern methods of male contraception, so far there are no truly promising leads. There are some steroid compounds available for clinical testing but preliminary evidence indicates that much has yet to be learnt about dosage, routes of administration and means of evaluation. Work being carried out to develop such agents is limited to a small number of laboratories and there is a general dearth of fundamental information on male reproductive processes. The meeting considered what investigations would be of the greatest value.

8.45 In recent months, the use of prostaglandins in fertility control has given rise to considerable interest. A number of clinical trials of their possible use for fertility control have been initiated, but shortage of supplies has been a major limiting factor. The availability of synthetic prostaglandins can be expected to change this situation significantly and it is likely
that many investigators will embark on prostaglandin clinical trials. A workshop was therefore organized in March at the WHO Research and Training Centre on Human Reproduction, Stockholm, which brought together most of the clinical investigators engaged in this field. Thirty-nine participants from 15 countries attended the meeting, which provided the opportunity for a valuable exchange of information on some of the pharmacological properties of these drugs. It became clear that much more conclusive work needs to be done before the widespread use of prostaglandins can be contemplated. A second meeting on prostaglandins was held in August at the same centre. It reviewed data that had become available since the March workshop; more particularly, the results of the different methods of administration of prostaglandins were assessed and their clinical applicability evaluated, and protocols were prepared for collaborative studies that were initiated following the meeting.

8.46 In the evaluation of any proposed new contraceptive method the primary concern must be, not only its efficacy, but also the safety of the user and the well-being of any offspring that may be born should there be contraceptive failure. The method must also be generally acceptable and inexpensive if it is to have wide application. Clearly, well-designed clinical trials to test all these factors are essential. Following the course held in India in 1970, a second inter-regional course on the methodology of clinical trials with fertility-regulating agents was organized in Teheran in December with UNFPA support. It was attended by 34 participants from the Regions of South-East Asia, Europe, the Eastern Mediterranean and the Western Pacific. A WHO research team on clinical evaluation of fertility-regulating agents was set up at the end of the year at the Chulalongkorn Medical School, Bangkok, to assist in the design and conduct of clinical trials in South-East Asia.

8.47 One aspect of the evaluation of contraceptive methods that must not be neglected is surveillance for their possible side-effects. A WHO seminar on surveillance methodology, held in Oxford, England, in October, brought together 26 participants from all parts of the world to discuss the use of epidemiological techniques for detecting side-effects of fertility-regulating agents as early as possible. In their conclusions they stressed the importance of conducting studies of the safety of such agents—as well as of their efficacy and acceptability—in a wide variety of countries representing different genetic, cultural and environmental backgrounds. This seminar considered in particular the methods of fertility regulation that had been comprehensively reviewed in December 1970 by a WHO scientific group. The group’s report was discussed in June by the Advisory Committee on Medical Research, which expressed concern about various reported side-effects of hormonal contraceptives.

8.48 Several WHO-assisted studies relate to the evaluation of methods of fertility control. The Family Planning Association of Hong Kong, for instance, is investigating the effectiveness and side-effects of some of the newer intrauterine devices and injectable preparations. Studies are being conducted by the National Institute of Family Planning, in New Delhi, on the effects of hormonal contraceptives and intrauterine devices on endocrine function. The possible teratogenicity of contraceptive steroids is being investigated in anatomical and cytogenetic studies at the University of Geneva, Switzerland.

8.49 The concern of the Organization also for the less immediate effects of family planning—about which there is a dearth of information—was manifested by the convening of a scientific group on the genetic aspects of family planning (see paragraph 8.70).

8.50 Although more is known about the more immediate effects of family planning on the health of the mother and children, there is still a great need for data, particularly on different populations and different cultures. The collaborative epidemiological studies of family health and family size, initiated by WHO in 1970, have been pursued with common protocols and methods in the four centres in India, Iran, Lebanon and Turkey initially involved. Three new centres—in China (Taiwan), Pakistan and the Philippines—joined the study in 1971, and interest in undertaking similar studies has been expressed by scientists in Colombia, Egypt, Kenya and Malaysia.

8.51 In recent years there has been increasing interest in the interaction between emotional and psychological phenomena and reproductive processes. The Twenty-first World Health Assembly in 1968 had recommended the encouragement of research on psychological factors related to the health aspects of human reproduction (resolution WHA21.43), for scientific knowledge in this area is extremely scanty. A scientific group was convened in October to review some of the mental health aspects of human reproduction and to suggest topics for immediate investigation. In view of the multiplicity of biological, psychological, social and cultural factors involved, the group did not attempt to cover the whole field but restricted its attention to the mental health aspects of pregnancy, birth control, infertility, and the menopause. It

noted in particular that the complexity of the inter-play between the factors involved, combined with the difficulty of defining mental health or ill-health in relation to them, introduces serious methodological problems, whether in carrying out simple descriptive studies or in attempting to establish associations and causal bonds.

8.52 Information from many of the fields mentioned above was presented and discussed at an inter-regional seminar on advances in the clinical and public health aspects of human reproduction, family planning and population dynamics that was organized in Djakarta immediately preceding the Fifth Asian Congress of Obstetrics and Gynaecology. The seminar was attended by 44 teachers of obstetrics and gynaecology in medical schools in the Eastern Mediterranean, South-East Asia and Western Pacific Regions.

8.53 The Organization was represented at a meeting of the International Epidemiological Association in August, when it presented a paper on the epidemiological aspects of family planning; and at a meeting of an expert group of UNIDO for which it had prepared a report on the production, distribution and clinical trials of contraceptives in developing countries.

Human genetics

8.54 The WHO programme in human genetics is directed at achieving a better understanding of diseases of genetic origin that present public health problems, with a view to their ultimate prevention or control. Understanding involves the definition and survey of genetic disorders in different countries and in different ethnic groups, the study of the molecular basis of the defects and investigation of their treatment and prevention. Education and training of personnel are needed for the implementation of preventive measures.

8.55 First in the order of priority among diseases of genetic origin are the haemoglobinopathies and allied disorders, which are of public health importance in many countries, particularly those where malaria is or has been prevalent.

8.56 In the year under review surveys to ascertain the frequency of abnormal haemoglobins, particularly haemoglobin S, were extended to Togo and the People’s Republic of the Congo, while that in Nigeria was expanded to include a sub-Saharan population group. In the same country, the WHO Regional Reference Centre for Glucose-6-Phosphate Dehydrogenase, in Ibadan, is conducting studies into the reason why persons who are heterozygous for A (normal) and S haemoglobins produce more of the former than of the latter; it would normally be expected that they should produce equal quantities of both. The Organization is also supporting investigations by the Department of Pathology at the University of Lagos into the microcalorimetric properties of red cells containing different haemoglobin variants and into whether there is a correlation between their metabolic rates and the sickling process.

8.57 As was mentioned in the Annual Report for 1970, it has been shown that the frequency of haemoglobin S is slightly but consistently higher among migrants from West Africa than among the original populations from which they came. The study has now been extended to include migrants from the French Antilles in order to investigate whether a similarly higher rate occurs among migrants from environments where malaria is no longer a strong selective force.

8.58 Surveys for other abnormal haemoglobins, particularly for haemoglobin Bart’s, whose presence is indicative of α-thalassaemia, have been initiated in Israel and Italy. Surveys for F haemoglobin variants—carried on the γ-chain—are continuing in Malta, to detect enough families in which genes for both abnormal F haemoglobins and β-thalassaemia segregate, so that the linkage relationship between the locus for β-thalassaemia and the locus responsible for the production of the γ-chain may be assessed.

8.59 The collection and identification of haemoglobin variants are a necessary step on the way to controlling the disorders to which they give rise. The WHO International Reference Centre for Abnormal Haemoglobins, Cambridge, England, now has more than 140 variants of both the α and β-chains; and 14 new variants of G6PD have been identified by the International Reference Centre for Glucose-6-Phosphate Dehydrogenase, Seattle, Wash., USA, bringing the total to 90. The new variants of G6PD were obtained from surveys in Greece, New Guinea, the Philippines and Thailand.

8.60 With regard to research on treatment, the significance of single-haem/single-chain compounds, the haemichromes, which constitute the inclusion bodies in the red cells of thalassaemia patients, has been explored with WHO support at the Hadassah Medical School, Jerusalem. Results suggest that the inclusion bodies are the consequence of an excess of α-chains and that their precipitation in oxidized form is an important pathogenetic event in the haemolysis occurring in thalassaemia. This hints at the possibility of preventing haemolytic crises if such precipitation can be prevented.

8.61 Haemolysis in G6PD deficiency is also being investigated with assistance from WHO. It has been found at Vanderbilt University in Tennessee, USA, that, in vitro, xylitol from the pentose sugar xylose prevents haemolysis of deficient cells challenged by drugs that are normally haemolytic. This project is continuing, in the hope of assessing the possible preventive value of xylitol.

8.62 Increased attention is also being given to the associations between genetic markers and disease. At the WHO International Reference Centre for Serum Protein Groups, Austin, Texas, USA, a study is under way into the possible association of such markers with susceptibility to disease. This project, which is conducted in collaboration with the bacterial diseases programme, explores the differential susceptibility to typhoid fever of persons with different phenotypes of the group-specificity component system.

8.63 The antibody molecule poses an unusual challenge to the student of molecular genetics. As with haemoglobin, there is independence between the genetic markers in the chains composing the molecule; however, in the heavy chains of immunoglobulins of the G class, there are at least two independent genetic markers carried by the same peptide. This raises the question of how a single peptide may be coded by two independent genes; at present there is no satisfactory hypothesis to account for the phenomenon. To provide much-needed baseline data on this and related problems, the WHO Regional Reference Centre for Genetic Factors of Human Immunoglobulins, in Cleveland, Ohio, USA, is studying the distribution in different population groups of the markers carried by the IgG molecule and tabulating their frequency.

8.64 The number of potential mutagens and the number of systems that may be used to test for them are such that the investigation of mutagenic substances is a highly complex undertaking. A first line of approach to the study of this problem in human systems is the investigation of chromosome aberrations induced in vitro by a test substance. A pilot study, being undertaken in Moscow at the Institute of Human Morphology of the USSR Academy of Medical Sciences, has yielded certain information on the effects of nitroso-methylurea and of some antibiotics with cytostatic properties on the number and structure of aberrations in primary leucocyte cultures and fibroblasts. It has been found that the same compound will induce analogous aberrations both in primary leucocyte cultures and in fibroblasts, and it has been confirmed that different compounds can induce different aberrations in different groups of chromosomes. In the peripheral leucocytes of patients treated with these same cytostatic drugs, aberrations occurred that were similar to those seen in vitro; however, confirming the finding reported for 1970, they ceased to be observable when treatment was discontinued. Other compounds—namely, psychotropic drugs, hormones, caffeine and phenothiazine—are now under study.

8.65 The relevance of chromosome changes to clinical genetics is also being explored with help from the Organization. As part of the prospective study of chromosome aberrations begun in India in 1970, the Institute of Genetic Studies in Bangalore has begun karyotype analysis in a series of malformations found at birth and in selected series of patients with mental disorders. There is known to be an association between the occurrence of chromosome breaks and acute anaemia but it is not known what bearing one condition has on the other, nor even which precedes or follows the other; this is the subject of research being undertaken by the Department of Genetics of the National Institute of Nutrition in Mexico City. Preliminary reports on these projects have already yielded interesting by-products. For example, a non-random distribution of chromosomes has been observed in metaphase preparations, the homologues in some groups of chromosomes tending to stay closer to each other than would be expected if a truly random distribution obtained. Whatever may be the intrinsic scientific significance of this finding, it may also prove of value as chromosome identification systems become increasingly automated since it should facilitate the detection of chromosomes belonging to the same pair.

8.66 Studies of the basic molecular genetics of the less frequent inborn errors of metabolism have also been supported. An investigation into the primary genetic defect in hepatolenticular degeneration conducted by the Institute of Experimental Medicine in Leningrad, USSR, has shown that in patients homozygous for this disease there is a disturbance in the production of ceruloplasmin, the copper-binding protein. This disturbance, which may be located in the liver, results either in reduced synthesis of ceruloplasmin or in a protein with no copper transfer capacity. Analysis of the structure of the protein shows that it has two amino terminals (valine and lysine), suggesting that the molecule is composed of no less than two subunits. If this is indeed the case, at least two genes may be involved.

8.67 In the programme for the genetic study of special populations, support is being given to investigation, by the Institute of Anthropology of Moscow
University, of the basic population genetics of groups adapted to a cold environment, such as the Tungus-
Evenks of Central Siberia and the Chukchi and Eskimos of Northern Siberia. This contrasts with a
study of adaptation to heat being carried out among a Tuareg group in the Sahara by the National Institute
of Demographic Studies in Paris. The frequency of common genetic markers in these populations will
be determined, and, where possible, their genealogies and consanguineous marriages will be recorded.
Similar studies are being performed by the C.I. Parhon Institute of Endocrinology, Bucharest, on the
Tatars in the Dobrogea region of Romania; they constitute a special ethnic group that has lived in
relative isolation for many generations.

8.68 The Organization has also participated in a
study, conducted by Stanford University, California,
USA, of the population genetics of groups living in
isolation along the shoreline of Lake Atitlán in
Guatemala; the data yielded by this study are being
analysed. Studies on the genetic aspects of human
adaptation to life at high altitude are also being
pursued as part of the investigations described in
paragraph 5.81.

8.69 Four scientific groups concerned with different
aspects of human genetics were convened in 1971.
In June a scientific group on the treatment of haemo-
globinopathies and allied disorders reviewed and
summarized the present state of knowledge in this
field. The scientific group also considered critically
some recent findings on the possibility of treatment of
crises in sickle-cell anaemia and outlined a procedure
for the conduct of clinical trials of drugs against this
disease.

8.70 There are a number of important variables that
affect or are affected by family planning and may have
genetic consequences. Among these are parental
age at birth of the children, family size and child
spacing; certain contraceptive agents, also, may have
mutagenic effects. Changes in these factors may bring
new selective forces into play and may in time result in
alterations to the total gene pool. A scientific group
on the genetic aspects of family planning that met
in June considered the genetic changes likely to
occur and outlined the research required and the
methodology for its conduct. One of the main
observations of the group was that accurate planning
of births in relation to maternal age might greatly
reduce the incidence of chromosomal aberrations
such as Down's syndrome.

8.71 In August a scientific group on inherited blood-
clotting disorders evaluated recent developments in
the elucidation of the genetic basis of these disorders,
in their treatment and prevention, and in carrier
detection. The group paid particular attention to the
management of patients with such disorders and to
the situation of haemophiliacs in the family and in
society.

8.72 Another scientific group, that met in November,
reviewed advances in prevention, treatment and
rehabilitation in genetic disorders and considered
techniques now in various stages of development that
might soon become applicable to prevention and
treatment. The group noted, inter alia, the need to
determine more clearly the case-load of genetic
disease, and observed that such disease acquires added
poignancy and relevance in a world that views popu-
lation growth as an important problem and is in-
creasingly concerned with the quality of human life.

8.73 Reference is made in paragraph 10.17 to the
meeting of a scientific group concerned with the
testing and evaluation of drugs for their possible
mutagenicity.

8.74 The training aspect of the human genetics
programme may be illustrated by a course held in
Stockholm in August and September and attended
by participants from nine countries in four WHO
Regions. Over a two-week period they received
theoretical and laboratory instruction in current
cytogenetic techniques for the diagnosis of chromo-
some aberrations. These techniques are necessary
for the accurate diagnosis of different forms of mental
retardation and congenital malformations and are
an important tool for determining whether these
are inherited or due to some external agent. Among
the most recent techniques that were taught was that
of quinacrine fluorescence; by this method each
individual chromosome can be identified by its
specific pattern of transversal bands that are revealed
under ultraviolet microscopy.

Nutrition

8.75 Despite economic progress in certain developing
countries, advances in food technology and the
"green revolution" (the dramatic increase in cereal
production that has occurred, notably in parts of the
Americas and of Asia, through the use of new, high-
yield varieties of wheat and rice), there is no indication
that the nutritional situation in the world has improved
of recent years. Figures on the per capita availability
of foods at the national level may be misleading,
since increases in overall food supplies do not neces-
sarily mean that the less privileged sections of the
population are better fed.
8.76 In 1971, the Organization assisted the governments of more than 50 countries in developing or strengthening nutrition activities within the framework of the health services. Advice was given on the methodology of nutrition surveys, the organization of programmes for the prevention and treatment of the principal nutritional diseases, the establishment of nutrition units in ministries of health and the development of national policies on food and nutrition.

8.77 Growing worldwide concern about the problem of protein deficiency was reflected in the request of the General Assembly of the United Nations that the Secretary-General prepare, with the assistance of independent experts, a programme of concerted international action to avert a protein crisis in the developing countries. The Organization was represented at a meeting for this purpose, convened by the Secretary-General in New York in May, and contributed a background paper on the Organization's work in the field of protein-calorie malnutrition.

8.78 The eighteenth and nineteenth meetings of the FAO/UNICEF/WHO Protein Advisory Group were held in Rome in February and in Geneva in December 1971. The world protein situation was reviewed, a statement on low lactase activity and milk intakes was issued, and guidelines were approved for the production of fish and sesame protein concentrates, milk substitutes and meat analogues, and for the microbiology and sanitation of weaning foods.

8.79 Three ad hoc working groups of the Protein Advisory Group also met during the year. The ad hoc group on single-cell proteins, which met in Moscow in June, discussed the preparation of a guideline for the production of single-cell proteins for human consumption, made suggestions for the revision of the guideline on the preclinical testing of novel sources of protein and reviewed studies carried out by private groups on several algae and microfungi, including Spirulina, Scenedesmus and Fusaria.

8.80 The two other ad hoc working groups met in Washington, D.C., in October. The first dealt with the feeding of pre-school children and discussed, inter alia, the causes of infant and childhood mortality, criteria for the identification of mothers and pre-school children at risk of malnutrition, surveys of food consumption among pre-school children, water requirements of infants and the use of acidified and fermented milk for feeding infants and children. The second studied various aspects of milk intolerance, including its nutritional implications and the way in which it can affect the use of milk and milk products in developing countries.

8.81 In a recent review of the literature on nutrition in pre-school children in developing countries, it was estimated that, in the 24 countries for which data were available, between 4% and 44% of children under 5 years of age were suffering from protein-calorie malnutrition. In connexion with the XIII International Congress of Paediatrics, held in Vienna in August-September, the International Paediatric Association and WHO co-sponsored a workshop on pre-school nutrition, at which the nutritional problems of children who move from rural to urban areas were discussed by 46 participants from more than 30 countries and certain changes in medical curricula and in the training of paediatricians were recommended.

8.82 Protein-rich weaning foods can play an important part in the control of malnutrition among young children. A joint FAO/WHO travelling seminar on protein problems, with particular reference to weaning foods, was held in September. The participants, from eight countries of the African and Eastern Mediterranean Regions, visited Algeria and Ethiopia, two countries where protein-rich food mixtures for weaning have been successfully developed. They discussed the place of such mixtures in the prevention of protein-calorie malnutrition, their formulation and testing, their marketing and quality control and the economic aspects of their production. The WHO centres for testing protein-rich food mixtures in Chile, China (Taiwan), Ethiopia, Guatemala and India carried out tests on seven new processed weaning foods, all of which were found acceptable.

8.83 In November-December, a course on the epidemiology, prevention and treatment of malnutrition in young children was held in Thailand by WHO in co-operation with the Government of Denmark and with DANIDA financial assistance. The participants, most of whom were paediatricians, came from 12 countries in the South-East Asia and Western Pacific Regions. Lectures were given on the diagnosis, prevention and treatment of protein-calorie malnutrition, avitaminosis A, nutritional anaemias, rickets and diseases of malabsorption in

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1 Later renamed the Protein Advisory Group of the United Nations System, reflecting an increase in membership (see paragraph 126).


children. Weaning practices, the assessment of nutritional status, nutrition and population dynamics, education and training in nutrition and the coordination of nutrition activities at the national level were also studied.

8.84 A WHO consultation on the effects of malnutrition on the immune response, which took place in Geneva in June, prepared a protocol for the study of this important aspect of the interrelationship of nutrition and infection (see also paragraph 4.16). Studies on malnutrition and learning performance are being sponsored by WHO at the Children's Hospital, Mexico City.

8.85 In planning food supplies at the national level, it is essential to know the population's requirements for various nutrients as precisely as possible. FAO and WHO have co-operated for some time in the establishment of such requirements, and a Joint FAO/WHO Ad Hoc Expert Committee on Energy and Protein Requirements met in Rome in March 1971 to review information that had become available since the meetings of the second FAO Committee on Calorie Requirements in 1956 and of a Joint FAO/WHO Expert Group on Protein Requirements in 1963. The values proposed by the expert committee to meet energy requirements were slightly lower than those previously recommended. For the moderately active man and woman, the daily requirements—now expressed in joules instead of calories—were set at 12.5 and 9.2 megajoules (3000 and 2200 kilocalories) respectively. Safe levels of protein intake were calculated both by the factorial method and from the results of nitrogen balance studies. In terms of egg or milk protein, the safe daily intake levels per kg of body weight were set at 0.57 g and 0.52 g for men and women respectively. Higher levels were proposed for children and adolescents and for pregnant and lactating women.

8.86 Studies on protein requirements are being carried out, with help from WHO, at the Institute of Biochemistry, College of Medicine, National Taiwan University, China (Taiwan); the Nutrition Institute, Cairo, Egypt; the Institute of Nutrition of Central America and Panama, Guatemala City; and the American University of Beirut, Lebanon. A WHO-assisted study on the effect of calorie intakes on protein utilization was initiated during 1971 at the Department of Nutrition and Food Science, Massachusetts Institute of Technology, Cambridge, Mass., USA.

8.87 Anthropometric surveys are now being undertaken in six countries of the Western Pacific Region and one in Europe, with assistance from WHO. These will be repeated at intervals in order to assess trends in the nutritional status of the populations concerned.

8.88 WHO-supported research projects on various aspects of nutritional anaemias are in progress at the All India Institute of Medical Sciences, New Delhi, and the Christian Medical College Hospital, Vellore, India. In addition, studies on the effects of the iron supplementation of foods are being carried out in Thailand, in co-operation with the Swedish Medical Research Council. A meeting of investigators on nutritional anaemias was convened by WHO in Geneva, in October, to review recent progress, with particular reference to the standardization of procedures, the availability of iron, folate and vitamin B12 in diets, measures to prevent deficiencies of these nutrients, and future action in this field. With the assistance of the Wellcome Trust, WHO has continued to support research at the Christian Medical College Hospital, Vellore, on the etiology of anaemias in women and of tropical sprue.

8.89 Rickets is still highly prevalent in many parts of the world and, with SIDA assistance, WHO has sent a team of consultants to Algeria and Tunisia to study preventive measures that might be taken against this deficiency disease in the two countries and to ascertain whether further studies are needed before launching preventive programmes at the national level.

8.90 The Organization has continued to assist nutrition training courses for health workers at the Institute of Nutrition of Central America and Panama, Guatemala City; the National Institute of Nutrition, Hyderabad, India; the Caribbean Food and Nutrition Institute, Kingston, Jamaica; and the American University of Beirut, Lebanon. In addition, as part of a project for the provision of nutrition advisory services in the South Pacific, nutrition workshops are organized in various island territories, as required; FAO, UNICEF and WHO are co-operating with the South Pacific Commission in this project, which is based at Suva, Fiji.

8.91 In co-operation with FAO and UNICEF, the Organization continued to provide assistance to joint applied nutrition programmes, particularly in the Region of the Americas.

8.92 WHO also co-operates in the work of the Codex Committee on Foods for Special Dietary Uses,
which was created in 1965 by the FAO/WHO Codex Alimentarius Commission and meets each year in the Federal Republic of Germany. The 1971 meeting, held in Bonn in December, discussed the standardization of international regulations concerning foods for infants and young children, including complete infant foods, processed foods based on cereals and canned baby-foods. Other aspects of the joint FAO/WHO food standards programme are dealt with in paragraphs 1.245 and 10.39.

8.93 Workers' feeding programmes are rare in the developing countries, although it is generally recognized that they are of value. An FAO/ILO/WHO expert consultation was held in Rome, in May, to study ways and means of promoting such programmes. It was recommended that further studies should be made to obtain more conclusive data on the relationship between the feeding of workers and their health, efficiency and productivity.

8.94 The Organization continued to co-operate with the World Food Programme, notably by providing technical advice on new projects and contributing to the evaluation of projects that have been in progress for some time (see paragraph 12.42).
CHAPTER 9

EDUCATION AND TRAINING
FOR THE DEVELOPMENT OF HEALTH MANPOWER

9.1 The promotion of education and training is an essential element of WHO's assistance in all its programmes and the training of particular categories of health personnel is dealt with in the relevant sections of this Annual Report. This chapter is concerned with principles and procedures in education, including research on teaching methods and the development of new approaches, and with the co-ordination of various forms of assistance, such as the provision of teaching staff and fellowships.

9.2 Two events marked WHO's programme in the field of health manpower development during 1971: the action taken by the Twenty-fourth World Health Assembly in connexion with the Organization's assistance in the training of national health personnel, and the assessment made by the UNICEF/WHO Joint Committee on Health Policy of jointly assisted education and training programmes.

9.3 In May 1971 the Twenty-fourth World Health Assembly considered a report on measures that might be taken by WHO to assist countries further in the training of health personnel at all levels. The report, which had been prepared at the request of the Twenty-first World Health Assembly, incorporated the views of the regional committees on the question of health manpower development and the opinions expressed by members of the Executive Board at its forty-seventh session, and also took into account certain trends in the development of the Organization's education and training programme. The Assembly, in resolution WHA24.59, expressed the belief that a necessary condition for achieving the goal of training the required health personnel, particularly in developing countries, is the co-ordination of efforts of all Member States and of the relevant international organizations on bilateral, multilateral, regional and worldwide bases. It invited the Director-General to extend such co-operation, in particular with UNICEF, UNDP and UNESCO; to pay special attention, in the current and long-term education and training programmes of WHO, to the training of teachers for the medical schools of developing countries (see paragraph 9.16), and also to the continuing education of health workers (see paragraph 9.13); to intensify the study of the criteria for assessing the international equivalence of medical degrees and diplomas (see paragraph 9.8); and to proceed with the study of the outflow of trained personnel from developing to developed countries.

9.4 To improve and expand the assistance jointly provided by WHO and UNICEF for the training of health personnel, a detailed assessment was made of projects in this field, and a comprehensive report on the subject was submitted to the UNICEF/WHO Joint Committee on Health Policy at its eighteenth session, in February 1971. In its own report, which has been widely distributed to national health authorities, the Committee made a number of recommendations regarding future action by UNICEF and WHO, emphasizing in particular the importance of evaluating projects, of concentrating aid on certain priorities, and of helping in the establishment of national, regional and inter-regional training centres. It also recommended that assistance be given to governments in defining the types of auxiliary health workers required to meet their needs, in analysing the role of these workers in the health team, and in producing appropriate job descriptions to serve as a basis for designing their training programmes. Subsequently the Executive Board, at its forty-eighth session, reiterated the importance of placing emphasis on the training of health personnel for rural areas and the under-privileged sections of large cities.

9.5 The demand for more and better trained personnel has emphasized the need for more effective teaching methods. Recent developments in educational technology, particularly the application of the systems approach to teaching, are leading to the more rational use of teaching methods and material to enable students to attain well-defined objectives. This approach is only just beginning to be applied to the education and training of health staff, and it is the aim of the
Awards presented at the Twenty-fourth World Health Assembly

Upper left: Professor E. J. Aujaleu of France was awarded the Léon Bernard Medal and Prize for his outstanding achievements in public health and social medicine.

Middle left: Dr Chamseddine M. H. Mofidi of Iran received the Dr A. T. Shousha Medal and Prize for his most significant contribution to public health in the geographical area in which Dr A. T. Shousha served WHO.

Below: Professor Leonard J. Bruce-Chwatt of the United Kingdom (left) and Professor Augusto Corradetti of Italy (right) were the joint recipients of the Darling Medal and Prize, awarded for their contributions to malarialogy.
RIGHT-HAND PAGE
Upper right: A student is examined in obstetrics and gynaecology at a medical institute in Moscow.
Lower right: Mothers seek advice at a maternal and child health centre in India.

Family Health

LEFT-HAND PAGE
Information on family planning is important for the health of all members of the family, and particularly of mothers and children, whether given in the course of home visits in Costa Rica (upper left) or to Indian fathers (below).
WHO Publications

WHO publications during the year covered a range of subjects from insecticide resistance in arthropods to biological research in schizophrenia, from the International Health Regulations to the evaluation and testing of drugs for mutagenicity. A sampling of the 1971 publications, and of the languages in which they were issued, is shown below.

Right: One of the 40 photomicrographs that illustrate (in colour) the Histological Typing of Oral and Oropharyngeal Tumours (International Histological Classification of Tumours No. 4).
Organization to provide much-needed leadership and co-ordination of effort in this new field. Long-term objectives include the evaluation of audiovisual materials by collaborating institutes and field teams; the provision of an information service on evaluated audiovisual aids and on the methods and equipment needed for effective performance; the encouragement and support of research on improved teaching methods; and the application of the newer communications media to the training of health workers.

9.6 Activities during 1971 were concentrated on demonstrating to medical teachers and administrators recent advances in teaching methods as applied to the health field. A media centre was established at WHO headquarters, where teachers can obtain information on the sources and availability of audiovisual aids, see and try out for themselves examples of tested equipment, and study a display of various new approaches to educational technology selected from faculties and institutes in different parts of the world. The centre includes a workshop where teachers can practise techniques in preparing simple visual aids (especially overhead projector transparencies and slides); and receive guidance on the equipment, supplies and staffing required for a simple audiovisual production unit. In addition, media demonstrations were arranged at the Twenty-fourth World Health Assembly; at the Regional Office for the Western Pacific during the twenty-second session of the Regional Committee; at the Regional Office for South-East Asia during the fourth meeting of directors and representatives of schools of public health (see paragraph 9.12); in Dakar, on the occasion of the third of a series of workshops on medical education methodology for countries of the African Region; and in Craiova, Romania, where advice was given on recent trends in teaching methods that might be applicable in the new medical faculty.

9.7 The advantages and implications of individual study systems—which are being increasingly used in medical faculties—were discussed by a study group on the value of the programmed course in medical education that met in Geneva in November. It made recommendations on the way in which the Organization could assist in the co-ordination and development of individual and small group learning systems in medical education and in facilitating their distribution to short-staffed faculties and institutes in developing countries.

9.8 During the year the Organization sought the advice of members of the WHO expert advisory panel on professional and technical education of medical and auxiliary personnel and, through the Council for International Organizations of Medical Sciences, of the latter's professional society members regarding the definition of the term "physician", pursuant to resolutions WHA22.42 and WHA24.59 of the Twenty-second and Twenty-fourth World Health Assemblies. In the light of that advice a definition was drafted for submission in the first instance to the forty-ninth session of the Executive Board in January 1972. Of the several approaches to the problem of equivalence of medical degrees and diplomas, mentioned in the same resolutions, the assessment of student achievement and the comparability of curricula seem to be the most promising. A consultation was held in March to develop guidelines on the basis of which medical schools could design basic curricula, and another in July—with the assistance of UNFPA—to discuss, in particular, core curricula for the training of future primary-care physicians on the basis of the family as the smallest social unit.

9.9 WHO gave technical advice during the year to the Government of the Federal Republic of Germany on the setting up of a national institute for the appraisal of student performance in all medical schools of the country. This step towards the establishment of a central system for devising and scoring examination questions is the first initiative of its kind at national level, and it is hoped that it may serve as an example for other countries. The Organization is also assisting the Government of Switzerland regarding medical school capacity studies being carried out under the auspices of the Conférence Universitaire Suisse, whose mandate is to seek a solution to the admission problem at present faced by medical schools in Switzerland.

9.10 In accordance with recommendations made during consultations on the feasibility of research projects on the sociological aspects of medical education, research was started at two centres—the Department of Sociology of Bedford College, University of London, and the Department of Sociology in Community Medicine of the Mount Sinai School of Medicine, City University of New York; the aim is to obtain information on problems related to student failure, professional counselling for students, and their admission to medical school.

9.11 To help countries with the establishment of adequate institutionalized systems for the continuing education of health workers, the Central Institute for Advanced Medical Studies in Moscow has been entrusted with the collection of information on post-graduate education; and the first reports on the information obtained were widely distributed by WHO.
in 1971 to Member States, training institutions and interested individuals.

9.12 New developments in public health, including new techniques in the administration and organization of health services, have made it necessary to review the teaching of public health and place more emphasis on, *inter alia*, training in managerial sciences, research methodology and the application of operational research methods to the organization of health services. This was discussed at the fourth meeting of directors and representatives of public health schools, held in New Delhi in March 1971, when participants from the African, South-East Asia, Eastern Mediterranean and Western Pacific Regions considered teaching methods, specialization, the functions of the public health school and its role in the training of health auxiliaries. Work was begun during the year on the updating of the *World Directory of Schools of Public Health*, 1965.

9.13 International comparative studies on continuing education for doctors and on basic public health training programmes for physicians were made during the year, and the results are being analysed. WHO also co-operated with the International Epidemiological Association in the preparation of a guide to teaching methods in epidemiology.

9.14 An analytical study of the use of auxiliary health personnel was continued on the basis of a field research project started in 1969 in Egypt and later extended to Brazil and Hungary. The principal investigators met in Geneva in June 1971 to assess the work done and the difficulties encountered, and to orientate the study towards the practical objectives of improving the distribution of functions among the various members of the health team and redesigning their training accordingly.

9.15 An important project in this field was initiated during the year in Algeria with the establishment in the city of Constantine of an institute of health technology for the training of middle-level health personnel—mainly medical or health assistants and public health midwives—to staff the Algerian network of health units, particularly in rural areas. WHO is executing agency for this project, which is being carried out with the financial support of UNDP/ SF.

9.16 Health manpower development programmes require adequate preparation in educational science not only for future teachers of medicine and allied health sciences, but also for those already engaged in teaching. As part of WHO's comprehensive, co-ordinated, long-term teacher training pro-
Table 4. Assignments of teaching staff, 1971

1. For training professional personnel* (by subject)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Teachers</th>
<th>Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic medical sciences</td>
<td>43</td>
<td>363</td>
</tr>
<tr>
<td>Paediatrics, maternal and child health</td>
<td>12</td>
<td>65</td>
</tr>
<tr>
<td>Clinical and related fields</td>
<td>37</td>
<td>272</td>
</tr>
<tr>
<td>Public health and preventive medicine (including hospital administration and statistics)</td>
<td>16</td>
<td>135</td>
</tr>
<tr>
<td>Dental education</td>
<td>3</td>
<td>27</td>
</tr>
<tr>
<td>Nursing</td>
<td>91</td>
<td>811</td>
</tr>
<tr>
<td>Environmental health</td>
<td>12</td>
<td>98</td>
</tr>
<tr>
<td>Veterinary public health</td>
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<td>3</td>
</tr>
</tbody>
</table>

Total 215 1774

For training auxiliary personnel

<table>
<thead>
<tr>
<th>Country</th>
<th>Teachers</th>
<th>Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
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<td>Central African Republic 3</td>
</tr>
<tr>
<td>Algeria</td>
<td>5</td>
<td>Ceylon 3</td>
</tr>
<tr>
<td>Bolivia</td>
<td>1</td>
<td>Chad 1</td>
</tr>
<tr>
<td>Burma</td>
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<td>Congo 1</td>
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Total 271 2258

2. Countries and territories to which assigned (continued)

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<tr>
<td>Zambian Republic</td>
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* Some instructors were engaged in the training of both professional and auxiliary personnel.

Co-operation with other organizations

9.21 As in previous years, WHO co-operated with UNITAR (see also paragraph 9.31) in the organization of seminars—in particular, an inter-regional seminar on technical and financial co-operation, held in Geneva in September. It continued to co-operate with the Carnegie Endowment for International Peace; and it also provided lectures on various aspects of the human environment for the Ninth Graduate Study Programme organized by the United Nations in Geneva during July and August.

9.22 There has been a significant increase in the number of requests made by governments for assistance from UNDP/SF in the development of education and training projects, and WHO has provided advice to countries in the planning of such programmes. Activities financed from UNDP/SF and assisted by WHO included the Institute for Health Manpower Development at the Al Joumhouria Hospital in Aden, People's Democratic Republic of Yemen; the community-oriented faculty of medicine in Aleppo, Syrian Arab Republic; the Institute of Health Technology in Constantine, Algeria; the Institute of Health Manpower in Sana'a, Yemen; and the University Centre for Health Sciences in Yaoundé, Cameroon.

auxiliary health personnel for family planning activities were made during a consultation in January, and another consultation was held in June to consider the educational methods, audiovisual aids and relevant evaluation procedures that could be utilized in family planning training programmes for health personnel in general. Proposals include the preparation of a special cadre of educators; the establishment of regional centres to provide information and assist in the organization of training programmes; and the adaptation of educational methods and audiovisual aids to local needs and resources. In addition, a study group met in Geneva in December to review principles and methods for developing education and training programmes in family planning as an integral part of health services. Assistance was provided during the year to several health training institutions in the revision of their curricula to include human reproduction, family planning and population dynamics in basic, postgraduate and in-service training programmes; and a WHO staff orientation course on the health aspects of family planning was organized in Geneva in October. 1

1 Staff training activities in other fields are dealt with in paragraph 14.24.
9.23 The activities relating to education in family health have been carried out with assistance from UNFPA.

Fellowships

9.24 The steadily increasing needs of Member States for assistance in the further education of their health service staff are reflected in the wide variety of fellowships provided by WHO. Although these are mainly allocated to postgraduate studies, many are awarded for undergraduate studies, and some for observation visits by senior health personnel and teaching staff. The WHO programme for the training of doctors for Zaire, and for Burundi and Rwanda, has been very successful. Of the 154 medical assistants from these countries who received WHO fellowships for studies in France and Switzerland between 1960 and 1971, 150 have now graduated and are employed in the health services of their own countries, many of them holding positions of high responsibility. A large number of fellowships are also provided for participants in meetings and other educational activities organized by WHO.

9.25 The range of subjects for which fellowships are requested and the number and variety of institutions providing training continue to increase. Countries that previously sent students abroad for training are now receiving fellows in their own institutions. Increasingly, Member States are seeking to place their students in the comparable conditions of neighbouring countries, or even within their own country, rather than sending them to some distant country where the facilities are very different from those available at home. Students from developed countries are seeking training in less developed areas, and the former one-way traffic is becoming a network of exchanges, demanding close international co-operation and goodwill. The educational institutions (including those of industry) of receiving countries, in particular, have demonstrated over the years their willingness to take on a considerable additional teaching load and to place their facilities at the disposal of WHO fellows, and countries sending fellows are, for their part, paying greater attention to the selection of students.

9.26 Since 1948 WHO has granted some 40 000 fellowships, and the present annual figure is about 4000. The rapid growth and the diversity of the fellowships programme have made it necessary to seek improved administrative methods, and consideration is being given to the possibility of using the computer as an aid to administration and evaluation. In this connexion a new master list of subjects based on the Programme Information Retrieval System code has been prepared; it will greatly facilitate cross-referencing with country programmes and other aspects of the Organization's assistance to countries.

9.27 From 1 December 1970 to 30 November 1971, WHO provided assistance to enable 5774 individuals to study abroad. The Organization awarded 3317 fellowships for study, including 214 for undergraduate study, and 2457 fellowships for participants in meetings or other educational activities organized by WHO. Further information on fellowships awarded in relation to particular countries and projects may be found in Part III. Annex 9 summarizes the number of fellowships by subject of study and by region.

9.28 Further information on grants awarded under the WHO research training programme is given in paragraph 11.7 and in Annex 8.

Library and documentation services

9.29 “Medical literature services to Members” was selected by the Twenty-third World Health Assembly as the subject for an organizational study, and the Executive Board, at its forty-seventh session, considered a report by the Director-General containing a general statement of the origins, development, nature and role of medical literature, and a brief review of the services available to facilitate its utilization. The Board recommended that, in view of the complexity of the subject and the need to obtain further information from Member States, the study should be continued for another year. This recommendation was adopted by the Twenty-fourth World Health Assembly, in May 1971, and questionnaires have been sent to Member States requesting supplementary information both on general biomedical literature and on WHO publications; an analysis of the replies received will be submitted to the Executive Board at its forty-ninth session.

9.30 The preparation and maintenance of the bibliography on medical education were completely reorganized, the basis of selection was broadened and the literature indexed in depth. Nearly 9000 citations are now contained in this card index, which covers the years 1956 to date; over 750 of these were added during 1971. Bibliographical inquiries have been invited from medical schools and libraries throughout the world, and during the year 63 requests were received and answered.

9.31 Extensive use was again made of the WHO Library for training purposes, both for WHO medical library fellows and for groups interested in modern methods of documentation and in the application of computer technology to library work. WHO collaborated with UNITAR in the organization of an orientation seminar on documentation of international organizations of the United Nations system; the seminar, held in March, was intended for the staff of permanent missions to the United Nations in Geneva. The numerous experiments and rapid developments in the application of computer technology to documentation, particularly to the retrieval of information, have made it essential to establish international cooperation and standardization, and WHO has participated in a number of meetings in this connexion. The Library continued to provide assistance to the Regional Library of Medicine in São Paulo, Brazil (see paragraph 16.142) and the number of publications exchanged increased during 1971.
CHAPTER 10

PHARMACOLOGY AND TOXICOLOGY

Pharmaceuticals

10.1 Recent advances and new concepts in pharmaceutical science have made it possible to ensure a greater measure of control over the quality of pharmaceutical preparations. This development was taken into account by the WHO Expert Committee on Specifications for Pharmaceutical Preparations, which met in April-May 1971, in considering the revision of the second edition of the International Pharmacopoeia. This expert committee recommended that the revision should start with the general monographs on tablets, capsules and injections, since these affect many of the individual pharmacopoeial monographs. It was considered that certain groups of drugs, such as tetracycline derivatives, steroids, phenothiazine derivatives and crude drugs, required special attention, and general principles for devising tests applicable to each group were suggested.

10.2 Thirty-three provisional monographs for newer drugs were adopted by the committee and are annexed to its report. These specifications are the result of collaboration between a number of laboratories; technical help in connexion with monographs for radioactive pharmaceuticals was provided by IAEA.

10.3 The committee also reviewed the replies received from Member States in response to the request of the Twenty-third World Health Assembly, in its resolution WHA23.45, for suggestions for improving the requirements for "Good Practices in the Manufacture and Quality Control of Drugs". No changes in the principles underlying the requirements were proposed, but the committee found it necessary, in the light of the comments received, to recommend certain textual amendments to clarify the meaning of some passages. The recommended changes are published as an annex to the expert committee's report.

10.4 In its resolution WHA24.56, the Twenty-fourth World Health Assembly requested the publication of a list of countries where the authorities responsible for the quality control of drugs recognize and implement the requirements for "Good Practices in the Manufacture and Quality Control of Drugs" and the certification scheme on the quality of pharmaceutical products moving in international commerce. A circular letter was sent to Member States asking them to provide the appropriate information before 31 December 1971.

10.5 The Organization was represented at a symposium on good manufacturing practices held in Geneva by the International Federation of Pharmaceutical Manufacturers Associations in September. The participants included more than 500 government officials and industrial and other specialists from 15 of the main drug-manufacturing countries. The discussions showed the considerable importance attached to the WHO recommendations for improving the quality of drugs in international commerce.

10.6 A supplement to the second edition of the International Pharmacopoeia was published. It includes new monographs for antituberculosis drugs and radioactive pharmaceuticals, new or amended appendices, and various alterations to monographs that appeared in the second edition. The monographs in this supplement, together with the provisional monographs appended to the report of the WHO Expert Committee on Specifications for Pharmaceutical Preparations (see paragraph 10.2), are intended for use in the quality control of drugs in international commerce. Some are being used in UNICEF/WHO-assisted projects, and the monographs for radioactive pharmaceuticals served as teaching material at an inter-regional training course on the preparation and control of radiopharmaceuticals which was organized jointly by IAEA and the Government of Czechoslovakia in Prague, in November-December, and at which a paper was presented by WHO.

10.7 The WHO Centre for Chemical Reference Substances, in Stockholm, has extended its facilities

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in order to meet the increasing demand for international chemical reference substances in connexion with the WHO programme on specifications for pharmaceutical preparations. Work to establish some 30 new reference substances is now in progress. The Organization also presented documentation for discussion at a colloquium on international pharmaceutical reference standards, held jointly by the International Pharmaceutical Federation and the American Pharmaceutical Association/Academy of Pharmaceutical Sciences in Washington, D.C., in September.

10.8 The twenty-fifth and twenty-sixth lists of proposed international nonproprietary names for pharmaceutical substances, containing 98 and 77 names respectively, were published in the *WHO Chronicle*. A third cumulative list of proposed international nonproprietary names was published, comprising the 2734 names previously published in lists 1-25. An eleventh list of recommended international nonproprietary names, consisting of 165 proposed names to which no objection had been filed or in respect of which objections had been withdrawn, was also published in the *WHO Chronicle*.

10.9 The Organization has continued to help governments with the development of their facilities for drug quality control, providing advisory services and organizing regional meetings such as the regional seminar on the quality control of drugs at inspector's level held in Bangkok in January-February 1971.

**Biological standardization**

10.10 Under its biological standardization programme, WHO has established international standards and reference preparations for over 150 biological substances used prophylactically or therapeutically in human and, to a lesser extent, veterinary medicine. It has also established some 120 international reference reagents to be used in diagnosis for the identification of micro-organisms.

10.11 Meeting in November, a WHO expert committee on biological standardization considered the establishment of international biological standards and reference preparations for the antibiotics doxycycline, lymecycline, and clindamycin and discussed the need for replacing gramicidin S. The discontinuation was proposed of certain reference preparations established many years ago, notably those for arsenicals and melaminyl trypanosomicides, on the grounds that these substances had been largely superseded by other drugs and pure chemical samples could be used for reference purposes. However, it was not clear how this would affect control laboratories which still use these preparations, even if only to a limited extent. A further proposal was made for the discontinuation of the International Standard for Vitamin D3; this would, however, give rise to complications since the international unit would probably continue to be used, as was the case when the International Standard for Vitamin A was discontinued several years ago.

10.12 It was decided to replace the International Reference Preparations of Cholera Vaccine (Inaba) and Cholera Vaccine (Ogawa) by preparations of monovalent cholera vaccines which had been shown, in an international collaborative assay, to have greater antigenicity. As a result, certain provisions concerning antigenicity testing in the revised Requirements for Cholera Vaccine had to be reconsidered.

10.13 The expert committee also reviewed progress in work for the replacement of the international standards for several other immunological substances, including diphtheria toxoid (plain), pertussis vaccine, certain blood-typing sera, diphtheria antitoxin for use in flocculation tests, gas-gangrene antitoxin (histolyticus) and certain veterinary antisera.

10.14 The Requirements for Poliomyelitis Vaccine (Oral) were originally published in 1962 and revised in 1966. Recent scientific developments and further experience in the manufacture and control of this vaccine have necessitated yet another revision. The expert committee adopted the newly revised requirements, which now include provisions for oral poliomyelitis vaccine prepared by growing the virus on human diploid cells—a procedure with many advantages which is now followed in several countries.

10.15 The research programme to improve existing requirements for biological substances continued to develop. A collaborating group of six laboratories for research and reference services is being established; reports on studies at these and other laboratories on the potency assay of diphtheria and tetanus toxoids will be published in the *Bulletin of the World Health Organization*. Other work in progress includes studies of mouse strains for pertussis vaccine assays and of methods for the evaluation of immunizing potencies.

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of diphtheria and tetanus toxoids in animals and man. Toxoids suitable for administration to man have been prepared for these studies and are being tested simultaneously in the laboratory and the field.

10.16 Efforts to promote the development of national control laboratories for biological substances have been pursued. A guide to the provision of technical facilities for this purpose was published in 1970 as an annex to the twenty-second report of the WHO Expert Committee on Biological Standardization,¹ and since then the Organization has been collecting information on the facilities available within each Region. This information should make it possible to provide more extensive advisory services to countries interested in producing better vaccines and organizing wider immunization programmes, thus helping them to ensure a measurable degree of control over the quality of biological products.

Drug efficacy and safety

10.17 During the past five years, advanced methods for testing the mutagenicity of drugs have been added to the existing screening tests for drug toxicity. These methods, using small laboratory animals, permit the establishment of mutagenic dose-response curves that can be correlated with those of other important biological effects. Although specific figures cannot yet be adduced to show the potential benefits of these recent advances, the risk of a chemically induced increase in the mutation rate in man can probably will be lowered. A WHO scientific group, which met in Geneva in July 1971 to formulate generally acceptable principles and requirements for evaluating and testing substances of possible therapeutic interest for mutagenic effects, once again stressed the importance of at least evaluating, if not testing, all drugs for mutagenic potential. In its report,² the group gives guidance on priorities for testing and reviews methods that could be helpful in initiating a testing system.

10.18 WHO is supporting research on the relationship between morbidity and drug consumption, in which investigators in Norway, Sweden and the United Kingdom are taking part. A solution is needed to many of the methodological problems connected with the collection and interpretation of data in order to be able to make comparisons between countries. The principal investigators met twice during the year—in Oslo in April and in Geneva in November—to discuss the research problems involved and priorities for investigation.

10.19 One form of morbidity associated with drug consumption is excessive use of combinations of analgesics. In most cases phenacetin is involved, but there is mounting clinical evidence that other analgesics, including aspirin, may produce papillary necrosis. This problem demands the attention of doctors, pharmacists, pharmaceutical specialists and governments, since renal disease caused by common "over-the-counter" analgesics is obviously preventable.

10.20 WHO is supporting a study being carried out by Professor U. C. Dubach and co-workers at the University Polyclinic, Basle, Switzerland, to assess, over a period of five years (1968-1972), the risk of kidney damage due to the abuse of analgesics. Laboratories in the Federal Republic of Germany and the United States of America are collaborating in this controlled study, which covers more than 1000 women aged 30-49 years who have shown metabolites of phenacetin on two consecutive urinary examinations. Analysis of the data should permit a quantitative evaluation of the risk involved and lead to the establishment of appropriate preventive measures.

10.21 The exchange, through WHO, of information on decisions by governments to limit the availability of specific drugs for reasons of insufficient safety or lack of efficacy continues, and ten such decisions were notified during 1971. The Twenty-fourth World Health Assembly was presented with an outline of basic principles of drug control and guidelines for the organization of a national regulatory agency for drug control, together with a review of ways in which WHO could assist governments in this connexion. This document was prepared in response to the request of the Twenty-second World Health Assembly, in its resolution WHA22.41, that the Director-General should “examine possible ways of providing advice to governments in developing machinery for evaluating the therapeutic safety and efficacy of drugs”.

10.22 WHO is co-operating with UNIDO, which is promoting the manufacture of pharmaceutical substances in developing countries, notably by advising on questions of drug safety, efficacy and quality. A study of the special problems of the developing countries in the field of pharmacotherapy was undertaken by the Organization during the year. An extensive collection of literature on the subject from the countries concerned was assembled and is being evaluated.

Drug monitoring

10.23 Incomplete knowledge of the type, frequency and severity of adverse reactions to drugs is a major weakness of modern pharmacotherapy, and a number of countries have accordingly established national centres to monitor such reactions. On the basis of case reports of suspected drug reactions from practising physicians, hospitals, medical journals and drug manufacturers, these centres try to establish, as soon as possible after a drug goes on the market, whether it is liable to produce undesirable effects not detected during its clinical trials and the approximate frequency and importance of such effects.

10.24 WHO has continued to advise and support both existing and planned national drug monitoring centres in many parts of the world. In September, the Organization convened a meeting in Geneva to advise on the organization, functions and responsibilities of national drug monitoring centres and review their contribution to pharmacotherapy and the safety control of drugs.

10.25 The meeting recommended that existing centres should extend their activities to include the systematic monitoring of populations, and that available health statistics and drug utilization records should be used for this purpose. It was considered that Member States without national centres should investigate the possibility of establishing drug monitoring systems, particularly as this would facilitate studies of the possible influence of environmental and ethnic factors on the frequency and nature of adverse reactions to drugs in different population groups.

10.26 The WHO project for international drug monitoring, initiated in 1968 at Alexandria, Va., USA, was transferred to WHO headquarters in Geneva at the beginning of 1971 and has now entered its primary operational phase. National monitoring centres in 12 Member States are actively participating in the project. Methods for the processing, recording, linkage and retrieval of reports of adverse reactions to drugs have been developed, together with systems for signalling new or increasingly reported reactions. By 1 October 1971, the files of the project contained almost 27,500 reports of suspected reactions to more than 1900 different drugs, recorded under their nonproprietary names. Patterns of drug reactions in different countries are being studied, as well as the occurrence of serious or unusual drug reactions and interactions.

10.27 The WHO-assisted studies for identifying patients receiving certain drugs and determining the pattern of suspected drug-induced diseases are being co-ordinated for use in the medical and scientific investigation of suspected reactions detected by the WHO international monitoring system. Intensive hospital monitoring systems in Aberdeen and Dundee, Scotland, are collaborating in this work.

10.28 The integration of data from hospital monitoring systems in Canada, the United Kingdom, and the United States of America was continued during 1971, as were studies at two poison control centres in France on the correlation between cases of accidental poisoning by drugs and adverse reactions to drugs used therapeutically. A survey of the extent and severity of drug reactions in a community health centre in the Netherlands is also in progress.

Drug dependence

10.29 The increase and spread of drug-taking, particularly among young people, continued to be a major preoccupation of the health authorities in many parts of the world. In approaching the problem, several interacting factors must be considered: the personal characteristics of drug-takers, their broad and immediate socio-cultural environments, the properties of the drugs involved and the amounts taken. Moreover, multiple drug use appears to be on the increase: a growing number of individual users are taking more than one type of drug, and the use of cannabis is spreading in countries where alcohol is widely used.

10.30 Measures to reduce the self-administration of dependence-producing drugs include limiting their availability by means of controls on their licit and illicit production and distribution; limiting the demand for them through educational, treatment, rehabilitation and other community services; and furthering knowledge of the causes, extent and consequences of drug use and the relative merits of different approaches to its treatment and prevention.

10.31 WHO was represented at a United Nations conference of plenipotentiaries, held in Vienna in January-February 1971, at which a new convention on Psychotropic Substances was adopted. This convention, which provides for various levels of control over specified psychoactive drugs hitherto not subject to international control, will become operative once it has been formally accepted by 40 countries. WHO contributed to the preparatory work on the convention, advising on the selection of drugs requiring control at different levels and providing technical data on some 250 psychoactive substances. Originally assembled for the WHO Expert Committee on Drug Dependence, these data were published by the Organization...
at the end of 1970. During 1971, the Organization also considered the status of two drugs notified under existing instruments for the international control of narcotics. Throughout the year the governments of a number of countries have been engaged in revising their laws and regulations on dependence-producing drugs and in bringing additional drugs under control. The guidelines provided by the new international convention and by the seventeenth report of the WHO Expert Committee on Drug Dependence have proved helpful in this connexion.

10.32 A number of international, national and local organizations, both official and voluntary, have been extremely active in efforts to reduce the demand for drugs and limit their availability. They have been particularly concerned with securing a better knowledge of the problems involved and the services needed to deal with them, with disseminating information among those responsible for public policy in respect of drug-taking and for the management of drug-takers, and with establishing the necessary services for treatment and rehabilitation. The establishment during the year of the United Nations Fund for Drug Abuse Control should provide a new source of assistance to projects, particularly in the developing countries, for the reduction or control of supplies of specific dependence-producing drugs or the provision of services for prevention, treatment and rehabilitation. The fund is financed by voluntary contributions.

10.33 In its resolution WHA24.57, the Twenty-fourth World Health Assembly observed that the self-administration of narcotic and non-narcotic dependence-producing drugs is rapidly becoming a major world health problem, approved the expansion of the Organization’s programme on drug dependence proposed by the Director-General, recommended that governments of Member States be assisted, on request, in developing procedures for the co-ordination of their national programmes in this field and that WHO continue to collaborate with other international organizations and agencies in planning and implementing international programmes. Under the expanded programme referred to in the World Health Assembly’s resolution, selected institutions and members of WHO expert advisory panels would provide regular brief, factual reports on drug dependence in various geographical areas. In addition, epidemiological planning and monitoring systems to foster comparability in studies of drug use and dependence would be developed, together with more extensive research and training programmes, including collaborative undertakings involving a number of institutions.

10.34 The first inter-regional course for national programmes on problems of alcohol and drug dependence was held by WHO in the Netherlands, Poland and the United Kingdom in September-October (see paragraph 3.76). In many parts of the world the number of older persons dependent on alcohol and sedatives undoubtedly exceeds the number of young people dependent on cannabis preparations, central nervous stimulants, hallucinogens and narcotics. The excessive use of alcohol by young people is, moreover, becoming a matter of concern in various countries. The course was designed in part to examine ways and means of improving the co-ordination or integration at the national level of the various official and voluntary drug-dependence programmes carried out by different agencies.

10.35 Drug dependence was the subject of the technical discussions held in Madrid on the occasion of the twenty-first session of the WHO Regional Committee for Europe in September. As members of the Committee had expressed particular concern about drug dependence at previous sessions, an increasingly active programme has been developed in this field in the European Region, covering epidemiology, prevention, treatment and research. A working group on measures for the prevention of drug abuse and dependence, which met in the Hague in April, outlined specific preventive goals and recommended suitable approaches to each of them.

10.36 A WHO study group on youth and drugs, held in Geneva in October, reviewed the various interacting factors involved in the non-medical use of drugs. The group noted that, although many societies appear to be more concerned about the use of “newer” drugs, especially by younger people, the number of casualties from the non-medical use of drugs is still highest among older people using substances that have been taken for centuries. Nevertheless, the serious individual, public health and social problems associated with the use of certain drugs, in particular by young people of all socio-economic classes, continue to increase in many parts of the world, although in some they are perhaps levelling off. The group noted that, since the causes of drug dependence are multiple and a given person may use drugs at different times for different reasons, a balanced community approach is necessary in dealing with drug-taking behaviour among all age-groups. The group suggested ways in which knowledge about the causes and extent of drug

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dependence might be improved and considered the relative effectiveness of different approaches in prevention and treatment.

10.37 At a round-table conference on the non-medical uses of dependence-producing drugs, held in Geneva in October by the Council for International Organizations of Medical Sciences, with the participation of UNESCO and WHO, the administrative, psychiatric, sociological, legal and scientific aspects of the subject were reviewed. Among the topics discussed were: factors associated with the use of dependence-producing drugs, including alcohol; current patterns of drug abuse in various countries; and preventive approaches, including community-based programmes.

10.38 A WHO scientific group met in Geneva in November to review present knowledge on how opiates of natural origin compare with the available fully synthetic alternates from the point of view of effectiveness and adverse effects, including dependence liability, particularly when used for the relief of pain, cough and diarrhoea. After reviewing a series of studies on the subject published by WHO over the past 17 years,1, 2 the group considered that the natural and semisynthetic opiates are not indispensable to the practice of modern medicine. Synthetic alternates exist that are equivalent—and in certain respects may be superior—to the natural and semisynthetic compounds although for the most part they retain the same disadvantages, especially with regard to dependence liability.

Food safety

10.39 The basis for national food legislation as it is known today was established in the last century. By now most of the world's more developed countries have complex national food legislation, but in many cases this needs revision in order to take recent developments in food technology into account. In addition, a number of the newly independent and developing countries are now preparing basic food laws and introducing systems of food control. Hence, there should be internationally acceptable food standards designed to safeguard the health of the consumer, and national legislation on food should not conflict with these standards. These considerations led to the establishment in 1963 of the joint FAO/WHO food standards programme, the principal organ of which is the Codex Alimentarius Commission.

10.40 To date, the Commission has 93 Member countries. Approximately 200 standards for foodstuffs are at present being prepared by various subsidiary bodies of the Commission. These standards cover the essential composition and quality of the foodstuffs concerned, the maximum permissible limits for food additives and contaminants, tolerances for pesticide residues, questions of hygiene, weights and measures and labelling requirements. They take several years to prepare and require extensive intergovernmental co-operation. In 1971 the second set of a series of recommended standards was distributed to governments for acceptance.

10.41 The Commission also formulates advisory codes of hygienic practice for the handling, protection and processing of foods; these have been favourably received by the various governments. A new committee on meat hygiene has been established by the Commission, and an ad hoc meeting of experts was held in November to review the proposed code for ante- and post-mortem inspection of meat animals (see also paragraph 1.249). The Commission also recommends methods for the analysis of various food ingredients, additives and contaminants. Unlike the standards, these are not mandatory.

10.42 Two important subsidiary bodies of the Commission are its committees on food additives and on pesticide residues, which work in conjunction with the joint FAO/WHO Expert Committee on Food Additives and the FAO/WHO Joint Meeting on Pesticide Residues. Because of the increasing use of additives and pesticides in the last decade, internationally accepted rules on the use of these substances and the levels that can be permitted in foods are necessary to safeguard the health of the consumer.

10.43 At the eighth session of the Codex Alimentarius Commission, in June-July, it was recommended that a joint FAO/WHO food standards conference should be held in Africa in 1973. The acceptance thus far received for Codex standards were reviewed, and their evaluation by the Commission at a later meeting was recommended. A number of commodity standards were recommended for distribution to Member governments for acceptance.

10.44 In 1970, as a result of increasing concern over the use of food additives, the Twenty-third World Health Assembly passed a resolution (WHA23.50) establishing a food additives information service similar to that in operation for drugs. In the course of 1971 eight information sheets concerning the prohibition or limitation of use of food additives were received by WHO and distributed to governments.
10.45 The use of additives in prepackaged baby food and the question of their safety were discussed at a special joint FAO/WHO meeting and then by a Joint FAO/WHO Expert Committee on Food Additives, both of which met in Rome in June. In its report the expert committee set forth the general principles to be used in assessing the health hazards associated with additives and contaminants in baby food and evaluated the safety of a number of other substances. It also called attention to the need for more extensive toxicological data. In addition, a number of substances, including modified starches, which are extensively used in foods, were evaluated by the committee, and all except one assigned a temporary acceptance. Acceptance, subject to good manufacturing practice, was assigned to most of the enzymes obtained from edible parts of animals and plants. In evaluating enzymes from other sources, the usual toxicological criteria were applied. Nine miscellaneous food additives in current use were evaluated and seven were assigned limited or unlimited, temporary or regular, acceptable daily intakes.

10.46 An estimate of potential intakes for a number of additives, presented by WHO at a meeting of the Joint FAO/WHO Expert Committee on Food Additives in 1970, has received widespread recognition as a criterion in assessing permissible levels of use of food additives. In order to improve the accuracy of the data, a further study is planned in collaboration with countries carrying out dietary surveys.

10.47 Because of worldwide concern about the possible hazards to man of pesticide residues in food, a joint meeting of the FAO Working Party of Experts on Pesticide Residues and the WHO Expert Committee on Pesticide Residues was held in Geneva in November. On the recommendation of the Codex Alimentarius Commission, the meeting gave priority to pesticides of importance in international trade. Eight pesticides were considered, six of them—chloromequat, chlorfenvinphos, fenthion, trichloronat, trichlorfon, and the oxygen analogue of dimethoate—for the first time. Sufficient toxicological information was available to permit acceptable daily intakes to be established for six of these pesticides. Further information on the potential intake of pesticides residues in the normal diet in certain countries was reviewed, and it was recommended that this study should be continued and expanded.

10.48 As there have been many outbreaks of poisoning following the consumption of sea fish not normally considered toxic, a project for the surveillance of biotoxins in sea fish used as food was prepared in consultation with FAO and submitted to UNDP. It is hoped that, by ensuring the safety of such fish for the consumer, this project would permit a fuller use to be made of seafood, particularly in those tropical areas where the problem is most acute. The project would be co-ordinated by WHO in close conjunction with FAO and existing research establishments.

10.49 In view of widespread concern about the presence of mercury in certain fish, the Organization is collecting data on the subject from a variety of sources. Modest financial support was given to a number of research institutes to enable them to assist with the compilation and consolidation of the necessary information. The toxic hazards presented by mercury will be discussed at the next meeting of the Joint FAO/WHO Expert Committee on Food Additives, scheduled for 1972.

10.50 A paper on the identification, effects and control of chemical contamination of food chains was jointly prepared by FAO and WHO for the United Nations Conference on the Human Environment, to be held in Stockholm in 1972.

10.51 At the request of the Polish authorities, the Organization advised the State Institute of Hygiene, Warsaw, on various aspects of the problem of pesticide residues and contaminants in food.

10.52 Although the value of irradiation in the processing of certain foods is established, the safety of products treated in this way is not always certain. Further data on the subject are being gathered through WHO-supported and other studies, which will be evaluated by a joint FAO/IAEA/WHO expert committee on irradiated foods. A previous joint expert committee on the subject, held in 1969, recommended the temporary acceptance of certain irradiated foodstuffs. WHO is taking part in an advisory capacity in an international project on the safety of irradiated foods, sponsored by IAEA and the European Nuclear Energy Agency.

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11.1 Research is an intrinsic element of all WHO's operational programmes, and accounts of particular research activities—whether conducted by WHO itself or, more commonly, stimulated, sponsored and co-ordinated by WHO—will be found throughout this report under the relevant headings. The present chapter summarizes some of the general aspects of the Organization's co-ordinated research programme and some developments in research in epidemiology and communications science.

Co-ordination of medical research

11.2 Much of the co-ordinated research programme continued to be conducted through the network of WHO international and regional reference centres, on which the Organization relies heavily, and with the help of national laboratories and institutions undertaking collaborative research projects. The reference centres are listed in Annex 6, where asterisks indicate the international reference centre, the five regional reference centres and the research and training centre that were designated in 1971, bringing the total number of centres to 206 at the end of the year. The work of the collaborative research projects in 1971 is referred to in the appropriate sections of this report; 226 new projects were initiated during the year, bringing the number of such projects in operation in 1971 to 950.

11.3 Advice on what research is needed in a variety of fields and on how best to apply or advance knowledge in those subjects was supplied during the year by 15 scientific groups convened by WHO. The subjects they dealt with were: human development and public health; development of environmental health criteria for urban planning; treatment of haemoglobinopathies and allied disorders; genetic aspects of family planning; research in epidemiology and communications science; principles for the evaluation and testing of drugs for mutagenicity; inherited blood-clotting disorders; standardization of techniques for the collection and reporting of data on community water supply; mental health aspects of human reproduction; clinical immunology; oral enteric bacterial vaccines; opiates and their alternates for pain and cough relief; prevention, treatment and rehabilitation in genetic disorders; etiology and prevention of dental caries; and vector ecology. Details of these meetings are given in the relevant sections of this report.

11.4 A critical examination of certain aspects of the Organization's research programme is made annually by the Advisory Committee on Medical Research. At its thirteenth session, in June, it considered in depth programmes concerned with research on the ecology and biology of vectors (see Chapter 2), and with mathematical models in health planning research (see below). Short progress reports were presented on action taken on suggestions and recommendations made by the committee at its previous session.

11.5 The committee discussed at length the problems created by the adverse effects of environmental influences on health and examined research approaches to these problems. It also noted that the beneficial effects of environmental components deserve precise identification and study.

11.6 The committee examined the reports of six scientific groups—on psychogeriatrics; the prevention of Rh sensitization; methodology for family studies on genetic factors; microbiol sensitivity testing of antibiotics; methods of fertility regulation (advances in research and clinical experience); and the use of cannabis.

11.7 Under the WHO research training programme 59 grants were awarded in 1971 to enable research workers to work abroad and widen their research experience with a view to increasing their contribution to the research activities of their own countries on their return. In addition, 38 grants were awarded to promote the exchange of scientific knowledge by investigators working on subjects of interest to WHO by enabling them to visit scientists in other countries working in similar or related fields. The research grants awarded for training and exchange are shown, by subject and type of grant, in Annex 8.

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1 See *WHO Chronicle*, 1971, 25, 385-395 for a review of this session of the Advisory Committee on Medical Research.
11.8 WHO continued its co-operation with the Council for International Organizations of Medical Sciences (CIOMS) in the various activities of the latter (see also paragraph 10.37). The pilot project for the preparation of a list of names of diseases recommended for international use, as a complement to WHO's International Classification of Diseases, having been completed in 1970, CIOMS has begun the implementation of the project itself in co-operation with WHO. During the year drafts were prepared for communicable diseases, cardiovascular diseases, diseases of the blood and blood-forming organs, diseases of the digestive tract, and diseases of the lungs.

Developments in epidemiology and communications science

11.9 In accordance with the policy adopted in January 1971 after a review by the Executive Board at its forty-seventh session, the Organization's programme of research in epidemiology and communications science continued to be marked during 1971 by a reorientation of activities towards the primary objective designated as "planning for health". As part of this programme three main areas have been defined which, although diverse in their subject matter, are interconnected and closely related to this central theme. These areas are: (a) the organization and strategy of health services, dealing with the organizational problems of public health decision-making at an operational level; (b) scientific studies of single diseases with well-defined mechanisms, for which the population dynamics can be described in some detail; and (c) scientific studies of complex multifactorial health problems, with special emphasis on human ecology. It is believed that multidisciplinary research in these three specific areas will provide knowledge by which a more comprehensive programme of planning for health may be developed.

11.10 Within these three areas some twenty interregional projects or other research activities were being conducted in 1971, and in the majority of these the field work or the data analysis was largely completed by the end of December. Thus at the year's end the programme was in five main continuing spheres of action, together with a number of activities on a lesser scale and of new projects due to be initiated or to be put into effective operation in 1972. The five main aspects were: a programme of comprehensive health planning research (in the area of the organization and strategy of health services); research into the epidemiology and control of malaria in the African savanna (in the area of scientific studies of single diseases); and (related to scientific studies of complex multifactorial problems) a study in the Netherlands and the USSR of the methodology of public health intervention for disease prevention; research in the mathematical theory of communicable disease; and research into the applications of biomedical engineering to epidemiology.

11.11 By its very nature the research conducted in the course of the projects that have been terminated does not lend itself to brief summary (much of it is being prepared for formal publication), and only interim results can be reported for the continuing activities. However, it may be of interest to indicate some of the types of findings that have been made and the lines along which research continues.

11.12 In the area concerned with the organization and strategy of health services, a social and economic analysis of health service patterns in Tunisia was successfully terminated during the year. Final analysis was completed of the data that had been collected in 1969 and a report was presented to the Tunisian Government. It dealt with the methodological and operational problems encountered in studying the utilization of health services in a developing country such as Tunisia, gave the substantive findings made, and suggested the implications for future action by the Ministry of Health and for further research in health planning and the development of health information systems.

11.13 A long-term programme of comprehensive health planning research in Colombia is being carried out jointly by the Colombian Government, PAHO and WHO. The overall objective is to develop a method for introducing new elements into an existing comprehensive health planning system to render it more efficient and better adapted to local needs and resources. A pilot project was started in 1970 with the immediate objective of preparing a detailed protocol for the long-term research and development programme. This protocol, which was completed in 1971, outlines the conduct of the second phase of the programme—involving an analysis of the health planning system in the country, and its relationship to the health services—on the basis of the description of the health and health planning situation in the Department of Valle that was compiled during the pilot phase. A paper on the epidemiological aspects of the long-term programme was presented to the International Epidemiological Association in September.1

11.14 A study of the mechanism of decision-making in a health ministry which was carried out in Bogotá and Cali, Colombia, was also completed during the year. As a health planner's functions include the submission of alternative health strategies to those responsible for taking the decisions it is essential to know who the health decision-makers are, what type of decisions they make at what levels, and what constraints affect them. So far, there have been few data on this in the health field. This study, which is being prepared for publication, describes a health decision network from the ministerial to the peripheral level and links the findings to the executive groups responsible for implementing decisions on health matters.

11.15 As part of the operational aspect of research in health planning, efforts are also being undertaken to evaluate national health planning systems in order to seek out planning methods, procedures and approaches in one country that may have useful application to others. The health planning system in the USSR was selected for study in 1971. A multidisciplinary group, consisting of experts in the disciplines of epidemiology, operational research, the behavioural sciences, health administration and health planning, visited national and regional planning organizations in the Soviet Union. The methods of health planning from the level of the Supreme Soviet down to village level in one of the republics in the Soviet Union were examined for features of particular relevance to developing countries.

11.16 Apart from the research project on schistosomiasis in man-made lakes (see paragraph 2.52) on which a beginning was made during the year, the major continuing study of single diseases with well-defined mechanisms is the investigation into the epidemiology and control of malaria in the African savanna, to which reference has been made in paragraph 2.34. A broad aim of this work is to determine how the variables influencing a particular problem—in this case, malaria—can be expressed in quantitative terms so that it becomes possible to predict with some reliability the outcome of a planned series of health actions. The collection and processing of baseline demographic, parasitological, entomological and meteorological data continued in 1971, as did work on the validation of a mathematical model ¹ permitting prediction of the distribution of malarial infection from epidemiological data and allowing a choice to be made between control alternatives on the assumption that they are defined by specified changes in parameter values. For example, the model has confirmed that mass drug administration at intervals greater than 14 days cannot be expected to bring about an interruption of malaria transmission and this interval is being used in one part of the project area so that immunological and other studies may be made of the effect of interruption in a holoendemic zone. However, a 14-day interval, though known to be effective, is hardly a practical proposition for mass administration in field conditions. An indication is therefore being sought of what amount of control can be achieved with drug administration at more practical intervals. Simulation with the model showed that there would be no significant epidemiological difference between administration at 5-week and at 10-week intervals, and since the latter obviously represent a greater economy and facility they have been selected for testing.

11.17 The group of studies described as scientific studies of complex multifactorial problems, with special emphasis on human ecology, has included an investigation in two urban areas (Cali, Colombia, and Hanover, Federal Republic of Germany) of the distribution and levels of health disorders and an attempt to relate these to factors in the physical and social environment. In this study, the data collection was concluded in 1971 and an analysis is being made of the differential distribution of selected health variables related to such community characteristics as housing standard, pattern of urban growth and expansion, and social composition as well as to the type and accessibility of medical services. More than 200 types of data items collected in Hanover have been examined in conjunction with the population census data and with information on certain parameters of health importance, including street accidents, tuberculosis, and school health examinations. Using computer mapping techniques, it has been possible to show associations in both space and time between a number of these, although their significance is not yet established. The information for Cali includes environmental data as well as mortality data collected in the inter-American investigation of mortality in childhood (see paragraph 16.124) and survey data, collected by groups participating in that investigation, on demographic features and on fertility and morbidity. The application of techniques similar to those used in Hanover shows groupings of deaths due to various causes and could be used in conjunction with health service data to indicate a possible redistribution and restructuring of maternal and child health services within the comprehensive health planning in Colombia referred to above.

11.18 Other research is concerned with health and urbanization, with particular reference to migrants. The known or traditionally expected patterns of health and ill-health have been altering radically as an ever-increasing proportion of rural populations the world over has been migrating to towns and cities. It is important to know with some precision in what way these patterns are changing and what are the factors at play. At the moment, however, for most populations not even the baseline data are known that would permit comparison of the health status of urban migrants and of those who have remained in the rural areas. A study of the feasibility of determining the health effects of urbanization was therefore begun in 1970 in Iran through the joint Iran/WHO International Epidemiological Centre, Teheran, and completed in 1971 with the computer analysis of the collected data. This study was designed to determine the practicability of identifying and being able to follow up recent migrants to the Teheran urban area. It has yielded a number of interesting findings—for instance, psychiatric interviews showed a rather high prevalence of anxiety and depression syndromes among the migrants to Teheran—but there was a loss rate of over 40% in the selected sample from one survey to the next, indicating that the method used (area sampling and serial interviews) is unworkable for longitudinal studies in the situation in which it was tested.

11.19 In a parallel study in Senegal, WHO collaborated with the University of Dakar and the Dakar centre of the Office de la Recherche scientifique et technique outre-mer (ORSTOM) in a study of the adaptation of adult Séré migrants from Niakhar (a rural area) to urban Dakar, together with inquiry into the changes in health, including mental health, that occur in such migrants. This study was based on a comparison of a group who had remained in Niakhar with another who had migrated to Dakar. Each person studied was given a standard clinical evaluation; numerous laboratory tests of parasitic infestations as well as of some indicators of chronic disease (e.g., cholesterolaeemia, serum glucose, blood-urea nitrogen); a detailed psychiatric interview adapted from the work of Dr Alexander Leighton, with the results later scored by three psychiatrists; and a questionnaire designed to measure the individual's security in the original rural community and the degree of adaptation of recent migrants to urban life.

11.20 The field work was completed during 1970 and most of the data analysis in 1971, with a view to publication. In general, the urban group appears to be healthier than the rural, particularly in terms of nutritional status and parasitic infestation. In addition to describing differences between the rural and urban groups in terms of their health status, it has been possible within subgroups of the urban population to relate their health status to the degree of their social adaptation to urban life. For example, it was found that girls 15-19 years old have more difficulties than other women and than men in adapting to urban life and that within this group poor adaptation is significantly correlated with increased blood pressure.

11.21 A related study has been conducted in collaboration with the New Zealand Medical Research Council. There has recently been considerable migration from the Tokelau Islands to New Zealand, and it has been found relatively easy to follow up the migrants after arrival. Since extensive medical examinations had been conducted in the Tokelau Islands in 1968, for once the baseline data are known and changes in the migrants’ health status before and after migration can be measured and their social adjustment to an urban environment can be assessed by periodic re-examinations in New Zealand. This study grew out of the observation that the blood pressure is high and tends to rise with age among Polynesians living in New Zealand and in some of the more developed South Pacific islands but is fairly low and does not increase with age in the more remote islands. Several hypotheses to explain this difference are being tested, the major one being that stress resulting from cultural disjunction increases the blood pressure and may have other adverse health effects. Extensive field work was carried out in 1971 and, although WHO's direct contractual relationship with the study has come to an end, the Organization remains closely associated with it and may expect to benefit from the greater understanding it should provide of the effects on health of social and environmental change.

11.22 Research into the methodology of public health intervention to prevent disease is included among the scientific studies of complex multifactorial problems. In a pilot study conducted in 1969-1970, 601 men in Zagreb, Yugoslavia, were screened to identify a group at increased risk of myocardial infarction and cerebral stroke as judged by “borderline” levels of blood pressure, cholesterolaeemia, impaired glucose tolerance, or any combination of these. From among them, 107 subjects were recruited for a study to determine the feasibility of long-term prophylactic treatment in an open population. For the purposes of the study, they were divided into treatment and control groups and an 18-month follow-up period was selected. Analysis of the data was largely completed.
in 1971. The low drop-out rate, success of the follow-up, and other factors show that this type of investigation is feasible in an urban, non-institutionalized population. The results also indicate the importance of studying the behavioural characteristics of the population before conducting the screening examinations, and it was observed that the group given repeated health examinations sometimes had lower levels of the risk factors being measured than the group given drug treatment.

11.23 This pilot study identified parameters needed for the design of similar investigations and brought to light problems that require further research. These were taken into consideration during the year in preparing the protocol for a more detailed study of the methodology of cardiovascular prophylaxis in two contrasting medical-care systems—in Rotterdam (Netherlands) and Kaunas (USSR). Prior to the start of field investigations, which are planned for 1972, epidemiological record systems and questionnaires were tested and a cost-effectiveness evaluation programme was developed and refined.

11.24 Among other studies of complicated multifactorial problems are those dealing with the spread of infectious diseases to man through animals. In the project started in 1969 in Iran to investigate the role of small animals in maintaining and transmitting to man several human pathogens, that has been conducted through the Iran/WHO International Epidemiological Research Centre in Teheran, activities in 1971 were concentrated on serological studies (both in Iran and in collaborating laboratories in the USSR) on small mammals captured and on investigations of the vector role played by their ectoparasites, as well as on continued analysis of the data collected in 1969-1970.

11.25 Some 5000 small mammals were captured in nearly 50 localities in different parts of the country and examined for a variety of zoonotic agents, including the rickettsiae and some viruses and bacteria (e.g., *Rickettsia sibirica*, *Coxiella burnetii*, Sindbis, West Nile and Crimean haemorrhagic fever viruses, and *Francisella tularensis*). Evidence of the presence in Iran of some of these agents—and particularly of tularemia in domestic and wild mammals—was obtained for the first time. Multiple infections were common. A computer mapping programme was used to describe prevalence rates in different areas, the relationships between infections in different species and in hosts and parasites, and the association between infections and environmental features such as vegetation, soils and altitude. Such data assist in the delineation of areas of high and low risk and, when related to existing data for man, allow an assessment of the efficiency and scope of disease control programmes. A number of papers on the serological, ecological and zoogeographic findings are in the process of publication.

11.26 A cognate investigation that was carried out in Switzerland on the potential contact rates between animals that may play a role in human infection also terminated at the end of the year. Data were assembled on 1000 small mammals that were captured, marked, released and recaptured several times. The analysis has shown the home ranges, movement patterns and contact rates between individuals of different species in time and space; and population life-tables have been constructed giving the rate at which potentially susceptible individuals enter a population between seasons during an 18-month period covering at least six rodent generations. This information is of immediate value for interpreting sampling studies of rodent populations (for diseases such as plague) and for simulation models of epidemic behaviour in rapidly fluctuating animal populations for which estimates of seasonal densities and contact rates have been determined.

11.27 In a project on mathematical aspects of mass health screening, an efficient method of summarizing the results of symptom questionnaires has been developed and tested on screening data. Using this method, it is also possible to determine how much, if any, the sensitivity and specificity of screening are improved by the addition of more expensive tests and therefore to plan an efficient screening programme. Other procedures that have been developed and tested include mathematical models to permit the risk of subsequent development of disease to be predicted from information on known risk factors and to bring to light new risk factors. These procedures can also take into account information from two or more consecutive examinations in order to see whether this results in better prediction and to estimate the desirable frequency of mass health screening.

11.28 In another study, on the mathematical theory of communicable disease, a computer model was constructed\(^1\) that allowed a precise estimate to be rapidly made of latent and infectious periods, well-documented data on outbreaks of measles and infectious hepatitis being used. However, application of this model was restricted to households of two or three individuals, thus limiting its value for investigation of these detailed aspects of the dynamics of

epidemic spread. During the year, a different type of mathematical analysis—using an approximation procedure—was developed to extend the potentialities of the model to groups of any size. This was applied to data from a well-studied outbreak of smallpox and found to give a good fit.

11.29 A number of activities in instrumentation and computing were undertaken in biomedical engineering. These included the description and construction of semi-automated, computer-compatible devices to facilitate the collection of large volumes of data while, at the same time, reducing the error rate which is incurred by the traditional intermediate manipulation that has been necessary prior to computer manipulation. Three such devices were developed during the year in collaboration with technical institutions: a portable, battery-operated health data recorder that allows information obtained by use of a dichotomous questionnaire to be recorded directly on magnetic tape in form suitable for immediate computer analysis; a method for expressing in digital terms co-ordinates of latitude and longitude (precise to within one minute), permitting accurate epidemiological mapping by computer; and a computer-programmable device that permits data elicited at interview to be promptly tested for inconsistencies. Operational prototypes were constructed for the first two, while an experimental version for the third was produced and tested successfully. They will be further tested in WHO research studies in 1972.

11.30 A scientific group that met in June-July reviewed the Organization's programme in research in epidemiology and communications science, particularly with respect to the development of mathematical models, and to their potential contribution to epidemiological field studies as well as to how the practical situations encountered in such studies could be helpful in validating and improving the models. The group considered the application of models to communicable and non-communicable diseases, to ecology, and to the planning and organization of health services, and suggested lines along which such models might be further refined, especially in connexion with communicable diseases.
CHAPTER 12

CO-OPERATION WITH OTHER ORGANIZATIONS

12.1 The Second United Nations Development Decade, which began on 1 January 1971, provided the impetus for extensive reviews of the functioning of the United Nations system with the aim of enabling it to fulfil the responsibilities set forth in the International Development Strategy. The Economic and Social Council devoted much attention throughout its two sessions, in April-May and in July 1971, to the reorganization of its own internal structure to facilitate compliance with the requests of the United Nations General Assembly and to enhance its role, as set forth in the United Nations Charter, as the central intergovernmental co-ordinating body with respect to economic and social co-operation. The discussions of the Council were based in part upon recommendations made to it by its Committee for Programme and Co-ordination.

12.2 The Council took steps to meet its responsibilities with respect to evaluation of progress during the Second United Nations Development Decade by establishing a Committee on Review and Appraisal. It also decided to establish for the first time in the United Nations system a standing intergovernmental committee to deal with matters of science and technology; the Council's Advisory Committee on the Application of Science and Technology to Development (ACAST), with which WHO has co-operated closely and extensively, will continue as an advisory body to the intergovernmental committee.

12.3 The Council's Committee for Development Planning gave initial consideration to the establishment of criteria for the first biennial evaluation, in 1973, of progress in the implementation of the International Development Strategy. WHO has been represented at the meetings of the Committee for Development Planning and has participated in working groups of that committee, as well as in the work of the Administrative Committee on Co-ordination's Sub-Committee on the United Nations Development Decade.

12.4 The Organization participated in the following preparations for the United Nations Conference on the Human Environment, to be held in Stockholm in June 1972: sessions of the intergovernmental preparatory committee for the conference, and of various intergovernmental working groups convened by the conference secretariat on such matters as marine pollution, monitoring and the drafting of a Declaration on the Human Environment; the ACC Functional Group on the Human Environment, which assumed responsibility for the preparation, as a basic document for the conference, of a paper outlining past and future environmental programmes and indicating the activities and capacities of the organizations of the United Nations system with respect to environmental questions; regional seminars or conferences organized by the four regional economic commissions (ECA, ECAFE, ECE, and ECLA) and the United Nations Economic and Social Office in Beirut; and a panel of experts convened by the Secretary-General of the conference, at Founex, Switzerland, in June. Also, at the request of the conference secretariat, WHO prepared four basic papers: on water supply and sewage and wastes disposal; human health and welfare factors; contamination through water contact—criteria, standards and guides for permissible levels of human exposure; and identification and evaluation of the principal acute and long-term effects of environmental agents on man's health, including genetic effects.

12.5 The World Plan of Action prepared under the direction of ACAST was published during the year. The basic material for the chapter on health was provided by the Organization, which also supplied material for other chapters with essential health components. The Economic and Social Council will consider the recommendation of ACAST in depth at its 1972 sessions. During the course of 1971 efforts were initiated, with the co-operation of WHO, to prepare regional plans of action that would lead to concentration of efforts on matters of most direct regional importance.

12.6 Increasing concern with all aspects of the protein question has led to a broadening of the former FAO/UNICEF/WHO Protein Advisory Group, and is expected to lead to an increase in its activities and to a wider utilization of its reports and findings. On the recommendation of ACC and as a result of a decision of the Economic and Social
Council, it is henceforth to be known as the Protein Advisory Group of the United Nations System. The International Bank for Reconstruction and Development (IBRD) has already become a sponsor of the Group, and it is anticipated that other agencies will do likewise.

12.7 A co-ordinated response by the organizations of the United Nations system to the needs resulting from natural disasters is a matter to which the Economic and Social Council and the General Assembly devoted considerable attention during 1970. Pursuant to their resolutions the Secretary-General of the United Nations presented to the Council at its fifty-first session, in July 1971, a report proposing the arrangements considered necessary to provide the most effective response of the United Nations system to such emergencies. The arrangements were approved by the Council and a later resolution of the General Assembly provided for the designation of a Disaster Relief Co-ordinator and the establishment of an adequate permanent office within the United Nations secretariat to co-ordinate information on needs arising from natural disasters and other disaster situations, and activities in response thereto by organizations of the United Nations system as well as non-governmental organizations, such as the League of Red Cross Societies.

12.8 During the last eight months of 1971 WHO actively participated in providing assistance to refugees from East Pakistan in India, as well as in the provision of humanitarian assistance to East Pakistan. To this end the Organization played an active role in the Standing Inter-Agency Consultation Unit established by the United Nations High Commissioner for Refugees, who had been designated as the focal point by the Secretary-General. In addition the Organization was represented through the Regional Office for South-East Asia in the parallel focal point arrangement for co-ordination established in New Delhi with respect to Pakistan refugees in India. Throughout the eight-month period beginning in May 1971 extensive efforts were made by both WHO headquarters and that regional office to assist in meeting needs for drugs, vaccines, and other medical supplies for the prevention of disease, particularly in relation to the problem of cholera. On behalf of the United Nations co-ordinated undertaking, WHO assumed responsibility for the purchase and shipment of required medical supplies. Similarly the Organization co-operated with the United Nations Headquarters Co-ordinator for International Humanitarian Assistance to East Pakistan designated in June by the Secretary-General, and subsequently both headquarters and the Regional Office for the Eastern Mediterranean assumed major responsibility with respect to health matters, including the provision of medical supplies and personnel (see paragraphs 14.31-14.33).

12.9 Details of WHO's close collaboration with the United Nations Fund for Population Activities and the United Nations Fund for Drug Abuse Control, which was established in April 1971, are given in the relevant sections of this report—in particular, Chapters 8 and 10. Both of these funds are supported by voluntary contributions from States that are Members of the United Nations or the specialized agencies, and from foundations, individuals and other sources.

12.10 In the field of drug abuse control the Organization continued to co-operate with the United Nations, and particularly with its Commission on Narcotic Drugs. It was represented at the plenipotentiary conference held in Vienna in January-February, when a Convention on Psychotropic Substances was adopted and opened for signature. The Economic and Social Council, in a resolution adopted in May, requested the Secretary-General to convene as early as feasible in 1972 a conference of plenipotentiaries to consider all amendments to the Single Convention on Narcotic Drugs, 1961, at which the Organization will also be represented.

12.11 The year was marked by a number of bilateral inter-agency consultations convened to discuss approaches to problems of mutual interest at an early stage prior to the formulation of programme and budget proposals. Such consultations took place in 1971 with the United Nations, UNIDO, ILO, FAO and UNESCO. Further consultations were held within the framework of ACC in an effort to ensure that programme undertakings of various organizations in the United Nations system in similar or related areas were complementary and co-ordinated. In addition to the extension of this type of early consultation, it has long been the practice of the Director-General to transmit the Proposed Programme and Budget Estimates to the Secretary-General of the United Nations and the executive heads of all other specialized agencies and IAEA. In conformity with resolution 1549 (XLIX) adopted in July 1970 by the Economic and Social Council, the Proposed Programme and Budget Estimates for 1972 were circulated in December 1970 to the aforementioned at the same time as they were transmitted to Member States of the Organization—together with a request for comments with respect to programmes of other organizations in areas related to the work of WHO. Comments received from ILO, FAO, and IBRD were submitted to the WHO Executive
Board in January 1971 and, later, to the World Health Assembly, together with comments subsequently received from the United Nations, UNESCO, and IAEA.

12.12 Efforts were made during the year to intensify the development of co-ordinated activity with the four regional economic commissions and the United Nations Economic and Social Office in Beirut (UNESOB). At the regional level co-ordination involved a variety of areas, including developmental planning, population, statistics, and rural and community development. Full-time liaison officers are maintained at the headquarters of ECA in Addis Ababa and ECAFE in Bangkok. In addition, liaison is maintained with ECLA in Santiago, Chile, with ECE in Geneva, and with UNESOB. Representation at the headquarters of the United Nations continues to be maintained by the Liaison Office.

United Nations Development Programme

12.13 At the eleventh and twelfth sessions of the Governing Council of the United Nations Development Programme (UNDP)—held in January 1971 in New York, and in June 1971 in Santiago, Chile, respectively—the debates centred mainly on the proposals of the Administrator designed to implement the Consensus approved at its tenth session. Special attention was given to the reorganization of UNDP structures both at headquarters and at field level. The Council agreed to the creation of regional bureaux at UNDP headquarters to serve Africa, Asia and the Far East, Latin America, and the combined area of Europe, the Mediterranean and the Middle East; these bureaux are to co-operate closely with the UNDP Resident Representatives in the appraisal of country programmes and in the formulation, implementation, evaluation and follow-up of projects. The Council also approved the establishment of a programme co-ordination branch, to provide overall supporting services to regional bureaux, and a programme analysis and policy planning branch, to be responsible for long-term planning of UNDP activities as well as for carrying out programme analysis, research and evaluation to provide a basis for advising the Administrator on new directions the programme might take. The functioning of these arrangements—which are transitional measures—will be fully reviewed at the fourteenth session of the Council, in June 1972.

12.14 The Council also noted the establishment by the Administrator of an advisory panel on programme policy, whose duty is to counsel the Administrator on the content and scope of the development programme as a whole.

12.15 The measures already instituted to strengthen the role of the Resident Representative were endorsed, and particular emphasis was placed on the duties to be performed by Resident Representatives as team leaders for the United Nations system of organizations at the field level. In addition, Resident Representatives were given the authority to approve country projects costing up to $100,000 each; projects above this level are to be approved by the Administrator.

12.16 The Council continued its consideration of the principles and procedures governing country programming exercises—the cornerstone of the new system which has emerged as a result of the Capacity Study and the Council’s decisions thereon. An essential element of country programming—which started for the first countries in 1971—was the approval by the Council of the indicative planning figures for the period 1972-1976. Such figures constitute an order of magnitude for the proposed programme, and it was agreed that in drawing up the programme priority should be given to projects previously approved under the Technical Assistance and Special Fund components. It was also decided that as from 1 January 1972, as a consequence of the merger of the Technical Assistance and Special Fund components, the separate existence of the two would cease.

12.17 WHO participated—usually through its representative assigned to the country in question—in the first country programming exercises, which were organized under the leadership of the UNDP Resident Representative with the co-operation of other agencies and, where possible, representatives of sources of bilateral assistance, as well as of the government concerned. WHO is taking the necessary steps, both at the regional and headquarters levels, to review and comment on the country programme emanating from each exercise, account being taken of the WHO regular programme in each case.

12.18 The following countries carried out their country programming exercise in 1971 for presentation to the January 1972 session of the Governing Council: Algeria, Bulgaria, Chad, Colombia, Cyprus, Fiji, Ghana, Hungary, Kenya, Laos, Lesotho, Malaysia, Mauritius, Panama, Philippines, Togo, United Republic of Tanzania, Yugoslavia, and Zaire.

12.19 WHO was represented at the two 1971 sessions of the Inter-Agency Consultative Board (IACB), which decided that all projects being recommended
to the Governing Council for approval should be reviewed by a Programme Working Group. The Group met in March and October.

12.20 The Governing Council, at its eleventh and twelfth sessions, approved a further series of Special Fund projects that had previously been reviewed by IACB. Among these were 14 for which WHO was designated as executing agency. At the January session nine projects were entrusted to WHO, of which six were in the field of environmental health—in Afghanistan (water supply and sewerage for Greater Kabul), Algeria (national water supply authority), Iraq (rural water supplies), Kenya (sewerage and groundwater survey, Nairobi), Mali (drainage system and water supply study), and Nigeria (wastes disposal and drainage in Ibadan—phase II). Two other projects were designed to assist with vaccine production and research (Cuba and Egypt), and one—an inter-regional project—was for the study of the epidemiology and control of schistosomiasis in man-made lakes (Lake Volta, in Ghana, and Lake Nasser, in Egypt, being the main lakes selected).

12.21 At the June session the five WHO projects approved were for environmental pollution control in São Paulo, Brazil; water supply and sewerage in Tananarive, Madagascar; Brucella vaccine production in Mongolia; assistance to the Institute for Health Manpower Development in Aden, People’s Democratic Republic of Yemen; and water and air pollution control in Romania (phase II).

12.22 These projects bring the number that WHO has been called upon to execute to 52 of the total of 1430 projects approved for UNDP financing, and the total funds earmarked for the execution of the WHO projects amount to US $46 million, or 3.5% of the overall Special Fund programme to date.

12.23 Plans of operation for the following Special Fund projects were signed during 1971: the Federal Research and Development Centre for Environmental Pollution Control, in Czechoslovakia; supplementary assistance in the preparation of a master plan for water supply and sewerage for the Accra-Tema metropolitan area, Ghana; water supply and sewerage for Abidjan, Ivory Coast; Kompong Som water supply, Khmer Republic; wastes disposal and drainage in Ibadan, Nigeria (phase II); water pollution control, in Romania; and water supply for Sana’a and Hodeida, in Yemen.

12.24 Plans of operation were negotiated during the year for Special Fund projects in Afghanistan, Algeria, Cameroon, Iran, Iraq, Mali and Mexico, and for the project on the epidemiology and control of schistosomiasis in man-made lakes. Meanwhile pre-project activities were approved for the National Institute of Public Health, in Constantine, Algeria; the centre for the utilization of computers in health programmes, and the Pan American Zoonoses Centre, both in Argentina; the rural water supply pilot project, in Ghana; the establishment of pilot zones for water quality control, in Hungary; the Institute for Health Manpower Development, in the People’s Democratic Republic of Yemen; the environmental protection programme, in Poland; community-oriented education at the Faculty of Medicine of the University of Aleppo, in the Syrian Arab Republic; and the investigation programme on environmental sanitary quality preservation, in Venezuela. UNDP also agreed to finance preparatory assistance to the Governments of Dahomey, Ghana, Ivory Coast, Mali, Niger, Togo, and Upper Volta in the form of a mission to study the possibilities of, and prepare the way for, an onchocerciasis campaign in the Volta river basin; the mission—headed by WHO, and with the participation of FAO and the International Bank for Reconstruction and Development—started its work in July 1971.

12.25 WHO organized or participated in a number of other UNDP preparatory assistance missions during 1971, often in collaboration with other agencies; such missions included those to Chile, Guyana, the Libyan Arab Republic, and Sudan, which resulted in the finalization of requests for submission to UNDP. Other requests for Special Fund assistance were received from the Governments of Gabon, Ivory Coast, Lebanon, Philippines, the Syrian Arab Republic and Zambia.

12.26 Terminal reports were established for: Argentina (Pan American Zoonoses Centre); Brazil (Institute of Sanitary Engineering); Ceylon (public water supply, drainage and sewerage for the south-west coastal area); China (Taiwan) (sewerage planning for the Greater Taipei area); Ghana (preparation of a master plan for water supply and sewerage for the Accra-Tema metropolitan area); Kenya (operational research on human and animal trypanosomiasis eradication in the Nyanza and Western Provinces); Philippines (master plan for a sewerage system for the Manila metropolitan area); Turkey (master plan for water supply and sewerage for the Istanbul region). In addition, an interim report was submitted to UNDP on the project in Romania for assistance in water pollution control.

12.27 WHO continued to review requests submitted by governments for Special Fund assistance, advising on the health implications of such requests and proposing appropriate measures to protect the
health of the population. It is being called upon to participate in a growing number of Special Fund schemes being executed by other agencies; by the end of the year, agreements reached with FAO, ILO and the United Nations provided for the transfer to WHO of some 563 man-months to cover the assignment of health specialists in 61 projects. During 1971 WHO provided assistance in public health administration, epidemiological surveys, health training, sanitary engineering, biology and medical entomology, and continued its work within the context of the Mekong Basin development project which is being executed by the United Nations through the Economic Commission for Asia and the Far East.

12.28 Co-ordination with the United Nations Fund for Population Activities, which is administered by UNDP, continued to be strengthened (see Chapter 8).

12.29 Country, regional and inter-regional activities under the Technical Assistance component remained at much the same level as in 1970. In line with an earlier decision of the Governing Council, formal endorsements by governments through UNDP Resident Representatives were secured for regional and inter-regional proposals as a prerequisite for their approval by UNDP. The old system of programming was discontinued at the end of 1971, and from 1972 onwards inter-country, inter-regional, sub-regional and global projects will be programmed under indicative planning figures apportioned to the four regions represented by the new UNDP regional bureaux. During 1971 close consultation was therefore maintained with UNDP both through the Programme Working Group and at the inter-secretariat level in order to ensure a smooth transition and continuation of the regional and inter-regional projects in succeeding years.

12.30 Details of the allocations made to WHO under the Technical Assistance component of UNDP are given in paragraph 14.13.

12.31 The bilateral arrangements first introduced in 1970 for the financing of certain inter-regional activities through an annual contribution of approximately $500,000 by the Government of Denmark to the WHO Voluntary Fund for Health Promotion were continued with success in 1971—mainly in connexion with the repetition of earlier and well proven courses. WHO and the Danish International Development Agency (DANIDA) improved their joint planning techniques for the future development of this programme, which had previously been organized under UNDP auspices.

12.32 Projects financed under both the Special Fund and Technical Assistance components of UNDP are shown in the list in Part III of the Report.

United Nations Children’s Fund

12.33 The Executive Board of UNICEF, at its annual meeting held in Geneva in April 1971, approved programme allocations of US $63 million. Commitments for health amounted to US $30.2 million, or 47.8% of the total allocations approved. About 90% of that amount was for the establishment and strengthening of basic health services, with emphasis on maternal and child health, environmental sanitation, health education, nutrition and family planning. The remaining 10% was for malaria eradication.

12.34 The Board approved the recommendations on education and training contained in the report 1 of the eighteenth session of the UNICEF/WHO Joint Committee on Health Policy; these provide new guidance for the development of jointly assisted programmes in the field of education and training of national health personnel of all categories.

12.35 In the recent outbreaks of cholera in Africa and other Regions, UNICEF has provided emergency aid, with technical advice from WHO. At its eighteenth session the Joint Committee considered the possibilities of future WHO and UNICEF assistance in this field and its recommendations—including the provision of support for the development of rehydration units in health centres and hospitals, and the establishment of rehydration fluid production plants—were subsequently approved by UNICEF’s Executive Board.

12.36 In pursuance of the new approach to the campaign against malaria adopted in 1970, the Board approved recommendations for commitments that provided for a continuation of assistance for a limited period in programmes in which eradication in the foreseeable future seemed feasible, and a phasing-out of aid where prospects were not favourable. It considered that where phasing-out of UNICEF aid was indicated it should be done with due flexibility, a case-by-case review being required. In view of the request of a number of governments in Central America, the Board recommended that UNICEF sponsor a high-level interdisciplinary conference, to be held in Costa Rica, for the development of a suitable malaria strategy for the area.

12.37 Regarding fluoridation and dental health, the Board approved the Joint Committee’s recommendation that UNICEF be prepared to support the fluorida-

tion of water supplies in a few selected cases through the provision of initial supplies and equipment and aid for training activities, accompanied by other measures of an educative and preventive character in dental care. The Board also approved the Joint Committee’s recommendations concerning a combined diphtheria/pertussis/tetanus/heat-killed typhoid vaccine—namely, that WHO should continue to study the effectiveness and reactogenicity of this type of vaccine before it can be recommended for general use in UNICEF/WHO-assisted projects; it might, however, be provided—at the request of the countries concerned, and after examination of the technical aspects by WHO—for use in areas where typhoid was a serious public health problem and where logistic and financial considerations made the control of typhoid, particularly in children, difficult and expensive.

12.38 A revised version of the chapter on the health care of mothers and children in the UNICEF Field Manual was issued during 1971. The new text, which was prepared with the assistance of WHO, is distributed to UNICEF field staff concerned with projects for the development of basic health services and their maternal and child health aspects.

12.39 Close collaboration and good working relations have been maintained at all levels, both in the newer and in the more traditional aspects of jointly assisted programmes. WHO was represented at the UNICEF programme preview meetings held during the year, as well as at the regular inter-secretariat reviews of programmes and operational issues.

United Nations Relief and Works Agency for Palestine Refugees in the Near East

12.40 WHO continued to support and direct technically the health programme of UNRWA by providing the services of five staff members, including the Agency’s Director of Health. In spite of its serious financial situation and the fact that it had to exercise strict economies in expenditure, the Agency managed to avoid any further significant reductions in the three main activities for which its Health Department is responsible—namely, medical services, environmental sanitation, and supplementary feeding. Priority continued to be given to the prevention and control of communicable diseases (in particular, cholera) and to assistance to mothers and children, including nutritional aspects. In general, the level of the health services provided by the Agency is comparable with that of those provided by the host governments for their own populations.

12.41 The Twenty-fourth World Health Assembly examined a report on health assistance to refugees and displaced persons in the Middle East submitted by the Director-General, together with a summary of the Annual Report of the Director of Health of UNRWA, and adopted two resolutions. In accordance with the first (WHA24.32), requesting the Director-General to intensify and expand WHO’s programme of health assistance to the refugees and displaced persons in the Middle East to an amount of at least one million dollars from funds outside the regular budget, an appeal was addressed to all Members and Associate Members of WHO to make a donation in cash or in kind. The second resolution (WHA24.33) requested the Director-General to strengthen co-operation with the International Committee of the Red Cross and to take all other effective measures within his power to safeguard health conditions among the refugees, displaced persons and inhabitants of the occupied territories.

World Food Programme

12.42 As at 15 September 1971 approximately US $109 million was allotted by the World Food Programme to health-promoting projects: this represents more than 10% of the total commitments for its regular programme at that date (US $1 071 409 000). These projects—concerned with the feeding of mothers and pre-school children, the improvement of hospitals and convalescent institutions, and other public health programmes—may be classified in three categories: those for the development of human resources, where the food is utilized for the supplementary feeding of clearly identified vulnerable groups of the population; those for establishing or strengthening the health services infrastructure, where the operational savings accrued as a result of the food aid are used as a local currency capital investment for building health centres, improving hospital catering, equipment and health services; and those in which food aid is used to develop environmental sanitation and other specific health projects, the food constituting partial payment of the wages of the workers employed, or compensation of voluntary workers if the project is operated on a self-help basis.

12.43 Although the Programme provides aid for a variety of development projects, so many have health implications that all are now sent to WHO for technical scrutiny of their health aspects; between December 1970 and September 1971 just over 40 projects (including extensions of on-going Programme activities) were referred to WHO for this purpose; among these were 27 new projects. The Organization also carried out follow-up studies of a number of projects approved in previous years. Many of the 500 or so current
projects have been in progress for some time; WHO is increasingly being called upon to assist in their evaluation and is developing standardized criteria for this purpose.

12.44 The use of food aid to promote not only nutrition but other aspects of public health is becoming an increasingly important feature of the Programme, particularly as protein-rich foods are at present in short supply. In 1971 there was, however, an increase in the number of nutrition projects in favour of vulnerable groups, and such projects were either started or expanded in Botswana, Iran, East Pakistan and Venezuela. In fact, the amount invested in projects of this nature in 1971 was more than twice the average for the preceding eight years. The largest single investment made by the Programme during 1971 was in a health-promoting project: an investment of US $6.9 million was approved for the purpose of extending the activities of the National Institute of Nutrition in Venezuela to rural areas. The Organization participated in the preparation of this project and in ascertaining the priorities involved. In several projects—for example, the large-scale integrated nutrition project in Colombia—WHO is supporting school feeding activities having a bearing on health promotion and nutrition education.

12.45 As a result of heavy commitments to various large-scale projects launched in previous years and an unusually high demand for emergency assistance, the number of new projects undertaken levelled off during 1971 and the amount invested per project has had to be reduced. This will not, however, preclude support to new health-promoting projects, and the authorities responsible for country health programming are being invited to consider including proposals for such projects in their requests to the World Food Programme.

12.47 Close liaison was maintained with the League of Red Cross Societies with regard to natural disasters and other emergency situations. The Guide to Sanitation in Natural Disasters, published by the Organization early in 1971, is being widely used in conjunction with the disaster relief handbook published by the League (see paragraph 5.70).

12.48 While it is not feasible to list all of the cooperative activities with non-governmental organizations in either official or working relations with WHO, selected examples below indicate various aspects of mutually beneficial collaboration.

12.49 In connexion with the theme of World Health Day 1971, “A Full Life Despite Diabetes”, the International Diabetes Federation co-operated in the arrangement of various activities (see paragraph 13.1).

12.50 In the European Region, the International Dental Federation participated in a consultation on trends in dental education.

12.51 The World Psychiatric Association and the World Federation for Mental Health took part in a working group on community measures for comprehensive psychiatric care, and the World Psychiatric Association and the International Council of Nurses participated in a symposium on trends in psychiatric care in day hospitals and units in general hospitals (see paragraph 18.75). WHO was represented at the Fifth World Congress of Psychiatry in Mexico, organized by the World Psychiatric Association, and at a meeting of that Association’s Executive Board at the time of the congress.

12.52 The work of the WHO-assisted Tuberculosis Surveillance Research Unit of the International Union against Tuberculosis led to the creation of the International Tuberculosis Surveillance Centre under the joint sponsorship of WHO, the International Union against Tuberculosis and the Organization for Health Research in the Netherlands (see paragraph 1.110). The Union also participated in a review of the classification of pulmonary tuberculosis in preparation for the ninth revision of the International Classification of Diseases (see paragraph 1.114).

12.53 WHO co-operated with the Council for International Organizations of Medical Sciences (CIOMS) regarding the preparation of a list of names of diseases recommended for international use, as a complement to the International Classification of Diseases (see paragraph 11.8), and participated in a CIOMS round-table conference on the non-medical uses of dependence-producing drugs (see paragraph 10.37).
12.54 Various activities have been carried out jointly or in close co-operation with the International Society of Cardiology; these include studies and three international meetings sponsored by the Society in co-operation with WHO (see paragraph 3.17). The Society’s Council on Rehabilitation co-operated in various WHO cardiovascular disease control activities in the European Region (see paragraph 18.16).

12.55 WHO was represented at a meeting in Canberra of the Special Committee on Problems of the Environment of the International Council of Scientific Unions.

12.56 The Organization participated in a symposium on good manufacturing practices held by the International Federation of Pharmaceutical Manufacturers Associations and in a colloquium on international pharmaceutical reference standards organized by the International Pharmaceutical Federation and the American Pharmaceutical Association/Academy of Pharmaceutical Sciences (see paragraphs 10.5 and 10.7).

12.57 The International Union of Architects and the International Union of Local Authorities participated in a scientific group on the development of environmental health criteria for urban planning (see paragraph 5.72).

12.58 A special long-playing record and cassette designed to impress upon young people the dangers of venereal disease were produced by the International Union against the Venereal Diseases and the Treponematoses in co-operation with WHO (see paragraph 1.86).

12.59 The Organization co-sponsored with the International Paediatric Association at the time of the XIII International Congress of Paediatrics a workshop on the nutrition of pre-school children (see paragraph 8.81). The International Union for Child Welfare and the International Council on Alcohol and Addictions co-operated with WHO in activities relating to alcoholism and drug dependence. The International Union for School and University Health and Medicine, with the co-operation of WHO and UNESCO, is sponsoring an international study on the biological aspects of university youth unrest.

12.60 WHO contributed to the international symposium on man-made lakes organized by the Scientific Committee on Water Research and the International Council of Scientific Unions (see paragraph 2.49).

12.61 A number of activities were carried out in close co-operation with the Permanent Commission and International Association on Occupational Health, notably in connexion with the Second International Symposium on Carbon Disulfide Toxicology and the International Conference on Occupational Health, as well as in matters of occupational cancer.

12.62 The International Union of Immunological Societies, which maintained working relations with WHO, is co-operating with the Organization and the WHO International Reference Centre for Immunoglobulins in Lausanne, Switzerland, in the development of standards for a number of immunological preparations. WHO is also collaborating with the nomenclature committee established by the Union (see paragraph 4.19).

**SUMMARY OF CO-OPERATION WITH OTHER ORGANIZATIONS**

12.63 The following is an illustrative list of the main subjects of collaboration during the year between WHO and other organizations, apart from the co-operation mentioned above with UNDP, UNICEF, UNRWA, the World Food Programme and non-governmental organizations. Specific instances and details of co-operation are also to be found in other chapters of this volume.

**United Nations and related agencies**

*United Nations*

12.64 Economic and social development: WHO participated in preparatory work for the review and appraisal of progress in the Second United Nations Development Decade, in the seventh session of the Committee for Development Planning, and in the work of the ACC Sub-Committee on the United Nations Development Decade; it continued to co-operate with the four regional economic commissions (ECA, ECAFE, ECE and ECLA) and the United Nations Economic and Social Office in Beirut (UNESOB), and maintained full-time liaison officers with ECA and ECAFE; it contributed to the ECA symposium on rural development in Africa in the 1970s and the fourth ECAFE conference of Asian economic planners, and provided advice on health aspects of comprehensive development programmes under consideration at regional level.
12.65 Environmental health: in addition to the preparations for the United Nations Conference on the Human Environment described in paragraph 12.4, WHO activities included participation in the work of the ACC Sub-Committee on Marine Science and its Applications and the ACC Sub-Committee on Water Resources Development; continued active participation in the Joint Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP) (see paragraph 5.25); the continued assignment of WHO sanitary engineers at ECA and ECLA headquarters; contribution to and participation in the ECE Working Group on Air Pollution Problems, ECE Committee on Water Problems, and the first session of Senior Advisers to ECE Governments on Environmental Problems; meetings of African national committees for the International Hydrological Decade; participation in United Nations inter-regional seminars on current issues of water resources administration.

12.66 Housing and urban planning: WHO’s activities included participation in the seventh session of the Economic and Social Council’s Committee on Housing, Building and Planning, and in the work of ACC related to housing and urbanization; participation in a United Nations inter-regional symposium on the training of planners for comprehensive regional development; contribution to and participation in the United Nations working group on planning of human settlements and in an ECA seminar on housing administration in Africa; continued co-operation in on-going activities of regional economic commissions, in particular through the WHO sanitary engineer attached to the liaison office with ECA.

12.67 Lower Mekong Basin development programme: continued participation with respect to public health aspects, and representation at meetings of the Mekong Committee.

12.68 Statistics: co-operation with the ACC Sub-Committee on Statistical Activities and the Statistical Commission; participation in and contributions to the seventh session of the Conference of African Statisticians and the Conference of African Demographers, an ECAFE working group on social statistics, the ECE Conference of European Statisticians, an ECE meeting on demographic projections, and an ECE regional seminar on demographic statistics.

12.69 Dependence-producing drugs: participation in an ad hoc inter-agency meeting on narcotic questions convened by ACC, and in the twenty-fourth regular session of the Commission on Narcotic Drugs; collaboration in activities in connexion with the work of the United Nations Fund for Drug Abuse Control; participation in the conference of plenipotentiaries on psychotropic substances (see paragraph 10.31); continued co-operation with the International Narcotics Control Board.

12.70 Population activities, including family planning: participation in the ACC Sub-Committee on Population; presentation of a report to the Population Commission on WHO assistance in the development of family planning services (see paragraph 8.4); extensive co-operation with the United Nations Fund for Population Activities and its Inter-agency Consultative Committee; participation in the Secretary-General’s preparatory committee for the 1974 World Population Conference; contributions to, and participation in, regional meetings, including the first ECA regional inter-agency co-ordination meeting on population and the ECA African population conference, an ECAFE regional seminar on the interrelation between population and manpower problems and preparatory meetings for an ECAFE regional seminar on population aspects of social development and for the second Asian population conference, and an ECE consultation on co-ordination among the international organizations concerned in population statistics and projects; assistance in the training of United Nations Population Programme officers; co-operation and participation in meetings of experts to advise the United Nations secretariat in drawing up guidelines for United Nations work related to social welfare aspects of family planning, the ACAST ad hoc working group on population, and the UNDP population and family planning donors conference.

12.71 Road traffic safety: continued co-operation in the ECE programme on medical fitness for driving and licensing, and collaboration with the ECE working group on vehicle construction (see paragraph 5.45); participation in ECE road traffic safety meeting.


12.73 Youth: participation in an ACC ad hoc inter-agency meeting on youth and in a United Nations symposium on the participation of youth in the Second Development Decade; contributions to studies being prepared by the Secretary-General; participation in an informal meeting organized by the United Nations Research Institute for Social Development to review a draft report on a project on the preparation of children and youth for modernization, and in an
international panel to discuss a draft study by the United Nations Institute for Training and Research on the participation of youth in the work of organizations in the United Nations system; co-operation in an ECA seminar on planning and co-ordination in the field of child welfare.

12.74 Status of women: participation in a United Nations African regional seminar on participation of women in economic life, and in an ECA regional conference on education, vocational training and work opportunities for girls and women in African countries.

12.75 Human rights: participation in the session of the Commission on Human Rights, particularly during consideration of an item on the protection of human rights in the light of scientific and technological developments, in accordance with resolution WHA23.41; participation in a United Nations inter-agency meeting on the International Year for Action to Combat Racism and Racial Discrimination.

12.76 Transport questions: participation in ECE groups of rapporteurs on container transport, and on the packaging of dangerous goods.

12.77 Rehabilitation of the disabled: participation in an ACC ad hoc inter-agency meeting on rehabilitation of the disabled (see paragraph 6.19), in a United Nations inter-regional training course for instructors in prosthetics, and in two United Nations meetings of experts on the planning, organization and administration of national programmes for rehabilitation of the disabled in developing countries; collaboration in an inter-agency comparative study on rehabilitation services (see paragraph 6.21).

12.78 Mental health: continued co-operation with the United Nations Social Defence Research Institute (see paragraph 3.95).

12.79 Science and technology: participation in meetings of ACAST, its ad hoc working groups and regional groups; assistance to regional economic commissions in the preparation of regional plans of action to complement the World Plan of Action; participation in the work of the ACC Sub-Committee on Science and Technology; preliminary consultations and submission of comments on an outline proposed for the United Nations study of the role of modern science and technology in the development of nations, pursuant to General Assembly resolution 2658 (XXV).

12.80 Social development questions: participation in the ACC Sub-Committee on Human Resources, Education and Training, and in the twenty-second session of the Commission for Social Development; contribution to a United Nations inter-regional course on social planning; co-operation with the United Nations and UNITAR in connexion with studies on the outflow of trained personnel.

Office of the United Nations High Commissioner for Refugees

12.81 Close working relations were maintained, particularly with regard to the health aspects of resettlement of refugees in Africa, including consultation on specific health problems, the provision of technical advice on the siting of settlements and the provision of fellowships to refugees; and with regard to the provision of emergency assistance to refugees from East Pakistan (see paragraphs 12.8 and 14.31); representation at meetings of the Executive Committee.

United Nations Industrial Development Organization

12.82 The provision of advice on questions of drug safety, efficacy, and quality in connexion with UNIDO's promotion of the manufacture of pharmaceutical substances in certain developing countries; preparation of a report on the production, distribution and clinical trials of contraceptives in developing countries for a UNIDO expert group; inter-agency consultations to define general areas of co-operation and collaboration regarding the provision of advice on the establishment of pharmaceutical industries in developing countries; exchange of advice and consultation on problems of industrial waste disposal and public health aspects thereof.

United Nations Institute for Training and Research

12.83 Participation of WHO in a colloquium organized by UNITAR for senior officials of the United Nations system; continued co-operation in the organization of briefing or training sessions for the Institute's fellows and study groups; co-operation in the organization of inter-regional seminars and in an orientation seminar on documentation of international organizations of the United Nations system (see paragraph 9.31).

International Labour Organisation

12.84 Extensive co-operation regarding occupational health: ILO participation in a WHO consultation to assess the problem of occupational cancer (see paragraph 5.37); WHO participation in ILO conference on pneumoconiosis, in the discussions on the convention and recommendation on benzene adopted by
the fifty-sixth session of the International Labour Conference, and in an international symposium on safety and health in shipbuilding and ship repairing organized by ILO (see paragraph 5.47); collaboration with ILO and the International Social Security Association in the organization of the first African congress on the prevention of occupational accidents (see paragraph 5.46); assistance in the preparation of the ILO model code of practice on the safe use of pesticides; co-operation in assisting countries in designing employment programmes (see paragraph 6.11); joint FAO/ILO/WHO consultation on workers' feeding (see paragraph 8.93); in connexion with the ninth revision of the International Classification of Diseases, collaboration with ILO and the International Social Security Association in the preparation of proposals regarding the classification of occupational diseases, accidents and handicaps.

Food and Agriculture Organization of the United Nations

12.85 Nutrition: extensive co-operation continued in various aspects, including collaboration in the organization of courses and seminars at regional and national level (in co-operation with UNICEF); joint FAO/WHO travelling seminar on protein problems (see paragraph 8.82); Joint FAO/WHO Ad Hoc Expert Committee on Energy and Protein Requirements (see paragraph 8.85); continued co-operation in the Protein Advisory Group (see paragraph 8.78) and in applied nutrition programmes.

12.86 Food safety: FAO/WHO Codex Alimentarius Commission (see paragraphs 1.248-1.249, 8.92, and 10.39-10.43); Joint FAO/WHO Expert Committee on Food Additives (see paragraph 10.45); joint meeting of the FAO Working Party of Experts and the WHO Expert Committee on Pesticide Residues (see paragraph 10.47); joint courses on meat hygiene (see paragraph 1.247).

12.87 Pesticides: continued collaboration with regard to rodent control (see paragraph 2.132) and the safe use of pesticides (see paragraphs 2.140 and 2.141), and co-operation in the establishment of specifications for pesticides (see paragraph 2.147); arrangements made for representatives of national health authorities to participate in seminars organized by FAO and representatives of agricultural authorities in those organized by WHO.

12.88 Veterinary public health and zoonoses: FAO/WHO co-ordinated research programme on wildlife rabies (see paragraph 1.207); FAO/WHO Brucellosis Centres (see paragraphs 1.215-1.218); WHO/FAO Leptospirosis Reference Laboratories (see paragraphs 1.222-1.224); co-operation in the elaboration of methods and criteria for assessing the importance of the zoonoses and determining their priority in national development programming (see paragraph 1.239); veterinary education (see paragraph 1.242).

United Nations Educational, Scientific and Cultural Organization

12.89 UNESCO/WHO consultation on planning for health education in schools (see paragraph 6.62); continued co-operation regarding the health component of UNESCO literacy programmes and assistance to UNESCO-sponsored Arab States Functional Literacy Centre; co-operation in educational projects on human reproduction relating to school or youth programmes and in strengthening family life education in schools; collaboration with regard to the International Hydrological Decade and the Man and the Biosphere programme (see paragraphs 5.26 and 5.65).

International Bank for Reconstruction and Development

12.90 Memorandum of Understanding signed with the Bank, establishing the framework for a collaborative programme in pre-investment activities (see paragraph 5.109); provision of health specialist for IBRD-sponsored mission for the preparation of a comprehensive programme in Iran of pre-investment studies related to general social and economic development (see paragraph 6.6).

World Meteorological Organization

12.91 Arrangements made for co-ordination of WMO and WHO activities in respect of air pollution monitoring; participation in the Sixth World Meteorological Congress, and in the second meeting of the Inter-Agency Panel on Standardization in Hydrology.

Inter-Governmental Maritime Consultative Organization

12.92 In collaboration with ILO, finalization of a guide to medical first aid at sea in cases of poisoning; participation in the nineteenth session of IMCO'S Sub-Committee on the Carriage of Dangerous Goods and in its International Conference on Special Trade Passenger Ships; continued consultation on problems of marine pollution, particularly through the Joint Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP) (see paragraph 5.25).

International Atomic Energy Agency

12.93 Collaboration in studies on exposure to ionizing radiation in the environment (see paragraphs 5.29-5.34), and with regard to the medical uses of
radiation and isotopes (see paragraphs 5.88-5.90), including the Joint IAEA/WHO Expert Committee on the Medical Uses of Ionizing Radiation and Radioisotopes. Contribution to report on emergency assistance in the event of nuclear accidents, prepared by IAEA. Co-operation in preparation of an atlas on typical treatment plans for cobalt teletherapy.

12.94 Collaboration with IAEA and ILO in a study of the aspects to be considered in drafting legislation with respect to exposure to radiation (see paragraph 5.96); co-operation with regard to the training of radiographers, medical physicists, etc. (see paragraphs 5.104-5.105). IAEA/WHO consultation on ways of implementing recommendations of the International Commission on Radiological Units and Measurements and the International Commission on Radiological Protection (see paragraph 5.99).

12.95 Participation in advisory capacity in international project on the safety of irradiated foods sponsored by IAEA and the European Nuclear Energy Agency (ENEA), and in FAO/IAEA panel of experts to consider technological factors involved in food irradiation.

12.96 IAEA provided technical help in connexion with provisional monographs for radioactive pharmaceuticals that were among those adopted by the WHO Expert Committee on Specifications for Pharmaceutical Preparations (see paragraph 10.2).

International Civil Aviation Organization

12.97 Development of a comprehensive programme of research into the safety of the vapour dissection system in aircraft (see paragraphs 2.161-2.162).

Other intergovernmental organizations

Council of Europe

12.98 Co-operation with respect to various aspects of development problems; WHO participation in the Council's expert committee on air pollution, the Second European Population Conference, and the organizing committee for a symposium on drug dependence; co-operation regarding the standardization of training and equivalence of qualifications of medical laboratory technicians (see paragraph 6.25); participation in the ninth session of the European Public Health Committee.

Organization of African Unity

12.99 Approval by FAO, WHO and appropriate commission of OAU of statutes of the joint FAO/WHO/OAU Regional Food and Nutrition Commission for Africa; continuing consultation on WHO co-operation with and participation in OAU's Scientific Trypanosomiasis Research Council; representation at Conference of Heads of State and Government, Council of Ministers and other OAU meetings; participation in meetings of OAU's Educational, Cultural, Scientific and Health Commission, and its scientific advisory panels on viral, bacterial and parasitic diseases, on education, and on maternal and child health; maintenance of Liaison Officer with OAU; consultations on humanitarian assistance pursuant to resolution WHA24.51.

Organization for Economic Co-operation and Development

12.100 Participation in OECD's fourth Annual Population Conference (see paragraph 8.4); in a meeting of its Scientific Programme Committee regarding an international project in the field of food irradiation, an expert meeting on health and social indicators, a workshop on environmental education, a sector group of the environment committee on unintended occurrence of chemicals in the environment, an ad hoc meeting of group of experts on the measurement of air pollution, a study group on problems of the environment, and an international symposium on counter-measures to driver behaviour under the influence of alcohol and other drugs.

Council for Mutual Economic Assistance

12.101 Participation in meeting of the heads of water resources agencies, and in the second symposium on the problems of reducing pollution of the air caused by exhaust gases in towns.
CHAPTER 13

PUBLIC INFORMATION

13.1 The year 1971 marked the fiftieth anniversary of the discovery of insulin. Accordingly, World Health Day was devoted to the theme "A Full Life Despite Diabetes". The International Diabetes Federation co-operated in the arrangements for World Health Day observance, and one of the discoverers of insulin, Dr Charles Best, took part personally in a number of functions organized for the occasion. An interview with Dr Best was published by WHO and widely reproduced in the press, and another was distributed on request to 36 countries for radio broadcasts. The countries in which particular attention was focused on World Health Day and its theme included Belgium, Canada, Egypt, France, India, Japan, Kuwait, Lebanon, Pakistan, the Philippines, Senegal, Singapore, Switzerland, the United Kingdom, the USA, and the USSR. A Danish colour film on diabetes, produced in collaboration with WHO, was widely shown in cinemas and on television. The Belgian postal authorities brought out a stamp to commemorate the discovery of insulin, and in Switzerland a national diabetes case-finding campaign was launched. A catalogue of films on diabetes was compiled by WHO and distributed with other material, including a special diabetes issue of World Health, the illustrated monthly magazine of WHO. A number of radio programmes, recorded for the occasion in English, French and Spanish, were distributed to over 100 outlets on request.

13.2 During the year, some 150 press releases were issued by WHO headquarters or the regional offices. As in 1970, cholera was the subject most frequently treated in newspaper articles mentioning WHO. The press and radio gave special prominence to cholera in Africa and India (West Bengal), and to its reappearance in Europe. However, interest eventually waned, perhaps because of the repeated reporting of sporadic cases in European countries, and perhaps also because the nature of the disease and its comparative unimportance as a potential cause of mortality in countries with a reasonably high level of sanitation and adequate health services were beginning to be better understood by the general public.

13.3 The smallpox eradication campaign also received considerable attention from the media of mass communication. The success of the world campaign in leading some countries to alter their vaccination requirements was widely reported and discussed.

13.4 Judging by the press cuttings received during the year, it may be said that newspaper comment on WHO continued to be favourable. The few adverse comments were almost exclusively concerned with incomplete reporting of cholera. A more systematic review of press cuttings about WHO was instituted during the year.

13.5 Nine feature articles on health subjects of international importance were produced and distributed for use by the general press, an innovation being the offer of a selection of photographs to accompany most of these articles. Women's working capacity, rabies in Europe, and legislation on abortion in different countries were among the most successful subjects in this series.

13.6 With the publication of an edition in Arabic, World Health in 1971 appeared in nine languages, the others being English, French, German, Hindi, Japanese, Portuguese, Russian, and Spanish. The Japanese edition increased in circulation during the year to an average of 20,000 copies per issue and the Russian edition from 30,000 to 50,000 copies. The German Green Cross, which publishes the German edition, made additional printings of the issues on diabetes and on drug abuse. The regular distribution of the magazine now exceeds 200,000 copies, including the copies distributed by pharmacists in French-speaking and German-speaking Switzerland. The demand for some issues was so heavy that they had to be reprinted.

13.7 As a contribution to the International Year for Action to Combat Racism and Racial Discrimination, instituted by the General Assembly of the United Nations, the subject was discussed in the October number. As a tribute to UNESCO on its twenty-fifth anniversary, the November issue of World Health was devoted to education of health workers. The
December issue celebrated the twenty-fifth anniversary of UNICEF. An issue containing articles on water supply, waste disposal, and various forms of pollution was produced in anticipation of the United Nations Conference on the Human Environment, to be held in Stockholm in 1972.

13.8 Preparations for that conference and for the public information activities relating to it also included the production of five short films on environmental pollution. These films were made for WHO by Hungarofilm, Budapest. Others produced during the year by WHO included a short film on smoking (also by Hungarofilm) and an animated film based on the WHO emblem and designed to serve as an introduction to WHO films and television programmes. This was produced by Animafilm, Bucharest. Facilities for film production at WHO headquarters were considerably improved; French and Spanish commentaries were recorded for the film “Healthy Hearts”, originally produced by Film Polski, and production was started on a half-hour film on cardiovascular diseases based on interviews with eminent cardiologists.

13.9 The latter is one of the films being prepared for World Health Day 1972, the theme of which is “Your Heart is Your Health”; another was made for WHO by Sovinfilm, Moscow, and is a 10-minute animated colour cartoon on the prevention of heart diseases.

13.10 Over 270 copies of films produced by WHO were sold during the year, and WHO films were shown at a number of film festivals: “The Drug Bug”, at the International Red Cross Film Festival at Varna, Bulgaria, and the Leipzig Film Festival, German Democratic Republic; and “Little Man – Big City”, at the New York Film Festival.

13.11 A new set in the series “Photos for Television” was produced on nursing. Film crews from the Federal Republic of Germany, France, Italy, Spain, Switzerland, and the United Kingdom were helped to prepare programmes for television.

13.12 About 40,000 photographs were produced and distributed in 1971. In collaboration with the International Society of Cardiology and the International Cardiological Federation, about 1500 photographs were provided for the press campaign of European Heart Week.

13.13 Photographic feature stories made by WHO during the year included the following subjects: education and training (Austria, Cameroon, Federal Republic of Germany, Morocco, USSR), environmental pollution (Japan, USA), cardiovascular diseases (Finland, Israel, Sweden, USA), leprosy (Burma), malaria and smallpox (Afghanistan), and first aid (Hungary). These features are distributed for use by the world’s press.

13.14 WHO publications and photographs were exhibited on special stands at the International Congress of Immunology, Washington D.C., and the International Paediatric Congress, Vienna. The Organization also took part in the health section of the fair at Martigny, Switzerland, which was visited by some 120,000 people. Two WHO films were shown daily during the International Pharmacy Exhibition in Basle, Switzerland, in October. In addition, photographs illustrating the work of WHO were shown at about thirty exhibitions in different parts of the world.

13.15 WHO continued to participate in Development Support Information programmes in close cooperation with other specialized agencies and UNDP. A Finnish television team visited Ghana and Nigeria, and reported on water supplies in rural areas. In November, medical editors from France and Sweden and a photographer covered health problems in Nepal and the Philippines.

13.16 Ten radio programmes in the regular series “Around the World with WHO” were produced in English, French and Spanish, and distributed on request to 183 radio stations, compared with 164 in 1970. NABC, a radio network in the United States of America, redistributed the English-language programmes to several hundred of its affiliated stations. The feasibility of producing a new programme, directed particularly to audiences in the USA and Canada, was investigated. Among the special radio programmes produced during the year were a programme on the human environment, largely composed of statements of delegates to the Twenty-fourth World Health Assembly, and another one on the work of the International Agency for Research on Cancer. Both programmes were produced in English and French.

13.17 A new version of the basic brochure on WHO was brought out in 1971, and preparations were made for the publication of a new catalogue of WHO photographs early in 1972. About 5000 people were shown round the WHO headquarters building in organized groups by members of the visitors’ service.

13.18 Several regional events should be noted. In South-East Asia a five-day workshop on the promotion of public health information in the Region was organized. The meeting was attended by participants
from Ceylon, India, Indonesia, Nepal, and Thailand, as well as by representatives of UNICEF and UNDP. The discussions were concerned mainly with means of strengthening and measuring the effect of public health information disseminated through the mass media. An anthology of *World Health* articles and special features issued in the South-East Asia Region was published under the title "War against disease"; a second anthology was published later in the year in Hindi, and World Health Day material was translated into a number of languages spoken in the Region, as was done in other Regions also. In the European Region an illustrated brochure was produced containing highlights from meetings of the Regional Committee from 1951 to 1970. In the Region of the Americas, an illustrated brochure was brought out on the structure and activities of the Pan American Sanitary Bureau.
CHAPTER 14

CONSTITUTIONAL, FINANCIAL AND ADMINISTRATIVE DEVELOPMENTS

Constitutional and Legal

14.1 On 26 April 1971 the Gambia became a Member of the World Health Organization by depositing with the Secretary-General of the United Nations an instrument of acceptance of the WHO Constitution, and on 13 May 1971 the Twenty-fourth World Health Assembly admitted the Sultanate of Oman to membership, which became effective on 28 May 1971, date of the deposit of the instrument of acceptance of the WHO Constitution by the Government of Oman with the Secretary-General of the United Nations. Bahrain and Qatar, Associate Members of the Organization since 8 May 1968 and 5 March 1964 respectively, attained independence on 15 August and 1 September 1971. Bahrain became a Member of WHO, after having been admitted to membership in the United Nations on 21 September 1971, by depositing on 2 November 1971 an instrument of acceptance of the WHO Constitution with the Secretary-General of the United Nations. At the end of the year WHO had 131 Members and one Associate Member. A list of Members and Associate Members at 31 December 1971 is given in Annex 1.

14.2 An application for membership of WHO by the German Democratic Republic was submitted to the Twenty-fourth World Health Assembly, which decided in resolution WHA24.20 to defer consideration of this matter until the Twenty-fifth World Health Assembly.

14.3 Since 1970 four further Member States, Mongolia, Oman, Poland, and Somalia, deposited with the Secretary-General of the United Nations instruments of acceptance of the amendment to Article 7 of the Constitution which had been adopted by the Eighteenth World Health Assembly in 1965 (resolution WHA18.48), thus bringing the total number of acceptances to 47.

14.4 The Director-General was informed by the United Nations that in 1971 the Secretary-General received nine instruments of acceptance of the amendments to Articles 24 and 25 of the WHO Constitution, bringing the total number of acceptances at the end of the year to 61. These amendments, adopted by the Twentieth World Health Assembly in 1967 (resolution WHA20.36) will, when they come into force after acceptance by two-thirds of the Members of the Organization, increase from 24 to 30 the number of Members entitled to designate a person to serve on the Executive Board.

14.5 By a communication dated 18 February 1971 and received on 22 February 1971 by the Director-General, Israel notified its intention to withdraw from participation in the International Agency for Research on Cancer. In accordance with Article XIII of the Statute of the Agency, Israel was considered as having withdrawn from participation on 22 August 1971 and ceased to be a Participating State on that date.

14.6 Up to the end of 1971, 73 Member States had acceded to the Convention on the Privileges and Immunities of the Specialized Agencies together with its Annex VII, which relates specifically to the World Health Organization. During the year, no further accessions were received by the Secretary-General of the United Nations, depositary of the Convention.

The Financial Position

Budget for 1971

14.7 The effective working budget approved by the Twenty-third World Health Assembly for 1971 amounted to US $73 475 000, which was an increase of US $5 825 000 over the corresponding amount for 1970.

14.8 In resolution WHA24.10, the Twenty-fourth World Health Assembly, on the recommendation
of the Executive Board, approved supplementary budget estimates for 1971 of US $2 312 000, of which US $1 740 000 were in respect of the effective working budget, thus resulting in a total effective working budget for 1971 of US $75 215 000.

14.9 The approved budget level for 1971, including the supplementary estimates, was US $89 414 764. The difference of US $14 199 764 between the effective working budget and the approved budget level is accounted for by a transfer to the Tax Equalization Fund of US $9 460 931 and an undistributed reserve of US $4 738 833 equal to the assessments on the inactive members (the Byelorussian SSR and the Ukrainian SSR) and on China and South Africa.

14.10 The supplementary budget estimates, which were necessary in order to give effect to the decisions of the United Nations General Assembly concerning increases in the salaries for professional and ungraded categories of staff, were financed by an increased appropriation by the Health Assembly of available casual income.

14.11 The revaluation of the Swiss franc in May 1971 gave rise to certain budgetary problems which it was found possible to overcome by intensifying budget control and by delaying the filling of vacant posts during the remainder of the year. This involved certain transfers between sections of the Appropriation Resolution for 1971 which were agreed to by the Executive Board. They are shown in Annex 13.

14.12 The distribution of the approved effective working budget among the appropriation sections, taking account of the adjustments referred to above, is also shown in Annex 13.

United Nations Development Programme

14.13 During 1971 WHO was allocated an amount of US $5 441 136 from the Technical Assistance component of the United Nations Development Programme. This, together with allocations received in previous years, gave a total of US $16 054 860 applicable to the years 1971 to 1975. Of this sum US $10 127 445 were in respect of the 1971 approved programme, including US $1 300 340 for administrative and operational services costs. The final amount allocated to WHO in respect of the 1970 approved programme was US $7 390 560.

14.14 From the Special Fund component of the United Nations Development Programme, WHO was allocated an amount of US $7 129 498 in 1971 which, together with an uncommitted balance of US $5 529 935 brought forward from 1970, gave a total of US $12 659 433 available for commitment.

United Nations Fund for Population Activities

14.15 For 1971 the Organization received a total of US $5 827 820 from the United Nations Fund for Population Activities to carry out projects relating to health aspects of human reproduction, family planning and population dynamics in accordance with the policy established by the Health Assembly.

Voluntary Fund for Health Promotion

14.16 Contributions in cash and in kind received in 1971 for the Voluntary Fund for Health Promotion amounted to US $6 853 977, bringing the total of contributions credited to the Fund since its inception to US $44 751 740 as at 31 December 1971. These contributions related to the following sub-accounts:

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<tr>
<td>Working Capital Fund</td>
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Working Capital Fund

14.17 The obligations incurred in 1971 and the status of the collection of contributions and of advances to the Working Capital Fund at the end of 1971 are shown in the Financial Report, which is published as a supplement to the Annual Report of the Director-General for submission with the Report of the External Auditor to the Twenty-fifth World Health Assembly.

14.18 The Twenty-fourth World Health Assembly (in resolution WHA24.17) decided that Part I of the Working Capital Fund, composed of advances assessed on Members, should remain at the amount of US $5 000 000, to which should be added the assessments of Members joining the Organization after 30 April 1965. Part I amounted to US $5 018 000 at 31 December 1971. In the same resolution, the Assembly decided that Part II, made up of transfers of casual income, should remain established at US $6 000 000 for 1972. The amount of the Working Capital Fund thus totalled US $11 018 000 at 31 December 1971.

Revolving Fund for Teaching and Laboratory Equipment for Medical Education and Training

14.19 The status of the Revolving Fund for Teaching and Laboratory Equipment for Medical Education and Training is shown in the Financial Report. During 1971, 29 requests, amounting to US $438 851, were accepted (see also paragraph 14.29). The items supplied included cinefilm projectors and audiovisual aids, surgical instruments and apparatus, radiological and other electromedical equipment, glassware, and spare parts.

Real Estate Fund

14.20 The status of the Real Estate Fund, which was established by the Twenty-third World Health Assembly, is shown in the Financial Report. The Twenty-fourth World Health Assembly (in resolution WHA24.23) appropriated to the Real Estate Fund the sum of US $631 000 from casual income.

14.21 The Twenty-fourth World Health Assembly authorized for the 12-month period beginning in June 1971 the following construction programme to be financed from the Real Estate Fund, at an estimated cost of US $775 000: an additional temporary office building at headquarters at a cost of approximately US $600 000 (resolution WHA24.22); initial topographic surveys, test borings and studies required for the permanent extension to the headquarters building at an estimated cost of US $50 000 (resolution WHA24.22); the acquisition of a small additional parcel of land to enlarge the building site for housing for the staff of the Regional Office for Africa at a cost of approximately US $15 000 (resolution WHA24.24); and the construction of an addition to the Regional Office building for South-East Asia (resolution WHA24.25) for an amount of US $110 000.

Administration

Structure

14.22 There were relatively few organizational changes at headquarters during 1971. From the Division of Health Protection and Promotion, the Nutrition unit was transferred to the Division of Family Health and the units of Radiation Health and Occupational Health to the Division of Environmental Health. Administrative Co-ordination, which had been reporting to the Assistant Director-General responsible for administrative and financial matters, was transferred to the Division of Co-ordination and Evaluation. In the Division of Research in Epidemiology and Communications Science, the units of Epidemiology of Communicable Diseases and of Epidemiology of Non-communicable Diseases were disestablished and a new unit of Research in Epidemiology created. The units of Community Water Supply, Sanitation Services and Housing, and Wastes Disposal in the Division of Environmental Health were disestablished and two new units created—Community Water Supply and Sanitation, and Development of Institutions and Services. The unit of Epidemiological Surveillance and Quarantine was renamed Epidemiological Surveillance of Communicable Diseases. The Headquarters Programme Committee, composed of all the Assistant Directors-General, which was established in 1970, formulated criteria and guiding principles in programme planning, evaluated selected aspects of the programme and advised on the framing of the annual programme and budget estimates for 1973. A redistribution of divisional responsibilities among the technical Assistant Directors-General was also undertaken. The structure of the Organization as at 31 December 1971 is shown in Annex 16.

Staff

14.23 On 30 November 1971, the total staff (excluding staff of the Pan American Health Organization) was 3643 as compared with 3497 on 30 November 1970, an increase of approximately 4.17%. Details of the numbers and distribution of the staff and of its composition by nationality on 30 November 1971 are given in Annexes 14 and 15. The latter shows that on that date the number of Members
and Associate Members whose nationals were employed by the Organization in posts subjects to geographical distribution was 99, or 74.4% of the total membership of the Organization.

14.24 In addition to the regular study leave and refresher training, several group courses were organized in 1971 for both technical and administrative staff. They were held in Geneva. Eleven staff members attended the eighth training course for WHO representatives in February 1971. In June, 15 administrative officers from headquarters and nine from the regional offices attended the third training course for administrators. In October, a course on health aspects of family planning was attended by 12 regional and field staff members. Three hundred and sixty-nine staff members attended courses in the language laboratory, which provided audiovisual tuition in four languages.

Headquarters accommodation and other related matters

14.25 For several years the World Health Assembly has expressed its continuing concern that adequate office accommodation for headquarters be obtained. Negotiations with the cantonal authorities of Geneva were pursued with a view to acquiring land for the construction of a permanent addition to the headquarters building, and in December 1971 the Republic and Canton of Geneva was able to acquire a property adjacent to the headquarters ground and sell it to the Organization.

14.26 In the meantime, the construction of an additional temporary office building was authorized by the Twenty-fourth World Health Assembly in resolution WHA24.22 (see paragraph 14.21).

14.27 By the same resolution, the World Health Assembly authorized the Director-General to undertake the construction of an additional underground parking garage for about 300 automobiles, at a cost not exceeding US $1 100 000. This is to be financed by loans repaid by rental revenues from both the proposed and the existing garage.

14.28 The construction of the additional temporary office building and the underground parking garage was started in July 1971.

Supply services

14.29 The total value of supplies and equipment purchased through headquarters during 1971 approached US $10 500 000, not including approximately US $1 500 000 required to cover freight and insurance charges. Line items ran to 42 000. Some 6650 purchase orders were placed with upwards of 2000 different suppliers in 36 countries for shipment to approximately 2000 projects, suppliers, and receivers of grants located in 120 countries throughout the world. These figures include purchases, amounting to US $3 322 000, made on a reimbursable basis for 19 countries, and for the United Nations and specialized agencies, UNICEF, the Office of the United Nations High Commissioner for Refugees, the International Computing Centre, the International Agency for Research on Cancer, and inter-governmental and non-governmental organizations in official relations with WHO. Of this total, US $387 000 were for purchases made out of the Revolving Fund for Teaching and Laboratory Equipment for Medical Education and Training (see paragraph 14.19). Purchases from research grants awarded to individual investigators or institutions amounted to US $370 000.

Supplies for emergency and relief operations

14.30 Supplies required in connexion with the Organization's emergency action for the control of cholera (see paragraph 1.165) were provided to 24 countries in Africa, Europe and Asia. The greater part of these supplies went to India to combat outbreaks among the refugees from East Pakistan. In addition to provision of cholera vaccine, rehydration fluids, tetracycline, diagnostic media and sera, jet injectors and syringes to those areas notifying cholera outbreaks, self-help measures in Ethiopia and Kenya were supported by providing supplementary vaccine production equipment. WHO depots of rehydration fluid and tetracycline were established at Abidjan for West Africa and Nairobi for East Africa, as well as at the Regional Office for Africa in Brazzaville.

14.31 The provision of assistance for the refugees from East Pakistan in India confronted all the organizations involved in the United Nations relief operation with problems of unusual proportions. WHO was responsible for all health aspects of this operation in co-operation with UNICEF and the League of Red Cross Societies. The Office of the United Nations High Commissioner for Refugees was designated by the United Nations Secretary-General as the "focal point" for the co-ordination of the activities of the United Nations agencies and programmes, as well as the non-governmental organizations involved in this relief operation.

14.32 The role of the Organization included arrangements for providing, scheduling, loading and dispatching chartered and military aircraft made available
by the Governments of Belgium, the United Kingdom and the USA. Air cargo destined for refugee relief was also carried free to India, on a "space-available" basis, by a number of commercial airlines. By the end of the year, the special all-cargo airlift which commenced on 10 June had carried 700 tons to India. A large part of these cargoes consisted of rehydration fluid and cholera vaccine. Other emergency supplies sent by air included tetracycline, chloramphenicol, clioquinol, sulfonamides, dexamethazone, prednisolone, chloroquine, diphtheria and tetanus vaccines and sera, anti-gas-gangrene serum, normal saline, cutting down sets, gastric tubes, disinfectants, water-purification tablets, jet injectors, and syringes. The value of supplies provided by the Organization up to 31 December 1971 and purchased against pledged funds stood at US $1 700 000. In this connexion it should be noted that many pharmaceutical producing firms in the Federal Republic of Germany, France, Switzerland, the United Kingdom and the USA provided supplies to the Organization at far below the normal selling price.

14.33 Medical supplies and equipment requested by the Government of Pakistan for relief operations in East Pakistan were provided by the Organization under the United Nations operation for humanitarian assistance to East Pakistan. At the end of 1971, the value of the purchases for supplies to East Pakistan amounted to US $200 000. Some 130 tons were dispatched by air and 10 by sea.

Data processing

14.34 In 1969 and 1970 the Auditor-General of Canada, in his capacity as chairman of the Panel of External Auditors, carried out a study of the data processing facilities and operations of the organizations in the United Nations system and recommended the creation of "a separate facility in Europe for the United Nations system of organizations which provides data processing, systems and information services on an inter-organizational basis . . . ."

14.35 In compliance with this recommendation, which was in line with wishes expressed by the Advisory Committee on Administrative and Budgetary Questions, the Economic and Social Council, and the General Assembly of the United Nations for a more effective co-ordination of data processing activities among the United Nations and specialized agencies, the Organization signed a memorandum of agreement with the United Nations and UNDP providing for the establishment, on WHO's premises of a common data processing facility known as the International Computing Centre (ICC). The Centre acquired an IBM System/350 model 65 computer and began operations on 1 March 1971. As from that date, the Organization discontinued its electronic data processing installation and is now using the more powerful computer on a co-operative, cost-sharing basis. These developments, which represent a tangible achievement of the co-ordination efforts in the United Nations system of organizations, were reported to and endorsed by the Executive Board and the World Health Assembly.

Co-ordination in administrative, budgetary and financial matters within the United Nations system of organizations

14.36 In 1971, the Administrative Committee on Co-ordination (ACC) approved standard provisions for the financial regulations relating to external audit principles and their application throughout the United Nations system of organizations. The text is to be submitted to the governing bodies of the organizations, including WHO, participating in ACC for their consideration. A new format of ACC's annual report on expenditures in the United Nations system in relation to programmes was well received by the Economic and Social Council (ECOSOC).

14.37 During the summer, WHO provided background information papers and presented its views to the Special Committee established by the United Nations General Assembly to undertake a thorough review of the long-term principles and criteria governing the whole United Nations common system of salaries, allowances and other benefits. WHO provided accommodation for the Special Committee in July, when it heard the representatives of the specialized agencies in Europe, including WHO. Inter-agency consultations were also undertaken to study the possibility of establishing an International Civil Service Commission and a United Nations Staff College.

14.38 Five formal reports received from the Joint Inspection Unit were considered by the Executive Board at its forty-seventh and forty-eighth sessions, held in January and in May 1971, together with the Director-General's comments. One of these reports was on the activities of the Joint Inspection Unit for the period July 1969 to June 1970 and three dealt with United Nations activities in, respectively, Indonesia, Nepal and some Central American countries. The Director-General's comments and the decisions of the Executive Board on them were transmitted to ECOSOC, to the Chairman of the Joint Inspection Unit, and to the External Auditor.
14.39 The fifth report, entitled "A rationalization of the proceedings and documentation of the World Health Assembly" and the Director-General's comments on the fifteen recommendations it contained were considered by the Executive Board and sent to the Health Assembly for information. The Executive Board requested the Director-General to study certain of the recommendations further and to report thereon to its forty-ninth session in January 1972.

14.40 The Twenty-fourth World Health Assembly, after having considered the United Nations General Assembly's resolution 2735 A (XXV) on the continuation of the Joint Inspection Unit beyond 31 December 1971, decided (resolution WHA24.53) that WHO should continue to participate in the Joint Inspection Unit on the existing experimental basis for a further period of two years beyond 31 December 1971.
PART II

THE REGIONS
Fig. 14. WHO Regional Offices and the areas they serve

AREA SERVED, AS AT 31 DECEMBER 1971, BY:

- Regional Office for Africa
- Regional Office for South-East Asia
- Regional Office for the Americas/PASB
- Regional Office for Europe
- Regional Office for the Eastern Mediterranean
- Regional Office for the Western Pacific

Regional Office

HQ

COPENHAGEN

WASHINGTON

ALEXANDRIA

NEW DELHI

BRAZZAVILLE

MANILA
CHAPTER 15

AFRICAN REGION

15.1 During 1971 the Organization’s programme in the African Region was concerned increasingly with the strengthening of national epidemiological services and of epidemiological surveillance, especially in relation to cholera, smallpox, yellow fever, plague and, to a lesser extent, typhus.

15.2 In view of the generally inadequate development of statistical, laboratory and epidemiological services in the Region, it is clear that a great deal remains to be done before effective and widespread surveillance can be achieved. In this respect, the two WHO epidemiological surveillance centres in Nairobi and Abidjan provided the Member States with assistance in planning, implementing and evaluating programmes for the control of diseases of public health importance.

15.3 The further spread of the cholera pandemic, which affected 17 countries in the Region in 1971 as against 11 in 1970, called for a major effort in the provision of emergency aid. A long-term programme is being developed to strengthen national plans for the surveillance and control of diarrhoeal diseases and the general improvement of environmental sanitation. The concern with cholera has not, however, lessened the Organization’s activities against other communicable diseases. At the country level, integration of smallpox and tuberculosis programmes continued, particularly in the new epidemiological services projects in Burundi, Ghana, Kenya and Rwanda.

Communicable diseases

15.4 During the year smallpox eradication campaigns that had been begun in the Region in 1968-1969 came to an end. In Central and East Africa, they were replaced by the maintenance phase in the following countries: Burundi, Rwanda, United Republic of Tanzania, Zaire, and Zambia. Kenya is expected to enter the maintenance phase in the near future. In Malawi, where widespread vaccination has been practised for many years, a programmed mass vaccination campaign has now been started. In the countries of western Africa where assistance from the United States Agency for International Development (USAID) is continuing, all the combined smallpox and measles vaccination programmes have now entered the maintenance phase.

15.5 There was an active focus of smallpox in Botswana.

15.6 In the course of mass vaccination campaigns, the greatest care has been taken to set up an active epidemiological system for the surveillance of smallpox. It is noteworthy that in West Africa no case has been notified since May 1970. In Zaire, only 63 cases had been reported through November 1971; this was only 12% of the number for the corresponding period in 1970 (see paragraph 15.89). There have, however, been reports of the importation of smallpox cases into border areas of Kenya and Uganda from endemic areas of Ethiopia and Sudan. Through effective containment measures the outbreaks were stopped.

15.7 WHO is providing personnel for eight smallpox eradication projects in the Region and is meeting the local costs of the campaigns in 13 Member States.

15.8 The continuation of smallpox vaccination among the new cohorts of the population requires the co-operation of the staff of permanent health centres. However, when health services are poorly developed or where endemic foci occur in border areas, the use of mobile teams may still be necessary. In Rwanda and Zaire such mobile teams are also responsible for epidemiological surveillance.

15.9 WHO supported national yellow fever vaccination campaigns in the Gambia and in Senegal by providing a total of 450 000 doses of 17D yellow fever vaccine. With bilateral aid, Upper Volta has almost completed the country vaccination programme planned for 1971. Thanks to a contribution made by the Government of Sweden in response to a recommendation of the Twenty-third World Health Assembly (resolution WHA23.34), WHO was able to provide nine countries in West and Central Africa with 46 deep-freezers for use in yellow fever vaccination campaigns. In Sierra Leone, the Organization assisted in both the serological and entomological aspects of a yellow fever survey which is to assess the immunity
level of the population at risk. A similar survey is
being prepared in Ivory Coast. The Dakar centre of
the Office de la Recherche scientifique et technique
outre-mer, in conjunction with the Organization, is
carrying out a vector survey in Cameroon and Senegal.

15.10 Sixty-five cases of yellow fever were reported
from Luanda, Angola, in March and April. This led
Zaire and Zambia to plan emergency vaccination pro-
grammes in the border zones. In West Africa, an
outbreak of the disease occurred in Okwoga district,
Benue Province, Nigeria, during the last quarter of
1970, indicating that the jungle yellow fever cycle con-
tinues to be maintained there. The Government
reinforced the vaccination programme, partly with
vaccine produced by the national laboratory at Yaba.
A reported outbreak of jaundice in the Onitsha area,
East-Central State, proved to be of viral hepatitis.

15.11 Trachoma is still the greatest single cause of
blindness and impaired vision, particularly in the
United Republic of Tanzania, the northern states of
Nigeria and some parts of Ivory Coast. In the latter
two countries, onchocerciasis also poses a serious
health and economic problem as it does in northern
Ghana, where blindness is caused by both diseases.
Following a sample survey in the United Republic of
Tanzania, it was estimated that the total number of
persons suffering from either economic or absolute
blindness among a population of 236,000 in the
Dodoma region was between 4000 and 6600. Control
activities in limited areas of that region have confirmed
that the local application of antibiotics can signific-
antly reduce trachoma prevalence.

15.12 Persisting transmission and focal outbreaks of
endemic treponematoses continue to occur in some
countries where mass treatment with penicillin had
been carried out earlier by the health authorities with
international assistance. In Niger, WHO assisted in a
sero-epidemiological sampling survey covering 17 vil-
lages in the departments of Niamey, Dosso and
Maradi. Serum samples were sent to the WHO
International Reference Centre for Endemic Trepo-
nematoses, at the Institut Alfred-Fournier, Paris.

15.13 A WHO team undertook a preliminary study
in areas of Senegal, Mali and Mauritania included in
the Senegal River basin with a view to a later multi-
purpose serological survey. At the same time WHO
assisted those three countries to obtain baseline data
on the present situation of endemic syphilis.

15.14 By the end of 1971, all except one of the ten
WHO-assisted tuberculosis programmes in the Region
had been integrated into projects with wider objectives,
Nigeria, 17 from Sierra Leone and one from Ethiopia in the Eastern Mediterranean Region.

15.18 The outbreaks of cerebrospinal meningitis mentioned in the Annual Report for 1970 continued in 1971 and affected seven African countries in the meningitis belt: Chad, Dahomey, Mali, Niger, Nigeria, Senegal and Upper Volta. Vigorous measures were taken by the national health authorities to provide prompt diagnosis and adequate treatment and control. WHO co-operated in a trial of a polysaccharide vaccine in Northern Nigeria. The results were inconclusive and a further trial is expected to be made. Drugs for the treatment of the disease were provided to Mali, Nigeria and Senegal in response to government requests.

15.19 During 1971, cholera was reported from six countries, Cameroon, Chad, Kenya, Mauritania, Senegal and Uganda, in addition to the 11 where it was present in 1970. WHO assisted in organizing emergency supplies needed to combat the epidemic, and provided technical advice on cholera prevention and control to the Central African Republic, Dahomey, Nigeria, Uganda and Zambia. During the first half of the year, 2,470,000 ml of vaccine, 92,241 litres of rehydration fluid, 30,420 capsules (250 mg) of tetracycline and 13.5 pounds of TCBS culture medium were supplied. Three subregional depots were established, at Abidjan, Brazzaville and Nairobi, to facilitate the dispatch of these supplies as need arose.

15.20 One fatal case of plague was reported from Djugu district in north-eastern Zaire. WHO assisted that country and Mauritania in assessing problems of plague control and improving the laboratory diagnosis of the disease.

15.21 During the past few years louse-borne typhus has been reported from endemic foci in the highlands of Burundi and Rwanda. In 1970, Burundi reported 17,200 cases and 87 deaths, and in 1971 the disease continued at approximately the same level of morbidity in populations where body lice infestation is present. WHO assisted both countries in assessing the current epidemic situation, investigating the resistance of body lice to insecticides, and supplying drugs.

15.22 Malaria control activities continued on the same lines as in 1970, but methods were increasingly diversified and adapted to local conditions. In Cameroon, Comoro Archipelago, Guinea, Nigeria, Senegal and Togo, WHO assisted in programmes operating within the framework of basic health services for the distribution of chloroquine for both suspected and confirmed cases of malaria. Assistance was given in developing antilarval control measures in Monrovia and in several towns of Cameroon and Nigeria, and in evaluating the malaria situation and organizing antilarval action in Bangui, Brazzaville, Fort Lamy, Freetown, and in the Valley of Mosso Cankuzu (Burundi) and several places in Zambia.

15.23 An evaluation of malaria chemoprophylaxis in schools that was made in Cameroon at the end of the scholastic year showed that this means of control reduced the original malaria prevalence by two-thirds. However, the cost-benefit results were not very encouraging. In the hope of reducing the transmission of malaria in forest zones with a considerable density of Anopheles funestus, trials of the method of applying DDT in a single spraying cycle were carried out in Klouto, Togo. A first evaluation of the method will be made in April 1972.

15.24 In Mauritius, where the eradication campaign has been in the maintenance phase since 1968, a WHO team has carried out an evaluation of the malaria situation to serve as the basis for possible recommendations that Mauritius may be considered for entry in the WHO official register of areas where malaria eradication has been achieved (see also paragraph 2.3).

15.25 A concerted onchocerciasis control programme involving the governments of seven countries in the Volta River basin was launched during the year with the aim of making possible the reclamation of vast areas of fertile land which the disease renders unfit for development. In July, a preparatory mission to governments, sponsored by WHO and UNDP/SF, and based in Ouagadougou, began the collection of available epidemiological, socio-economic and other relevant information on onchocerciasis in the countries concerned (see also paragraphs 2.64 and 2.127). Field investigations in Ghana on the ecology of the Simulium fly which transmits onchocerciasis identified its resting places, thus opening the way for further advances in methods of controlling the disease. In this connexion, plans were formulated for a large-scale trial of Simulium control by aerial application of insecticide along the White Volta river in Ghana and Upper Volta.

15.26 Schistosomiasis has gained ground as a result of the development of hydroelectric or hydro-agricultural schemes and the creation of man-made lakes. An inter-regional project, financed by UNDP/SF, on research into the epidemiology and methodology of schistosomiasis in man-made lakes was
initiated during the year, the project headquarters being in Accra.

15.27 The schistosomiasis control project in the United Republic of Tanzania has entered its attack phase. In the Misungwi pilot zone, molluscicide application operations proved effective. A 12-month follow-up of patients given chemotherapy in a rural area in 1970 showed that satisfactory results had also been obtained by mass treatment with niridazole. In a similar project in Ghana good progress was made in locating infested habitats and in treating them with molluscicides. Both Gabon and Zambia were assisted in assessing the schistosomiasis situation and in formulating plans to control the disease.

15.28 The available evidence suggests that trypanosomiasis is increasing in prevalence in a number of countries, including the Central African Republic, the Congo, Guinea, the United Republic of Tanzania, and Zaire. WHO provided 1500 ampoules of melarsoprol to help control a recurrence of the disease in two localities in Botswana.

15.29 The project for operational research on human and animal trypanosomiasis in Kenya, which was terminated during the year, achieved some notable results (see paragraph 2.84). At the request of the East African Community, WHO helped in formulating a request for UNDP financial assistance in setting up a regional project for applied research on trypanosomiasis and its control.

Non-communicable diseases

15.30 Research in various aspects of cardiovascular disease is being sponsored by WHO in Nigeria, Senegal and Uganda. Several countries in the Region have agreed to participate in community programmes for the control of rheumatic fever and rheumatic heart disease (see also paragraph 3.32).

15.31 The United Republic of Tanzania was assisted in undertaking projects for the fluoridation or defluoridation of water supplies, and it is planned to extend assistance in this field to other countries in which the water supplies have been found to have inadequate or excessive fluoride concentrations. The Organization advised the University of Dakar on the preparation of a teaching programme in dental health and dental care, and on a training programme for dental technicians.

Environmental health

15.32 WHO is the executing agency for nine water supply and wastes disposal projects in the Region supported by UNDP/SF and for one financed by the Swedish International Development Authority (SIDA). The international funds committed amount to a total of approximately US $9 500 000.

15.33 In the Central African Republic the project for sanitation and drainage in Bangui met some difficulties in recruiting staff during the year. However, the intensive training of staff made it possible to develop and reorganize the national sanitation services. The digging of drainage ditches was continued.

15.34 In Ghana, the report on the Accra-Tema water supply and sewerage project has been completed. The Ghana Water and Sewerage Corporation was given technical assistance as regards finance, management, and utilization of data. The pre-project activities for the provision of water supplies in rural areas received UNDP approval. In consequence, the Government of Ghana is being assisted in revising the request for a full-scale UNDP/SF project.

15.35 In the Ivory Coast, the subcontractor began work in July on the water supply and sewerage project for Abidjan. Data collection on pollution in the Abidjan lagoons was started. As part of this project, a study is under way of means to diminish the health hazards caused by insufficient drainage of sewage and storm water in certain districts of Abidjan.

15.36 In the project for master plans for sewerage, storm drainage and groundwater investigations for Nairobi, sectorial studies are being undertaken on sewers and underground water sources. As for the project financed by SIDA, the necessary personnel is in place to carry out a sectorial study and national programming for community and rural water supply, sewerage, and water pollution control.

15.37 Assistance has been given to the Government of Liberia in drawing up a request to UNDP for assistance in a national water supply programme.

15.38 A pre-investment study on water supply and sewerage for Tananarive has received UNDP/SF approval and a plan of operation has been drawn up.

15.39 In Mali, the draft plan of operation for a study of drainage in Bamako and water supply for selected provincial towns has been approved by UNDP. A project manager has been selected for the project and supplies ordered.

15.40 In the project in Ibadan, Nigeria, for master plans for wastes disposal and drainage, two "comfort stations" equipped with latrines, showers and clothes-washing facilities have been built in the centre of the city, and others are under construction. Health
education activities have been begun. Studies are under way for the organization of the sewerage department of the City of Ibadan.

15.41 In Senegal, the project for the preparation of a master plan for water supply and sewerage for Dakar and its surrounding areas advanced satisfactorily. The drilling component of the groundwater studies has been finished and the data thus collected are being used to develop the analogue model. Geophysical and radioisotope studies have been carried out. The master plan has been submitted in draft form pending the completion of groundwater studies.

15.42 In Uganda, the first phase of the project for master plans for water supply and sewerage for Kampala and Jinja was completed, and a review made of plans for the second phase, which will be concerned largely with matters of administration and management. A group of national engineers working under the WHO project manager are executing the five-year programme drawn up in 1970 to meet immediate needs.

15.43 In addition to the above, 24 environmental health projects were in operation in 21 countries of the Region during the year. Of these, 18 were integrated into projects for public health administration or for the development of basic health services. In addition to planning and developing environmental health programmes, WHO assistance was directed to training sanitation personnel and strengthening environmental control services in health or other ministries.

15.44 Assistance to Mauritius in environmental health came to an end during the year, and activities in that field were carried on by a national sanitation unit which WHO had assisted to set up in the Ministry of Health. Three new projects were initiated in Ghana, Uganda, and the United Republic of Tanzania with WHO assistance in the form of personnel. WHO also assisted in setting up a training programme in sanitary engineering (sanitary chemistry and biology) at Nairobi University. The training of health inspectors and other sanitation personnel was continued in 11 countries.

15.45 In connexion with cholera control programmes in the Region, members of WHO field teams were frequently required to plan and develop emergency sanitation programmes.

15.46 An account of a seminar on community water supply, held in Brazzaville in April, will be found starting at paragraph 15.95.

15.47 Advisory services were provided to Zaire in connexion with sanitary engineering training at Kinshasa University, and assistance was given to the Congo and Madagascar in planning for the improvement of environmental sanitation conditions.

15.48 In response to requests from the Governments of Liberia, Sierra Leone and Togo, advisory services were provided in developing occupational health programmes. The Government of Ghana was assisted in organizing an occupational health course at the University of Ghana during the months of October, November and December.

15.49 Some countries in the Region are now establishing radiation protection services with the assistance of WHO. In Liberia, the Organization is advising in the development of a radiological unit in the J. F. Kennedy Memorial Hospital, Monrovia, and has undertaken to assist a radiological services project. An inter-country consultant service on radiation health is being established to help develop services and programmes in this field throughout the Region.

Organization of health services

15.50 For the first time in the Region, a bilingual course in health planning was organized for persons directly concerned with this subject; it is described starting at paragraph 15.101.

15.51 The Organization provided medical staff to assist the Seychelles and Zambia to formulate national health plans, and a team comprising a health manpower specialist, a public health administrator experienced in epidemiology, a hospital administrator, a statistician and a sanitary engineer to assist the Government of Malawi in formulating a national health plan as part of the country’s five-year socioeconomic development plan. The latter project is partly financed by Danish Government funds.

15.52 In Kenya, Uganda and Zambia, previously separate WHO-assisted projects on environmental health, nutrition and nursing have been integrated into basic health services projects. Similarly, maternal and child health and environmental health projects have been combined in a project to develop basic health services in Gabon (see paragraph 15.105). This is a trend that may well be followed in developing basic health services in other countries of the Region.

15.53 The Organization continued to support a number of health laboratory projects. Activities are concentrated on the development of a central laboratory with a network of intermediate and peripheral units. Six epidemiological services projects in five countries of the Region include a health laboratory
component. WHO has provided laboratory technicians for basic health services projects in 11 countries in order to improve the activities of peripheral laboratories in rural areas. The Organization is assisting Burundi to set up a blood bank. Assistance was given to three countries in evaluating existing laboratory services and planning their future development. Advice on the production of cholera vaccine was provided to Kenya, Nigeria and Senegal.

15.54 In order to train staff according to programmes set up in relation to the needs of African countries, courses in laboratory technology have been among those provided at the training centres for health services personnel in Lagos and in Lomé. At the latter centre, a level B \(^1\) technician course with 16 participants started its third and last year, while a level C \(^1\) technician course with 13 participants ended in July and a nine months' refresher course for seven WHO technicians serving in basic health services projects was started in September. In Lagos, 19 participants attended a three-month course for polyvalent microscopists which was completed in July 1971. A seminar on the development of health laboratory services was held in Brazzaville in July. It was attended by 19 participants from 17 countries.

15.55 A seminar on the evaluation of health education programmes, held in Brazzaville in June, was attended by 23 participants from 22 countries. Forty national senior health staff participated in the third health education seminar in Kintampo, Ghana, for which WHO provided assistance. In Nigeria, a WHO health education adviser helped to prepare the health and home science section of a primary school syllabus for Lagos State and eight teachers' handbooks for primary and secondary schools. Research was conducted in school health education in secondary school and teacher training colleges. A health educator was assigned to the project for master plans for wastes disposal and drainage, Ibadan. Assistance was given to a course for senior nurses and midwives in the Lagos Training Centre for Health Service Personnel. In Uganda, health education activities were integrated in the project for development of basic health services. The Government of Malawi was assisted in planning a health education programme.

15.56 There have been several developments in nursing education and training in the Region. In Kenya, Nigeria, Swaziland and Zambia nursing leaders have met to consider objectives which are derived from recognized health tasks as a basis for curriculum development. University-based programmes of nursing education are assuming more importance in the overall development of nursing. In Kenya, for example, the post-basic nursing education project has worked with the basic health services project in assisting the chief nursing officer to prepare improved descriptions for various nursing posts. In Ghana, the department of nursing was represented on planning committees for training programmes and provided short courses for ward sisters to promote more interaction between the classroom and field practice areas.

Health statistics

15.57 WHO has assisted seven countries of the Region in developing their demographic and health statistics services. They are Ivory Coast, Liberia, Kenya, Sierra Leone, Uganda, the United Republic of Tanzania, and Zaire. In these programmes due emphasis was given to the collection and analysis of data on communicable diseases, but attention was also paid to other kinds of statistical information needed by health planners. The Organization is now able to meet the numerous requests from governments for assistance in establishing or improving statistical services. A special effort has been made with regard to the training of personnel and WHO fellows are now accepted at the French-language statistical training centre in Yaoundé and at two English-language centres located respectively in Achimota, Ghana, and Dar es Salaam. The Organization has assisted by providing teaching staff.

Family health

15.58 Problems concerning human reproduction, growth and development require particular attention in the African Region, where mothers and children represent a majority of the general population. As the health status of this group is inseparable from the general health of the community, all family health activities assisted by WHO in the Region, including nutrition activities, now form part of basic health services projects with the exception of one maternal and child health project in Ivory Coast.

15.59 Most activities in this field are the traditionally accepted ones that aim at better prenatal, delivery, postpartum and child care. The importance of the health aspects of family planning is gaining recognition, although population control and the limitation of family size are not considered problems of high

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\(^1\) The categories of technical laboratory personnel referred to here are those recommended by the WHO Expert Committee on Health Laboratory Services in its fourth report (*Wild Hlth Org. techn. Rep. Ser.*, 1966, No. 345, p. 5).
priority in most countries of the Region; indeed, some, such as Cameroon, the Central African Republic and Gabon, are more concerned with problems of infertility or slow rates of population growth. In Botswana, Liberia and Nigeria, among other countries, family planning activities(103,789),(985,846)

15.60 With support from WHO and UNFPA, Mauritius has launched a programme which seeks to integrate into the Government’s maternal and child health services the family planning activities that were formerly conducted by non-governmental organizations. UNFPA has also provided support for an inter-country project in school health education and family health education in which UNESCO is interested. The project, which went into operation at the end of 1971, seeks to introduce suitable health education materials into the curricula of both primary and secondary schools in the Region.

15.61 The negative attitude towards family planning activities in some countries appears to be due to their still being considered only, or principally, as a means of controlling population growth. It is hoped that, by reducing the relatively high mortality rates of infants, children and mothers, the development of adequate basic health services will bring about a change in current attitudes and will correct the prevalent idea that numerous offspring are necessary to ensure a desired number of children with good chances of survival and healthy development.

15.62 In Kenya, nutrition activities were integrated into the basic health services during the year and a national food and nutrition council was established. Assistance was also given to Dahomey to integrate its present nutrition activities into the framework of the health services.

15.63 In the Central African Republic, the main nutritional problems of public health significance were assessed; and measures, including training of personnel and nutrition education, were recommended to deal with them. Studies on the prevalence of nutritional diseases were carried out in Botswana, Cameroon, the Central African Republic, Malawi, Rwanda, Zaire and Zambia. In Madagascar, WHO assisted in carrying out trials to ascertain the acceptability of a protein-rich food mixture.

15.64 Courses in nutrition were given to medical students and students in allied health professions in Cameroon and Senegal and to trainees at the WHO Training Centre for Health Service Personnel in Lomé. The training of health workers in nutrition was continued in Burundi, Kenya, Malawi and Zaire, while practical field training in public health nutrition was given in demonstration zones in Burundi, Kenya, Senegal, Togo and Zaire. WHO assisted in evaluating the public health nutrition training programme in Senegal. For the control of endemic goitre, salt iodization was carried out in Kenya and a study was made of all technical, administrative and legal aspects of salt iodization in Ghana. Measures were taken to expand the consumption of soya in Kasai Province, Zaire.

15.65 The joint FAO/WHO/OAU Regional Food and Nutrition Commission for Africa continued its activities and published a further number of its nutrition bulletin.

Education and training

15.66 Integrated teaching is being increasingly practised at the University Centre for Health Sciences at Yaoundé and appears to be gaining ground elsewhere. During the year a university centre for health sciences came into existence in Cotonou, Dahomey. The Organization assisted by sending five educators, among whom is the Rector of the University, to Brasilia in July to study modern methods of integrated medical teaching.

15.67 As part of a survey carried out in the six WHO Regions to obtain data on postgraduate teaching of public health, visits were paid to 11 medical schools and one university centre of health sciences in the Region in order to collect information on the teaching of public health at both undergraduate and postgraduate levels. A preliminary conclusion was that there was a need for the integration of such teaching at the undergraduate level and—particularly in the French-language medical faculties of the Region—for its development at the postgraduate level. This conclusion corroborates the recommendations of the third and fourth meetings of the directors or representatives of schools of public health held respectively at Alexandria in 1969 and at New Delhi in 1971. Both of those meetings were attended by participants from the African Region. Available information on the continuing postgraduate education of physicians has also been collected in a selected group of countries of the Region.

15.68 A seminar on auxiliary health personnel was held in Brazzaville in October 1971 with a view to
determining the obstacles to a rational utilization of auxiliary personnel and recommending appropriate measures to overcome them.

15.69 Two regional centres for training in the methodology of medical teaching are being planned, one at Kampala and the other at Yaoundé. One of the two persons who will be responsible for the Kampala centre has been sent for a year of study at the Center for Educational Development of the University of Illinois College of Medicine, Chicago, USA. The first workshop on the methodology of medical teaching for French-language personnel was held in Dakar in April 1971 and was attended by 20 teachers from French-speaking medical faculties throughout the Region.

15.70 As part of the programme of staff exchanges between medical schools, eight medical faculties in the African Region and one in the Eastern Mediterranean Region exchanged teachers for a total of more than 250 days. WHO assisted five countries of the Region in developing training centres for health team personnel. Six teachers were recruited for four of these training centres.

Pharmacology and toxicology

15.71 In the field of pharmacology, assessments of the level of activities for the quality control of drugs were undertaken in Kenya, Uganda and the United Republic of Tanzania. WHO co-operated in surveys for a UNIDO-assisted project to set up a pharmaceutical industry in Nigeria. Requests for similar co-operation were received by the Organization from Kenya, Nigeria, Uganda, the United Republic of Tanzania, and Zambia. WHO also provided preliminary assistance with a view to the establishment of a hospital-based drug monitoring centre in the Central African Republic.

Co-operation with other organizations

15.72 Co-operation with the United Nations Development Programme has been maintained in respect of an increasingly large number of projects. During the year, UNDP approved four new pre-investment projects in the field of environmental sanitation for which WHO is the executing agency.

15.73 Collaboration was established with the United Nations Fund for Population Activities (UNFPA) with regard to a project in Mauritius and an inter-country project in health education (see paragraph 15.60).

15.74 Co-operation with UNICEF was particularly concerned with the question of the format of plans of operation for jointly assisted projects. Relations were maintained with FAO, with special reference to WHO participation in large-scale development projects for which FAO is the executing agency. The Organization collaborated with the International Bank for Reconstruction and Development (IBRD) in sectorial and pre-investment studies in Kenya, Nigeria, Uganda and the Republic of Tanzania, and with the African Development Bank with respect to water supply and drainage projects for which the latter is providing foreign exchange.

15.75 WHO continued to co-operate with the United States Agency for International Development (USAID) in programmes for smallpox and measles vaccination in West Africa and in discussions on a project for training auxiliary health personnel in three countries of Central Africa.

15.76 Co-operation was also maintained with a number of other organizations in connexion with various aspects of health work in the Region, including the Economic Commission for Africa, the Organization of African Unity, the Organization for Co-ordination and Co-operation in the Control of Major Endemic Diseases, the Organization for Co-ordination in the Control of Endemic Diseases in Central Africa, the East African Medical Research Council, and the International Children’s Centre, Paris.

Administrative and organizational developments

15.77 During the year, a new unit was established in the Regional Office to deal with co-operative development programmes financed by UNDP or other sources of external assistance.

15.78 The increase in the volume of work at the Regional Office has necessitated an expansion both of staff and of office accommodation. Plans for the extension of the office building were approved during the year; the construction of 30 housing units for internationally recruited staff was begun, and a small additional parcel of land was acquired (see paragraph 14.21).

The Regional Committee

15.79 The twenty-first session of the Regional Committee for Africa was held at the Regional headquarters in Brazzaville from 8 to 14 September 1971. The session was attended by representatives of 29 Member States (including a representative attending on behalf of certain territories in the Region) and an observer from Botswana. For the first time the Gambia was represented as a full Member State. The United Nations, UNICEF and UNDP were
represented, as were the Organization of African Unity, the African, Malagasy and Mauritian Common Organization, the International Committee of Military Medicine and Pharmacy, the Organization for Co-operation in the Control of Endemic Diseases in Central Africa, and three non-governmental organizations. The Deputy Director-General attended the session.

15.80 During the discussion of the Annual Report of the Regional Director for the period 1 July 1970 to 30 June 1971, cholera was the subject which received most attention from the representatives. They noted with satisfaction the rapidity, efficacy and scope of the assistance provided to the 17 countries affected by the epidemic and also to those that were menaced by it. It was pointed out that the risk of cholera becoming endemic in the Region was accentuated by factors such as the particular character of the epidemic, the weakness of health services, the insufficient number of laboratories and generally unsatisfactory hygienic conditions.

15.81 The other communicable diseases caused hardly less anxiety. It was remarked that trypanosomiasis had reappeared in certain countries, that schistosomiasis had spread into new areas, and that onchocerciasis continued to produce harmful effects on the economy of the affected countries. The assistance of UNICEF had been requested in launching new programmes of malaria control. Tuberculosis, leprosy and typhus continued to constitute serious problems in certain countries. There was a risk that the smallpox eradication programme, which was entering the maintenance phase in a number of countries, might be jeopardized as a result of the announced withdrawal of bilateral assistance from one source; the measles vaccination programme which was being carried out concurrently in 20 countries of the Region might be similarly endangered.

15.82 The discussion revealed the importance which Member States attached to education and training. Several countries were intending to set up medical schools, and the medical school in one country was preparing to establish postgraduate training.

15.83 Representatives showed particular interest in matters concerning the organization of health services, the role of health education and of environmental health in the overall strategy for health development, and the development of the new university centres for health sciences.

15.84 The programme and budget proposals for the African Region in 1973 were discussed and approved for transmission to the Director-General. Once again anxiety was expressed concerning the continued reduction in the credits allotted to health activities under the United Nations Development Programme; the Committee recommended that Member States give due priority to health matters when preparing their country programmes according to the new UNDP procedure.

15.85 The Committee approved the report submitted to it on long-term planning for the development of human resources. It expressed its gratitude to the Congo for a gift of land for the Regional Office.

15.86 The subject of the technical discussions was "The place of public health education in programmes for the training of health-team personnel". The Committee confirmed the decision taken at its twentieth session that the subject for technical discussions in 1972 would be "Environmental health activities in the context of an integrated concept of public health services", and selected "The place of mental health in the development of public health services in Africa" as the subject for the discussions in 1973.

15.87 The Committee also confirmed its previous decision to hold its twenty-second session in Conakry, and accepted the invitation of the Government of Nigeria to hold its twenty-third session in Lagos.

Some Aspects of Work in the Region

15.88 A list of the projects current during the year will be found in Part III. The following have been selected for fuller description.

Smallpox eradication in Zaire

15.89 The purpose of this project was to eliminate smallpox from the country and included the vaccination of the whole population against smallpox—and additionally, the vaccination of children in the age-group 0-15 years against tuberculosis with BCG. The plan of operation of the project was signed in 1966 but the field operations began only in March 1968. The target was to complete the mass campaign within a period of four years, and this was achieved. For a first period of six months, two pilot zones—one in the province of Kasai Oriental and the other in the province of Equateur—were set up to establish operational procedures. From the start, jet injectors were used for the combined smallpox and BCG
vaccination, and assessment was carried out by an independent team.

15.90 By the end of 1968, two million vaccinations had been carried out by two groups, each consisting of five teams of vaccinators. The team members were recruited in the provinces where the attack phase was initiated.

15.91 From the beginning of the operations, efforts were made to vaccinate the susceptible cohorts in health centres and to provide facilities for the training of the health centre staff in the required techniques. There was a parallel development of epidemiological surveillance and case notification, with the result that the number of cases of smallpox reported grew from 1479 in 1967 to 3800 in 1968. As the campaign was extended, the number became steadily less, dropping to 716 in 1970 and 63 through November 1971.

15.92 The campaign has been carried on by 195 national staff, 12 international staff provided by WHO, and 5 staff provided through bilateral assistance. The WHO staff consisted of 5 medical officers, 2 administrators and 5 technicians. A government epidemiologist was in charge of the whole operation. WHO supplied 72 transport vehicles and 150 jet injectors, all the smallpox vaccine and three-quarters of the BCG vaccine required. UNICEF provided the supplies of BCG vaccine for 1971.

15.93 When a group of vaccinating teams had finished work in one province it went on to another. Despite the difficulties encountered in transporting the material from province to province, it was possible to complete the attack phase of the campaign in August 1971, when the last mass vaccinations were carried out in the province of Kivu. The vaccination coverage exceeded 90% and frequently approached 100%. The take rate was always satisfactory. It is noteworthy that approximately 24 million inhabitants of the country were vaccinated during the mass campaign, a figure which is well above the official 1970 census figure for the population.

15.94 As the attack phase was terminated in the provinces, the groups of vaccination teams were transformed into smaller surveillance teams responsible for case reporting, containment measures against any fresh outbreaks, and routine vaccinations where required.

Seminar on community water supply

15.95 A seminar on community water supply was held at the Regional Office in Brazzaville from 21 to 27 April 1971 with 27 participants from 24 countries in the Region. The participants were mostly senior officials and engineers responsible in their respective countries for planning and development in one or more of the following fields: water supply, environmental health, health services, and general and local government.

15.96 The objectives of the seminar were to study and analyse problems of planning, design, construction and maintenance of community water supplies and to formulate guidelines and methods for promoting the development of community water supply programmes in countries of the Region. Both the political and administrative aspects of the problems involved were discussed.

15.97 To obtain information on existing conditions, questionnaires on water supply had previously been sent to all countries in the Region, and the replies were used to prepare a background information paper. The discussions during the seminar covered the four following subjects: planning, investigation, design and construction of community water supplies; financing of community water supplies in developing countries; administration of community water supplies in developing countries; and training of water supply personnel.

15.98 In the recommendations of the seminar there was general agreement on the need to train community water supply personnel in regional centres, to make greater use of local firms and national personnel, to standardize water supply equipment, and to conduct research on the possible use of local materials and inexpensive construction methods suitable to the conditions in the Region.

15.99 The participants stressed the advantages of comprehensive plans for the development of water supplies, particularly in rural areas where the need was most pressing. It was agreed that the people themselves should be involved and that reliance should not be placed solely on outside help. It was also felt that, in view of the relation between the overall development of a country and the state of health of its population, the provision of safe and ample water should have priority in the development programmes of every country.

15.100 It was generally agreed that national bodies for the planning, administration and organization of water supplies should be established and that water supply development should be considered in relation to that of facilities for the disposal of the resulting waste water.
Training in national health planning in the African Region

15.101 Two closely related African regional activities in national health planning were organized by WHO in 1970 and 1971. Both represented new departures for the Region. The first, a workshop held in Brazzaville in June 1970, followed recommendations made at the technical discussions on “National health planning: its value and methods of preparation” at the nineteenth session of the Regional Committee for Africa in 1969. Its purpose was to develop methods and approaches appropriate to health planning in the countries of the Region. It was attended by high-level health administrators from ten countries.

15.102 Consultants and WHO staff from the Americas and Asia briefly reviewed for the participants the planning methods used in certain countries of those continents, indicating advantages and disadvantages noted in their application. The participants studied the various stages of planning and the workshop reached conclusions which would serve as guidelines in the training of national health planning staff in Africa.

15.103 The conclusions from the workshop were used in preparing a two-month bilingual course in national health planning held in Brazzaville, at the Ecole normale supérieure, in July and August 1971. There were 21 participants from the following countries: Burundi, Cameroon, Central African Republic, Congo, Ivory Coast, Liberia, Madagascar, Malawi, Mauritius, Nigeria, Rwanda, Togo, Swaziland and Zaire. They included medical officers, statisticians, economists and hospital administrators who are either working in health planning units or involved in policy and planning in ministries of health or ministries of planning and development in their respective countries.

15.104 The purpose of the course was to impart knowledge and skills that would enable participants to apply health planning methods and techniques in their own countries. Purely didactic teaching was avoided and there was free discussion of the papers prepared by the lecturers on subjects such as the determination of health levels, vital and health statistics, health and economics, social aspects of health planning, problems of economic growth, operational research, cost analysis, hospital accounting, and the role of the administrator in financial and budgetary control. For the practical work, participants divided into three groups, each of which made a study of a previously selected country on which official information was available. Experience was thus gained in activities related to a specific country, including: analysing the health situation and existing health activities; assessing health problems and the human, material and financial resources available to deal with them; making projections of population, morbidity and mortality, and defining priorities and targets in consequence; taking the necessary steps to prepare, implement and evaluate a plan; and preparing and pursuing logical methods for each step of their activities.

Development of basic health services in Gabon

15.105 In January 1970 existing WHO-assisted projects in maternal and child health and environmental health in Gabon were combined in a project for the development of basic health services. Prior to that date, the maternal and child health activities of the project had been carried on at an urban pilot centre at London, Libreville, which had been in operation since 1962, at a regional centre opened in 1968 at Port-Gentil, and at a second regional centre newly started (1969) at Makokou in the north of the country. Three rural subunits were attached to each of the two regional centres. In the past two years a third regional maternal and child health centre has been built by the national authorities at Oyem in the district of Woleu, and the construction of a new maternity hospital for the same district has been started at Mitic. Assistance was given in the education and retraining of personnel for these new centres. Surveys were carried out in all the districts where it was intended to establish regional centres and a programme for strengthening the basic health services was developed for each district.

15.106 Standard record cards for mothers and children attending the centres were designed and tried out at the London pilot centre and in some centres at the periphery. The resulting model has been accepted for use in all health centres including those of the Gabonese Social Security Fund and those operated privately. Assistance was also given in preparing a standard report form for health centres which was accepted for general use in 1971.

15.107 On the environmental health side, a national sanitation service had been established in 1967, staffed by 15 sanitarians trained at the National Health School, Libreville, and three health inspectors who had, in addition, had training in Canada. In 1964 a demonstration and training zone had been set up with WHO assistance in N’Kembo, on the outskirts of Libreville, and used principally for the practical training of sanitarians.

15.108 For the combined project, a Gabonese sanitary inspector who returned to his country in 1970 after obtaining a diploma in France was appointed to
act as counterpart to the WHO sanitary engineer. WHO has granted fellowships to enable other Gabonese students to obtain training abroad in environmental health subjects. In the N'Kembo demonstration and training zone, a programme for the construction of pit latrines has aroused considerable interest among the local population.

15.109 The staff of the combined project have collaborated in teaching at the National Health School and in the revision of its programmes. This school provides a specialized 10-month course for nurses with two or more years of practical experience and a state diploma course for nurses, midwives, sanitarians, laboratory workers, etc. In-service training courses for health workers have been organized in several districts of the country. The training of sanitarians and health inspectors is now given at a new school, built in 1969 near to the demonstration and training centre at N'Kembo. The five students in the second year of the 1969-1970 course all passed their examinations and entered government service.

15.110 All the personnel of the project, whether national or international, have been concerned in health and nutrition education. These activities are carried out in close collaboration with national women's organizations and Red Cross workers. The Government is most concerned about the high infant mortality rate, estimated at around 230 per thousand live births, and the low rate of natural increase of the population. Surveys have shown that there is a high frequency of sterility among Gabonese women—as high as 30% according to some estimates. Up to 1950 the population was actually declining, and since has been increasing very slowly. Health education activities are therefore directed in part to combating this state of affairs. A pilot operation has been undertaken to prepare the way for the establishment of demographic observation posts, and a socio-medical fertility study has been planned.

15.111 Among the activities of the project may be mentioned the assistance given in setting up a national committee for cholera control and a national committee of public health which will combine the functions of previously established committees for maternal and child health, school health and sanitation.
CHAPTER 16

REGION OF THE AMERICAS

Communicable diseases

16.1 With a view to improving and extending epidemiological and disease surveillance activities in the Americas, surveys of the existing services and of the type of information available were initiated in a number of countries of the Region. Tabulation and analysis of the data received from 18 countries were begun.

16.2 An epidemiology course with emphasis on surveillance was held from April to December at Atlanta, Ga., USA, in collaboration with the Center for Disease Control there. This was the first of a series of courses planned to help meet the need for epidemiologists in the Region.

16.3 Assistance was given to the national health authorities of Argentina, Brazil and Paraguay in planning an assessment of the smallpox eradication activities in areas where the risk of epidemics was still considered to be specially high. In Argentina and Paraguay no cases were reported during 1971.

16.4 In Brazil, where the attack phase was concluded following the total coverage of Mato Grosso State, the areas selected for the investigation included the São Francisco river regions of Bahia and Minas Gerais, Brasilia and its surroundings, and the States of Guanabara and São Paulo.

16.5 The national authorities decided to revaccinate in the States of Alagoas, Pernambuco, Piauí and Rio Grande do Norte, in the north-east of the country, where vaccination maintenance had proved insufficient. The number of persons vaccinated during 1971 was a little over 7.5 million, bringing the total population covered in the country to more than 85 million.

16.6 Only 19 cases of smallpox, all in Guanabara State, were reported in Brazil as compared with the 1293 cases reported during the same period of 1970. The outbreak was discovered when the attack phase of vaccination reached the last favela to be vaccinated in Guanabara in March 1971. Eighteen of the cases were found in Vila Cruzeiro, where approximately 25 000 persons live; the last case, reported on 19 April, was due to transmission within the hospital where some of the 18 other cases had been isolated. Every reported case is investigated and subjected to laboratory control. There are 2800 reporting units distributed all over Brazil.

16.7 Among the topics discussed at a symposium on vector control and the recrudescence of vector-borne diseases, sponsored by the Organization in Washington, D.C., in June, were the principal mosquito-borne virus diseases which continue to recur in the Americas, the persistence of yellow fever transmission causing particular concern. The participants also considered the causes of recrudescences of malaria in the Region and the responses of vectors to current eradication and control measures.

16.8 Venezuelan equine encephalitis, which has been slowly moving from South through Central America since 1969, particularly along the Pacific coast, caused significant epizootics in 1971 in Mexico and in Texas, USA. Beginning in the spring, the epizootic advanced through the Gulf coastal states of Mexico, causing an estimated 14 000 equine deaths and some 17 000 human cases with 42 deaths. In Texas, during the first week of July, it produced an estimated 1500 deaths in horses and 84 laboratory-confirmed human illnesses but no human deaths. In both places, intensive control programmes were organized with technical assistance from the Organization; the use of attenuated vaccine and the quarantine of horses were the principal methods adopted. Supplementary control measures included the aerial application of ultra-low-volume insecticides, the spraying of premises, and disinsection applied to rail, road and air traffic (see also paragraph 16.22).

16.9 A total of 1805 cases of paralytic poliomyelitis had been reported from 15 countries of the Region up to the middle of August. This was 15% more than the number reported during the same period in 1970. Serious localized outbreaks occurred during 1971 in Argentina and the Dominican Republic. New country-wide poliomyelitis control programmes were launched in Brazil and Mexico.

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1 In the Region of the Americas the Pan American Sanitary Bureau has a dual capacity as secretariat of the Pan American Health Organization and Regional Office of the World Health Organization.
16.10 By the end of October, 59 cases of louse-borne typhus had been reported from Ecuador and 79 from Peru. The figure for the latter country was almost four times the total for the whole of 1970. A field study, using the attenuated type E typhus vaccine, was completed in Bolivia, mainly for the protection of children under the age of 5 years in the Departments of Chuquisaca and La Paz. The programme was a joint project of the Government of Bolivia, the Department of Microbiology of the University of Maryland (USA), and the Organization.

16.11 Both venereal syphilis and gonorrhoea, but especially the latter, continued to increase in most countries of the Region. Increased awareness and interest were stimulated following the technical discussions on the subject of venereal diseases in 1970 at the XVIII Pan American Sanitary Conference/twenty-second session of the WHO Regional Committee for the Americas. The proceedings of these discussions were published in 1971.1

16.12 Two meetings were held between Mexico and the United States of America in a joint effort to attack the problem of venereal diseases in border areas.

16.13 An international travelling seminar on venereal disease control was jointly sponsored by the International Union against the Venereal Diseases and the Treponematoses, the United States Public Health Service, and the Organization. Twenty participants from all Regions of WHO, after two days of orientation at the Regional Office in Washington, D.C., visited centres throughout the USA during the month of October. The seminar concluded at the Center for Disease Control, Atlanta, Ga., where a three-day symposium on recent advances in clinical, research and control activities took place at the beginning of November.

16.14 A plan of action was drawn up to determine the true status of yaws in Haiti after two decades of control activities, and to eliminate the few remaining foci of the disease.

16.15 Ten countries were receiving assistance from the Organization for tuberculosis projects during the year. In Colombia and Mexico mass BCG campaigns were completed and the maintenance phase was organized. Bolivia terminated a BCG campaign in six of its nine departments. Advisory services were provided to Mexico on the production and quality control of freeze-dried BCG vaccine.

16.16 Efforts on a national scale to integrate tuberculosis activities into general health services were made in Chile, Colombia, Cuba and El Salvador. The integration programme was still limited to verification areas in Brazil and the Dominican Republic, while in Honduras and Mexico it had entered its country-wide expansion phase. A regional study of current ambulatory tuberculosis treatment was undertaken by a working group set up jointly by the Latin American Committee of the International Union against Tuberculosis and by the Organization.

16.17 In Chile, Colombia, Cuba and Ecuador, the Organization provided assistance for national courses in tuberculosis control and epidemiology for physicians, nurses and bacteriologists. An assessment of the regional courses on the bacteriology of tuberculosis held over the past five years showed that 66 bacteriologists from 16 countries had undergone the special training provided and that in 1971 some three-quarters of them were engaged in responsible work in that specialized field. A fifth regional training course in tuberculosis was held in Caracas with participants from seven countries.

16.18 An ad hoc advisory committee that met in Washington, D.C., reviewed the present status of leprosy in the Region and recommended measures for the control of the disease. Assistance was provided to Colombia for the study of leprosy in animals. The Organization also provided assistance to the West Indies to study the reasons for the wide variation in leprosy prevalence that exists between neighbouring islands and to develop a model control programme. At a refresher course for pathologists held in Caracas in December emphasis was laid on the special features of the histopathology of leprosy and on the clinical diagnosis and classification of the disease.

16.19 The Organization collaborated with the Governments of Bolivia, Brazil, Ecuador, and Peru in their programmes of surveillance and control of plague. Assistance was also provided to Brazil for research into plague epidemiology and rodent ecology.

16.20 As a precautionary measure against the possible appearance of cholera in the Americas, information concerning laboratory diagnostic facilities and methods of surveillance and treatment was distributed to governments. It was emphasized that the medical profession should watch for and report suspected cases and that public health authorities in every country should be ready with facilities for diagnosis, isolation and treatment. A laboratory course on the diagnosis of cholera was given at the Oswaldo Cruz Institute, Rio de Janeiro, for health workers from various areas of Brazil.

16.21 New national programmes in the field of veterinary public health were formulated in Bolivia, Chile, Colombia, Surinam, Trinidad and Tobago, Uruguay and Venezuela. They were concerned with one or more of the following diseases: urban canine and bat-transmitted rabies, brucellosis, bovine tuberculosis, echinococcosis (hydatidosis) and Venezuelan equine encephalitis.

16.22 An epidemic of Venezuelan equine encephalitis spread northward through Mexico into the State of Texas in the USA (see above). The epidemiological and control aspects of that disease were reviewed during the IV Inter-American Meeting on Foot-and-Mouth Disease and Zoonoses Control at the Ministerial Level held in Lima, in April, and at a round-table discussion held in Mexico City in May. The Organization sponsored and collaborated in both meetings, and also sponsored a workshop-symposium in Washington, D.C., in September to review the available scientific information concerning this disease.

16.23 The Pan American Zoonoses Centre in Ramos Mejía, Buenos Aires, and a PAHO advisory committee collaborated in the preparation and development of guidelines and criteria for national control programmes for bovine brucellosis. The aim is to assist in standardizing criteria and methods and to facilitate the preparation of country projects for which it is intended to request financial assistance from international credit agencies. Following a request to UNDP for further financial aid for the centre, a review was carried out of the activities and achievements of the centre since 1967. This resulted in a recommendation that the centre's programme be expanded to provide assistance throughout the Region. The centre sponsored international courses on the planning of animal health services and on food microbiology and hygiene, and national courses on leptospirosis and brucellosis. It also participated in several regional or national courses on the zoonoses and on food hygiene.

16.24 The Pan American Foot-and-Mouth Disease Centre (which is located in Rio de Janeiro, Brazil) conducted an international seminar in Costa Rica on the prevention of foot-and-mouth disease and a regional course in Surinam on the same subject. Both were held during June; 18 persons from 12 countries that are free of the disease attended the seminar, the course or both. A training unit for the production and quality control of vaccine was being developed at the centre as a co-operative project of the Government of Brazil, the Inter-American Development Bank, and the Organization.

16.25 The animal health services of the countries of the Americas keep a register of outbreaks of animal vesicular diseases, and the centre's epidemiological surveillance programme uses this information in the preparation of the Epidemiological Surveillance Report of Foot-and-Mouth Disease, which is distributed throughout the Region.

16.26 The Organization and USAID collaborated with the Government of Brazil in evaluating the latter's malaria eradication strategy. Preparations were made for multidisciplinary reviews of the malaria programme in Mexico and Paraguay. The eight countries whose malaria projects were reviewed in 1970 were assisted in developing plans for eradication programmes in line with the recommendations made. Those countries in Central America where the principal malaria vector, *Anopheles albimanus*, is resistant to chlorinated insecticides were given help in carrying out their decision to use the carbamate insecticide, propoxur, which was generously provided by the Government of the Federal Republic of Germany. A special evaluation of the malaria situation was carried out in Cuba following a request by the Government that the country be included in the WHO official register of areas where malaria eradication has been achieved.

16.27 At the end of 1971, the situation in the 34 countries or territories in the Region with originally malarious areas was as follows: 12 had achieved eradication, the entire territory of one was in the consolidation phase, and the remaining 21 were applying attack measures in all or part of their malarious areas. Taking the Region as a whole, there was only a slight gain in terms of areas in the maintenance and consolidation phases, and most of the advances were in Brazil, which by mid-year had transferred areas with 1.7 million inhabitants from the attack to the consolidation phase. Although no major changes in the classification of areas were involved, the incidence of malaria declined in Colombia, Ecuador, Panama and Paraguay.

16.28 The latest estimates are that, by the end of 1971, of the 181,257,000 residents in originally malarious areas, 44.6% were living in areas where eradication of malaria had been achieved, 36.2% in areas where the prospects of achieving eradication were good, and 18.2% in areas where progress had been limited.

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1 See Off. Rec. Wld Hlth Org., No. 188, p. 128. The countries concerned are Costa Rica, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Nicaragua and Panama.
16.29 Field studies of the socio-economic impact of malaria on selected farm families and rural industries of Paraguay were completed, the resulting data were coded, and analysis was begun. A field trial was initiated in February in El Salvador to test the effect obtained by spraying only a small portion of the interior of dwellings with propoxur, at an average of 60 g of active substance per house, and in shorter cycles than usual (i.e., 35 days). The method has given promising results. In vitro testing was continued of the susceptibility of *Plasmodium falciparum* infections to various drugs; this method proved to be applicable in field conditions and has been used to study resistant strains in Brazil and Panama and susceptible strains in Haiti. The Organization supported work carried out at New York University, N.Y., USA, on a method of obtaining immunization against malaria, starting from sporozoites of the parasites, and to studies at the University of California at Riverside, of cross resistance of *Anopheles albimanus* to the various insecticides tested in areas of Central America for inclusion in the propoxur project. Studies of the genetic aspects of *An. nuneztovari*, *An. darlingii*, *An. albimanus*, *An. oswaldoi*, and *An. triannulatus* were also assisted at the University of Illinois.

16.30 With a view to improving sprayers and nozzle tips, field trials were continued jointly with the national malaria eradication services of El Salvador and Nicaragua and the Technical Development Laboratories of the United States Public Health Service. The Organization collaborated with the Central America Malaria Research Station in work on the epidemiology of malaria in problem areas. The use of serological methods to ascertain levels of malaria endemicity was investigated in the course of malaria eradication programmes in Brazil, El Salvador and Nicaragua.

16.31 Formal courses in malariology were offered by the Government of Venezuela at the Malaria Eradication Training Centre in Maracay.

16.32 A meeting of a working group for the coordination of the malaria eradication programme of Central America and Panama took place in May in Managua. The Organization assisted in organizing border meetings between Argentina and Bolivia, Brazil and Paraguay, Colombia and Ecuador, and Colombia and Venezuela. In November, an inter-American malaria research symposium was sponsored by the Organization in co-operation with the Government of El Salvador and the Center for Disease Control, Atlanta, Ga., USA, with the aim of facilitating the exchange of ideas and information between research workers and the directors of national malaria eradication services.

16.33 Efforts to develop a standard diagnostic antigen for Chagas’ disease were continued in collaborative work between laboratories in six countries in the Region. Sera were collected for pooling as a positive reference serum, and arrangements were made for the standardization of the haemagglutination test for the disease. The Organization sponsored a technical laboratory session in Buenos Aires for the purpose of developing a standard procedure for the indirect haemagglutination test, and a meeting in Caracas on clinical Chagas’ disease (see also paragraph 3.35). A comprehensive bibliography on Chagas’ disease was completed for publication.

16.34 Support was given for a research project in Brazil designed to test the efficacy of drug treatment in preventing the development of the severe form of schistosomiasis. Assistance was furnished to Brazil in the preparation of draft requests to UNDP for aid to programmes dealing with schistosomiasis and Chagas’ disease.

16.35 The Organization assisted in a study of American paragonimiasis in Ecuador and Peru, and another on onchocerciasis in Mexico. Assistance was given in establishing a laboratory in San Marcos University, Lima, for the diagnosis of toxoplasmosis; the laboratory has started to produce antigens for the Sabin and Feldman reactions and other tests.

16.36 Twelve countries and territories continued to be free of *Aedes aegypti*. Brazil gave considerable impetus to its campaign and had almost eliminated this vector of yellow fever from reinfested localities in the north. Costa Rica restarted a surveillance service and discovered a vector focus believed to be due to the reintroduction of the mosquito at the Puntarenas seaport. Mexico continued to treat foci in reinfested localities on the border with the USA. Campaigns were under way in 21 countries and territories and either in a preparatory phase or in course of organization in six. Activities in Colombia, El Salvador, Honduras and Venezuela were limited in scope but plans were made for their country-wide expansion. The Organization developed an intensive programme to assist countries that are free of *Ae. aegypti* to avoid reinfestation. The programme includes the revision of surveillance activities, the intensification of inspections in seaports and airports, and personnel training and retraining. A cost-benefit study related to the prevention of *Aedes aegypti*-borne diseases in the Region was initiated.
Non-communicable diseases

16.37 In the field of dental health, the Organization provided technical assistance in the development of water fluoridation programmes to Brazil, Chile, Colombia, Costa Rica, El Salvador, Jamaica, Mexico, and Trinidad and Tobago, and conducted courses in El Salvador for the six Central American countries. The schools of dentistry of Brazil, Colombia, the Dominican Republic, Ecuador, El Salvador, Haiti, Mexico, Nicaragua, Panama, Paraguay, Peru and Venezuela and the School of Dental Nurses of Jamaica received assistance in the development of their administrative structures and curricula. A survey on the status of dental manpower was conducted in all the islands of the Caribbean.

16.38 Demonstration projects in community mental health continued in Argentina, Chile and Jamaica, and the Government of Venezuela was assisted in organizing a seminar for senior medical officers and nurses on mental health activities in general health programmes. Recommendations for the reorganization of mental health services were made to Costa Rica, El Salvador, Guatemala and Uruguay, and advice was provided to the Central American governments concerning the reorganization of psychiatric nursing services and the teaching of psychiatric nursing. In Panama a programme of continuing education in psychiatry for rural physicians was initiated, and a course on brain damage in children was attended by 20 physicians, nurses, and special educators. A survey on the training of psychiatrists was initiated in several countries of the Region. Following a survey of epilepsy in 10 countries, the selection of appropriate places for an epidemiological study of that disease was started.

16.39 A study was made of cardiovascular problems in Colombia, Mexico and Venezuela. The Organization continued sponsoring the Spanish edition of Modern Concepts on Cardiovascular Diseases, a monthly publication widely distributed throughout Latin America.

16.40 Activities in the field of cancer were geared to the promotion and support of programmes for early detection and control of cervical and other forms of cancer, and of radiotherapy and registry programmes. Resources were provided to a laboratory dealing with cytology of the cervix uteri in Santiago, Chile, to facilitate the expansion of its training and service activities; similar action was initiated in Brazil. Technical and logistic support was given to a comprehensive cervical cancer control programme in metropolitan Lima which includes detection, diagnosis, treatment and follow-up. The Organization helped to set up an exfoliative cytology training centre in Trinidad, which will assist in meeting the manpower needs of eastern Caribbean countries in cervical cancer detection. A group of experts was requested to draw up a manual of norms and procedures for cervical cancer control.

16.41 The survey on smoking patterns begun in 1970 in six capitals and two large Latin American urban centres was continued with support from the American Cancer Society and UNDP.

Immunology

16.42 The Organization is assisting two immunology research and training centres, one in São Paulo, Brazil, and the other in Mexico City. They operate in co-ordination with other WHO-sponsored centres outside the Region (see paragraph 4.2). In both centres, students learn by performance and example how research of high quality is conducted. Whenever possible, diseases of local public health importance are used as models for the training given.

16.43 From 1969 to 1971, five courses of four to eight months’ duration have been conducted in the São Paulo centre for students from Brazil and other countries of Latin America and the Caribbean. Selected trainees may spend an additional seven months engaged in research projects under the guidance of the staff.

16.44 The centre in Mexico City uses the laboratory facilities and permanent staff of several co-operating institutions. It offers a three-year training programme, leading to a doctorate in immunology, and shorter courses and seminars at postgraduate level. Both basic and applied research relevant to public health problems of the Region have been conducted on a variety of subjects.

Environmental health

16.45 The Government of Peru and the Organization formalized the agreement for the establishment of the Pan American Centre for Sanitary Engineering and Environmental Sciences (CEPIS), which has been functioning in Lima since 1968. The Government will contribute land, new buildings for offices and laboratories, and financial assistance for equipment and for the operation of the centre. The Organization will continue to provide technical staff and to pay their salaries. In 1971, the centre produced a report summarizing the findings of various studies conducted throughout the Region on the use of waste stabilization ponds; it collaborated with the Battelle Memorial
Institute in a study of the possibility of initiating a water-quality monitoring network in Latin America; and it organized the first sanitary engineering research meeting in Latin America. By the end of the year the centre was providing technical assistance to all Member governments in Latin America and the Caribbean with regard to air pollution, industrial hygiene, housing and urbanization, physical planning, water treatment, systems analysis, and hydraulic resources.

16.46 Potable water was provided within the Region to over 50 million persons more than the number served in 1961. By the end of 1971, approximately 75% of the total urban population of the Region (excluding Canada and USA) had potable water either through house connexions or public outlets, and 23 countries had reached or surpassed the goal set by the Charter of Punta del Este of providing potable water to 70% of urban populations.

16.47 All the countries that had not reached the 50% goal set by the Charter for rural communities (as well as those which had exceeded this goal) had national rural water supply programmes under way and could report steady advances. About 18% of the rural population had safe water supplies either by house connexions or public outlets. Eighty-three million persons had both water supply and sewerage services in urban and rural areas. Of the more than US $2600 million committed since 1961 by the governments of Latin America and the Caribbean for construction, expansion and improvements in that field, the contribution of the countries themselves totalled US $1688 million and funding by international lending agencies US $920 million. The Inter-American Development Bank alone provided loans totalling US $553 million.

16.48 Assistance provided to the institutions responsible for 17 water supply and sewerage services in 16 countries produced many positive results. For example, two major water supply agencies reported increases of up to 25% in the collection of charges due, and another achieved a 20% reduction in the actual construction time of a series of projects.

16.49 The Pan American Air Pollution Sampling Network operated through more than 30 stations in 19 cities of Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, El Salvador, Jamaica, Mexico, Peru, Uruguay, and Venezuela (see Fig. 11, page 95). A report on the data collected up to 1970 was reproduced for distribution. Advice was given to Colombia for improvements in its air pollution legislation and to Argentina on the drafting of a similar enactment. Assistance was given to Chile in the preparation of a request to UNDP for assistance to a project in environmental engineering that includes air pollution control.

16.50 Further assistance in the control of water pollution was provided to the four countries—Argentina, Brazil, Paraguay and Uruguay—concerned with the development of the River Plate basin, to Uruguay with regard to the Santa Lucia basin, to Ecuador for the Guayas River basin, to Colombia for the Bogotá River basin, and to several other countries.

16.51 Advice on the public health aspects of rural housing and planning was provided to Argentina, Colombia, Ecuador, Trinidad and Tobago, and Venezuela. Peru received similar assistance in the Tingo María rural settlement, the La Joya irrigation project in Arequipa, and the Huallaga River basin. Activities in this field were carried out in collaboration with the United Nations, FAO, the Organization of American States, the Inter-American Development Bank, and USAID.

16.52 With reference to the collection and disposal of solid wastes, advisory services were provided to Bridgetown, Barbados; Santa Cruz, Cochabamba and La Paz, Bolivia; Port-au-Prince, Haiti; and Panama City, Panama. Assistance was given to Argentina in developing a national wastes disposal plan for medium-sized cities, and to Chile in preparing both a national programme and a specific project for the metropolitan area of Santiago.

16.53 Working in close collaboration with UNDP, IBRD, the Inter-American Development Bank, and USAID, the Organization participated in economic development missions and management studies which covered planning, financing and personnel training. In Guyana and Surinam, feasibility studies were made concerning plans for national water supply and sewerage.

16.54 The programme to improve the teaching of sanitary engineering in four universities in Venezuela, sponsored by the Government, the Organization and UNDP, was completed. Technical assistance in sanitary engineering education and training was given to schools of engineering and of public health in Brazil, the Dominican Republic, Haiti and Mexico. Under a tripartite agreement signed in 1971, Switzerland is providing assistance to strengthen Guatemala's sanitary engineering education programme through a project, for which the Organization is the executing agency, at the Regional School of Sanitary Engineering for Central America and Panama, University of San Carlos. Support was given to 85 short intensive courses held in 22 countries and
to a national seminar. An international seminar on water quality control took place in Barbados. *Medidores de agua domiciliar*, a two-volume reference manual on community water meters, is being finalized by the Organization.

16.55 During 1971, the Organization provided technical assistance to 20 projects for research in sanitary engineering. A conference on research in sanitary engineering in Latin America, held at the Pan American Centre for Sanitary Engineering and Environmental Sciences, Lima (CEPIS) in August-September, was attended by 52 participants from nine countries. The problems relating to the development of research in this field were analysed and practical steps for incorporating research in sanitary engineering education were recommended.

16.56 A survey of radiation health resources in the Region, begun in 1970, was completed. The programme of environmental radioactivity monitoring of air and milk was continued with the co-operation of the United States Environmental Protection Agency. Advice on radiotherapy services, radiation protection, legislation and other aspects of radiation safety was given to Argentina, Bolivia, Chile, Colombia, Ecuador, Jamaica, Peru and Venezuela, with all of which countries the Organization had agreements for assistance in radiation protection programmes.

16.57 Assistance to improve or expand industrial hygiene programmes was furnished through CEPIS to Argentina, Colombia, Ecuador and Venezuela. In Bolivia a study of the programme of the National Institute of Occupational Health was followed by recommendations for improvement and the Organization gave support for a short course in industrial hygiene at the University of San Andrés. The Institute of Occupational Health and Air Pollution Research at Santiago, which is used as a regional training centre, received further assistance.

Organisation of health services

16.58 During the year, the countries of the Region introduced readjustments in their quadrennial projections of collaborative activities using a system devised by the Organization to promote a continuing process of joint programming. Assistance was given to Brazil in preparing and evaluating health plans for seven north-eastern or south-eastern states (Alagoas, Bahia, Ceará, Minas Gerais, Paraiba, Pernambuco, Rio Grande do Norte) and to Mexico for similar activities in the State of Chiapas. Assistance of the same kind was provided to Bolivia, Ecuador, El Salvador, Honduras and Peru. With the Organization's assistance, Chile redefined its health policy and was preparing a sectorial plan. Costa Rica prepared a maternal and child health programme, following the project systems analysis method designed by WHO (see also paragraph 6.83). In Colombia the programme of the Department of Antioquia achieved the phase of specific sectorial analysis and the Department of Valle defined research projects related to the second phase of its programme. Joint research by the Government of Argentina and the Pan American Programme for Health Planning resulted in the formulation of a mathematical model for the analysis of the financing of the health sector. The activities in the Pan American Programme for Health Planning are described starting at paragraph 16.138.

16.59 Of the 49 projects in administration of health services that were in operation during 1971, 35 were at the national, state, or provincial level, 11 were limited to a specific region of a country, and three, including the Plate River basin project, related to adjoining areas in two or more countries. The expansion of health services to embrace rural populations was given particular attention in countries where malaria eradication had reached either the consolidation or the maintenance phase. The concept of integration of services and that of regionalization were taking root in most countries of the Region. Efforts to improve the quality of personnel were continued through fellowships, training courses and in-service training.

16.60 The Organization provided advice, in response to requests from governments, on administrative legislation, management techniques, and programme budgeting. Twenty-eight health officials from 12 countries attended the seventh four-month Latin American training course in administration. Six shorter courses were also held, and 133 fellowships were awarded to health officers of 31 countries to study administration.

16.61 A first attempt was made to define a health legislation system adapted to the current health situation and needs of countries in the Region. A study made by the Organization in collaboration with the Government of Costa Rica indicated that, alongside a basic legal system establishing the health rights and duties of individuals and issuing appropriate regulations, there should be a secondary system dealing with the organizational structure needed to provide health services for the community. The systems outlined may serve as a model to be adopted by other countries.
16.62 Assistance was given to Brazil, Costa Rica, Honduras and Panama in co-ordinating medical care services and to ten other countries in the administration, planning, and equipping of hospitals. The six countries (Brazil, Chile, Colombia, Peru, Uruguay, Venezuela) covered by the progressive patient care project assisted by the W. K. Kellogg Foundation extended the scope of their services to include intermediate and ambulatory care. A seminar on administration of progressive patient care services was held for high-level officials of the six hospitals concerned, and a travelling seminar was conducted on the clinical aspects of intermediate care and consolidation of the services of intensive care units.

16.63 Marked technological improvements have resulted from the activities of the Hospital Maintenance and Engineering Centre in Venezuela, described starting at paragraph 16.133.

16.64 Mexico embarked on a six-year programme to provide overall rehabilitation services, and Colombia made plans for national rehabilitation coverage. At the University of the West Indies planning was initiated to add physical therapy training to the curriculum. The Organization assisted five countries in the training of non-medical personnel in rehabilitation work.

16.65 With assistance from the W. K. Kellogg Foundation, a project was started for the improvement of the medical care and hospital administration sections of the libraries of ten schools of public health. It is planned that each library should receive 2000 books, 35 subscriptions to specialized journals and a three-month travelling fellowship for the librarian in charge. An intensive, three-month training programme on hospital and medical care administration for 28 hospital directors from Ecuador took place in Quito, and the third seminar on medical care and hospital administration for 28 faculty members from Central America, the Dominican Republic and Mexico was held in Costa Rica. Assistance for similar programmes was given to Paraguay and Uruguay.

16.66 Eighteen country projects and four zone projects for the improvement of public health laboratories were in operation during the year. Seventy-six fellowships were awarded, and a permanent service to provide reagents to countries was maintained. The UNDP-assisted project for the development of national laboratories in Mexico began full operation in vaccine production, and UNDP approval was given for a similar project in Cuba. Assistance was given to Chile, Peru and Venezuela in obtaining UNDP and Inter-American Development Bank funds for the development of similar projects.

16.67 The testing was begun of a methodological model developed in 1970 by the Organization for the evaluation of health education activity. An interdisciplinary study group met to consider ways and means to improve educational activities in family and community health services in countries of the Region.

16.68 With assistance from the Organization, a number of countries introduced changes to improve their health education services, and some redefined the functions of the staff. Guyana began to prepare a maternal and child health programme, in which the health education component of family health services is emphasized. At the end of the year, Jamaica had 156 family planning clinics supervised by specialized educators in the 14 parishes; the National Family Board and Ministry of Education were collaborating in a family-life education programme and the curricula of secondary schools included sex education. The Organization also assisted in health education activities in the schistosomiasis research project in St Lucia and the malaria eradication programme in Surinam. An educational guide on echinococcosis (hydatidosis) was prepared for schoolteachers in Argentina, Paraguay, Peru and Uruguay; and Argentina, Brazil, Chile, and Ecuador were helped in planning to improve their curricula for health education teacher preparation. In Barbados plans were under way for introducing the teaching of health education in the curriculum of Codrington College, and three fellows from Caribbean countries, at the termination of the required health education course, followed an eight-week field training programme prepared and carried out by staff of the University of Michigan and the Organization.

16.69 The tenth seminar on health education for the Central American isthmus was held in San José, Costa Rica, in October for 30 health educators from six countries. A similar seminar attended by about 100 health educators took place in Bahia, Brazil, in November. The schools of public health of Chile, São Paulo (Brazil), and Puerto Rico (USA), which prepare health educators for Latin America, graduated 17, 20, and 27 students respectively.

16.70 With a view to assisting governments to improve or establish nursing services, a working group on nursing systems prepared a model that will be tested in one or two countries.

16.71 During the year, the Organization provided assistance in the field of nursing to 36 countries and territories through 65 projects, of which 18 were inter-country; most of these projects were focused on planning and on the education and training of per-
sonnel. In Lima and Bogotá national seminars were held on nursing planning within the general context of national health plans.

16.72 Thirty nurses from 18 countries participated in a seminar to define the present role of nurses responsible at the national level for the organization and administration of the nursing care of hospital patients. Work was started on the definition of criteria for evaluating the quality of the nursing care provided in public hospitals.

16.73 On an average in the Region, auxiliary nursing personnel represent about three-quarters of the total nursing staff. The Organization assisted in restructuring courses for this category of nurses, especially those working in rural areas, and in planning and implementing in-service continuing education programmes and local seminars on the administration of hospital nursing services. Assistance was also given in preparing nursing staff for intensive care units in six countries. Specialized nurses were sent to Caribbean and Central American countries for the improvement of the care given to psychiatric patients. In Panama and Colombia training centres were established for the preparation of nurses for maternal and child health and family planning activities.

16.74 The Organization assisted research in nursing education by supporting a survey of 70 university schools of nursing in 14 countries. Representatives of 30 nursing schools participated in a seminar where the results of that survey were utilized to develop criteria for university-level nursing education programmes. In the Caribbean area a resurvey of 22 nursing schools was carried out. Their progress was assessed against established criteria and the feasibility of introducing concepts of family planning into their curricula was studied.

Health statistics

16.75 Publications in health statistics included English and Spanish editions of Reported Cases of Notifiable Diseases in the Americas, 1968 and of Facts on Health Progress, 1971. The latter report contains a statistical evaluation of progress toward the health goals of the Charter of Punta del Este. Volume 2 of the eighth revision of the International Classification of Diseases (the index volume) was published in Portuguese. The code for surgical operations from the International Classification of Diseases, as adapted for use in the USA, was translated into Spanish and printed for distribution in the Region.

16.76 The collection of the data for the inter-American investigation of mortality in childhood in the 13 original study areas in eight Latin American countries was completed by 1971. A provisional report on the results of the first year of the investigation was given at a meeting of the Mexican Public Health Association, and meetings were held in Brazil and Colombia to discuss the results and their practical applications. Further details of this large-scale investigation are given starting at paragraph 16.124.

16.77 In preparation for the ninth revision of the International Classification of Diseases, a study of multiple causes of deaths occurring in hospitals was in progress in seven countries with the collaboration of the Latin American Centre for Classification of Diseases. In nine countries national committees on vital and health statistics were working on proposals for changes in the ninth revision of the Classification.

16.78 The Regional Advisory Committee on Health Statistics held its sixth meeting in Washington, D.C., in November. One of the main objectives of the meeting was to plan for the use of simple surveys and other statistical methods to supplement the information usually obtained from health statistical systems in order to establish a reliable basis for effective planning and evaluation of health programmes.

16.79 UNDP gave substantial support to the Centre for Utilization of Computers in Health, which is located in Buenos Aires and assisted by the Organization, and agreed to consider a proposal for a five-year programme of assistance to the centre.

16.80 The advisory services provided by the Organization to Barbados, Chile and Jamaica included the appraisal of computer resources and a study of the availability of such facilities to ministries of health for administrative or statistical purposes. Assistance was given to Peru in establishing computer programmes and organizing a course of instruction for processing vital and health statistics. At the Regional Office several short courses in the use of computers were conducted and substantial improvements were made in the processing of vital and health statistical data. The computer-based system for the inter-American investigation of mortality in childhood contains over 100 million data items for computer analysis.

16.81 The programme for training medical record librarians is attracting more candidates each year as health administrations become more aware of the value of good medical records. Nearly 1000 persons were being prepared in auxiliary-level courses held in almost every country and 200 in intermediate-level courses organized in seven countries. A training
programme in this field for professional-level personnel was initiated in Buenos Aires during the year; it was the first such course in the Region except for those in North America and Puerto Rico. Material was translated into Spanish and published for the use of medical record librarians in Latin America.

**Family health**

16.82 Twenty-two Member States received technical and financial assistance for integrated family planning and maternal and child health programmes. In Colombia a programme in maternal and child health and family welfare was extended to cover 474 clinics, where approximately 4000 cases were being recorded monthly. A maternity-centred programme to provide maternal and child health and comprehensive family planning services to 97% of the child-bearing population in Costa Rica was started during the year in five hospitals; it will be used as a model for similar undertakings in other countries.

16.83 Maternal and child health courses were organized to train Latin American professional health workers in Argentina and Chile and at the School of Nursing, University of Panama. Support was given to training courses in social and clinical paediatrics in Chile, Colombia and Paraguay. For these purposes 91 fellowships were awarded.

16.84 Both scientific research and training activities were carried out by the Latin American Centre for Perinatology and Human Development in Montevideo, which is assisted by the Ford Foundation and administered by the Organization. One of the collaborative research activities of the centre was the study, undertaken in Cuba, of delayed rupture of ovular membranes. Another collaborative research project, on perinatal risk factors, was being prepared jointly with Argentina and Chile. A training course was held at the centre in April for 15 fellows from Argentina, Brazil, Chile, Cuba, Mexico, Uruguay and Venezuela, and for two physicians from Canada and one each from Costa Rica, Spain and the USA. Among the subjects covered were high-risk pregnancy, electronic instrumentation and microanalysis techniques, and general aspects of research methodology. At the first Latin American congress on neuropaediatrics, held in Montevideo in March, the centre presented papers on fetal asphyxia and brain injury in the newborn.

16.85 The Organization continued to provide technical and financial assistance and fellowships to countries interested in strengthening and extending their nutrition services. Assistance was given in planning and evaluating projects assisted by the World Food Programme. A technical workshop prepared guidelines on food fortification appropriate for the Region.

16.86 Assistance in curriculum planning and course content was given to the 17 four-year university degree programmes in the Region for nutritionists and dietitians, in seven of which the students graduated during the year. The Organization also supported two new training programmes for nutrition assistants in the Dominican Republic and Paraguay. Advisory services were provided to the postgraduate courses in public health nutrition in Puerto Rico and in Recife, Brazil. An analysis of nutrition training for medical students at the University of West Indies was carried out and recommendations were made for future development.

16.87 Support was provided for research projects on endemic goitre, nutritional anaemias and human growth and development in Bolivia, Brazil, Chile, Ecuador, Jamaica and Uruguay. Nine Latin American countries expressed interest in participating in the collaborative anthropometric study for the assessment of nutritional status promoted by WHO. A working conference on standardizing methodology and computer analysis for assessing nutritional status met in Buenos Aires in November.

16.88 The Institute of Nutrition of Central America and Panama (INCAP) conducted a one-year course in public health nutrition for physicians. During 1971, the third group of students graduated from the institute's school of nutrition. The institute undertook research projects on amino acid enrichment of corn, enrichment of sugar with vitamin A, and the relationships between nutrition and infection and between nutrition and mental development. It also provided advisory services to governments on food and nutrition policies.

16.89 The Caribbean Food and Nutrition Institute conducted a national nutrition survey in Guyana, organized several one-day meetings on the feeding of young children, and held a seminar on food service management. An appraisal which was made of the graduates of the institute's first course on community nutrition held in 1970 at the University of the West Indies, Jamaica, was of value in planning the second course, held in 1971.

**Education and training**

16.90 Studies of the teaching of social and preventive medicine were conducted in all schools of medicine in Latin America, and those for the schools of Bolivia, Ecuador, Peru and the countries in Central America were analysed and published. Pursuant to a recommendation by the second Caribbean Health Ministers
Conference held in Barbados in 1970, a study was conducted in several islands of the Caribbean area; the findings pointed to the need to establish a common training school for disciplines allied to medicine, possibly in the form of a regional centre.

16.91 To strengthen teaching institutions and programmes, the Organization collaborated with the National University of Honduras in planning the type of teaching to be given when new clinical teaching facilities are established and assisted the University of the West Indies, Jamaica, in long-range planning for the expansion of the postgraduate continuing education programmes of the School of Medicine. The Ministry of Health of Mexico was assisted in the preparation of projects to decentralize the medical school of the National University and to train intermediate-level health personnel at the secondary-education level. The Faculty of Medical Sciences of the State University of Guanabara, Brazil, was given help in drafting plans to establish a biomedical centre, and that country’s School of Public Health was advised regarding the possibility of assistance in evaluating and improving the methodology of teaching, administration, and curriculum content. Assistance was given to the University of Nuevo León, Mexico, in planning the establishment of an institute of health sciences. Under the sponsorship of the Organization, the VII Conference of Latin American Schools of Public Health was held in Cuba in October.

16.92 The Organization held a workshop on health sciences education in Washington, D.C., in January and February, during which 15 professors or directors in medicine, public health, dentistry, nursing and nutrition discussed solutions for teaching problems connected with the health professions in Latin America. Another workshop on education in health sciences was held in Havana; and two on educational objectives and curriculum design were held in Peru. Similar workshops took place in Honduras and in El Salvador. Seminars on the teaching of social sciences were conducted in Argentina and Peru. Courses for health administrators were planned for countries of Zones III and IV.

16.93 The Organization is interested in the possibility of a project for preparing, testing and distributing instructional material for the teaching of basic sciences in schools of health professions. It has therefore explored recent advances in pedagogical knowledge and technology with officials of the Educational Development Center in Boston, Mass., USA, a nonprofit organization which has developed a variety of simplified electronic equipment, films, books and other education materials.

16.94 The programme for supplying low-cost textbooks for medical students operated in 150 Latin American universities in 1971. More than 11,000 copies of the first five textbooks selected were sent to participating institutions. The committee for the selection of texts on obstetrics and gynaecology held its first meeting. Special agreements were reached with the University of the West Indies Medical School in Jamaica and with the School of Medicine of Haiti to provide low-cost textbooks through a grant which makes possible the direct purchase of texts from general distributors.

Pharmacology and toxicology

16.95 Technical advisory services on drug control problems were furnished to Chile, Peru, and Uruguay, and on the occasion of a meeting of representatives of the health ministers of the Caribbean held to consider setting up a central drug testing laboratory to serve the countries of that area. The Organization co-operated with the Government of Venezuela in the establishment of a food hygiene training centre in Caracas to serve the Region by providing instruction in the basic principles of food technology and in food inspection and control techniques. The centre’s programme includes advanced training for experienced professional workers in food hygiene and basic courses for newly appointed inspectors. The first nine-month course was attended by 11 health workers from 10 countries. A course on food microbiology and hygiene was held at the Pan American Zoonoses Centre in August-September for 19 participants from 12 countries.

Research

16.96 The tenth meeting of the PAHO Advisory Committee on Medical Research was held in Washington, D.C., in June to review the Organization’s programme for the co-ordination of research over the past decade. Beginning with a minimum of administrative superstructure, the programme had reached an outlay of approximately US $3.5 million annually and its accomplishments were numerous and important. Practically all Latin American countries had received assistance in a wide variety of research projects. Research centres such as the Institute of Nutrition of Central America and Panama, the Pan American Zoonoses Centre, the Pan American Foot-and-Mouth Disease Centre, the immunology research and training centres in São Paulo and Mexico City, and the Latin American Centre for Perinatology and Human Development had benefited under this programme from the Organization’s support and guidance.
Meetings and conferences had been organized for discussion of research problems and exchange of information among workers in given fields. A total of 125 technical reports and 25 scientific monographs had been published.

16.97 For the next decade the Advisory Committee recommended that the research and research training efforts of the Organization be increasingly directed to problems of administration and delivery of health services, housing and environmental control, and chronic diseases.

16.98 Recent research on the application of vaccines against viral, rickettsial and bacterial diseases was reported at an international conference held by the Organization in Washington, D.C., in December 1970. The proceedings were issued in 1971 in the PAHO Scientific Publication series. Other research on virus diseases was reported and discussed at the symposium on vector control mentioned above in paragraph 16.7 and at the workshop-symposium on Venezuelan equine encephalitis referred to in paragraph 16.22.

16.99 A symposium was held at the Regional Office in Washington, D.C., in June to review the applications of systems analysis in health screening and hospital management. The information it brought out on operations research methods as applied to health problems should be of value to systems engineers, statisticians and health administrators.

16.100 Together with the Wellcome Trust, the Organization provided assistance for advanced training in clinical research. This programme is specifically designed to take advantage of the training potential of recognized research institutions and laboratories in both Latin America and the Caribbean. Five research training grants were awarded in perinatology, endocrinology, immunology and cytogenetics.

16.101 An account of the Regional Library of Medicine will be found starting at paragraph 16.142.

Co-operation with other organizations

16.102 During 1971 the Organization extended its collaboration with the Pan American Health and Education Foundation (PAHEF). This non-profit foundation, which began activities in 1970, may receive donations from persons and private institutions as well as grants from foundations. Its central purpose is to advance the fundamental objectives of the Organization, with which it carries out joint projects. Grants to PAHEF from the W. K. Kellogg Foundation, the Milbank Memorial Fund, the Research Corporation (Williams-Waterman Fund), the Population Council, and private corporations and individuals already total over US $3 million for activities over a five-year period. PAHEF also has signed a loan contract with the Inter-American Development Bank for US $2 million for a revolving fund to finance the medical textbook programme as a joint activity with the Organization.

16.103 The Venezuelan Health and Education Foundation (FUNDAVENSE; a non-governmental, non-profit organization supported by contributions from private and public sources) was established in March 1971 to work with the Ministry of Health and public agencies of Venezuela engaged in protecting and promoting health and rehabilitation activities and training the required professional and technical personnel. In October, the Organization entered into an agreement to collaborate with the Government of Venezuela, FUNDAVENSE and PAHEF to protect and improve health, support the education of health personnel and promote the welfare of the Venezuelan people.

16.104 The new country programming approach established by UNDP was carefully pursued, in co-operation with that Programme, and assistance was provided to national authorities in implementing it. Colombia, Panama and Venezuela have already introduced the new approach in programming their health activities and in preparing the presentation of their country programmes for the UNDP Governing Council in January 1972. Participation in country planning exercises was also initiated in Argentina, British Honduras, Chile, Costa Rica, Honduras, Jamaica and Peru.

16.105 The Organization was represented at the 1971 General Assembly of the Organization of American States, held in Costa Rica in April; the Twelfth Assembly of Governors of the Inter-American Development Bank in Lima in May; the seventh annual meeting of the Inter-American Economic and Social Council in Panama in September; the twenty-second meeting of the Inter-American Committee on the Alliance for Progress; and meetings of the Inter-American Emergency Aid Fund Committee.

16.106 The Organization co-ordinated the emergency relief activities of the Inter-American Emergency Aid Fund and other organizations and served as a channel for the procurement of drugs, biological substances, medical equipment, and other supplies to alleviate

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conditions caused by disasters. Chile was given such assistance following torrential rains, storms, and floods in the first part of the year and again after the earthquake in July. Emergency assistance was given to Nicaragua to relieve conditions caused by hurricanes and volcanic eruptions.

**Scientific communication and public information**

16.107 A list of the official documents and scientific and other PAHO publications issued during the year, with indications of the language in which each appeared, will be found in Annex 10.

16.108 Two new titles were added to the 49 colour filmstrips produced in previous years. During 1971 more than 3300 copies of filmstrips were distributed for use as teaching aids, primarily for university-level students of the health professions.

16.109 Some 150 press releases on technical meetings and the initiation of new health projects were prepared in English, Spanish and Portuguese. Under the title “Health for the Americas”, four radio programmes in Spanish were released to broadcasting stations throughout Latin America. Radio and television interviews with leading personalities in the health field in the Americas were recorded and distributed. One of the principal events thus dealt with was the entrance of Canada as a full member of PAHO. The theme of World Health Day “A Full Life Despite Diabetes” generated much interest among the public and 19 500 kits in English, Spanish and Portuguese were distributed in addition to the 3500 delivered to the press. The film, “Four in the Crowd”, attracted considerable attention. Posters on the diabetes theme were widely shown and special cards were displayed in buses and streetcars.

16.110 The quarterly Gazette continued to be published in English and Spanish, with a circulation of 11 000 copies in each language.

**Constitutional and legal developments**

16.111 The necessary preliminary arrangements having been completed, Canada became a member of the Pan American Health Organization on 27 September 1971. All countries in the Western Hemisphere are now members.

**Administrative and organizational developments**

16.112 The Department of Evaluation in the Regional Office was merged with the Department of Special Technical Services. The IBM System/360 computer was officially inaugurated during the year, and lists for distribution of the Organization’s publications were computerized. New systems were programmed and implemented for budgetary, financial and personnel arrangements. Innovations were introduced in the format of the Annual Financial Report to permit easier analysis.

**The Regional Committee**

16.113 The XX Meeting of the Directing Council of the Pan American Health Organization, which was also the twenty-third session of the WHO Regional Committee for the Americas, was held in Washington, D.C., from 27 September to 7 October 1971. It was attended by representatives of all but one of the Member States in the Region and by those of France, the Netherlands, and the United Kingdom of Great Britain and Northern Ireland on behalf of certain territories in the Region. Early in the meeting Canada’s request to join the Pan American Health Organization was approved and representatives participated in the meeting on behalf of Canada as the twenty-ninth member of PAHO. Observers from UNICEF, UNDP, FAO, the Organization of American States, the Inter-American Development Bank, and eight non-governmental organizations attended. Also present were the Chairman of the PAHO Executive Committee and an Assistant Director-General of WHO.

16.114 The appropriations for PAHO for 1972 amounting to US $20 388 614 were approved; they included the regular working budget which, at US $17.8 million, was almost 8% more than the 1971 figure of US $16.5 million. Note was taken of the draft programme and budget proposed for PAHO for 1973 and it was recommended that the Member Governments should be consulted on their more recent needs and priorities before the final preparation of the document. The proposed WHO programme and budget estimates for the Region for 1973 were endorsed for transmission to the Director-General. As to the draft of the WHO programme and budget proposals for the Region for 1974, the Committee requested the Director-General to give favourable consideration to increasing the proportion assigned to the Region, recognizing that this request should not imply a recommendation for increasing the total WHO budget.

16.115 The Committee reiterated its wish that governments with malaria eradication programmes should re-examine them, if they had not already done so, and recommended that they issue regulations governing the use of acceptable insecticides for health campaigns and agricultural use. It urged the countries and territories concerned to make every effort to eradicate Aedes aegypti and to intensify surveillance against reinfestation. The progress obtained in the
smallpox eradication campaign was noted. The statement of the Government of the United States of America that it was recommending that compulsory smallpox vaccination should be suspended in the states of that country was considered justified because of the excellent epidemiological surveillance services in the USA; it was, however, recommended that other countries maintain their vaccination services and improve their epidemiological surveillance systems.

16.119 The Regional Director was instructed to include in the PAHO regular budget increasing amounts for the research and research training programme and to renew efforts to obtain access to the funds made available for the Regional Scientific and Technological Development Programme of the Organization of American States.

16.120 The Committee considered in depth a report on traffic accidents as a public health problem and adopted a resolution on this subject containing detailed recommendations to governments and suggestions to the Regional Director. An offer by the United States of America to finance an international seminar or working party of experts to discuss the role of the consumption of alcohol in the causation of traffic accidents and to develop preventive measures was gratefully accepted. Concern was expressed about the steadily increasing abuse of drugs in the Region, and the Regional Director was requested to continue his efforts to carry out an epidemiological investigation into the extent of the problem in the countries of the Americas and the circumstances that permit the spread of the habit. The Director-General was asked to approach the United Nations Fund for Drug Abuse Control with a view to obtaining the funds for the investigation.

16.121 It was recommended that a meeting of ministers of health of the Americas be held immediately before the XXI Meeting of the Directing Council, which will also be the twenty-fourth session of the Regional Committee, scheduled for Santiago, Chile, in September or October 1972. The meeting would consider, inter alia, the establishment of goals and priorities for the decade 1971-1980, based on analysis of health progress in the Region for the decade 1961-1970.

16.122 “Environmental pollution” was the topic of the technical discussions and the subject selected for 1972 was “Community health services and community involvement”.

Some Aspects of Work in the Region

16.123 A list of the projects current during the year will be found in Part III. The following have been selected for fuller description.

Inter-American investigation of mortality in childhood

16.124 In 1966 the Organization undertook an investigation of mortality in childhood in various parts of the Americas, the aim being to obtain accurate and comparable statistics on causes of death among children under 5 years of age in order to gain a better understanding of the factors responsible for excessive mortality in this age-group. The project, which is supported by a grant from USAID, stems from an earlier investigation of mortality in adults in 12 cities, the results of which were published in 1967.1

16.125 After a pilot study in five areas (two in Brazil, one each in Colombia, Guatemala and Jamaica), the investigation proper started in 1968 in 13 study areas in Latin America (three in Brazil, three in Colombia, two in Argentina, one each in Bolivia, Chile, El Salvador, Jamaica and Mexico). Study areas in Canada and the USA were added in 1969 and 1970 respectively.

16.126 The field work for the collection of data in the original 13 project areas was completed in 1970, and the findings for the first year (1968-1969) have now been analysed. The information for that year covers almost 18,000 deaths and includes data from both official and non-official sources (autopsies, hospital records, private physicians’ records, and family interviews).

16.127 An important finding is that many deaths among children aged 5 years or less—including up to 50% of neonatal deaths in some areas—go unregistered, partly because a number of hospitals do not include deaths occurring soon after birth in their official statistics. In several instances, the search for information on these unregistered deaths held up the processing and analysis of the material.

16.128 In the 13 areas studied in 1968-1969, excessively high mortality rates were recorded for infants (42-110 per 1000 live births) and for children in the second year of life (2-59 per 1000 population). Nutritional deficiency was an underlying or associated cause of 38-69% of deaths of children under 5 years of age, excluding the neonatal period. Immaturity was an associated cause of 47-72% of all neonatal deaths.

16.129 Infectious diseases formed the most important group of underlying causes of death for children under 5 years of age, with diarrhoeal diseases and measles heading the list. Between 40% and 70% of deaths from measles were associated with nutritional deficiency. The high death rate from measles shows that there is an urgent need for vaccination programmes against the disease in Latin America.

16.130 The contribution of social, cultural, biological and environmental factors to mortality in children was also studied. In areas where the death rates were high, the educational standard of the mothers was found to be low. Mortality was greatest among infants of higher birth orders and those born to older mothers. Information collected on the outcome of previous pregnancies of women whose children died during the study period suggested that the risk of pregnancy loss among these women was unusually high.

16.131 Infant mortality in previous offspring and during the period of the investigation was lower in cities than in rural areas. This may be explained by the greater availability in cities of such facilities as piped water supplies and health education and family planning services. In two cities and three rural areas with particularly high mortality rates, it was observed that less than 20% of the homes of the deceased children were supplied with water. A study of breastfeeding patterns among the mothers of deceased children brought out the interesting finding that in two cities with high infant death rates less than 40% of children dying between 28 days and 4 years of age had been breast-fed; this warrants further research.

16.132 The amount and type of care received by the mothers during pregnancy and delivery and by the children during illness were investigated. The facilities available for such care and the extent to which they were used varied widely from place to place. In general, it appears that special attention should be paid in the countries concerned to the development of services for prenatal and obstetrical care and for the prevention of infectious diseases and of nutritional deficiency among mothers as well as children.

Hospital Maintenance and Engineering Centre, Venezuela

16.133 Since the sound operation of a hospital and the quality of the care it provides depend to a large extent on the design and maintenance of its equipment and other facilities, a Hospital Maintenance and Engineering Centre has been set up in Caracas to provide advisory services, training and research, first on a national and then on a regional basis. The first phase of this project, the only comprehensive undertaking of its kind in Latin America, ended in 1971. It was assisted by UNDP/SF, with the Organization acting as executing agency.

16.134 Established in 1970, the centre has worked in close co-operation with the Venezuelan Polytechnic Institute and the national network of vocational schools in training technicians, and with the Central University of Venezuela, Caracas, and its School of Public Health in effecting technological improvements. In co-operation with ILO, training in leadership and supervision has also been provided.

16.135 The centre uses the new Maracay Hospital as a pilot hospital where it is possible to test the feasibility of various maintenance and operational procedures prior to their publication and their introduction in teaching. The staff, consisting of instructors in 17 technical branches, has prepared 63 publications—sets of instructions, teaching guides and technical
manuals—covering the aspects of engineering and maintenance of concern to hospitals. These publications, which are designed to be easily understood by any student or hospital employee, are at the disposal of governments of other countries of the Region.

16.136 On the recommendation of the centre, the School of Public Health at the Central University of Venezuela has introduced 36 hours of engineering into the curricula for hospital directors and hospital administrators. The Venezuelan Ministries of Health and Social Welfare and of Public Works are cooperating in designing new hospitals on functional lines on the basis of special studies carried out by the centre; as a result, substantial savings are being made both in investments in hospital construction and in operational and maintenance costs.

16.137 The first phase of the project concluded with the establishment by the Government of Venezuela, with assistance from the centre, of a national maintenance policy for health facilities, covering such aspects as the education and training of staff, research, the provision of technical assistance and the establishment of standards and regulations for hospital management and administration. In the second phase, the emphasis will be on the provision of assistance to other countries in the light of the experience that has been gained.

Pan American Programme for Health Planning

16.138 The Pan American Programme for Health Planning was started in 1968 to continue and expand training activities carried out by the Organization since 1962 in co-operation with the Latin American Institute for Social and Economic Planning, Santiago, Chile; to foster and undertake research on planning methods; to collect and disseminate information on health planning; and to strengthen the Organization's advisory services in this field. The Organization is acting as executing agency for the project, which is financed by UNDF/SF. To date the following countries have signed the plan of operation for the programme: Brazil, Chile, Colombia, Costa Rica, El Salvador, Honduras, Panama and Peru. The programme operates through the Pan American Centre for Health Planning, which has been established in Santiago.

16.139 Between 1962 and 1970, nine international courses for a total of 287 government officials directly or indirectly responsible for health planning at the national level were held in Santiago, with assistance from the Organization. Under the expanded programme, the teaching activities have been decentralized. Thus, in 1970, an English-language course with 12 participants from the Caribbean countries was given at the University of the West Indies, Jamaica, and the regular international course in Chile was replaced in 1971 by a course in Costa Rica for 20 health planning officials from Central America and Panama. In addition, advanced one-month courses on investment programming, sectoral diagnosis and institutional analysis in health, financing of the health sector, and planning strategy were given during 1971 in Argentina, Chile and Peru to a total of 120 health planners.

16.140 Research into the health planning processes was started in 1968 as part of the programme. A numerical experimental model, known as the "link" model, has been developed to study the application of different health planning methods under varying theoretical and practical conditions. In 1971, five submodels were designed for the study of specific variables in respect of communicable diseases, health policy systems, manpower and investments; these will make it possible to determine the adjustments that should be made to the link model before its application in a given country. Progress has also been made in the development of a methodological model for diagnosing the health situation of a country and evaluating its health planning system.

16.141 In February 1971 the first meeting was held, at the Pan American Centre for Health Planning, of a technical advisory committee appointed to review the programme. It recommended an outline of proposed training, research and information activities for the period 1971-1974.

Regional Library of Medicine

16.142 The Regional Library of Medicine was set up at the Paulista School of Medicine, São Paulo, Brazil, in 1967 to provide practitioners in the health sciences with up-to-date information, as well as to improve medical and allied education in the countries of the Region, encourage biomedical research, and provide training for biomedical librarians. The Library is administered by the Organization, which is responsible for the appointment of the scientific director and designated two other full-time international staff members in 1971. In addition, there are 31 full-time employees partially or wholly subsidized by the Paulista School of Medicine or by the Organization.

16.143 The current budget of the Library, amounting to some US $270 000, is made up of contributions from the Organization and from the Brazilian Government, the São Paulo State Fund for Research, the
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Municipality of São Paulo, and the Commonwealth Fund in the United States of America. This sum does not include a contribution of US $100 000 made by the Paulista School of Medicine for the extension of the library building. Further valuable support, in the form of services, is provided by the United States National Library of Medicine. The Pan American Federation of Associations of Medical Schools and the Brazilian Association of Medical Schools also co-operate in the project.

16.144 Under a contract with the Organization and the United States Book Exchange, the United States National Library of Medicine has been helping to increase the Regional Library's collection of current medical literature both in quantity and in scope, as well as giving technical advice, providing advanced training for the staff and dealing with such inter-library loan requests as the Regional Library cannot meet from its own collection.

16.145 During its first two years of operation, the Library doubled its initial collection of some 15 000 volumes. By mid 1971, the 450 titles of the periodicals collection taken over from the host library had been increased to more than 2000 by means of subscriptions, exchanges or gifts. By the same time, over 30 000 back issues had been received through the United States Book Exchange or from other sources. As a result, the Library's collection of selected medical periodicals dating from 1960 onwards is well on the way to completion.

16.146 Inter-library loan services through a network of subcentres in Brazil were initiated in January 1969; in 1970 they were extended to other countries in Latin America. By 31 July 1971, the Library had processed almost 67 000 requests. About 74% were met from the Library's own resources, 13% through libraries elsewhere in Brazil or in other countries, and 13% by the United States National Library of Medicine. Requests for bibliographies and references are also dealt with.

16.147 In 1970 the Library organized in-service training in medical librarianship for staff members of newly established medical schools in Brazil; by mid 1971, 28 persons had received such training for periods averaging four weeks. Plans were made in 1971 for a four-level educational programme for medical library technicians, librarians, managers, and users. In this connexion it is proposed to issue a list of books and periodicals that would furnish a suitable basis for collections at new medical schools and hospitals lacking easy access to medical libraries.

16.148 Another aspect of the Library's work is the promotion of documentation centres in other countries of the Region with the aim of establishing a Latin American network of biomedical and scientific information services.

16.149 Since 1969, the Library has issued an information bulletin in Spanish and Portuguese; 2000 copies are distributed quarterly to libraries and other institutions associated with biomedical research and teaching in the Region. Pamphlets have been issued in Spanish on the minimum requirements for a medical library and on the organization of a medical school library. A second catalogue of recent acquisitions was prepared in 1971.

16.150 In June 1970, on the recommendation of the Organization, the Regional Library distributed photocopies of key articles on nuclear medicine to Latin American research workers in this field. Since then, this service has been extended to include material on social and preventive medicine, hospital administration and medical care, medical education, perinatology and parasitic diseases.

16.151 The Library's programme is reviewed annually by a scientific advisory committee, which meets under the chairmanship of the director of the United States National Library of Medicine and on which the Pan American Federation of Associations of Medical Schools and the Paulista School of Medicine are represented.
CHAPTER 17

SOUTH-EAST ASIA REGION

17.1 Considerable progress was made in 1971 in the national programmes against smallpox and malaria in countries of the Region, and there was an important expansion in the field of environmental health. In view of the keen interest manifested by several governments, studies of problems of health manpower and delivery of health care were started or further assisted in several countries.

17.2 The improvement of family health is a priority subject in the health programmes of many governments of the Region and the number of projects related to this increased during the year. Group educational activities have become an important component of WHO’s assistance in South-East Asia, and about 50 seminars, meetings, training courses, etc. were held, covering subjects such as national health planning, hospital facilities, maternal and child health, family planning and human reproduction, rehydration therapy, nursing, health and school health education, blood bank procedures, organization of mental health services, quality control of drugs, health statistics and medical education.

Communicable diseases

17.3 Communicable diseases remain the Region’s largest problem. Cases of smallpox were reported from India, Indonesia and Nepal, although in decreasing numbers, and in all three countries antismallpox activities were expanded and intensified, with WHO assistance.

17.4 The regional tuberculosis training and evaluation team, which had earlier undertaken an evaluation of the programme in Ceylon, was assigned to Burma in mid-1971 for a similar purpose. Assistance was given to the Tuberculosis Chemotherapy Centre in Madras (India) in the analysis and interpretation of the results of studies nearing completion, in designing new studies, and in planning a review of microbiological and biochemical aspects of chemotherapeutic trials, as well as to Indonesia in strengthening tuberculosis control activities and in planning for their future development.

17.5 Cholera continued to be reported from Burma, India, Indonesia and Nepal, and from many more areas in those countries than hitherto; it is probable that at least some of this apparent spread is a reflection of intensified governmental efforts to disseminate knowledge about cholera and of the organization of surveillance measures. Fortunately, the fear of reporting cholera cases on the grounds that this might be an obstacle to the progress of trade and tourism seems to be waning in the Region. A part of WHO assistance in this field has been directed to rehydration therapy. A WHO-assisted course on rehydration therapy centres was held in Indonesia in April (see paragraph 17.65), and advice on the production of rehydration fluids was also given to Burma and Mongolia.

17.6 In May-June a severe epidemic of cholera started in some of the camps for East Pakistan refugees, notably in West Bengal, India. A major concern of the Organization in the Region during the year was the procurement of emergency medical supplies—and the co-ordination of their delivery—for these refugees. Close collaboration was maintained for this purpose with the other organizations within the United Nations system and with government departments, and particularly with the Office of the United Nations High Commissioner for Refugees, designated by the Secretary-General of the United Nations as the “focal point” for the co-ordination of the activities of the United Nations agencies and programmes involved in this relief operation.

17.7 Plague is well under control but still receives high priority in the surveillance programmes of all the countries in the Region. In the year under review the enzootic plague foci were dormant. No outbreak of human plague was reported, but sporadic cases occurred from time to time, indicating the continued circulation of Yersinia pestis and the need for efficient and constant surveillance activities. Burma was given some assistance in the review of plague surveillance activities and in field investigations. In Indonesia also, steps were taken to launch epidemiological surveillance of plague and to undertake studies of the behaviour of its vectors.
17.8 The leprosy control programme is now gradually being integrated into the basic health services in Thailand. The problems of achieving satisfactory coverage of the population as part of this integration are being studied. The national leprosy control project in Burma, which has now covered most of the population, is to be assessed in 1972, with the aim of integrating it into the health services. In Ceylon, school surveys are being intensified in areas of high prevalence. In India data from a longitudinal study in two project areas (Aska, in Orissa, and Pogiri, in Andhra Pradesh) of the WHO-assisted leprosy control programme were assembled and are being processed.

17.9 A regional symposium on venereal diseases was held in Thailand in December 1971. Indonesia, with WHO assistance, is conducting a reassessment of the present yaws situation.

17.10 The reporting of diphtheria, pertussis and tetanus is still poor in the Region as a whole. Combined diphtheria-pertussis-tetanus (DPT) immunization campaigns in the Region are usually confined to the larger urban centres, although in the Mongolian systematic immunization through the maternal and child health services continues, with a very high degree of coverage of the eligible children; the methodology of epidemiological surveillance and follow-up action has been satisfactorily developed and has resulted in a considerable reduction of diphtheria in comparison with the situation before the mass immunization campaign was undertaken in 1966-1967 with WHO assistance. The status of the production of tetanus vaccine in Burma was reviewed with WHO assistance.

17.11 In Burma, a high cure rate for active trachoma has been achieved with two courses of treatment, and in Thailand the trachoma programme was assessed with WHO assistance and is expected to be integrated into the basic health services.

17.12 Only one large outbreak of poliomyelitis was notified in the Region, when some 1100 cases were observed in New Delhi during the first half of 1971. With the decrease of the infant mortality rate in the capital and other big cities (to under 80 per thousand), there is an accompanying risk of an increasing incidence of poliomyelitis—an association already observed in other developing countries. Whether to use the vaccine on a systematic basis, with routine immunization of the newborn, or to use it only for the control of outbreaks is being studied by the Organization in collaboration with national governments. Viral hepatitis continued to be endemic in all countries, occurring mostly sporadically or in small outbreaks. No large outbreak was reported.

17.13 In Burma the filariasis control programme aims at the coverage of the whole of Rangoon by vector control activities, case-finding and treatment, including the treatment of microfilaria carriers. In India, surveillance of the distribution of the disease and of vector density was in progress in ten states; and in Ceylon, the incorporation of filariasis control in the framework of a vector control project is being undertaken.

17.14 To strengthen the training in veterinary public health, assistance was given to the All India Institute of Hygiene and Public Health, Calcutta, which is offering a two-year course leading to a Master's degree in this subject. The status of production of rabies vaccine in Burma was reviewed and, in Burma and India, WHO-assisted efforts were continued to improve the quality of vaccine intended for both human and animal use. For quick diagnosis where the appropriate facilities and trained staff are available, the fluorescent antibody technique was introduced.

17.15 Assistance continued to be given in strengthening epidemiological services and in improving the epidemiological surveillance of communicable diseases. In India, a summer course for teachers of epidemiology was held at the All India Institute of Hygiene and Public Health, Calcutta, with assistance from WHO and UNICEF.

17.16 The revised global strategy for antimalaria measures has been implemented in one form or another in all the malaria programmes in the Region. Plans of operation based on local circumstances have been drawn up with WHO assistance by the responsible authorities in Burma, Ceylon, Indonesia, the Maldives and Thailand. Some 60% of the population of the Region are now living in areas in the consolidation or maintenance phases of malaria eradication. However, in some parts of the Region the situation did not show improvement, partly owing to the fact that supplies of DDT and other insecticides were not ordered in sufficient quantity and in time for the scheduled spraying. In some countries, indeed, the 1971 DDT spraying was so delayed that the possibility of increased malaria incidence cannot be discounted. The question of the possible hazards of the insecticides used for malaria eradication was discussed by the Regional Committee in October (see paragraph 17.45).

Non-communicable diseases

17.17 Cancer detection in the South-East Asia Region is based largely upon hospital registries, rather than population registries; the trend in hospital data
suggests that oropharyngeal, cervical and oesophageal cancer is being found with increasing frequency. Epidemiological surveys and the organization of services for early detection and treatment, and health education for prevention are being developed in the Region. In the pilot project for the early detection of cervical and oropharyngeal cancer in Kancheepuram, India, which is being conducted with assistance from the Norwegian Government and WHO, presurvey studies were completed, and the data collected are being analysed. Advice was given to Mongolia on the organization of oncological services and on chemotherapy and for strengthening the radiation therapy facilities, as well as in the field of rheumatic heart disease, particularly in children. A seminar on the epidemiology, prophylaxis and clinical management of rheumatic heart diseases was held in New Delhi in February.

17.18 With a view to increasing competence in immunology in the Region, WHO assisted the National Institute of Communicable Diseases, Delhi, in strengthening its capabilities for research on the immunology of diseases of local importance. In addition, the possibility of establishing a research and training centre in immunology in the Region was explored.

17.19 Assistance for the training of professional and auxiliary dental personnel was given to Ceylon and Indonesia; in the latter country a consultant helped to draw up a long-term plan for the development and expansion of the existing dental schools and colleges.

17.20 A WHO-sponsored national seminar on the organization and future needs of the mental health services was held in New Delhi in February. Assistance was given to Ceylon in devising measures for the improvement of the teaching of mental health in its two medical faculties, and to India in assessing the present status of, and facilities for, training in psychiatry in several medical colleges.

Environmental health

17.21 Rural community water supply programmes assisted jointly by WHO and UNICEF are under way in Ceylon, India, Indonesia, Nepal, and Thailand; and one for Mongolia is in the planning stage. A similar programme in the Maldives is being prepared by WHO and UNDP. In India, a village water supply programme, which is an expansion of the rural water supply scheme started in 1963, is being carried out in several states, with increased technical and financial support from the two agencies. The national community water supply programme in Thailand, which saw further expansion, received assistance in the exploration and development of groundwater resources.

17.22 The UNDP/SF project for the preparation of a master plan for water supply and sewerage for one region of Ceylon was completed and reports are in preparation (see paragraph 17.57). A similar project was started in Nepal in January. In India, a WHO-assisted course on preventive maintenance of water distribution systems was started. WHO's programme of assistance has also included advice on the drafting of legislation for air pollution control and on refuse disposal systems.

17.23 WHO-assisted studies and observations of public health problems connected with water-resource development in the Lower Mekong Basin were continued (see paragraph 17.54).

17.24 In the field of radiation health, emphasis continued to be placed on training. In Burma, the second training course for technicians and artisans in the repair and maintenance of hospital equipment and, in India, a fifth course for hospital and electromechanical repair technicians were completed. The School of Radiographers in Chandigarh (India), the School of Radiographers and Electro-Medical Technicians, Djakarta, and the School for Medical Radiography, Bangkok—all of which receive long-term WHO assistance—continued with their regular training courses. The courses in hospital physics at the Bhabha Atomic Research Centre, near Bombay, India, also received support.

17.25 WHO gave advice on occupational health and rehabilitation to various institutions in Burma, Ceylon, Indonesia and Thailand. In India, WHO continued to help with the training of prosthetic technicians and with research on the development of standard components for orthopaedic appliances. The School of Physiotherapy at Baroda, India, was upgraded and the syllabus revised. To this school, as well as to the one in Bangkok, WHO continued to provide assistance.

Organization of health services

17.26 A second regional course in national health planning was held during the months of January to April, first at the National Institute of Health Administration and Education, New Delhi, and later at the Asian Institute for Economic Development and Planning, Bangkok. It followed a syllabus drawn up in the light of experience gained in the first course, which had been held from November 1969 to February 1970. Assistance was also provided for a country-level course in national health planning, held in Indonesia in July-August 1971.
A regional seminar on functional programming of hospital facilities was organized in New Delhi in October-November.

Operational studies and research have been guided by advice and assistance from the WHO inter-country team for the strengthening and development of health services, in particular in connexion with a study of health manpower in Ceylon. In Indonesia, WHO helped with the development of a health resources reporting system and with the preparation of a health manpower study that is envisaged for a later date, as well as with the organization and conduct of a national workshop on health management. In Thailand, assistance was given in reviewing the data assembled in health manpower studies conducted earlier. In collaboration with the National Institute of Health Administration and Education, in India, the initial stages of the first phase of a UNICEF/WHO-assisted research project in district health administration (Rohtak District, Haryana State) was completed. This phase was mainly concerned with interviews with public health centre staff and work analyses of the health centres.

In nursing, WHO assistance was primarily directed towards educational programmes. In order to meet the urgent need in the Region for nurses who are qualified in clinical nursing specialties, assistance was given through the fellowships programme and through training courses. The recognition of the need to ensure that curricula for preparing nurses were meeting changing health needs was reflected both in Nepal, where the course for training assistant nurse-midwives was lengthened by six months, and in Ceylon, where provision was made for general nursing students to be trained in both obstetrical nursing and midwifery.

Help was given to India in the preparation of a guide for the integration of family planning in the auxiliary nurse-midwife syllabus, and to Indonesia in the conduct of a short course to help teachers of nursing and midwifery to develop the family planning and population dynamics content of their curricula. The need for identification of effective systems for the delivery of such services as a part of the overall health services as well as for evolving sound systems for the education of the appropriate personnel continued to be a concern of the governments and WHO.

The pressing need of governments for assessing, reorganizing and strengthening their health education services at all levels and in different national health programmes has been taken into account in the WHO assistance for the formulation of long-range plans for further development in each country. The training of health educators and of other professional workers, integration of health education into the national educational systems, and the conduct of research on health behaviour have formed a part of this effort. In Ceylon, for example, major changes in the organization of health education services are taking place. Health education is a vital and integral component of the family health programmes in that country and in India, Indonesia and Thailand, and health behaviour studies are at an advanced stage of planning in several other countries. An inter-country workshop on the production, utilization and evaluation of health education media in family health was held in New Delhi in October.

Training programmes have been the first step in WHO projects for upgrading health laboratory services. Basic courses in medical laboratory technology are being conducted in all the countries of the Region, and WHO has continued to provide assistance to the different national laboratories for the promotion of reference services. In Burma, the planned reorganization of health laboratory services envisages the functioning of a graded, four-tier, hospital-based scheme to provide an integrated service; divisional and district laboratories are being upgraded and are receiving UNICEF assistance. The Central Public Health Laboratory in Djakarta, which has been established with assistance from the Swiss Government and WHO, has started functioning in its new building. Provincial and regency laboratories in Indonesia are being upgraded and personnel trained. In Mongolia, a laboratory council has been set up to promote the integration of the specialized laboratories into a unified laboratory service that will cater to medical and health needs. Assistance was provided to several countries in the management of laboratory animals.

Health statistics

In addition to continuing to support governments in efforts to develop basic health statistics systems, WHO has enlarged its programme in the field of statistics to meet demands resulting from the emphasis on national health planning (as reflected in the choice of the subject for the technical discussions held at the time of the Regional Committee's session) and from the increased commitment to family planning. A central theme has been the introduction of the statistician as a full member of a multidisciplinary team on health planning; one example of this was the participation of an expert statistician at the second regional course on national health planning mentioned above. In Ceylon, subsequent to the review of available data systems undertaken by WHO in 1970, a start was made in...
developing a group of related studies to serve as a basis for more detailed health manpower planning; a WHO statistician helped with the statistical aspects of these studies. Assistance was given to Thailand, which has embarked on a series of connected studies aimed at a comprehensive review of health manpower; to Mongolia, where the activities of the health statistical unit were further developed; to Nepal in the preparation of guidelines for a basic system of records and reports for health institutions; also to Thailand in reviewing the existing methods of collecting health statistics. In Indonesia, a two-week workshop for teachers of biostatistics was organized in Djakarta in February, with WHO assistance.

Family health

17.34 With funds made available by UNFPA, WHO has been able to start new projects in Ceylon, India and Indonesia for the improvement of family health. Early in 1971, a joint United Nations/UNESCO/WHO mission made a comprehensive review of the national family planning programme in Ceylon in the overall context of socio-economic development, advising on its continuance and improvement and identifying areas in which external aid would be required. In India, assistance was given in organizing a workshop and preparing a plan of operation for a project on integrating maternal and child health (including family planning) activities into the general health services. In Indonesia, which has a wide range of activities aimed at providing a sound base for the development of the national family planning programme, a review was made of UNFPA/WHO-assisted projects under the Ministry of Health and advice given on priorities for WHO involvement in operational studies; library facilities were also surveyed, and two WHO-assisted training courses on the health aspects of human reproduction for selected medical officers were organized. Work was continued on other UNFPA-funded projects already under way in Indonesia and Thailand, and a WHO team assisted the Government of Thailand in making a general appraisal of the family planning situation, in studying the third five-year plan in this connexion, and in indicating areas in which WHO might be of help. These projects are being closely co-ordinated with the activities of the existing WHO-assisted maternal and child health programmes.

17.35 In Burma a study was made and advice given on strengthening the organization and management of maternal and child health care, and WHO also organized a regional seminar on school health in Burma in February. In Mongolia, the Government has given particular attention to the improvement of the health care of mothers and children through the progressive integration of maternal and child health activities into the general health services.

17.36 In addition to co-operating with UNICEF by giving technical advice on applied nutrition programmes, WHO scrutinized the health aspects of requests for projects under the World Food Programme. Noteworthy activities assisted by WHO were the further development of the nutrition unit in the Directorate of Health in Burma, the establishment of two pilot nutritional rehabilitation centres in Rangoon, and a survey of nutritional and dietary conditions in a number of Burmese villages. In Indonesia, a feasibility study for a goitre control programme in the highlands of West Irian was carried out.

Education and training

17.37 A major activity in the field of education and training was the fourth meeting of directors or representatives of schools of public health, which was held in New Delhi in March, with participants from countries of four WHO Regions. Long-term assistance through visiting medical educators was continued in Burma and Indonesia, and follow-up visits by WHO teams were paid to medical colleges in Ceylon, India and Indonesia. Ceylon was helped with preliminary preparations for a study on the role and functions of doctors with a view to revising the medical curricula. WHO participated in a UNESCO mission to Thailand to advise on the Government's request to IBRD for assistance in strengthening the existing Faculty of Sciences at Songkhla University, and a WHO team held discussions with the national authorities in Khon Kaen on various aspects of developing a health sciences centre at Khon Kaen University.

17.38 In Burma, WHO is assisting with the first diploma course in child health at Institute of Medicine I, Rangoon, and with strengthening the undergraduate studies in paediatrics at the Institute of Medicine in Mandalay. In India, the Government has selected two medical colleges for a trial of the undergraduate curriculum in paediatrics prepared by the WHO-sponsored ad hoc Committee on Medical Education. A regional symposium on the role of the paediatrician in the family planning programme was held in Madras, India, in December.

17.39 In countries with national family planning programmes and UNFPA/WHO-assisted projects for the teaching of human reproduction, family planning and population dynamics, high priority was given to strengthening all departments, both preclinical and clinical, concerned with such teaching. WHO assisted
in organizing several seminars and workshops on the subject, and WHO teams of consultants visited selected medical colleges—for example, in Indonesia (see paragraph 17.68).

Pharmacology and toxicology

17.40 A WHO-sponsored seminar on the quality control of drugs at inspector level was held in Bangkok in January-February. This was the second regional seminar on the subject to be convened by WHO in South-East Asia, the first having taken place in Bombay in January 1969. In Ceylon, the training of pharmacists and the curricula at present in use were reviewed and measures suggested for improving the training of pharmacy technicians. In India, assistance was given in preparing a request for the development of a UNDP/SF project for the quality control of drugs; expert advice on biological preparations was also furnished for various laboratories.

Administrative and organizational matters

17.41 The ownership of the Regional Office building was transferred by the Government of India to the World Health Organization in September 1971. Action is in hand to construct a temporary structure as an annex to the existing building, in order to meet the requirements for additional office accommodation (see also paragraph 14.21).

The Regional Committee

17.42 The twenty-fourth session of the Regional Committee for South-East Asia was held in Rangoon from 28 September to 5 October 1971. Representatives were present from all Member States in the Region except the Maldives. In addition, the session was attended by a representative of the United Nations (also representing the United Nations High Commissioner for Refugees), and representatives of UNDP, UNICEF and seven non-governmental organizations in official relations with WHO. An observer from the Colombo Plan also attended. The Director-General of WHO was represented by an Assistant Director-General.

17.43 In its discussion on the annual report of the Regional Director, the Committee emphasized the need for active follow-up of various studies, including studies on manpower needs and on project systems and cost-benefit analyses, and considered that WHO should take an active part in developing a methodology enabling countries to determine their manpower needs accurately. In country programming, the planning process should be primarily centripetal, but there should also be an outward flow of ideas and directives in order to avoid gaps and inaccuracies that might occur in any total plan for the Region.

17.44 The Committee felt that family health programmes should be widened in scope so that the subject became a part of social and economic development, and that, in view of increasing requests for assistance in family health, better co-ordination of the work of the numerous agencies involved in these programmes was essential.

17.45 The Committee noted the satisfactory progress made in the control of communicable diseases, particularly smallpox, and the improvements in the exchange of epidemiological information among countries. Malaria programmes faced both a shortage of technical manpower and delays in the procurement of insecticides. The Committee stressed that every effort should be made to ensure the availability of adequate supplies of insecticides and that the value of DDT in public health programmes outweighed the dangers of its possible hazards; however, further development was needed of programmes associated with the investigation and control of possible health hazards arising out of the use of pesticides.

17.46 The integration into the general health services of specialized campaigns against communicable diseases was discussed. WHO’s efforts in training personnel in the maintenance of laboratory equipment were commended; however, it was stressed that problems remained concerning the procurement of spare parts for such equipment and the proper utilization of rural laboratories.

17.47 The Committee considered water supply and wastes disposal as still the most important environmental health problems in the Region, where, in view of the growing industrialization, the need for controlling environmental pollution was urgent.

17.48 Education and training were discussed at some length, WHO’s efforts in training health manpower being welcomed, although it was agreed that much remained to be done. In a resolution on the subject the Committee emphasized the importance of teaching community medicine to undergraduate medical students and for preparing doctors more adequately for community work.

17.49 Resolutions were also adopted on the strengthening of health statistics and on long-term planning.

17.50 The Committee established a subcommittee on programme and budget, consisting of representatives of all Members present, to review the proposed regional programme and budget estimates for 1973,
which were subsequently approved for transmission to the Director-General.

17.51 Technical discussions were held on the subject “Health statistics requirements for national health planning”, and “Teaching of community medicine in undergraduate medical education” was chosen as the subject for the technical discussions to be held in 1972.

17.52 The Committee confirmed its decision to hold its twenty-fifth session in Ceylon in 1972, and decided that the twenty-sixth session should be convened at the Regional Office in 1973.

Some Aspects of Work in the Region

17.53 A list of the projects current during the year will be found in Part III. The following have been selected for fuller description.

Public health advisory services, Mekong Committee

17.54 With the increased attention to questions of the environment and to the effects on health of environmental changes made by man, WHO is involved in many aspects of projects for economic and social development. In the vast project for the development of the Lower Mekong Basin, which involves two WHO Regions and is being financed by UNDP/SF and executed by the United Nations through its Economic Commission for Asia and the Far East (ECAFE), WHO’s concern as an associated agency is primarily with the changing epidemiological patterns connected with the impounding of the waters of the Mekong River for the Khmer Republic, Laos, Thailand and the Republic of Viet-Nam. Representatives of the riparian countries form the Committee for the Co-ordination of Investigations of the Lower Mekong Basin (Mekong Committee), which in 1968 adopted a report on a health survey conducted for the purposes of the project. WHO was called upon to provide advisory services to assist in implementing the recommendations of the report for the health protection of the labour force. At a technical meeting organized by WHO in Vientiane in June 1969 and sponsored by the Mekong Committee, it was noted that work had been delayed by outbreaks of malaria among the construction staff—a situation that can be avoided by undertaking control measures as an integral part of such projects. Under sub-contractual agreements between WHO and the executing agency (ECAFE), a WHO sanitary engineer specialized in antimalaria operations was assigned in July 1970 in consequence of that meeting to advise on communicable disease prevention and, in particular, on the setting up of labour camp health services and the institution of antimalaria measures. Project staff from the Western Pacific Region assisted with insecticide spraying operations and antimalaria drug distributions as part of these measures.

17.55 The Mekong Committee held a seminar on an amplified plan for the river basin in November 1970, which was attended by WHO. The participants at this seminar considered that the original plan had not laid enough stress on health factors. The health hazards connected with various engineering projects have since been brought to the attention of the Committee in special meetings and seminars and through WHO reports on visits to dam sites in the Khmer Republic, Laos and Thailand. Reports on malaria in the Khmer Republic covered in particular the situation on the Prek Thnot Dam site. In Laos, there was an outbreak of malaria in the region of the Nam Ngum Dam, but preventive measures were recommended and taken—including the administration of antimalarial drugs to the local population and to workers on dam sites—and it was possible to inaugurate the dam in 1971. A general model for the investigation of malaria control requirements on water resources development projects was elaborated, and other information prepared by WHO was presented at the fifty-third session of the Mekong Committee in September and October 1971.

17.56 An extension of the assignment of the WHO engineer has been requested and, although some earlier plans were completed without the inclusion of a health component, the Mekong Committee is taking the need for public health measures into account in further plans, which include specific support for the control of malaria and other vector-borne diseases in its project summaries for 1972 and 1973. Support is also to be given for research on schistosomiasis.

Public water supply, drainage and sewerage for the south-west coastal area of Ceylon

17.57 About two and a half million people live in the 430 square miles (1100 km²) of Ceylon’s south-west coastal area, between Je Ela north of Colombo and Galle in the south, and by 1967 when a Government request for UNDP/SF assistance in the preparation of a plan for public water supply, drainage and sewerage was approved, the need for safe water and sanitation had become acute in this narrow belt. WHO, as executing agency for the project, engaged a firm of consulting engineers as subcontractors and assigned a sanitary engineer and consultants. Work started in
July 1967 with the Government’s close collaboration. WHO’s assistance continued for four years, with an associated national training programme extending for a further three months to the end of 1971.

17.58 In the first of two phases, engineering and feasibility studies were carried out for five priority zones: Je Ela; other towns north of Colombo; Ambalangoda; Galle; and other towns south of Colombo. In the second phase, which started in July 1969, further engineering and feasibility studies were made, the master plan was drawn up, recommendations for national administrative, financial and legal measures were prepared, and the final engineering designs and contract documents for water supply schemes in Galle and the towns north of Colombo, and for increasing the capacity of the Ambatalle headworks, were completed. (The headworks, nine miles (12 km) inland above Colombo on the Kelani Ganga, is the water treatment plant for the towns south of Colombo.) The preparation of engineering designs, which is not usually a part of UNDP technical assistance in planning, was a special feature of this project.

17.59 The second phase also included special studies on oceanography, water resources, industrial wastes management, waste water reuse, water quality standards, the Colombo sewerage system, and corrosion, leakage and other problems of the Colombo water distribution system.

17.60 The aims of the project were successfully achieved within the prescribed four years. The master plan outlines the criteria for construction work and lays down a phased programme of development and costing, with estimates of population increase, water demands and sewage flows, up to the year 2000. The Government is preparing to implement the first stage under the five-year plan for the early 1970s; an agreement has been signed by the Governments of Ceylon and the United Kingdom for a 25-year interest-free loan to cover the foreign exchange requirements of the Galle water supply scheme, and similar negotiations are under way for the schemes for towns north of Colombo and for expansion of the Ambatale headworks.

17.61 After establishment of a training centre for water supply and sewerage personnel for Ceylon in the Department of Water Supply and Drainage in December 1969, courses on chlorination and water treatment were organized for engineers, operators and supervisory staff, and on maintenance and repairs for mechanics and plant attendants. Assistance with training as part of the project was extended for three months at the end of 1971 to provide for the installation of repair facilities for chlorination plant and to institute courses to train auxiliary personnel working on water supply schemes in pipe-laying and pumping-station operations.

17.62 The national staff and the office set up for the project have been maintained as a planning unit to follow it up and extend the studies to other areas. The recommendations for legislation to establish a national water and sewerage board are expected to be implemented soon; when the board is formed, it will take over by stages the operation of all water supply and sewerage systems in Ceylon.

**Rehydration therapy**

17.63 In a resolution adopted at the twenty-first session of the Regional Committee in 1968 (resolution SEA/RC21/R4), governments of countries in the Region were urged to organize rehydration services as part of community health services and to establish or expand the production of rehydration fluids, and WHO was requested to increase its assistance. Following the technical discussions at the nineteenth session, in 1966, on maternal and child health, which drew attention to the need to reduce child mortality from diarrhoeal diseases, a project for the strengthening of rehydration services had already been started in 1967 with the assignment of a consultant to assess rehydration fluid production capabilities in India and Nepal. At various times large quantities of fluid have been sent to Burma and Nepal to meet cholera emergencies. Visits by consultants in 1967 and later years showed that, while Thailand was self-sufficient and Burma produced annually 600 000 out of the 1 300 000 litres needed by its national services, in India rapid expansion was needed to keep up with the increased demand. Ceylon was importing all its stocks from abroad, and in Indonesia production was sufficient only for the capital.

17.64 All these countries were found to have services capable of instituting large-scale production of rehydration fluid, although old manufacturing plant in some cases needed replacement. In Mongolia discussions were held in 1971 on the possibility of establishing a central plant, and in Ceylon, which is already setting up such a plant with assistance from Japan, WHO supplied a double distillation unit. WHO also supplied laboratory equipment to Nepal.

17.65 In 1969 a project for the assessment of the feasibility of instituting nutritional rehabilitation and rehydration centres in the Region was started, and in several countries simple oral rehydration techniques were demonstrated that were suitable for use in hospital out-patient services and health centres. They
were also recommended for introduction as a subject in medical education. In 1971, a consultant was assigned to the rehydration therapy project to assist in the organization of a first course on rehydration therapy centres, which was held in Surabaja, Indonesia, in April; the 27 participants were teachers in medical schools and senior hospital paediatricians.

17.66 Also in 1971, studies were made of the possibility of producing containers for rehydration fluid locally so as to increase the availability of supplies—a problem of particular urgency in India, Indonesia and Mongolia. On the basis of a comparative review of manufacture and transport costs it was recommended that, where possible, the production of disposable, sterile, plastic one-litre containers for use by national rehydration plants be promoted and that regional filling stations with adequate stores of containers be established.

17.67 Future assistance to rehydration services in the Region will be directed at training of staff in clinical work and at improvements in the quality of locally produced fluids.

**Strengthening of the teaching of human reproduction, family planning and population dynamics in medical schools, Indonesia**

17.68 The Government of Indonesia is making a determined effort to establish a family planning programme as part of the work of the health services and, at the same time, to diversify the teaching in medical schools not only to cover the curative aspects of gynaecology, obstetrics and paediatrics and social and preventive medicine, but also to introduce as new subjects human reproduction, family planning and population dynamics. WHO assistance in this effort was requested and started in 1970 with two UNFPA-financed projects, one for the development of family health services, the other for the establishment of cytology services and training in cytology. Two workshops were also held in Djakarta in October of that year on national plans for the strengthening of family planning in health services, and on co-ordination of national and international resources in the programme; these were also financed by UNFPA.

17.69 The project for strengthening the teaching of the new subjects began in February 1971 with a two-month visit by a team of four consultants to nine of the 11 faculties of medicine in Indonesia. They recommended the award of fellowships to enable doctors to attend training courses—two were awarded by WHO for participation in a course for senior paediatricians (see paragraph 8.26)—the organization of inter-university seminars on such subjects as demography and perinatal medicine, the setting up of inter-departmental committees on teaching methods and organization, and the establishment of a postgraduate institute for training and research in population dynamics. In March, the consultant team, together with four faculty members from the University of Indonesia and four each from the universities of Airlangga (Surabaja), Gadjah Mada (Jogjakarta) and Padjadjaran (Bandung), took part in a workshop on the teaching of human reproduction, family planning and population dynamics organized by the Indonesian Consortium of Medical Sciences, a public body which was set up by the Government to promote the development of medical services and which issued the guide used by faculties of medicine in planning their curriculum. It is proposed to send consultants again in 1972 to follow up the team’s earlier work and to organize two more workshops on teaching methods.

17.70 One medical educator was assigned in March and another in June to advise on the obstetric, gynaecological and paediatric aspects of the teaching of human reproduction. Their work has so far been carried out in Djakarta and Bandung. With their participation a meeting was held in October and November 1971 to draft a plan of action not only for the strengthening of services and teaching bodies, but also for research in existing institutions. In December, two Rockefeller Foundation fellows were engaged as temporary advisers to assist in a workshop on the teaching of family and community health held in Surabaja. Distinctions were made between the related subjects for academic purposes, and the role of the faculties of medicine and the Ministry of Health in teaching and research were discussed.

17.71 The project is expected to end in 1973 with the assignment of medical education experts to assess the results achieved.

17.72 Because of the lack of textbooks in the Indonesian language, an associated project for providing medical school libraries with books on subjects related to family health also started with WHO assistance in 1971. Two consultants made a preliminary survey of libraries in faculties of medicine, health departments and training centres of the Ministry of Health and plans were made for the production of textbooks and compendia of information on family planning, human reproduction and population dynamics.
18.1 The programme of the Organization in the European Region—where some of the most highly developed health services in the world are found—reflects the health problems of the modern technological community. The deterioration of the environment in the Region and the stress under which man lives and works in industrialized communities are responsible for much ill-health and mortality. These were therefore matters of primary concern during the year, and there was a gratifying readiness on the part of Member States to share with the Organization the expenses of the three regional long-term programmes—in cardiovascular diseases, in environmental pollution control, and in mental health and control of drug abuse. With generous contributions from the Federal Republic of Germany and the Netherlands to the Voluntary Fund for Health Promotion, it was possible to expand the activities of the first programme and to accelerate the implementation of the two others.

18.2 This concentration of effort does not mean, however, that less attention was paid to other problems of concern to European public health administrators. Having had a considerable measure of success in the solution of many once intractable problems, they are taking on new tasks and responsibilities in an effort to remedy situations which only recently were beyond their means. Clear evaluations, scientific forecasting and practical planning are necessary to ensure the optimum use of manpower and money and to direct medical research into the most fruitful channels. At the higher administrative levels, there is a need to improve management techniques in the health services, and in many cases to consider the reorganization or reorientation of the central authorities. This is equally necessary locally for the improved running of hospitals, health centres and group practices. Fundamental to such change is far-reaching reform in the medical faculties and other institutions engaged in the education and training of personnel with direct or indirect responsibilities for health.

18.3 To meet these needs, the Organization has sought to secure a better definition of the principles governing public health planning, hospital computing systems, the availability of health manpower, and the education and training of health personnel.

Communicable diseases

18.4 The reappearance in the European Region of cholera in 1970 and 1971 after many years of freedom from the disease caused much concern among national health authorities. In all the countries affected, however, the health administrations immediately took the measures necessary to limit the outbreaks, which were all due to the El Tor vibrio. In countries with WHO-assisted environmental health projects, the WHO staff attached to these projects co-operated actively in surveillance and control activities. The relationship between the cholera outbreaks and local hygiene and environmental health in the affected areas was emphasized in a resolution passed by the Regional Committee at its session in September, requesting that a meeting of officials responsible for communicable disease control be convened without delay to work out a strategy for the control of cholera in those areas of the European Region that are concerned. This meeting took place in December, when a number of detailed recommendations on cholera control were made.1

18.5 Like the reintroduction into Europe of cholera, the spread of venereal diseases is attributed to the ever-increasing mobility of populations, reflected in tourist traffic and migration of labour. The procedures best suited to stem this spread were the subject of discussion at the meeting of a working group convened in Copenhagen in December.

18.6 National programmes for the surveillance and control of communicable diseases are being supported in five countries in the southern part of the Region; assistance is given in the form of consultant advice and lectures at national seminars. In an expanding programme for surveillance of salmonellosis, shigellosis and outbreaks of food-borne diseases in Europe a number of national health administrations were

1 See Wkly epidem. Rec., 1972, 47, 1-3.
approached to secure their co-operation. Similar action was initiated for a pilot poliomyelitis surveillance programme, and visits were made to Finland and Spain to discuss their participation in the programme.

18.7 Integration of tuberculosis control into the work of the general health services was discussed at a meeting held at the International Children's Centre (ICC) in Paris in April. The participants, including representatives of the ICC and the International Union against Tuberculosis, reviewed the problem in the light of experience gained in some countries of the Region and from certain pilot studies. While only two countries of the Region (Morocco and Poland) have national WHO-supported projects for the control of tuberculosis, many take advantage of the fellowships offered under inter-country or inter-regional programmes for studies in tuberculosis.

18.8 The ophthalmological conditions encountered in the European Region may be roughly divided into two groups: those due to the communicable eye diseases and those in which other causes are responsible for blindness or visual impairment. In respect of the former group, advice continued to be given to the national trachoma control projects in Algeria and Morocco. However, the inter-country activities in the European Region are now mainly oriented towards the non-communicable blinding conditions. Following a meeting on methods for the early detection of potentially blinding eye conditions in December 1970, a further meeting was held in October 1971, as part of a study on the role of the public health services in the prevention of loss of vision, to discuss the prevention of visual impairment due to diabetic retinopathy.

18.9 Few originally malarious countries in the Region are not yet included in the WHO official register of areas where malaria eradication has been achieved; one of these, Yugoslavia, requested certification. The three WHO-assisted antimalaria programmes in operation in the Region, which are progressing satisfactorily, were the subject of detailed evaluation during the year. In Algeria, 1971 was the third year of the attack phase in the first of the four regions to start malaria eradication; in the second region, two wilayate were in the first year of the preparatory phase and two in the first year of the attack phase; in the rest of the country epidemiological surveys and control operations are being carried out. The programme is being synchronized with the development of the necessary basic health services. In Morocco, the progress made in developing the basic health services throughout the country should make it possible to proceed from a pre-eradication to an eradication programme in the near future. The malaria eradication programme in Turkey is in its twelfth year and the great majority of the population are in consolidation phase areas; areas in the attack phase are confined to the eastern zones adjacent to countries where malaria is still endemic. While UNICEF has withdrawn its direct assistance to malaria programmes in the European Region, the World Food Programme is continuing its food distribution to workers taking part in surveillance activities in Turkey.

Non-communicable diseases

18.10 The regional cardiovascular diseases programme was further expanded in 1971—the fourth year of the first phase—quite largely owing to the support afforded by national health administrations. The most important project in this programme continued to be the establishment of ischaemic heart disease registers, on to which most of the other projects are hinged. There are now 18 ischaemic heart disease registers in the programme in the Region and two elsewhere. They are intended to form the nucleus around which community programmes for cardiovascular disease control can be built up. They provide the data and information that make it possible to plan and evaluate services for the care of cardiac patients and to carry out pilot studies for the improvement of those services.

18.11 The information on 4800 patients collected by the co-operating registers was reviewed by a working group on ischaemic heart disease registers—the fifth of its kind—convened in Copenhagen in April. The reliability and comparability of the data were discussed and it was agreed that a full-scale international study could now be organized and the pooled data centrally analysed and jointly published in 1972-1973. Each of the registers is also developing further activities suited to local conditions and problems, the organization that has been established being made use of for specific purposes such as multifactorial preventive trials, evaluation of the role of mobile coronary care units, evaluation of the rehabilitation of patients with myocardial infarction, and studies of the symptoms preceding myocardial infarction.

18.12 Basic documentation for these activities was prepared by several working groups organized under other projects within the long-term programme; among these was a working group on prodromal symptoms of myocardial infarction and sudden death, that met in Copenhagen in March.

18.13 In several countries the work done in one area has already stimulated activities in other parts of
the country. It is essential that such activities be nationally co-ordinated, especially as any future system of cardiovascular disease control should be integrated into the existing organization of community medical care. Some countries are therefore already establishing co-ordinating units to deal with these developments on a national scale.

18.14 Since the meeting of a working group in Rome in November 1970, five centres (in Belgium, Italy, Poland and the United Kingdom) have started feasibility studies on multifactorial preventive trials based on occupational (factory) groups. The studies were discussed at two *ad hoc* meetings of representatives of the five centres in London in March and Brussels in November.

18.15 Assistance was given for a project organized by the Finnish authorities in northern Karelia (an area known for its high mortality rate from myocardial infarction). This will be the first attempt in this field to apply preventive measures to the whole population of a well-defined area at the same time as health education of the public is actively pursued.

18.16 Efforts to develop adequate methods for evaluating the effect of rehabilitation programmes were continued, particular attention being paid to evaluation of the results of rehabilitation through ischaemic heart disease registers. Specific studies on the effects on randomly selected patients of conventional rehabilitation programmes of 2-4 months' duration, and assessment of the effects of long-term physical training for myocardial infarction patients on morbidity and mortality among them. Feasibility studies conducted on each of these subjects by different collaborating centres, and the results obtained to date, were discussed by a working group in Prague in October. In this connexion valuable collaboration was maintained with the Council on Rehabilitation of the International Society of Cardiology.

18.17 Since the inception of the programme in 1968 about 240 fellowships have been awarded in the field of cardiovascular diseases. Increasing numbers of candidates for fellowships who are interested in the epidemiological and statistical aspects of cardiovascular disease problems seek places every year in the epidemiology and medical statistics courses held annually in Bratislava (Czechoslovakia), Brussels and London in Russian, French and English respectively. A special cardiovascular diseases week was added to the courses in Bratislava and Brussels for the first time in 1971, and a meeting was held in Bratislava in June, with the participation of the directors of the courses, to evaluate the results. A fourth course, on physiological methods of assessing the working capacity of cardiac patients, was held in Brussels in October and November (in the French language).

18.18 A meeting took place in Copenhagen in November to review reports prepared by the national participants in an inter-country study of medical certification of causes of death. In this study special emphasis is placed on the diagnosis of ischaemic heart disease.

18.19 The protocol and record forms to be used in an international study of community programmes for the control of stroke and hypertension were revised at meetings held in Geneva in February and Göteborg in November-December (see paragraphs 3.25-3.29).

18.20 Detailed proposals for the continuation of the regional long-term cardiovascular diseases programme during the period 1973-1977 were approved by the Regional Committee in September. The projects dealing with community aspects of ischaemic heart disease will be continued and the programme extended to cover other cardiovascular conditions (cerebrovascular diseases, hypertension, congenital malformations of the cardiovascular system, chronic chest diseases leading to cor pulmonale and rheumatic heart disease). A working group met in Copenhagen in September to consider how the congenital malformations component should be developed.

18.21 A meeting was held in November to review the Organization's activities in cancer control in the European Region. Priorities were established with a view to the organization of comprehensive cancer control programmes in the Region.

*Environmental health*

18.22 It is generally recognized that without deliberate and sustained action to control pollution there will be a further substantial deterioration of the environment in the coming years, directly or indirectly endangering human health. Accordingly the Regional Committee in 1969 approved a long-term programme for the control of environmental pollution. In 1970, special attention was given to water pollution, and in 1971 the programme was expanded to include activities in air pollution control, solid wastes disposal, noise control and radiation protection. That this was possible was in large measure due to voluntary contributions from the Governments of the Federal Republic of Germany and of the Netherlands. On the other hand, a regional study on the general approach to environmental pollution had to be delayed in order to ensure its co-ordination with related studies being conducted by the Organization in other parts...
of the world. In this field, only a preliminary study of environmental pollution information systems in the Region was initiated in 1971.

18.23 Two important meetings on water pollution control took place in 1971. These were a seminar on automatic water quality monitoring in Cracow, Poland (see paragraph 18.81), and a conference on the accidental pollution of inland waters, organized in Bucharest in September in collaboration with other interested organizations and agencies (ECE, FAO, UNESCO, WMO, IAEA, and the Council for Mutual Economic Assistance). A number of studies started in 1970 were continued, and the first part of a manual of methods of analysis for use in the control of water pollution in Europe is in preparation.

18.24 Trends and developments in air pollution control were discussed by a working group that met in Copenhagen in January. In line with the group’s recommendations, work has begun on a manual to assist European countries in establishing national air quality standards, and guides and criteria concerning air pollution in Europe that will be part of this manual were discussed at a meeting in Copenhagen in May. This was followed by a meeting to study the long-term effects on health of air pollution, special consideration being given to chronic respiratory diseases in children.

18.25 The disposal of solid wastes was considered by a working group that met in Bilthoven, Netherlands, in May. In accordance with a recommendation by the group, the preparation of a European model code of practice for the land disposal of solid wastes has begun. The group also made suggestions for reformulating the regional programme for solid wastes disposal in order to meet the needs of the individual countries. A working group on noise control was convened in October in the Hague to review the existing legislation and regulations prior to the preparation of a model code of practice for noise control. The risks to personnel working in places where ionizing radiation and other physical hazards are present were reviewed by a working group in the Hague in November.

18.26 While long-established activities continued—such as the course for sanitary engineers in Warsaw, the provision of lecturers for other courses, and the environmental sanitation programmes in Algeria, Morocco and Turkey—much attention was devoted to the implementation of the increasing number of UNDP/SF-assisted programmes in environmental sanitation for which the Organization is the executing agency. Such projects are now in progress in eight countries of the Region—Algeria, Czechoslovakia, Hungary, Malta, Morocco, Poland, Romania and Turkey—and similar programmes in Greece and Yugoslavia are being negotiated. The project for a national water supply authority in Algeria was approved in 1971, as were pre-project activities for a programme for water pollution control in Hungary and a programme on comprehensive environmental pollution control in Poland as well as the second phase of the programme on water and air pollution control in Romania. A plan of operation was signed for a six-year programme for the establishment in Czechoslovakia of a federal research and development centre for environmental pollution control. Extensions of the programmes for wastes disposal and water supply in Malta and Turkey were also approved by the Governing Council of UNDP. The latter programme as well as the water supply project in Morocco were studied by the IBRD with a view to the possibility of loans being granted for their future development.

18.27 Pursuing its activities in occupational health, the Organization conducted a study on the epidemiology of toxic hazards and effects in industry in six countries of the Region. In June, a conference on modern trends in the prevention of pesticide intoxications was organized at Kiev; this is described starting at paragraph 18.68.

Organization of health services

18.28 An advanced course on health planning took place in the French language in Belgium and France during the months October-December. An evaluation of two similar courses held in previous years had been made and the 1971 course was modified to place equal weight on theory and on practice in the two host countries.

18.29 The problem of manpower planning, in particular as regards the demographic aspects of health manpower, was considered at a meeting of a working group in Paris in June, at which special stress was laid on the close relationship between all aspects of manpower planning and on the need to ensure their co-ordination.

18.30 A plan of operation has been finalized for a UNDP-assisted programme designed to assist the Government of Bulgaria to set up a scientific centre for hygiene and epidemiology, grouping together a number of formerly independent specialized institutions. Advice was given to Turkey in connexion with a reorganization of health planning services of the Ministry of Health that is envisaged.

18.31 The main problems encountered in the development of hospital computer facilities were given
thorough consideration at a symposium in Toulouse, France, in the summer (see paragraph 18.91); and a two-year study on the efficiency of medical care in the Region was completed and a report prepared that will serve as a basis for discussion at a conference on the subject planned for 1972.

18.32 Since 1962, the Organization has given support in the form of fellowships and the provision of visiting lecturers for nine-month training courses on hospital and medical services administration that are held in Moscow. A review of these courses took place in Varna, Bulgaria, in May, and the ninth course (in Russian) began in October.

18.33 As part of a study on the contribution of WHO to a joint European programme in road accident prevention and control, a working group met in Copenhagen in March to prepare a basic working document for the formulation of a long-term programme in this field. A second European liaison meeting on the prevention and control of road accidents was held in 1971, the first having been convened in 1968. It was attended by representatives from 16 European and other international agencies and organizations who discussed along what lines cooperation in road accident prevention could be intensified.

18.34 The perennial shortage of nurses remains a cause of concern in the Region. While the changes taking place in nursing are leading the profession to more administrative, teaching and supervisory responsibilities, the misuse of nursing skills on non-nursing tasks continues in spite of attempts at reform, for it is rooted in the traditional belief that nursing must cover practically all work done in a hospital setting. Efforts to make better use of the available nursing manpower may offer a more rational long-term solution than merely increasing the number of schools and the number of students training for the profession.

18.35 These considerations are reflected in the Organization’s regional nursing programme. The studies on advanced nursing education and on nursing resources and staffing patterns continued in 1971; and so far 10 countries in the Region have been covered for the collection of information and the provision of advice on nursing education and practice. A course for psychiatric nursing tutors, in English, was organized in July at the International School of Advanced Nursing Education, in Edinburgh, Scotland, which was originally established with WHO assistance. Efforts to establish a similar international school in Poland, for Russian-speaking students, are being supported by the Organization with fellowships for the teaching staff, consultant advice and supplies.

18.36 A directory of basic schools of nursing in Europe was prepared and widely distributed throughout the Region. It gives information on 3493 schools and on the general and nursing education systems in the 31 countries of the Region.

18.37 Health education plays an essential role in any successful long-term health programme and special attention is being paid to this aspect of the three regional long-term programmes. At the same time, health education activities outside these programmes were supported by the Organization, which awarded a fellowship for the training of a full-time professional health educator from Yugoslavia and provided visiting lecturers for the second international seminar on health education, held at Manchester, England, in July, and the fourteenth annual summer course on health education, organized in September at Perugia, Italy. Following a request by the Regional Committee in 1969, a survey on smoking and health was carried out in 1970 and 1971, paying special attention to the legal aspects of the question and the economic impact of possible government action.

18.38 The Organization furnished advice to Greece on the organization of health laboratories in connexion with that country’s national programme on development of public health services and training of personnel, which is assisted by WHO and UNICEF.

Health statistics

18.39 Parallel with an increasing interest in communications science, traditional activities continued in the field of health statistics. The third European conference on health statistics took place in Turin in May, and two meetings were arranged—in Copenhagen in April and at Primošten, Yugoslavia, in September—to discuss the preparation of publications dealing with comparative epidemiology requested by the Regional Committee in 1970. Jointly with ECE, a meeting on health statistics was arranged in Geneva in March, and a working group met in London in October to assist in the preparation of the ninth revision of the International Classification of Diseases.

18.40 The three annual courses in epidemiology and health statistics were held as usual, and as noted in paragraph 18.17, were also used to provide training for national personnel participating in the regional cardiovascular diseases programme.

18.41 While the WHO-assisted national programme on epidemiology and health statistics in Morocco terminated at the end of 1970, the similar programme in Algeria was intensified and that country’s interest in this subject is well illustrated by its expressed
desire to participate in an inter-regional study being undertaken by WHO on fertility patterns and fetal, infant and early childhood mortality. Malta will participate in co-ordinated studies on the registration of the outcome of pregnancies.

Family health

18.42 The Organization’s maternity-centred family planning policy has been well received in the countries of the Region, and two—Algeria and Turkey—received assistance for the establishment of projects based on this policy.

18.43 In April, a working group that met in Helsinki discussed induced abortion as a public health problem; much attention was given to the mental health and sociological aspects of induced abortion.

18.44 A study of undergraduate and postgraduate education in social paediatrics was conducted in eight countries of the Region and the findings were presented at a meeting of the newly established Association for Paediatric Education in Europe in August. Fellowships were again awarded for participation in courses on social paediatrics and on mother and child care run by the International Children’s Centre, Paris.

18.45 Advice on nutritional matters was given to Algeria, Morocco and Turkey, with special emphasis on continuing the weaning food programmes in those countries. WHO financial assistance to the three national projects was terminated at the end of the year and the continuation of the advisory services depends on UNDP approval of assistance to an inter-country project for this purpose as from January 1972.

Health protection and promotion

18.46 A third course on dental public health was given in Moscow in April. This course was in Russian and followed similar courses in Czechoslovakia in 1967 (in French) and in the United Kingdom in 1969 (in English).

18.47 A consultation on trends in dental education was held in Copenhagen in February with the participation of the International Dental Federation. A study on the evaluation of dental health services was made on the basis of data received from a number of countries in the Region, and the information obtained to date was presented at a meeting in Oslo in June of a working group on the use of epidemiological methods in dental public health services.

18.48 The Organization has embarked upon a five-year programme in mental health in the Region following approval by the Regional Committee in September 1970 of a proposal to that effect. This is a five-part programme, the components of which have been defined as: services and personnel; planning and organization; child and adolescent; alcoholism and drug dependence; and assistance to countries. For all components the programme is oriented to the public health implications of mental disorders, with emphasis on services rather than on one or another specific manifestation of mental illness. In this approach the multifactorial origin of most mental disorders is recognized and the consequent need for multidisciplinary care and treatment is taken into account. It was possible to execute the projects planned for 1971 largely as a result of a generous contribution by the Federal Republic of Germany to the Voluntary Fund for Health Promotion.

18.49 With respect to the first component, a working group which met in Opatija, Yugoslavia, in May reviewed community measures for the comprehensive psychiatric care of various patient groups, and in June a symposium on trends in psychiatric care in day hospitals and units in general hospitals was held in Salzburg, Austria (see paragraph 18.75). The World Psychiatric Association was represented at both meetings and the World Federation for Mental Health at the former. The second component of the programme was the subject of discussion at two other meetings—a working group on data collection and classification in psychogeriatric services in Tübingen, Federal Republic of Germany, in October, and a symposium on the classification and evaluation of mental health service activities in Geneva in November. A workshop on mental health statistics was arranged in London in March to give national workers guidance on the collection and application of mental health statistics for the operation and organization of their services. The problem of alcoholism and drug dependence was considered at a meeting in Copenhagen in February as well as by a working group on measures for the prevention and control of drug abuse and dependence convened in the Hague in April to discuss legal, educational, medical and social measures and their evaluation. This part of the programme benefits from the active co-operation of UNESCO, the Council of Europe, the International Council on Alcohol and Addictions, the International Union for Child Welfare, the World Federation for Mental Health, and the World Psychiatric Association.

18.50 Continuing the programme for training in the quality control of drugs, fellowships were awarded for three candidates from Czechoslovakia, Greece and Turkey for study in Denmark and Sweden.
Education and training

18.51 The Organization's activities in education and training reflected the social, technological and scientific pressures for change in this field that are being felt in the European Region. In Cracow, Poland, in November, a working group on communication in medical education discussed how best to promote collaboration between professional associations and organizations concerned with medical education in Europe, in preparation for the Fourth World Conference on Medical Education to be held in Copenhagen in 1972. Earlier, in June, a working group on the selection of students for medical education studied the role of selection in the light of the aims of medical education and the needs of health services; this meeting was held in Berne.

18.52 A WHO meeting concerned with teacher-training programmes in Europe took place in Copenhagen in November. In preparation for it, information had been collected on the availability and location of teacher-training facilities in the Region. The Organization provided assistance to seminars on the teaching of social sciences in medical education held in the Federal Republic of Germany, Ireland, Italy and Sweden, and five fellowships were awarded to Polish candidates for studies of social medicine. Other assistance in medical education was given for meetings in Bulgaria, Italy, Poland and Spain, inter alia, and fellowships were awarded for four Austrian medical teachers to visit different European countries to study educational innovations and changes. Arrangements were made for a group of four Algerian and two Moroccan medical teachers to visit the Americas to study medical education.

18.53 The European Conference on Medical Education, held in San Remo, Italy, in March, also benefited from WHO's support, as did a meeting immediately before that conference arranged with a view to establishing a Federation of Medical Education Associations.

18.54 In Turkey, advice was given in connexion with the planned reorganization of the School of Public Health at Ankara.

18.55 Pre-project activities for a new programme for the establishment of an Institute of Medical Technology in Algeria, with UNDP/SF assistance, were approved by the Governing Council of UNDP. In its initial phase the programme covers training of medical assistants and midwives; in a second stage it will include the training of nurses. In November, an essential part of the background information was the country reports prepared by the Organization in 1970, analysing the situation in the European countries.

Co-operation with other organizations

18.57 The first country programming exercise under the new UNDP procedure was initiated in Algeria in 1970; during 1971, UNDP country programming was started in Bulgaria, Hungary and Poland. Several problems were encountered in implementing the new procedure and UNDP/SF projects continue to require much attention, particularly those concerning environmental health.

18.58 Several of the larger meetings during the year were held with the collaboration or co-operation of other organizations within the United Nations system, among them being the United Nations, ECE, UNICEF, ILO, FAO and UNESCO. At smaller, more specialized meetings of working groups, collaboration with professional societies was also very rewarding. In addition, help was received from—and extended to—non-governmental organizations in official relations with WHO, and co-operation was maintained as well with several inter-governmental organizations outside the United Nations system. The Organization is represented at about 20 meetings a year organized by the Council of Europe and at similar meetings organized by the Council for Mutual Economic Assistance and the Commission of the European Communities on international health problems in the European Region. Contacts are also maintained with several bilateral aid agencies, notably the Danish International Development Agency (DANIDA).

Administrative and organizational developments

18.59 Construction of two wings for the Regional Office building, containing offices and restaurant facilities, was completed during 1971. The conference hall is expected to be ready in 1972. Owing to a steady increase in staff over the years it has been necessary to retain the separate temporary office accommodation located in another building near by. The Government of Denmark is looking into the possibility of further extension in the future by purchase of adjoining property.

The Regional Committee

18.60 The twenty-first session of the Regional Committee for Europe was held in Madrid from 14 to 18 September 1971 and was attended by 29 of the
31 Member States of the Region. The United Nations, UNICEF, the Council of Europe and a number of non-governmental organizations were represented. The Director-General attended the earlier part of the session.

18.61 During the Regional Committee’s consideration of the Regional Director’s annual report for the period from 1 July 1970 to 30 June 1971, the Regional Director emphasized the increasing collaboration between Member States and the Regional Office on matters outside the traditional framework of activities. The Regional Office was increasingly becoming a central point for the collection and dissemination of knowledge contributed by all who were concerned with the science and technology of health. There was also good co-ordination in health matters with inter-governmental organizations. The Regional Committee stressed the valuable contribution that the European Region could make to the solution of new problems, the importance of advanced training for health personnel, and the necessity of devising new methods for planning and evaluating health programmes.

18.62 The Committee expressed satisfaction with the progress made in the three long-term programmes — on cardiovascular diseases, environmental pollution control, and mental health — and it approved the proposals made for expansion of the cardiovascular diseases programme during the period 1973-1977.

18.63 The Committee also examined reports on long-term planning and evaluation, long-term financial indicators, comparative epidemiology in the European Region, occupational health, community water supply, and cholera (see paragraph 18.4).

18.64 The Committee endorsed the proposed programme and budget estimates for the Region for 1973, and nominated Dr Leo A. Kaprio for reappointment to the post of Regional Director for a further period of five years from February 1972.

18.65 The technical discussions were on the prevention and control of drug addiction, and there was also discussion of a paper submitted by the United Kingdom on modification of national policy in that country regarding smallpox vaccination. The Committee confirmed the selection of “The public health aspects of organ transplantation” as the subject for the technical discussions at its twenty-second session and decided on “Environmental factors in the etiology of chronic and degenerative diseases” as the subject for the technical discussions at the twenty-third session.

18.66 The Committee confirmed its decision to hold its twenty-second session in Copenhagen in 1972 and accepted an invitation from the Government of Austria to hold its twenty-third session in that country in 1973.

Some Aspects of Work in the Region

18.67 A list of the projects current during the year will be found in Part III. The following have been selected for fuller description.

Conference on modern trends in the prevention of pesticide intoxications

18.68 In recent years a great deal of attention has been paid to the effects of chemical pesticides on the environment, but rather less to the safety of the workers who are in daily contact with these compounds in the factories and in agriculture. A WHO conference on modern trends in the prevention of pesticide intoxications was accordingly convened in Kiev, USSR, in June 1971. The participants came from 17 countries of the European Region, and both ILO and FAO were represented.

18.69 Few countries in Europe report systematically on pesticide poisoning, and it is therefore difficult to assess its exact extent. Many severe cases are attributable to the deliberate self-administration of pesticides rather than to occupational or incidental exposure. The introduction of compulsory notification in all countries is desirable, but expert advice will be needed to ascertain the true cause in every case. This could be provided through existing poison information and control services. The conference considered that national statistics on mortality and morbidity from pesticide poisoning should be published annually and that long-term epidemiological studies should be undertaken on the effects of pesticides on human health.

18.70 The participants in the conference agreed that, despite the shortcomings of the available statistics, it can reasonably be assumed that the incidence of pesticide poisoning in Europe is low and tends to decline from year to year. This trend, however, may not last. Owing to their pronounced chemical stability and persistence, the organochlorine insecticides are being phased out of use and their place is gradually being taken by products—notably certain organophosphorus pesticides—which break down more
rapidly into harmless compounds but are initially far more toxic to man. Although a search is being made for compounds that will be at once highly efficient and relatively innocuous to man and wildlife, it appears unlikely that these two characteristics will ever be ideally combined in a single compound.

18.71 Doubts were raised about the effectiveness of existing methods for the protection of persons handling pesticides. For example, regrettably little has been done to ascertain whether the materials commonly used for such protective clothing as aprons, gloves and boots do in fact prevent pesticides from reaching the skin and being absorbed. Research on this question should also take into account the working and climatic conditions in which the clothing will be worn.

18.72 It emerged at the conference that, in most countries, a stricter control of the equipment used for aerial spraying is needed. The aircraft and the equipment attached to them are checked from the standpoint of flight safety, but it is also important to see that the spray nozzles are located in such a way as to minimize pollution of the environment by the pesticide. It is the joint responsibility of the agricultural and public health authorities to ensure that aerial spraying equipment is regularly inspected for safety and efficiency in use.

18.73 Pesticides are often used in countries other than those in which they are produced. The conference suggested the development of an international system for their classification and labelling according to their toxicity and the degree of hazard they present.

18.74 Other subjects discussed included the occupational health measures to be taken during the production, formulation, transport and distribution of pesticides; the surveillance of operators in the field; legislation for the control of pesticides; and educational measures.

Symposium on trends in psychiatric care

18.75 The long-term custodial care of psychiatric patients in special hospitals is increasingly being replaced by short-term treatment in small psychiatric units attached to general hospitals and by various forms of day care provided within the framework of a community mental health service. This and other trends in psychiatric care were reviewed at a WHO symposium in Salzburg, Austria, in June 1971. The latest in a series of meetings held in connexion with the Organization’s long-term mental health programme in the European Region, the symposium was attended by 40 psychiatrists, nurses, social workers, public health administrators and hospital directors from 29 countries of the Region and by representatives of the World Psychiatric Association and the International Council of Nurses.

18.76 Although the concept of community-based psychiatric services is now widely accepted, the extent to which it is actually applied varies from country to country for a number of reasons. These include restrictive legislation that may hamper the early recognition and treatment of psychiatric illness, lack of flexibility in the costing and financing of services, and conservative attitudes on the part of professional and other staff. Day-patient care is generally organized on too selective a basis, since in most instances the only patients who can benefit from it are city-dwellers suffering from relatively mild forms of mental disturbance. It was, however, recognized by the participants in the symposium that not all types of psychiatric patient can suitably be given this form of care and that the psychiatric hospital is still needed for the treatment of severely disturbed patients.

18.77 The participants agreed that day care and treatment in psychiatric units in general hospitals are suitable for patients of all age-groups, but that children should be separated from adults. Day care is particularly indicated for patients before admission to, and after discharge from, hospital; in a number of cases, it may obviate the need for in-patient care. There are definite advantages in treating problems of a psychosomatic nature in a general hospital, whether in the psychiatric department or elsewhere. So that the selection of patients may be as wide as possible, the premises provided should be extensive and permit the separation of different groups of patients. Two groups that ran the risk of being neglected were mentioned: those who are unable to help themselves because of lack of knowledge, low intelligence, or disease; and chronic patients such as those suffering from schizophrenia. Many of those in the first category are more in need of care than some who actually receive it.

18.78 Experience has shown that the newer forms of psychiatric care make heavy demands on staff, general practitioners, the family and the community as a whole. In the case of patients attending day hospitals, the co-operation of nurses and social workers may be needed to relieve the burden on their relatives and, in particular, to try to minimize the risk of adverse psychological effects on the children in the family.

18.79 It is possible that social workers may acquire increasing responsibility for the prevention and early treatment of conditions that can give rise to mental disturbance, and the medical and social services must
therefore work out a form of co-operation that will be effective in terms of service to the patients and at the same time administratively sound.

18.80 In conclusion, the participants in the symposium stressed that, in order to overcome such prejudice to the new approaches to psychiatric care as may still be encountered in both professional and lay circles, the benefits of these approaches must be demonstrated in concrete rather than emotional terms. Mental health workers advocating and using the newer forms of psychiatric care should therefore subject both their ideas and their services to a thorough critical appraisal.

**Seminar on automatic water quality monitoring**

18.81 As part of its long-term programme on environmental pollution control in Europe, WHO collaborated with the Government of Poland in the organization of a seminar to consider the automated methods that are gradually replacing manual sampling and analysis techniques in certain of the more highly industrialized countries for the measurement of the quality of surface water. The seminar, which was held in Cracow from 29 March to 2 April, was attended by 25 specialists from 17 countries of the Region, as well as by representatives of WMO and the Council for Mutual Economic Assistance. They reviewed the experience gained in the new technology and discussed its possible further development.

18.82 Twelve specialists from the Federal Republic of Germany, Poland, the United Kingdom and the USA presented papers and background documents, and conducted two workshops—one on new developments in sensor technology, the other on systems analysis in water pollution control. The experience gained in the UNDP/WHO-supported programme in Poland for the protection of river waters against pollution, in which a system of automatic water quality monitors has been established, provided valuable material for the discussions.

18.83 The meeting showed that, while only a few European countries have experience in automatic water quality monitoring, there is great interest in applying new techniques for automatic acquisition of data necessary for river management, conservation and pollution research. Automatic water quality monitoring is valuable for establishing water quality baselines and trends, detecting rapid changes such as those caused by accidental waste spills, and giving early warning to downstream water-users that water of a particular quality or degree of pollution is approaching their intakes.

18.84 In deciding on the location of monitoring stations, prime consideration should be given to the protection of water supplies of importance for the national economy and for public health. Suitable locations for such stations therefore include sites on international rivers downstream from major industrial complexes and above municipal water intakes.

18.85 Apart from special systems to suit particular circumstances, there are two basic instrument systems in use for automatic quality monitoring, one relying on in situ electrochemical transducers or sensors, and the other on automated repetitive wet analytical techniques. The variables that can most reliably be measured are temperature, hydrometeorological data, conductivity, turbidity, dissolved oxygen, oxidation-reduction potential, pH, and chlorides. New techniques permit the continuous laboratory measurement of trace metals in the parts-per-thousand-million range.

18.86 Telemetric systems connecting monitors with a control data-processing station make it possible for data to be evaluated rapidly, thus providing an early warning of accidental pollution. They make it possible to ensure continuous supervision of the monitors (since only the central station needs to be manned at all times) and rapid correction of any malfunctioning. Given highly skilled maintenance staff, the reliability of the monitoring network can thus be considerably increased (from 50% to 90% in the case of one network that was discussed).

18.87 The data obtained from automatic monitoring stations are best stored in digital computers which can be programmed to permit the retrieval of data, their evaluation, and comparison with environmental quality standards; to give alarm signals when standards are violated; to provide graphic and tabular summaries; and to check the functioning of the network.

18.88 The discussions at the seminar indicated that most of the problems arising with automatic water quality monitoring networks are due to failures in the pumps, the sensors, the flow system or the electronic system. Maintenance is therefore of the utmost importance.

18.89 From data presented at the seminar it seems that, for either basic instrument system, the method used for data collection has relatively little effect on costs. A monitoring station equipped, for instance, with automatic cleaning and calibration equipment is more costly to install than one where these are done manually; but, needing fewer staff, its running costs are reduced correspondingly.

18.90 The cost in the United Kingdom of collecting data on a continuous basis by instrumental methods was given as being of the order of £2000 per measured
variable per year, and a reduction of sampling frequency would have little bearing on this figure. However, in order to obtain the most information for the least cost, the design of automatic water quality monitoring systems must be based upon a thorough study of the optimum number of stations needed and their location, the variables to be measured, and the amount of data to be obtained. Much further work is required to perfect optimization methods.

**Symposium on the development of hospital computing systems**

18.91 The use of computers in hospitals is likely to have far-reaching effects on hospital management, organization and staffing as well as on patient care. A WHO symposium on the development of hospital computing systems, held at Toulouse, France, in June-July 1971, reviewed experience in this field to date. The participants came from 13 European countries, Canada and the USA and included administrators, doctors, a nursing officer and computer experts with experience of medical communications systems.

18.92 The special problems involved in the introduction of computing systems in hospitals were discussed, and accounts were given of projects in Denmark, France, Sweden, the United Kingdom, the USA and the USSR. It is clear that this innovation has important implications for the education of medical, nursing and other staff, who will need to become familiar with computer techniques and may also have to reconsider their attitudes to the organization of diagnostic and therapeutic systems.

18.93 So far the use of computers in hospitals has been relatively limited in most countries in the Region and largely confined to account and payroll systems. Attempts have been made to extend automated accounting systems to deal with various aspects of patient care, but they have not been notably successful because the requirements are not the same. Small computers are used in the clinical laboratories of some hospitals for certain calculations and administrative procedures, and their use in such fields as electrocardiogram analysis and the planning of radiation treatment is increasing. Unfortunately, work on the quantification of the benefits of health care is not yet sufficiently advanced to permit an objective assessment of the advantages to be derived from the application of the new techniques in the hospital setting.

18.94 The participants in the symposium agreed that the success of a hospital computer project will depend on a careful definition of the aims, components and functional requirements of the system proposed. A modular approach was advocated, i.e., the introduction of progressively more complex modules, or subsystems, that can operate independently and yet eventually be linked together to form a "total" system.

18.95 The project should be organized by a steering committee based at the hospital and responsible to the hospital authority. There was some disagreement among the participants concerning the choice of the project leader; many participants thought it essential that a doctor should be selected for the post, while others pointed out that, in some current projects, leaders with no medical qualifications are making valuable contributions to medical computing.

18.96 The contribution of central authorities—national, regional, or the headquarters of any hospital group—was also discussed. It consists essentially of controlling and co-ordinating the systems in the different hospitals under their authority in such a way as to minimize expenditure of money and time—for example, by purchasing equipment centrally and arranging for new projects to benefit from existing ones in such matters as system design and software provision.

18.97 Many of the speakers at the symposium considered that WHO has a particularly important part to play in the worldwide development of hospital computing systems by providing information on their uses and application in different types of hospitals, establishing international standards, giving guidance on cost-effectiveness assessment, and promoting the education and training of staff.

18.98 The symposium concluded that the computer can now be considered as an important tool in the organization of health care and the management of hospital resources. Its successful use depends, however, on an intensive analysis and synthesis of systems of hospital organization and of the requirements of these systems in the fields of information and communications.
CHAPTER 19

EASTERN MEDITERRANEAN REGION

Communicable diseases

19.1 In the Eastern Mediterranean Region, WHO is assisting eight countries to fight smallpox. In four—Ethiopia and Sudan in Africa and Afghanistan and Pakistan in Asia—the disease is endemic. About 32,000 cases were reported in 1971, as against the 7,000 reported from these four countries in 1970. This increase is almost entirely due to a very much wider reporting of cases from Ethiopia where a WHO-assisted project was in operation in 1971. The combined reporting, case finding, surveillance and containment activities of this project have already achieved excellent results, and about three million vaccinations were performed during the year. The programme in the Sudan was continued throughout the central and northern provinces, but activities in the south were still limited to large cities. In Afghanistan it is expected that the total population will shortly have been vaccinated. In East Pakistan, mass vaccination was discontinued. In West Pakistan, mass vaccination was completed in Punjab Province during the year and had already started in cities of the provinces of Sind, Baluchistan and North-West Frontier. In all four countries, specially trained surveillance teams were on the alert for the occurrence of cases.

19.2 In those countries where smallpox is not endemic—the People's Democratic Republic of Yemen, Saudi Arabia, Somalia and Yemen—mass vaccination activities are continuing and surveillance teams are ready to cope with emergencies. Training courses for surveillance officers and sanitarians were organized in Afghanistan, Ethiopia, Pakistan and Sudan. Both population coverage and vaccine potency are being assessed concurrently in all projects.

19.3 Some countries of the Region that were previously free from smallpox suffered serious outbreaks in 1971. Iran reported 29 imported cases and small numbers of imported cases were found in the French Territory of the Afars and the Issas and in parts of the Trucial Sheikhdoms. In all instances, vaccine, vaccination equipment, and advisory services in epidemiology were promptly provided by the Organization. During the year, the WHO field personnel for the smallpox eradication programme in the Region was increased to 16 epidemiologists and 3 administrative assistants. Health education materials such as posters, pamphlets and slides, were widely distributed to both endemic and non-endemic countries. Freeze-dried smallpox vaccine from donated stocks was provided to Bahrain, Lebanon, Tunisia and other countries in response to government requests. The production of freeze-dried smallpox vaccine by national laboratories was encouraged and the Organization provided several of them, on request, with equipment and supplies of chemicals and seed virus. WHO reference laboratories tested samples of their production and it is a matter for satisfaction that vaccine meeting WHO requirements for potency and stability is currently being produced in national laboratories in the Region.

19.4 All the countries and territories of the Region affected by cholera outbreaks had declared themselves free of the disease by the end of 1970 with the exception of the Syrian Arab Republic, Somalia and the French Territory of the Afars and the Issas, which reported freedom from cholera respectively in January, July and December 1971. WHO continued to respond to government requests for assistance in the form of personnel and supplies of cholera vaccine, rehydration fluid, diagnostic sera, antigens, culture media, antibiotics, jet injectors and publications.

19.5 Two WHO missions composed of epidemiologists, bacteriologists, clinicians and sanitary engineers visited Saudi Arabia before and during the Mecca pilgrimage in February 1971, to assist the Government with cholera preventive measures. It is greatly to the credit of the Saudi Arabian authorities that the pilgrimage was free from quarantinable diseases. In preparation for the 1972 pilgrimage, WHO assisted in training as many national personnel as possible in cholera bacteriology and epidemiology.

19.6 Assistance was also given to Afghanistan, Egypt and Iraq in augmenting their production of vaccine and rehydration fluid and in improving the laboratory diagnosis of cholera.
19.7 Seventeen participants from the Region attended an inter-regional travelling seminar on cholera control held in October.

19.8 WHO assisted in the expansion of national tuberculosis programmes in Jordan, Somalia, Sudan and the Syrian Arab Republic. The trend towards integration of tuberculosis control in the routine work of general health services continued in all countries where the health infrastructure was sufficiently strong to support additional activities. In the Syrian Arab Republic, for instance, tuberculosis control facilities are to be extended to the rural population which the specialized programme had failed to reach.

19.9 Integration requires the training of multipurpose health personnel, and training programmes for various categories of auxiliary personnel have been implemented. In this connexion UNICEF has provided teaching aids and local subsistence allowances for trainees. Participants from the Region attended the WHO-assisted seminar in advanced techniques for programming in tuberculosis in Oslo and the tuberculosis course held in Tokyo. Preparations were made for a regional tuberculosis seminar to be held in 1972. Maximum use was made of the inter-regional training course in the epidemiology and control of tuberculosis in Prague.

19.10 The staff of the basic health services of many countries are now undertaking the diagnosis and treatment of tuberculosis. It is relatively easy to detect cases among outpatients, but much more difficult to keep patients under regular treatment. For that purpose, peripheral treatment facilities must be provided close to the patient's residence, the patient must be persuaded of the necessity to follow the prescribed treatment, and an appropriate system must be maintained in order to follow up defaulters. A free drug supply should also be made available to all peripheral institutions to cater for the needs of cases in their jurisdiction. It has been found that under prevailing conditions, a daily self-administered regimen of isoniazid and thiocetazone is the most practical in the majority of countries of the Region. The feasibility of a fully supervised intermittent regimen consisting of twice-weekly application of streptomycin combined with oral isoniazid in high dosage is being studied in Ethiopia.

19.11 Integrating tuberculosis services into general health services implies the need to simplify and standardize the reporting and recording system. However, it is important to retain the data essential for assessing the tuberculosis control component of the integrated programme.

19.12 BCG vaccination has been carried out together with smallpox vaccination in the campaign in the Sudan. An assessment of this programme showed that such a combined vaccination campaign gives acceptable results. It was found, however, that increased attention should be given to operational factors such as advance planning of the deployment of field teams, their supervision and the assessment of coverage by random scar surveys. It was also found that, if appropriately planned, the BCG vaccination component would not impede the progress, output, or coverage of such a combined programme. In a few countries of the Region where specialized BCG vaccination campaigns are still in operation, it is probable that this activity can in the near future enter a maintenance phase during which a continuous coverage of the most vulnerable age-groups of the population will be provided through peripheral health institutions.

19.13 Leprosy is a serious public health problem in only a few countries of the Region. Among them, however, are Ethiopia, Sudan and Pakistan, three countries with large populations. Various approaches in leprosy control have been tried out in Pakistan, and technical assistance was supplied to Sudan and Tunisia.

19.14 Some progress has been made in persuading the medical profession and the national authorities concerned that institutional establishments for the treatment and isolation of leprosy patients do not provide a valid solution to the problem. In certain communities it is a difficult task to fight against the stigma of leprosy. Continuous health education is necessary to gain the confidence and co-operation of patients and the community. Shortage of drugs often interferes with the necessary continuity of chemotherapy.

19.15 A field trial of group A cerebrospinal meningitis vaccine was begun in November in Cairo and Alexandria, Egypt, in collaboration with the United States Naval Medical Research Unit No. 3. The study is designed to determine the protective power of the vaccine against meningococcal infections and diseases both in cases and in carriers, and to assess the serological response after vaccination. WHO is providing 70000 ml of a polysaccharide vaccine against group A meningococcus prepared by the Mérieux Institute in Lyons (France), as well as 70 000 ml of tetanus toxoid, to use as a control, and the necessary jet injectors. The Organization has also assisted the field study financially.

19.16 Two WHO-assisted projects for the control of communicable eye diseases were in active operation
in the Region during the year—in the Libyan Arab Republic and the Syrian Arab Republic. These are aimed at the eventual integration of trachoma control into the general health services. In both, community-wide treatment and treatment in schools were a basic feature, as were training of national personnel and health education. Sample surveys were conducted among statistically significant population groups to evaluate the efficacy of the control methods and the results obtained. Advice was also given to Bahrain for assessing the trachoma problem prior to undertaking control activities in the country.

19.17 By June 1971 the estimated population of the Region had risen to a total of 290 million, of whom 235 million were living in malarious areas. The population protected by malaria eradication programmes, including those in the maintenance phase, was 176 million, or approximately 75% of those originally at risk, while a further 42 million (or 18%) were protected by various malaria control measures. Thus some measure of protection was being afforded to about 93% of the population originally at risk in the Region. Antimalaria measures for the remaining 17 million (7%) of the population living at risk and considered still unprotected are gradually being put into effect. Field operations are under way in certain development projects in Ethiopia, in parts of the People's Democratic Republic of Yemen, among half a million of the Jizan population in Saudi Arabia, in the Sudan and in the Trucial Sheikdoms.

19.18 The reviews of malaria eradication programmes undertaken in 1970 in Afghanistan, Ethiopia and Pakistan were followed by a review of the Iraq programme in 1971. Critical assessments were also made of the programmes in Egypt and Sudan with reference to the possible malarigenic effects that the expansion of Lake Nasser may have in the border areas of those two countries. As yet there is no evidence of reintroduction of *Anopheles gambiae* into Egypt.

19.19 The review teams recommended that planning should be improved and related to health and overall socio-economic plans, that basic health services should be rapidly developed and malaria eradication integrated into them, that governments should give priority to matters of finance and trained personnel, that malarious areas and the malaria transmission season should be correctly delineated, and that there should be a critical epidemiological assessment of the achievements of malaria operation and of potential malarigenic situations. They also emphasized that all antimalaria measures should retain the eradication of the disease as their common goal.

19.20 The level of malaria endemcity has in general continued to decrease, but the upsurge of the disease in 1969 and 1970 in the Punjab in West Pakistan, and in the north and east of Afghanistan have left behind considerable reservoirs of parasites. Conditions are expected to improve with the implementation of the revised plans following the reviews of those programmes. Cyprus, Israel, Lebanon and the Libyan Arab Republic reported no more malaria transmission, although some imported cases occurred. Iran has had considerable success in its attack using the insecticide malathion on the vector *An. stephensi* which is resistant to both DDT and dieldrin in the south of the country. The same technique was used against that vector in Iraq, where the incidence of malaria in the Basrah *liwa* was the lowest for many years. The Syrian Arab Republic, using dieldrin against the DDT-resistant *An. sacharovi*, may be in sight of the goal of complete interruption of transmission (see paragraph 19.89).

19.21 In Afghanistan it has been decided to continue malaria eradication in the north and to conduct a "holding operation" south of the Hindu Kush. The Government allocation to malaria eradication was doubled, and UNICEF assistance is expected to continue for some time.

19.22 In Ethiopia eradication operations continued in the area in the attack phase, and certain development projects were brought under protection. The United States Agency for International Development has undertaken to make a loan of US $4.9 million to cover foreign purchases in 1971 and 1972, and WHO has collaborated in drawing up a plan of antimalaria action. Preparatory work continued in another area, and a study was undertaken of the feasibility of achieving malaria eradication among some 700,000 population by DDT spraying and strengthened surveillance operations.

19.23 In Pakistan it was decided to continue with malaria eradication but the future of the programme is now unclear in view of recent developments. Strenuous efforts were being made in East Pakistan, with the assistance of WHO, to prevent the reintroduction of malaria into areas that have been cleared of the disease.

19.24 Assistance to malaria eradication and control amounted to approximately US $1.5 million, or about 17% of the total WHO budget for the Region. Of this amount, some 57% was allocated for advisory services and some 32% for supplies and equipment. The malaria eradication programmes in Afghanistan, Iran and Iraq continued to be assisted by UNICEF, whose overall assistance to antimalaria operations...
in the Region has nevertheless declined, and those in Ethiopia and Pakistan by the United States Agency for International Development.

19.25 While the annual cost per capita of malaria eradication in the Region increased only by some US $0.2 between 1968 and 1970, it may be expected to rise more rapidly if the resistance of malaria vectors to DDT becomes a problem in the larger programmes also. Governments will then have to bear the additional burden of having to purchase more costly insecticides.

19.26 Inter-country border meetings to discuss common malaria problems were attended by Iraq, Jordan, Lebanon, the Syrian Arab Republic and Turkey. The 17th Inter-country Malaria Eradication Co-ordination Board meeting, held in Damascus in November, was followed by a seminar on malaria epidemiology sponsored by WHO in which 18 professional malaria workers from the above-mentioned countries and from Afghanistan, Iran and Pakistan participated.

19.27 The need has been felt for training public health workers in malaria, and malaria workers in simple public health tasks. The two main obstacles to multipurpose training in this field are the size, sophistication and time-limited character of malaria eradication operations and the present state of development of general health services, which in many cases are unable to absorb and provide supervision for the potential work force. There is also a resistance to change on the part of workers in both malaria eradication and the general health services. There has, however, been a distinct improvement in the training of entomological workers and in the methods used in the epidemiological investigations of foci and determination of malariogenic potential. This has been of particular benefit to large-scale programmes such as those in Afghanistan and Pakistan where different methods of attack on the vector mosquitoes may have to be adopted.

19.28 With the extension of irrigation schemes and agrarian reform projects in most countries of the Region, new breeding places are being created for the snail hosts of schistosomes. The new inter-regional project on the epidemiology and methodology of schistosomiasis control in man-made lakes for which UNDP/SF approval has been received, will help to remedy the situation.

19.29 An independent evaluation of the schistosomiasis control pilot project in Egypt in February and March led to the conclusion that molluscicide application as used in the project did not interrupt transmission of schistosomiasis to a degree which made it acceptable as a single method of control in the Nile delta. The evaluation, however, also demonstrated the unparalleled value of the information assembled by the project on the epidemiology of the disease.

19.30 Seventy-eight children under 5 years of age suffering from kala-azar were admitted to a children's hospital in Iraq during the period 1963-1971. Epidemiological studies were therefore undertaken by a unit specially created in the Endemic Diseases Institute in Baghdad. WHO assisted by carrying out a Phlebotomus study.

Non-communicable diseases

19.31 A group meeting on cancer control took place in Baghdad in November and December. A questionnaire on the prevalence of cancer, the mortality due to the disease, the results of treatment and the personnel and facilities available for diagnosis and treatment had previously been circulated among oncopathologists of the Region.

19.32 Direct assistance was continued to the Teheran Cancer Institute, the Cancer Institute in Cairo and similar institutes elsewhere. Preparations are under way for WHO-sponsored courses for technologists in Israel and for pathologists specializing in exfoliative cytology and obstetrical-gynaecological pathology to serve in cancer control and family planning programmes.

19.33 A study of existing dental services and of the training of dental auxiliaries was undertaken in the Libyan Arab Republic, and assistance was given to the dental assistants training programme at the University of Tel Aviv, Israel.

19.34 In general mental health services are not given high priority in the countries of the Region, although it is realized that there is an acute shortage of trained psychiatrists and psychiatric nurses. The overcrowded conditions and low standards in custodial care establishments are largely due to lack of financial, physical and manpower resources, and in some cases warrant urgent attention. There is a lack of appreciation of what can be achieved by the special education of the mentally retarded—particularly the mildly subnormal—and a number of countries have yet to make a start in this field.

19.35 In Iran a research project dealing with the epidemiology of mental disorders is going ahead with WHO collaboration. The Organization provided 18 fellowships in mental health to countries of the Region during the year.
Environmental health

19.36 During 1971, UNDP/SF-financed projects for water supply, sewerage and drainage were in operation in four countries and in the planning stage in five others. Details of the work to be carried out by subcontractors for the expansion of the Teheran sewerage system were finalized and a consulting firm selected, with the agreement of the Government, to execute the work in association with a local firm. Progress was made in the water supply project for Sana’a and Hodeida, Yemen (see paragraph 19.102. The mapping of the project areas was completed and hydrogeological investigations and master plan studies were begun. Operations were started in two Special Fund projects that were approved by the Governing Council of UNDP in January: a master plan for water supply, sewerage and drainage for greater Kabul; and a rural water supply programme in Iraq. A request for UNDP/SF assistance in the planning of a country-wide community water supply programme for the Libyan Arab Republic was drafted with WHO assistance. Two other requests, drawn up with help from WHO, were submitted by Lebanon and the Syrian Arab Republic, respectively, to UNDP. One is for a country-wide waste water management plan (Lebanon) and the other for a master plan for sewerage, drainage and solid wastes management in greater Damascus.

19.37 Assistance was provided to Tunisia in establishing a design office to be responsible for water supply schemes throughout the country, organizing and legislating for such schemes, and setting up national and regional laboratories for water quality control. Assistance was also provided in sewage treatment planning. A project, which may be financed by UNDP, is in preparation for waste water treatment and solid wastes disposal by composting or other means. Recommendations were made to the Libyan Arab Republic regarding the collection, transport, processing and disposal of solid wastes.

19.38 The development of community water supplies in Ethiopia was accelerated as a result of the loans made by several governments and agencies through bilateral arrangements. Pakistan, Sudan and Yemen have themselves financed and found the manpower to construct many new water supply systems and to extend existing systems. UNICEF has provided material assistance and WHO technical advisory services for these projects.

19.39 A number of governments have shown interest in undertaking research in the field of environmental health to find methods involving less expense than the imported or conventional procedures hitherto employed. The Organization assisted the Israeli Government in planning a central environmental health research laboratory and the Government of Egypt in expanding research activities at the Sanitary Engineering Research Centre in Alexandria.

19.40 In several countries of the Region, WHO sanitary engineers assisted their national counterparts in sanitation measures, including a water disinfection and quality control programme in connexion with anticholera measures. A WHO engineer also assisted an IBRD/UNICEF mission in planning a water supply subproject as part of the overall emergency aid and rehabilitation programme for the cyclone-affected areas in East Pakistan.

19.41 WHO advised governments on measures to improve radiological safety and to reduce the risk of over-exposures to ionizing radiation. Radiographic equipment has been improved by installing filters, repairing adjustable diaphragms, etc.; premises have been made more suitable; and better radiographic techniques have been taught both to new students and to professional radiographers.

19.42 The film-badge service, now in its fourth year of operation, is providing a useful indication of the quality of radiographic techniques and equipment in a number of countries in the Region. The number of film-badges provided by WHO has been increased in response to requests from Afghanistan, Bahrain, Cyprus, Egypt, Ethiopia, Lebanon, the Libyan Arab Republic, Pakistan, the People’s Democratic Republic of Yemen, Qatar, Sudan and Tunisia. National film-badge services are in operation in Egypt, Iran, Israel and Pakistan. Through the inter-country project for the maintenance and repair of X-ray equipment, a number of X-ray installations in Afghanistan and Iraq were repaired and their radiological safety improved.

19.43 WHO continued to assist in the training of radiographers in the Region and particularly in the Sudan, where national and foreign students are learning radiographic techniques. In Iraq, teaching of radiotherapy techniques is carried out at the Institute of Radiation and Nuclear Medicine, Baghdad, under WHO sponsorship.

19.44 Thirteen radiotherapy centres in Cyprus, Egypt, Iran, Iraq, Kuwait, Lebanon, Pakistan, Sudan and Tunisia have participated in the IAEA/WHO dosimetry service for cobalt teletherapy units. Surveys have shown an improvement in radiation dosimetry techniques when WHO recommendations have been followed. Preparations are being made for the
establishment of a secondary standard dosimetry laboratory in the Region.

Organization of health services

19.45 Several countries of the Region now have long-term health plans designed to contribute to overall national socio-economic development, and a number of others are moving towards the same goal. Where evaluations are made of planned development programmes, the weaknesses are found to be due to inadequacy of data, data systems and planning procedures and poor managerial capacity at all levels and in all branches of execution.

19.46 Several governments have reorganized the structure of ministries of health and have strengthened or established provincial health administrations. WHO has assisted Afghanistan, Ethiopia, the Libyan Arab Republic, Saudi Arabia, Sudan and Yemen in effecting changes of this kind. Institutes of public health are giving more attention to public health administration and the training facilities in institutes of public administration are being more widely used. WHO has assisted two countries of the Region, Afghanistan and Ethiopia, in reviewing their health legislation, and has supported several projects specifically aimed at improving public health administration and the organization of medical care and medical supply services.

19.47 Many areas of the Region were receiving organized community health care for the first time. Ethiopia, the Libyan Arab Republic, the People's Democratic Republic of Yemen, Saudi Arabia and Sudan were engaged in preparing plans for establishing community health services and in reviewing their health care organizations, while Egypt, Iran and Tunisia have obtained tangible results from the expansion of health care coverage in the past two years.

19.48 WHO continued to assist countries to develop services of this kind. The general trend of WHO-assisted basic health services projects in Afghanistan, Somalia and Yemen has been towards integration of maternal and child health services, family planning programmes, and activities to control communicable diseases (particularly malaria, smallpox and tuberculosis) within the health services at local and intermediate levels. The improvement of environmental sanitation was also included in such projects. Training activities were attuned to the specific needs of the country and comprised courses for auxiliary nurses and sanitarians in Yemen, a demonstration and training area for health students in Somalia, and courses for provincial health officers and other categories of staff in Afghanistan. In Iraq assistance was given in training doctors, nurses and sanitarians in public health practices.

19.49 Regular meetings and discussions were held to streamline WHO assistance to Yemen with that of the Red Cross, the Red Sea Mission and various voluntary or bilateral agencies.

19.50 As part of WHO assistance to governments in developing their hospital systems, two nurses were assigned to Iraq to organize and train the nursing staff of the principal hospital in Baghdad; a hospital architect made a survey of the layout, structure and installations of hospitals in Jordan; and suggestions were made for improving existing hospitals in Yemen. The need for WHO assistance in hospital administration and medical care in Tunisia was assessed. Assistance was given in establishing or expanding the following specialized units: a coronary care unit in Israel; an intensive care unit in Alexandria, Egypt, and two centres in Cairo—one for the treatment of burns and the other for allergic diseases of the respiratory system.

19.51 Assistance to nursing activities in the Region—in addition to the aspects mentioned in the preceding paragraphs—included help in strengthening nursing administration at the national level in Afghanistan; support for programmes offering a B.Sc. degree in nursing in Egypt (approximately 250 enrolled in 1971), Iran (about 100 enrolled), and Iraq (about 120 enrolled); and advice to the Syrian Arab Republic on the establishment of a programme in nursing education at the university level. A description of the post-basic nursing education programme in Shiraz, Iran, is given starting at paragraph 19.106. At the WHO-supported High Institute of Nursing, Cairo, 14 fourth-year students completed practical experience in psychiatric nursing, and 40 of the nursing staff of the psychiatric hospital at the University of Cairo, where the Institute is located, participated in an eight-week in-service course in psychiatric nursing.

19.52 In the field of rehabilitation, WHO provided physiotherapists to Egypt, Iran, Jordan and Lebanon, an occupational therapist to Pakistan and a prosthetic technician to Egypt.

19.53 During the year, WHO assisted 28 projects concerned with the organization of national or special health laboratory services. A travelling seminar was held in December at which directors of health laboratories in the Region were given the opportunity to review and discuss the following subjects: the orientation of laboratory services, coverage of population, control of laboratory performance, biological control
of vaccines and sera, laboratory personnel, automation, legislation and laboratory animals.

19.54 Four countries of the Region, Egypt, Ethiopia, Sudan and Tunisia, have requested UNDP/SF assistance in developing their health laboratory services, strengthening their laboratory manpower, increasing the coverage of services or improving vaccine production.

19.55 Training courses were organized for middle-level laboratory technicians. A course on cholera bacteriology was held in Beirut in February with 17 participants from countries of the Region. A training course on virology for technologists was held in Egypt from October to December.

19.56 Most ministries of health in the Region have departments specially concerned with health education, although the degree of their development varies. Properly planned health education activities can improve relationships between the supplier and consumer of health services. The Government of Pakistan, for example, has been making a considerable effort to introduce health education in a WHO-assisted water supply project in West Pakistan in order to help the users to understand the purpose of the project, and in order to obtain a better utilization of the services provided.

19.57 The Organization continued to assist the UNESCO-sponsored teaching programmes at the Arab States Functional Literacy Centre in Egypt. Following discussions at an inter-agency meeting on work-oriented literacy held in Paris at the end of 1970, UNESCO agreed to submit a request for UNDP funding to provide full-time health education advisers for this centre. Work-oriented functional literacy programmes are in operation in Iran and in some other countries of the Region. WHO is able to assist in introducing a health education component into such national programmes wherever the national health education services are insufficiently developed for that purpose.

**Health statistics**

19.58 Many countries are developing their own training programmes for health statistical technicians, clerks and other intermediate level personnel. Staff at the professional level usually obtain training through WHO fellowships. Assistance was given to a number of countries in developing medical records units and improving medical records. The Organization also provided advisory services in health statistics to the health department of UNRWA.

**Family health**

19.59 WHO assistance in the field of family planning is available to countries on request and is directed either to the development of the health aspects of family planning or to the integration of family planning activities into health services, usually those concerned with maternal and child health.

19.60 During the year, joint United Nations/UNESCO/WHO family planning missions visited Egypt, Iran and Pakistan to review and evaluate existing family planning programmes. Subsequently, agreements for assistance in this field were signed between each government and UNFPA. WHO assisted the family planning programmes of these countries in several respects, including the development of a maternity-centred approach to family planning at maternity hospitals and allied units, biomedical research, training of personnel, and teaching of family planning in medical and nursing institutions. Assistance was also provided to the Governments of Iraq and Tunisia for maternity-centred family planning programmes. Afghanistan, Lebanon, the People's Democratic Republic of Yemen, Sudan and some other countries have also expressed interest in this approach.

19.61 Seminars on the teaching of maternal and child health and family planning in medical schools were held in Egypt, Iraq and Pakistan during the latter part of the year. An inter-regional conference on the integration of maternal and child health services, including family planning, into basic health services was held in Cairo in November. The same topic generated great interest at the meeting of the Regional Committee for the Eastern Mediterranean held in Tunisia in September, when it was the subject of the technical discussions.

19.62 During the year WHO sponsored or assisted a number of training courses and seminars for the development and promotion of preventive and curative medical services for mothers and children. Among them were the regional training programme in child health and midwifery at the American University of Beirut, including three refresher courses in child health, school health and family health and a one-year post-basic midwifery programme. Afghanistan and Ethiopia were assisted in organizing or developing maternal and child health services and training, and the co-ordination of such services with related health and social activities. In Libya, training and supervisory activities were continued and services were expanded to new areas through maternal and child health and other centres.
19.63. Following a successful first course in 1970, a second regional nutrition course for the Eastern Mediterranean, jointly sponsored by FAO, UNICEF and WHO, was held at the American University of Beirut. It was attended by 29 persons from the ministries of health, agriculture and planning of 15 countries of the Region. A national food and nutrition seminar and a training course, sponsored by WHO in collaboration with FAO and UNICEF, were held in Cyprus in September to assist in developing nutrition programmes and policies in relation to the country's needs and resources.

19.64 As a prerequisite for planning and organizing adequate nutrition programmes in the Region, a study has been initiated to estimate the need for medical and non-medical nutritionists. A review of nutrition curricula in schools of nursing and public health institutions and an appraisal of nutrition teaching in medical schools of the Region are also being undertaken.

19.65 One way to combat infant malnutrition is to introduce suitable weaning foods. WHO is continuing its efforts in this direction in collaboration with FAO and UNICEF. Egypt and Iran are installing plants for the manufacture of protein-rich weaning mixtures; these plants are expected to go into production during 1972. In Iraq large-scale field trials are planned for a product similar to the weaning food Superamine developed in Algeria with assistance from UNICEF, FAO and WHO. Tunisia and the Libyan Arab Republic are actively studying the possibility of establishing similar plants for producing high-protein foods. In the Libyan Arab Republic, the nutrition situation was reviewed and certain recommendations made for future development; assistance was provided for the school feeding programmes and for the training of personnel. The Libyan National Food and Nutrition Council is planning food consumption and nutrition surveys to collect the necessary data on which its policies and programmes will be based. In Sudan, the Nutrition Division of the Ministry of Health was considerably strengthened and plans were formulated to decentralize the nutrition activities of the health services. In connexion with the latter, a national food and nutrition seminar is planned and two pilot areas have been chosen for the integration of nutrition activities into the basic health services. In Pakistan, support was given to applied nutrition activities such as nutrition education, food demonstrations, poultry farming and kitchen gardening. WHO co-operated with the United Nations and other specialized agencies, in emergency feeding programmes in East Pakistan. In Yemen, school and hospital feeding activities were initiated with assistance from the World Food Programme. Nutrition programmes in that country are now being strengthened through the training of national personnel and through education in nutrition. These projects are being undertaken in collaboration with FAO and UNICEF and with UNDP/SF support.

Education and training

19.66 During the year, WHO assisted in planning new medical schools in Jordan and Sudan for which the proposed locations are, respectively, Amman and Wad Medani. New schools are also planned in Kuwait and the Syrian Arab Republic. This will bring the number of medical schools in the Region to a total of 49. Afghanistan has been assisted in making plans for developing education and training in public health.

19.67 During 1971, WHO furnished 14 professors for existing medical schools in Afghanistan, Ethiopia, Iran, Pakistan, the Syrian Arab Republic and Tunisia, and assistance was provided to health training centres in Ethiopia, the People's Democratic Republic of Yemen, Qatar and Somalia.

19.68 In addition, WHO provided fellowships, supplies and equipment for teaching and scientific purposes and books and subscriptions to scientific periodicals for medical libraries. Under the programme for exchange of teaching staff, five professors from medical schools in Egypt and Iran participated in the work of similar institutions in other countries of the Region.

19.69 The proceedings of a conference on medical education held in Tehran in December 1970 were published and distributed; these contain the papers presented and the recommendations adopted.

19.70 A mission which included representatives of the Center for Educational Development, University of Illinois College of Medicine, Chicago, USA—which acts as a WHO inter-regional teacher-training centre—has recommended that the Faculty of Medicine, Pahlavi University, Shiraz, Iran, be considered as the site of the first regional teacher-training centre.

19.71 A meeting of directors or representatives of schools of public health in the geographical areas covered by the African, Eastern Mediterranean, South-East Asia and Western Pacific Regions of WHO, held in New Delhi in March, was attended by the Regional Director and six participants from the Region. The Organization was represented at the Sixth Annual Conference of the Association of Medical Schools in Africa held in Cairo in April,
and presented a paper on medical education and development at the Twelfth Science Week, sponsored by the Syrian Council of Sciences in Damascus in November.

Pharmacology and toxicology

19.72 As a result of a travelling seminar on the quality control of pharmaceutical preparations held in 1970 in three countries of the Region, WHO has been asked to provide the services of specialists to assist in teaching the application of modern techniques in this and allied fields. Assistance has also been requested by Iran in connexion with the establishment of a poison-control centre.

19.73 The need for qualified national personnel to man the pharmacy and medical supplies services in the Region has not yet been met. A regional syllabus is being prepared for use by governments in training pharmacy technicians to a level sufficient to maintain services until an adequate number of fully qualified pharmacists is available.

Services provided in connexion with UNDP/SF projects

19.74 During the year, WHO assisted nine countries—Egypt, Ethiopia, Iran, the Libyan Arab Republic, the People's Democratic Republic of Yemen, Sudan, the Syrian Arab Republic, Tunisia, and Yemen—in preparing or reformulating official requests for UNDP/SF assistance.

19.75 For 1971 the UNDP Governing Council has approved projects to the value of US $5 882 400 for the Region. Projects which will be submitted to the UNDP Governing Council for approval in January 1972 amount to approximately US $6 805 900. They are as follows: community-oriented education, Faculty of Medicine, Aleppo; comprehensive basic health services training, Iraq; Health Manpower Institute, Sana'a, Yemen. The following projects are under consideration for submission to the UNDP Governing Council: national waste water management plan, Lebanon; Health Training Institute, Libyan Arab Republic; national public health laboratory service, Sudan; and master plan for sewerage, drainage and solid wastes management in greater Damascus, Syrian Arab Republic.

19.76 Requests for UNDP/SF assistance for the Environmental Health Research Institute in Israel, for community water supply in the Libyan Arab Republic, and for a national health laboratory service in Tunisia, amounting to about US $2 925 000 were prepared.

19.77 The pre-investment projects in environmental health, upon their termination, will provide the governments concerned with the required basis on which to found requests for follow-up investment.

19.78 WHO acts as a subcontractor in the health field in connexion with Special Fund projects executed by the Food and Agriculture Organization and some other members of the United Nations system of organizations.

The Regional Committee

19.79 Sub-Committee A of the Regional Committee for the Eastern Mediterranean met at Monastir, Tunisia, from 20 to 23 September 1971. Sub-Committee B did not meet.

19.80 The meeting of Sub-Committee A was attended by representatives of Afghanistan, Cyprus, Egypt, Ethiopia, France, Iran, Iraq, Jordan, Kuwait, Lebanon, the Libyan Arab Republic, Oman, Pakistan, the People's Democratic Republic of Yemen, Saudi Arabia, Somalia, Sudan, the Syrian Arab Republic, Tunisia, and Yemen, as well as of Bahrain, then an Associate Member. The United Nations, UNDP and UNRWA were represented, as were six inter-governmental and international non-governmental organizations. The Director-General attended the session.

19.81 The Sultanate of Oman was welcomed as a new Member of the World Health Organization and of the Region.

19.82 In the discussion on the Regional Director's Annual Report for the period 1 July 1970 to 30 June 1971, stress was laid on the importance of realistic determination of national goals and priorities in long-term development plans and on the need for coordination of international and bilateral assistance. It was agreed that education and training of medical and auxiliary personnel remained a top priority, and the growth and achievements of medical schools and health manpower training institutes were welcomed. In this connexion it was noted that in 1971 education and training projects absorbed more than half of the total assistance from UNDP/SF whereas in earlier years such assistance had gone almost exclusively to pre-investment projects in environmental health. Progress towards eradication of smallpox and control of schistosomiasis was remarked upon and the

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1 Bahrain became a full Member of the Organization on 2 November 1971.
measures to prevent and control tuberculosis were reviewed with satisfaction.

19.83 Among the subjects discussed in detail were the cholera situation in the Region, health manpower planning, the conclusions drawn from reviews of malaria programmes, occupational health problems and a pilot epidemiological research project carried out by WHO in Tunisia on the use made of health services in the Cap Bon Governorate.

19.84 The proposed programme and budget estimates for the Region for 1973 were endorsed for transmission to the Director-General.

19.85 Dr A. H. Taba, whose appointment as Regional Director comes to an end on 31 August 1972, was nominated for reappointment for a further period of five years.

19.86 "The integration of maternal and child health and family planning activities in the general health services" was the subject of the technical discussions; and a number of subjects were suggested as being suitable for technical discussions in 1972.

19.87 Sub-Committee A confirmed its previous decision to hold its 1972 and 1973 sessions respectively, in Jordan and in the Syrian Arab Republic.

Some Aspects of Work in the Region

19.88 A list of the projects current during the year will be found in Part III. The following have been selected for fuller description.

Malaria eradication programme, Syrian Arab Republic

19.89 After a malaria training and demonstration project that was set up at Homs, Syrian Arab Republic, with UNICEF and WHO assistance in 1953 had confirmed the technical feasibility of DDT spraying operations to interrupt the transmission of malaria by the main vector, Anopheles sacharovi, the Government began a malaria eradication programme in 1956 with continued assistance from WHO and UNDP/TA financial support.

19.90 At that time, the estimated population of the country was 5 million, of which some 3.6 million were considered to be living in malarious areas. The total population has since increased to approximately 6.3 million, and the people living in the originally malarious areas, which have been protected by malaria eradication measures since the beginning of the project, number some 4.4 million.

19.91 Many difficulties and setbacks were encountered in the earlier years, even up to 1964, partly owing to the inadequate delimitation of malarious areas and to the attempt to comply with set targets for progression from the attack to the consolidation phase without reference to the correct epidemiological criteria for withdrawing insecticide coverage. The result was that transmission of malaria continued or resumed in most areas considered to be freed from the disease.

19.92 From the beginning of 1965 a concerted effort was made to reorganize the surveillance activities; the regularity and coverage of case detection began to improve; and a better evaluation of the effects of DDT spraying became possible. Other essential components of field operations, including geographical reconnaissance and spraying operations, also improved considerably. By 1966 the incidence of malaria had fallen to one case per thousand population in areas in the attack phase and to 0.1 case per thousand in areas in the consolidation phase.

19.93 With the improvement in evaluation methods it became evident that resistance of An. sacharovi to DDT was causing technical difficulties. This resistance, which had previously been reported in an area near Damascus in 1965, was confirmed in 1967 in the Ghab area (Orontes valley) of Hama Province, where a rise of malaria incidence occurred in 1968. WHO's experience in malaria operations has shown that although DDT resistance is slow to develop because of its recessive genetic character, the lethal effect of the insecticide inevitably continues to diminish so long as the selection pressure is maintained on the vector population.

19.94 Although in some areas it was possible to replace DDT by dieldrin late in 1968, fresh outbreaks of malaria due to DDT-resistant An. sacharovi spread from the Ghab area in 1969 to other provinces, including El Rakka and Hassakeh, and along the borders with Lebanon and Jordan. These foci were also covered by dieldrin spraying in the latter half of 1969, and in 1970 dieldrin was applied throughout areas in the attack phase, for the protection of some 500,000 people.

19.95 Following the introduction of dieldrin there was a marked improvement in the epidemiological situation, first in the Ghab area, where mass drug administration of weekly doses of chloroquine and pyrimethamine was also used, then in the foci in
which resistance to DDT had spread in 1969, and in 1970 throughout the whole area in the attack phase. Regular entomological investigations failed to reveal any specimens of An. sacharovi and there were no further indigenous cases of malaria, except in a few sectors in the provinces of Aleppo and El Rakka, where the insecticide application was delayed, and among nomads in the Euphrates valley. In addition very clearly circumscribed foci occurred in Aleppo Province which were found to be due to a secondary vector, An. claviger, breeding in the cisterns of houses; these foci were effectively treated with oil. Although An. claviger is known to transmit malaria elsewhere, these foci were effectively treated with oil. Although An. claviger is known to transmit malaria elsewhere, these foci were effectively treated with oil.

19.96 The incidence of malaria in the country during 1971 has been even lower than during 1970 and the change from DDT to dieldrin has provided the impetus to break the transmission cycle. But while the epidemiological situation is now better—and much will depend upon surveillance activities being maintained—it should be noted that there is evidence that An. sacharovi is developing resistance to dieldrin in the Ghab area and that this resistance may be expected to spread to other areas where the insecticide is used. Thus, if transmission is allowed to resume, it may not be possible again to stop the spread of malaria with dieldrin.

19.97 With the improved operational basis of the eradication programme the malaria workers in the country also have the advantage of close co-ordination and liaison with colleagues engaged in malaria work in Iran, Iraq and Turkey and in WHO’s programmes in the Region.

19.98 The malaria eradication programme in the Syrian Arab Republic has demonstrated that, although early errors in planning and in the delimitation of malarious areas and unsatisfactory operational coverage may have most adverse effects, administrative, operational and even technical problems can be overcome provided that governments continue to give the necessary support and the workers the necessary dedication, and that the technical advice furnished is of a high standard.

**Virus Research, Training and Vaccine Production Centre, Agouza, Egypt**

19.99 In 1960 WHO assisted the Government of Egypt to review the facilities for the laboratory diagnosis of virus diseases and for the production of certain virus preparations in Egypt at the laboratory of the Serum and Vaccine Institute in Agouza, near Cairo, which was chosen for development as a central laboratory for medical virology in Egypt. It was staffed in 1960 by five well-trained virologists who provided diagnostic services, mainly for influenza and typhus fever, and undertook limited surveys on poliomyelitis, typhus, Q-fever and other virus and rickettsial diseases prevalent in the country in cooperation with the Epidemiological Department of the Ministry of Health. Vaccinations carried out under the direction of the centre were an important part of activities for the control of poliomyelitis and measles. With further WHO assistance in the form of consultant advice, the provision of supplies and equipment and the award of fellowships for training, the centre expanded and made steady progress in the 1960s, and it obtained valuable information on respiratory virus diseases, especially in children, and on enteroviruses, arboviruses and rickettsial diseases.

19.100 The centre is also being developed for the training of virologists and technicians in virology not only from Egypt but also from other countries of the Region. In 1971 WHO assisted in a course for the technical personnel of the centre to train them in various stages of virus vaccine production; 15 staff members, nine of whom had had professional training abroad, attended the course. Two inter-country courses for laboratory staff were conducted at the centre, in 1968 and 1971. Seven fellows from Afghanistan, Ethiopia, Iraq, Jordan, Pakistan, Saudi Arabia and the Syrian Arab Republic and six from Egypt attended the 1971 course, which took place from 2 October to 31 December.

19.101 While significant work was done with limited staff and resources, the need for further expansion of the centre’s activities became evident. The Government provided for the construction of a new building and made a request for assistance from UNDP/SF to enable the centre to carry out research in viral and rickettsial diseases, continue its work in diagnosis and control and increase the production of virus vaccines. Assistance was also sought for the further training of staff of the centre and candidates from universities, including the postgraduate training of doctors. The training of the staff of provincial laboratories in viral and rickettsial laboratory diagnostic techniques was considered especially important in view of the Government’s desire to staff the 17 existing provincial bacteriological laboratories with personnel trained in virus work. Assistance under the Special Fund component was approved by the Governing Council of UNDP in January 1971. Fellowships were awarded by WHO to train six medically qualified persons abroad in general virological techniques, virus vaccine production and surveillance methods.
Water supply, Sana’ a and Hodeida, Yemen

19.102 In May 1969, at the invitation of the Government of Yemen, WHO assisted in the formulation of a request for UNDP/SF support in planning water supply and sewerage systems for the cities of Sana’a and Hodeida, where the need for safe water and sanitation was urgent. In the Sana’a valley, which is situated at an altitude of about 2400 metres, the water table is constantly falling, and the supply from dug wells 30 to 40 metres deep is often heavily polluted. There is no public water supply, nor is there a sewerage system. Sewage is disposed of in cesspits which are often infrequently overflown. In Hodeida, Yemen’s major port on the Red Sea and similar in size to the capital, with a population of over 100 000 (estimated to have doubled since 1962) the high salinity of the groundwater, which has been constantly increasing and is now about 4000 ppm, makes it quite unfit for consumption. Tests of water from a new well source in 1969 revealed excessive coliform pollution. An ancient sewer constructed in the days of the Ottoman Empire is now in very bad repair; the night-soil carting service is inadequate; and, in this city too, cesspits overflow and cause surface pollution.

19.103 The Government’s request was approved by the Governing Council of UNDP in June 1970, WHO being designated executing agency. This is the first UNDP project in which WHO has carried out the mapping work and has been fully responsible for the hydrogeological surveys and groundwater investigations—the preliminary operations undertaken in 1970 and 1971 preparatory to the drawing up of master plans; they have elsewhere been entrusted by UNDP to the United Nations or other organizations of the system as participating agencies.

19.104 Preparatory work in the field started under an advance allocation in September 1970 when WHO appointed an engineering organization from Czechoslovakia as subcontractor for the serial photography and mapping of the project areas (1100 km² for Sana’a and 800 km² for Hodeida). The field surveys were completed in January 1971, and aerial photographs and photo-mosaics were prepared for use in the making of topographical maps on three different scales (1:50 000, 1:5000 and 1:1000). This work was finished by the end of 1971 and, following the appointment of an Italian firm of engineering consultants as subcontractors and negotiations between the subcontractors and a British drilling firm in October 1971, the hydrogeological surveys and groundwater investigations began in December with the arrival of the drilling and other equipment.

19.105 The first phase of the project is expected to end in May 1973 with the completion of comprehensive surveys, feasibility studies and other research on engineering and managerial aspects necessary for the preparation of master plans.

Post-basic nursing education in Iran

19.106 In 1965, the authorities of the Pahlavi University in Shiraz, Iran, indicated their interest in establishing a post-basic programme at university level which would lead to a B.Sc. degree in nursing. In 1967, WHO assisted in planning the programme and a tripartite plan of operation was drawn up between the Ministry of Public Health, the University, and the Organization for the establishment of a Department of Nursing in the College of Arts and Sciences of the University. In addition to furnishing teaching staff, WHO undertook to provide books, teaching material and equipment.

19.107 In June 1967, the first WHO nurse educator was assigned to the project. In September of the same year 12 students were admitted, all graduates of the Nemazee School of Nursing in Shiraz. In mid-1968 the department was renamed the Department of Nursing Education and a WHO senior nurse educator was assigned. The enrolment that year was of 10 students, including three from two areas of Iran outside Shiraz. In September 1969, the first student to complete the two-year course obtained her B.Sc. degree. There were 21 students enrolled for the 1969-1970 academic year.

19.108 Until 1970, the two WHO nurse educators with the collaboration of a part-time chairman of the Department of Nursing undertook full responsibility for the development of the programme and the related facilities. In that year an Iranian nurse educator holding a M.Sc. degree in nursing and with many years of administrative experience was appointed as full-time Chairman of Nursing Education, and two Iranian nurses who had studied in the United States of America on WHO fellowships and obtained M.Sc. degrees in psychiatric nursing and in medical-surgical nursing respectively were added to the faculty.

19.109 In 1970, the attrition rate among the students having caused concern, a study was undertaken and it was found that, of the total enrolment of 52 since the establishment of the programme, 18 (34.5%) had withdrawn, mainly during the first or second semesters of their studies. One contributing factor has been the admission of part-time students who hold nursing positions to finance their studies. Government fellowships are available, but long-term
commitments are involved. Other sources of financial aid are being explored.

19.110 Although the majority of the students still come from Shiraz, five other areas in Iran are now represented and there is one student from the Sudan who has a WHO fellowship. The majority of the 11 graduates from the course are working in or near Shiraz, but, in view of the wider geographical distribution of the present student body, it may be expected that future graduates will spread further afield.

About 36 new students were enrolled for the 1971-1972 academic year. The teaching staff now numbers five.

19.111 It is anticipated that the programme will become increasingly important both for the country and for the Region as a whole. The possibility of developing a programme leading to a M.Sc. degree in the same university is being explored.

19.112 It is intended to undertake a full evaluation of the programme in 1972.
CHAPTER 20

WESTERN PACIFIC REGION

20.1 The establishment of an integrated network of basic health services covering both urban and rural areas is still the major goal of the assistance given by WHO to the developing countries and territories of the Western Pacific Region.

20.2 Communicable diseases remain a health problem of primary importance, and the 1971 programme of assistance reflected the need to consolidate the progress already achieved in controlling them. A high priority was given to training national health manpower. Increased emphasis was placed on the "country approach", and methods were devised to facilitate the orderly and planned development of health services with a realistic socio-economic national content.

20.3 Family planning activities were considerably expanded, largely thanks to funds provided by UNFPA. They are being carried out as far as possible in conjunction with maternal and child health projects.

Communicable diseases

20.4 The available data on communicable diseases in many countries of the Region are incomplete and often inaccurate and more efforts are required to develop and improve epidemiological services and surveillance mechanisms. Epidemiology projects in China (Taiwan), the Khmer Republic, Malaysia, the Republic of Korea and the Republic of Viet-Nam received assistance from WHO. Additional advisory and consultant services were provided by the regional communicable diseases team. In many areas, the shortage of trained personnel, the lack of budgetary support and an inadequate health infrastructure remain major handicaps to the progress of these projects. The seminar on methods of epidemiological surveillance and geographical pathology which took place in Manila in December 1971 also served to focus attention on epidemiological services and the need for training in epidemiology.

20.5 No confirmed smallpox has occurred in the Region for a period of five years.

20.6 The Region has not been spared the alarming increase in venereal diseases observed elsewhere. The problem has been particularly acute in areas where military operations are in progress. The Organization continued to support the national centre for venereal prophylaxis in Saigon and the development of venereal disease services elsewhere in the Republic of Viet-Nam.

20.7 Tuberculosis control is giving satisfactory results in those countries which are careful to follow the Organization's policies, methods and recommendations. The mortality rate from all forms of tuberculosis is seen to be falling in many countries. A prevalence survey conducted in the Republic of Korea revealed a distinct reduction in morbidity over a five-year period. BCG vaccination remains the leading control measure against tuberculosis and, except in a few island territories, it has been accepted and applied very extensively. The minimum BCG vaccination coverage recommended by WHO is 75% of the susceptible population. This has been achieved in the British Solomon Islands Protectorate, China (Taiwan), Hong Kong, Japan, East Malaysia (Sarawak), New Hebrides, the Republic of Korea, Singapore, Tonga and Western Samoa. In several countries and territories, the tuberculosis treatment service has achieved nationwide coverage. The effectiveness of the treatment given has, however, varied according to the state of development of the local health services, the availability of trained personnel and the budgetary support provided by the government. The organization and administration of national tuberculosis programmes, their co-ordination and co-operation with other health agencies, and the integration of tuberculosis services into the general public health services were discussed at a regional seminar in Seoul in October.

20.8 The domiciliary treatment of leprosy patients is receiving increasing emphasis in China (Taiwan), the Philippines and the Republic of Korea. The peripheral health units are more frequently being used for this purpose.

20.9 Plague was reported only in the Republic of Viet-Nam, where the Government is making every effort to control the disease. Cholera continues to be endemic in the Philippines and in the Republic of Viet-Nam. It was also reported in West Malaysia. The incidence of bacterial enteric diseases has not
20.10 A cost-benefit study of the relative effectiveness of different measures for the control of typhoid fever in Western Samoa was carried out. The study was based on a mathematical model and a typhoid control programme was established with WHO assistance. In certain selected areas, children of school and preschool age are being vaccinated with quadruple vaccine (diphtheria, tetanus, pertussis and typhoid), and in others water-seal latrines are being constructed and water supplies improved. Concurrently, health education is being intensified.

20.11 Antimalaria vigilance activities were continued in Brunei, China (Taiwan) and the Ryukyu Islands, where the malaria programmes are in the maintenance phase. The programmes in the British Solomon Islands Protectorate and West Malaysia have progressed according to plan. Following the review of the malaria eradication programme in the Philippines by a multidisciplinary team in 1970, epidemiological studies in depth were undertaken during 1971. As a result, it was recommended on technical grounds that areas with an estimated population of 1.2 million could enter the maintenance phase as soon as the basic health services were able to undertake vigilance activities. A multidisciplinary team reviewed the programme in East Malaysia (Sarawak) with a view to determining future strategy. In a review of the antimalaria programme in the Republic of Viet-Nam, particular attention was paid to the epidemiology of the disease, the present status and organizational structure of the programme and the scope of its activities.

20.12 The International Malaria Eradication Training Centre in Manila provided courses in malariology, epidemiology, parasitology, entomology and other aspects of malaria eradication for various categories of professional staff. On 1 July 1971, the United States Agency for International Development (USAID) replaced the direct assistance it had previously given to the Centre by a special contribution to the Malaria Eradication Special Account which will enable WHO to provide additional advisory assistance up to 30 June 1973. WHO was represented at the fifth meeting of the South-West Pacific Malaria Conference held at the School of Public Health and Tropical Medicine, University of Sydney, Australia, in October.

20.13 In the field of parasitic diseases, the Government of the Philippines was assisted in reviewing the schistosomiasis problem in that country and the strategy for controlling the disease. The World Food Programme (WFP) also assists this project, in which stress is laid on the use of agricultural engineering measures for control. In Western Samoa a second round of drug distribution for filariasis chemoprophylaxis is in progress. An independent assessment will be made in 1972 of the effects of mass drug administration and of the control of vector mosquitos on the incidence of filariasis.

20.14 Training courses on insect and rodent control were conducted in China (Taiwan) and the Republic of Viet-Nam. The Organization assisted in a preliminary investigation of biting midges in Brunei and advised on a programme of ecological studies to precede action to control this nuisance which is holding back the economic development of the coastal areas.

Non-communicable diseases

20.15 WHO collaborated with the South Pacific Commission in a seminar on dental health services held in Noumea in January. Almost all countries and territories in the South Pacific area were represented. It was reported that in most of them periodontal diseases led to much oral ill-health and loss of teeth in the later years of life. As a result of dietary changes, the onset of dental caries is occurring earlier and earlier in life. The seminar reviewed the results of national dental surveys based on WHO criteria undertaken in the South Pacific area, and their implications for dental health services. Dental surveys that are under way elsewhere in the Region are to be considered at a workshop to be held in Singapore in 1972.

20.16 Assistance was provided in China (Taiwan) and the Republic of Korea in connexion with dental health surveys there.

20.17 With a view to strengthening the training of dental auxiliaries and dental health education, visits were paid to Hong Kong, the Khmer Republic, Malaysia, the Republic of Viet-Nam and Singapore. Assistance was also given to Port Moresby Dental College, Papua New Guinea.

Environmental health

20.18 During the year, sanitary engineering units were established in the ministries of health of the
Khmer Republic and Laos. Assistance in water supply and sewerage operations was given to China (Taiwan) for a new comprehensive water supply and sewerage programme that went into operation in September 1971; to the Khmer Republic, where the UNDP/SF-supported water supply project in Kompong Som reached the transition point between the planning and construction phases; and to the Philippines for the provincial waterworks operation of the National Waterworks and Sewerage Authority. The Public Works Department in Singapore was assisted in sewerage planning and management and the operation of sewage treatment plants.

20.19 WHO advised on environmental health matters in connexion with UNDP/SF projects of assistance to the Institute of Planning, University of the Philippines, and to city and state planning in Singapore.

20.20 The Organization also assisted the Philippines in environmental health programmes and legislation; Singapore in food sanitation, storm drain cleansing and the disposal of solid wastes and industrial wastes; China (Taiwan) with regard to sewage pumping stations, ocean outfalls and fluoridation of water supplies; the Republic of Viet-Nam in carrying out water supply feasibility studies; and Papua New Guinea in environmental health programmes.

20.21 The WHO environmental health advisory services project in the South Pacific provided operational assistance for water supply and sanitation projects supported by UNICEF in the British Solomon Islands Protectorate, Fiji, Tonga and Western Samoa.

20.22 Planning is well advanced for the following projects: advisory services on water supply, sewerage and environmental pollution control in the Cook Islands; assistance to the Khmer Republic in meeting short-term needs for water supplies, sewerage and solid wastes disposal in Phnom Penh; and public health engineering advisory services for the Republic of Korea in connexion with two projects—one for water supply and sewerage, and the other for the development of basic sanitary services within the general framework of community health services.

20.23 Three undergraduate students and one postgraduate student from the Region are studying at the School of Engineering, Rabat, where WHO-assisted courses are provided for French-speaking sanitary engineers. WHO participated in a water supply and sewerage sector survey conducted in the Republic of Korea by the IBRD and in a discussion of environmental pollution at the Fourth Asian Health Conference of the World University Service in Hong Kong in July. The Organization was represented at the International Council of Scientific Unions Special Committee on Problems of the Environment that met in Canberra in September. An account is given starting at paragraph 20.103 of the third regional seminar on environmental health, held in Manila in May.

20.24 In December 1970, the Radiotherapy Department of the Outram Road General Hospital, Singapore, was designated as a WHO Regional Reference Centre for Secondary Standards in Radiation Dosimetry and will serve as such for an initial period of three years. During the year, a further 51 institutions participated in the project to improve accuracy in determining the radiation output of cobalt-60 teletherapy apparatus. The participating countries and territories are: Australia, China (Taiwan), Hong Kong, Japan, Khmer Republic, New Zealand, Papua New Guinea, Philippines, Republic of Korea, and Singapore. Both the above projects are carried out with the co-operation of IAEA.

20.25 Preparations were made to establish a postal monitoring service for estimating the radiation dose to personnel who are occupationally exposed to ionizing radiation and who work in countries without radiation monitoring facilities. A start has been made in evaluating the radiation health situation in the countries of the Region. Assistance has been given to China (Taiwan), the Republic of Korea, and Western Samoa under the inter-country project for training in the maintenance and repair of X-ray and other laboratory equipment (see paragraph 20.91).

20.26 The growing need for adequate services for the prevention, treatment and rehabilitation of occupational diseases and injuries and the importance of developing educational and training facilities for staff to man occupational health services were recognized by the Regional Committee in September.

20.27 In the Philippines, WHO and ILO continued to work together in an attempt to develop a broad national programme on occupational health and safety involving the ministries of health and labour and the University of the Philippines. In Singapore advice was provided on the development of a coordinated industrial hygiene programme including both teaching and services. China (Taiwan) received WHO assistance concerning both medical and technical aspects of occupational health, including the organization of industrial health laboratories, and in training various categories of staff.
Organization of health services

20.28 Assistance was given to Laos in reviewing its health programmes, and to Western Samoa in estimating and planning for the health manpower required for the national development plan. Advice was given to the Republic of Viet-Nam on the manpower study which is in progress and on plans to meet health service needs after the present emergency. Assistance was provided to Papua New Guinea in the preparatory phase of its national health planning. WHO is collaborating with the Department of Health of the Philippines in formulating a wide-ranging national health plan. For this purpose, an interim health planning unit staffed by former participants in the regional course on national health planning has been set up.

20.29 The inter-country national health planning training project completed its fourth three-month course in September. Teaching staff were provided by the Institute of Public Health, University of the Philippines, and by WHO. The Asian Institute for Economic Development and Planning in Bangkok contributed a lecturer in development planning and the health economist attached to the Institute gave lectures and demonstrations in his field. The course was extended to cover health planning on a wider scale than was undertaken previously. As in previous courses, opportunities for field practice were provided.

20.30 The technical discussions during the twenty-second session of the Regional Committee, on health manpower in the developing countries of the Region, highlighted the organizational arrangements that could help in the study and improvement of the manpower situation, certain measures that could be undertaken by countries to define and help solve their health manpower problems, and the assistance that international agencies could provide in health manpower development.

20.31 The Khmer Republic was assisted in adjusting its health programmes to the needs arising from the existing emergency. In the Republic of Korea, all WHO-assisted projects for general health services development were brought under a single plan of operation. Tonga has also decided on a similar plan for health services development, thus bringing to seven the number of countries and territories with such overall agreements.

20.32 In the demonstration province of Rizal in the Philippines, planning was completed for the community water supply project assisted by UNICEF, the system of health and medical records was revised and a comprehensive municipal and provincial health plan formulated. In addition, the demonstration province was assisted by an inter-regional project systems analysis team in planning the development of hospital services. In Laos, a second public health demonstration area was established on the Vientiane plain. In the British Solomon Islands Protectorate the construction of 46 rural health units was completed and the training of rural health personnel in antimalaria work was begun. In Western Samoa, action was taken to strengthen the health organization at the central level, and the integration of tuberculosis control into the general health services was started in the demonstration area.

20.33 In Malaysia, the operational research team completed its community health services study in eight districts. The results of the study, which is due for completion in 1972, will be used by the Government in its mid-term assessment and revision of the health sector of the Second Malaysia Plan.

20.34 In order to maintain the balance between medical care and preventive medicine without straining available community health resources, efforts are being made to increase the service capacity of medical care institutions with the minimum of input possible. In Laos, a WHO physiotherapist is assisting in the management of the rehabilitation services and in the training of physical therapists for provincial hospitals. In China (Taiwan), advice was given on the training of physical therapists enrolled at the University and on the manufacture of appliances for use in hospitals and rehabilitation institutions. WHO is also providing assistance in the organization of hospital nursing services and the training of hospital nursing staff.

20.35 The lack of an accurate system of health and medical records that can be used for statistical analysis and interpretation is a problem in almost all developing countries. In some, the only sources of data are the records of hospitals, dispensaries and health centres.

20.36 In the Republic of Korea, advice was given on the development of a simplified but adequate recording system suitable for adoption by government hospitals. In Laos, WHO assisted in improving hospital and health centre records. In the Republic of Viet-Nam, the medical records system is being revised and the statistical services in hospitals strengthened. The international form for medical certification of causes of death has been adopted. In the South Pacific area the Organization gave advice to territorial health services on the development of a simple but adequate system of records and reporting which will be useful
for health service planning and administration and will permit international comparability of the reports prepared.

20.37 Stronger and better organized laboratory services at all levels are urgently needed in many countries. At its twenty-second session in September, the Regional Committee adopted a long-term inter-country programme in the field of health laboratory services. In the assistance given to individual countries during the year, emphasis was placed on improvements in laboratory disciplines for diagnostic purposes and basic, refresher and advanced training for scientific and technical laboratory personnel.

20.38 Assistance was given to the Republic of Korea in the production of Japanese encephalitis vaccine and to the Republic of Korea and Malaysia on the production of freeze-dried smallpox vaccine. Suitable laboratory animals are an essential element in laboratory diagnosis and control but one which has been neglected in the Region. Assistance in producing them has been given to China (Taiwan), Hong Kong, the Philippines and the Republic of Viet-Nam.

20.39 Advisory services intended to strengthen the organization and content of health education in the general health services were extended to the British Solomon Islands Protectorate, China (Taiwan), the Gilbert and Ellice Islands, Malaysia, Papua New Guinea, and Singapore.

20.40 The broadening of WHO's family planning activities has led to an increased demand for assistance in the health education aspects of programmes in that field. This is reflected in the preparations made during the year for a workshop on the development of education and information materials on family health to be held in February 1972 and for a seminar on the role of health education in family planning later that year.

20.41 Nursing and midwifery personnel necessarily play a large part in the development of general health services, and are particularly involved in maternal and child health work and in the family planning activities that have recently been added to that field. Training programmes combining nursing, public health and midwifery elements in a broad curriculum are therefore increasingly needed, and are being developed in the Khmer Republic and the Republic of Korea at the diploma level, the post-basic level, or both.

20.42 It has been decided to set up a technical advisory committee on nursing to provide guidelines for future WHO assistance in strengthening nursing and midwifery programmes in the Region. It is proposed that the committee should include senior nurses, public health workers and an educator from countries of the Region as well as outside experts and WHO staff. The project was endorsed by the Regional Committee in September.

20.43 During the year, WHO co-operated with the Government of New Zealand in a survey of nursing manpower needs and of facilities for nursing training in the British Solomon Islands Protectorate, Cook Islands, Fiji, Gilbert and Ellice Islands, New Hebrides, and Tonga. The results may be expected to lead to improvements in nursing practice and to better co-ordination between nursing education and services. Assistance was also given in formulating the methodology to be employed in a nursing manpower study in the Philippines. An account of WHO assistance for nursing education in Laos will be found starting at paragraph 20.95.

20.44 The Organization provided statistical assistance to the Republic of Korea in connexion with the Japanese encephalitis vaccine survey and to Malaysia in operational research on community health services.

Family health

20.45 Advisory services in the field of maternal and child health were provided in the framework of overall projects for the development of health services in Laos, Malaysia, the Philippines, the Republic of Korea and in several countries and territories in the South Pacific.

20.46 In China (Taiwan), there is close co-operation between the maternal and child health services, the local health services and the day-care centres; these activities were expanded. Day-care centres, which provide a valuable channel for health services to reach children below school age, are also being established or expanded in Malaysia, the Philippines, the Republic of Korea, and the Republic of Viet-Nam.

20.47 In Singapore, a project to strengthen the organizational structure of the school health services is being assisted jointly by WHO and UNICEF.

20.48 WHO programmes in the field of health aspects of human reproduction, family planning and population dynamics have been considerably enlarged with the help of UNFPA. Two courses in family planning were held during the year. They were attended by 25 regional office and field staff and by observers from ECAFE, UNDP, UNICEF and ILO.

20.49 In the Philippines, a grant was made to strengthen teaching in family planning, human
reproduction and population dynamics at the Institute of Public Health of the University of the Philippines. WHO also assisted in the organization of a one-month workshop on the teaching of health aspects of human reproduction, family planning and population dynamics in schools of nursing. Forty nurse educators participated. A start was made with a family planning project linked to hospital maternity services, which will cover 25 training institutions and teaching hospitals in three years.

20.50 The School of Public Health, Republic of Korea, was given assistance in connexion with the teaching of the health aspects of human reproduction, family planning and population dynamics. Assistance was also provided for a 12-day workshop on the teaching of family planning in schools; 80 nurse educators from 48 nursing and midwifery schools participated.

20.51 The Organization gave support to studies in China (Taiwan) and in the Philippines on the relationship between family size and family health in a rural and in an urban area. Maternal and child health and family planning projects were started in the Gilbert and Ellice Islands and Western Samoa.

20.52 An inter-country workshop for health statisticians on statistical methods for use in national family planning programmes was held in October in Taichung, China (Taiwan). There were 20 participants from 13 countries or territories.

20.53 An inter-country seminar on the teaching of family planning, human reproduction and population dynamics in medical schools was held in Kuala Lumpur, Malaysia, in October with the participation of senior teachers of obstetrics and gynaecology, maternal and child health, and social and preventive medicine.

20.54 Nutritional disorders appear to be increasing in the low-income sectors of the main urban centres of developing countries in the Region. Information is being assembled on protein-calorie malnutrition, growth retardation, anaemias, vitamin A and B deficiencies, goitre, etc., and efforts are being made to strengthen the nutrition component of health services. Diseases of overnutrition such as obesity and ischaemic heart disease also require more attention.

20.55 Assistance in adapting nutrition teaching in schools of medicine to local conditions was provided in Fiji, Laos (where nutrition curricula were reviewed), Papua New Guinea, and the Republic of Korea. A survey of nutritional problems in the Gilbert and Ellice Islands was undertaken. Nutrition training of health personnel and other community workers received further assistance in Malaysia and Singapore. In the Philippines, the Organization assisted in a review of the laboratory facilities needed to support nutrition work. Assistance was also given in the evaluation of nutrition training activities in the Philippines applied nutrition project.

20.56 WHO-assisted research projects on the anthropometric status of populations are being undertaken in six countries of the Region; research on nutrition in pregnancy is under way in Singapore.

**Education and training**

20.57 The objectives of WHO-assisted country projects in education and training in the Region have been broadened to cover the overall development of medical education, including that of the training of nurses and other health personnel. One education and training project in the Republic of Korea, for example, covers several categories of health personnel.

20.58 Long-term advisers were provided to strengthen the teaching staff of medical schools in the Region that found it difficult to recruit national staff. In longer-established medical schools, lecturer consultants advised on the development of curricula in specialized fields as well as participating in the teaching programme.

20.59 A physiologist, a pathologist and a teacher in preventive medicine were provided to the Royal School of Medicine in Laos. Supplies and laboratory equipment were also made available for the practical teaching of these subjects. Medical schools in Malaysia, Papua New Guinea, the Republic of Korea, and Singapore were furnished with advisory services in social and preventive medicine. Advisory services in psychiatry were provided for the Medical School of Malaysia, in child health for that of Papua New Guinea, in behavioural sciences for that of the Philippines, and in industrial health for that of Singapore.

20.60 For such advisory services to be fully effective, it is desirable that community health centres be available for the practical teaching of various categories of health workers. This was often made possible through the co-operation of WHO-supported projects in community health services and medical care administration.

20.61 Medical education facilities in China (Taiwan) were assessed and encouragement was given to the formation of a national association of medical schools on similar lines to those already set up in the Philippines and the Republic of Korea.
20.62 The National Institute of Public Health, Republic of Viet-Nam, moved to more suitable quarters made available as a result of WHO assistance in reconstructing and renovating the former Institute of Anatomy of the School of Medicine. The Organization also assisted in curriculum planning and evaluation and in organizing the supervision of trainees. The programme for 1971-1972 provides for a total of 19 courses with a possible enrolment of some 660 students. UNICEF has extended its assistance to the project until the middle of 1973.

20.63 The Organization is assisting the Khmer Republic to strengthen its training institutions for medical, nursing and other health workers. Teaching staff has been provided and a community health centre developed for the practical training of medical students and nurses. Unfortunately it has not yet been possible to recruit a teacher in preventive medicine.

20.64 The establishment of a regional teacher-training centre for health personnel was endorsed by the twenty-first session of the Regional Committee in 1970. Feasibility studies were carried out in 1971 and it was found that the Medical Faculty, University of New South Wales, Sydney, would be a suitable site. Although no final decision has yet been made, a WHO-assisted workshop in medical education was held at the University of New South Wales in November-December as a first step towards the preparation of staff for the proposed centre. Two members of the faculty were awarded WHO fellowships to attend a short inter-regional course on teacher training for schools of medicine held in October at the Center for Educational Development, University of Illinois College of Medicine, Chicago, USA.

20.65 The fellowship programme continued to play a major part in WHO's education and training efforts. A questionnaire on difficulties encountered in the implementation of the programme within the Region was sent to all Member States and a working paper based on the results of the questionnaire was considered during the twenty-second session of the Regional Committee in September.

Pharmacology and toxicology

20.66 Since the regional seminar on quality control of pharmaceutical substances in May 1970, countries of the Region have shown increased interest in the possibility of WHO assistance in that field. During the year, the Organization assisted Malaysia with regard to legislation on drug quality and the general organization of drug quality control. Assistance was given to the Khmer Republic, the Philippines and the Republic of Viet-Nam in preparing requests concerning projects in this field to be financed under the United Nations Development Programme. Preparatory work has been undertaken for the establishment in Malaysia of a regional centre for training drug quality inspectors. Visits were paid to several countries in the Region to obtain information on the educational background and the responsibilities of drug inspectors as a basis for designing the curriculum. The centre will be located at the pharmaceutical laboratory and stores, Kuala Lumpur, and is expected to open in 1973. WHO has given advice on the facilities and equipment required.

Co-operation with other organizations

20.67 Close co-operation was maintained with the UNDP Resident Representatives, and the Organization provided information as required for the development of the health aspects of the country programming exercise of UNDP.

20.68 Co-operation with UNICEF remained close and was strengthened in many respects, particularly as regards assistance provided to countries in emergency situations and immediate programme readjustments that became necessary.

Administrative and organizational developments

20.69 The regional structure has been strengthened by the appointment of a regional adviser on maternal and child health (family planning) and the establishment of a family planning advisory field team consisting of a public health nurse, a statistician and a health educator.

The Regional Committee

20.70 The twenty-second session of the Regional Committee for the Western Pacific was held in Manila from 21 to 29 September 1971. The session was attended by representatives of all the Member States in the Region, and of the Member States responsible for territories in the Region. The United Nations, UNDP, UNICEF, ILO, the South Pacific Commission and the International Committee of Military Medicine and Pharmacy were represented, as well as nine non-governmental organizations. An Assistant Director-General attended the session as representative of the Director-General.

20.71 The Committee examined the annual report of the Regional Director for the period 1 July 1970 to 30 June 1971. Concern was expressed that the
communicable diseases remained a major health problem in many of the developing countries of the Region. Particular reference was made to the fact that, despite the efforts of governments, little progress had been made in the control of cholera. The importance of improving water supplies and sanitation to prevent the disease from becoming endemic in areas newly invaded by it was emphasized. The necessity for governments to give the necessary financial support to antimalaria programmes, particularly in areas where the chances of eradication appear to be good, was stressed. The Committee noted with interest that the introduction of master plans of operation for the development of national health services had proved to be an effective way of coordinating the activities of different projects in a country. The proposed regional programme and budget estimates for 1973 were reviewed by the Committee and approved for transmission to the Director-General. The Committee adopted a resolution requesting the Regional Director to give as much assistance to Laos and the Khmer Republic as was possible within the resources available and as could be effectively absorbed by them, taking into account the assistance already programmed in other areas.

20.72 The Committee reviewed a number of resolutions of regional interest adopted by the Twenty-fourth World Health Assembly. During the discussion on resolution WHA24.30 on occupational health programmes, satisfaction was expressed with the arrangements made by the Regional Director to organize national seminars during which the provision of occupational health services to small-scale industries would be discussed. The Committee requested the Regional Director to study the possibility of establishing occupational health training programmes of regional interest. The Health Assembly resolutions on community water supply, the cholera pandemic, disinsection of aircraft, the health consequences of smoking, and drug dependence proved of particular interest to the Committee. The Committee decided that smoking should be banned during official meetings of WHO in the Region and that items on disinsection of aircraft and drug dependence should be placed on the agenda for its next session.

20.73 The Committee reviewed a report summarizing the results of a questionnaire sent to countries in the Region in connexion with the implementation of the fellowships programme.

20.74 In its discussions of long-term financial indicators, the Committee agreed that an appropriate title for the subject was "Long-term planning in the field of health, including long-term financial indicators". It was recognized that long-term programmes and projections should faithfully reflect the ascertained needs of governments for their national health development plans, but the point was made that in many countries it would not be possible to provide such information since the period specified, 1974-1978, differed from national planning periods.

20.75 During its consideration of a report on the health manpower situation in countries of the Region, the Committee discussed health manpower supply and demand, the difficulties encountered in health manpower development and training, and the areas for international co-operation in these fields.

20.76 Among the other subjects discussed were regional activities in environmental pollution control, progress reports of current programmes receiving WHO assistance, and the steps taken in connexion with the establishment of a regional teacher-training centre (see paragraph 20.64).

20.77 The Committee endorsed proposals of the Regional Director for the establishment of a regional programme on health laboratory services and of a technical advisory committee on nursing.

20.78 It reviewed the present practice of requiring host governments to meet the total additional costs of holding Regional Committee meetings away from the Regional Office and decided that, in future years, and to the extent that the host government was unable to meet the additional expenses of such meetings, the costs should be met from the budget of the Organization. The Committee further called on each host government to provide local facilities and to pay as much as possible of the additional costs of meetings of the Regional Committee held on its territory, particularly those which could be met in its national currency.

20.79 The Committee noted with appreciation the possibility of holding the twenty-third session of the Regional Committee in Guam without the Organization incurring any expenses additional to those already appropriated for the 1972 meeting of the Regional Committee. It authorized the Regional Director to accept the invitation on behalf of the Regional Committee, if received by 31 December 1971. The Committee accepted an invitation from the Government of New Zealand to hold its twenty-fourth session in New Zealand. It was informed that the New Zealand Government would meet the additional expenses resulting from holding the meeting away from regional headquarters.
20.80 The theme of the technical discussions was “Health manpower in developing countries: problems and needs” (see paragraph 20.30). The Committee selected “Environmental pollution problems and approach to their control in the Western Pacific Region” as the subject for the technical discussions in 1972.

Some Aspects of Work in the Region

20.81 A list of the projects current during the year will be found in Part III. The following have been selected for fuller description.

Advisory services in communicable disease control, Gilbert and Ellice Islands

20.82 In 1967 some 7000 cases of gastroenteritis, among a total population of about 53,000, were reported in the Gilbert and Ellice Islands, where the second-ranking cause of death was infantile diarrhoea. At the request of the Government, a WHO medical officer (microbiologist) was assigned to the Gilbert and Ellice Islands from late in 1968 to February 1971 to provide laboratory support for epidemiological studies of the main communicable diseases, particularly the diarrhoeal diseases, and to assist the Government in organizing the laboratory services necessary for its disease control programme. He was also responsible for training national staff in bacteriological and serological techniques and advising on appropriate measures for communicable disease control. In a number of his investigations he was assisted by the epidemiologist from the WHO regional communicable diseases team.

20.83 The diarrhoeal diseases were studied in two ways: first, by bacteriological examination of all patients admitted to the Central Colony Hospital and to a number of district hospitals; and, secondly, by a longitudinal study in two selected villages where all children up to 11 years old were examined fortnightly for a year. Among 282 patients admitted to the Central Colony Hospital with diarrhoea, nearly 39% were found positive for Shigella, Salmonella or enteropathogenic Escherichia coli. Some 25% of the fresh stool samples collected showed parasitic infestation, predominantly trichuriasis. Hookworm ova were also found; these infestations could be largely responsible for the cases of anaemia and malnutrition that were seen. A high Shigella carrier rate (13 out of 178) was also found among patients admitted to the hospital without diarrhoea.

20.84 During the period 1969-1970, 16 cases of typhoid fever were detected and nine carriers of Salmonella typhi (predominantly of the E-9 phage-type) as well as one of Salmonella paratyphi A. The phage-typing was done at the WHO International Reference Centre for Enteric Phage-Typing, London. A serological survey indicated that typhoid fever was not of recent introduction and that subclinical and mild infections were fairly common.

20.85 Shigella, Salmonella and E. coli were isolated from 115 (37.4%) of the 307 persons with diarrhoea who were examined in the two villages selected for the longitudinal study. In all, some 7% of the children in these two villages experienced diarrhoea requiring medical attention during the year’s study; they were mainly under 3 years of age. Among the children under 11 years old who did not experience diarrhoea there was again found a high carrier rate for enteropathogens, 267 stool specimens being positive out of a total of 3897 examined—a rate of 6.8%.

20.86 The main source of water on the islands is unprotected shallow wells. From 28 of these 162 samples were taken for examination by the Millipore filter technique; 5 samples gave very high E. coli counts (100-1200 per 100 ml). These and other observations confirmed the already well established need for good sanitation, including the provision of a safe water supply and improved facilities for excreta disposal, to ensure satisfactory prevention of diarrhoeal diseases.

20.87 During his stay the WHO microbiologist also investigated an outbreak of skin lesions that started on Abemama Island and spread, despite some restriction of movement from that island, to a number of other islands in a matter of weeks, involving up to 45% of the population of the affected islands within six months. This was first thought to be an outbreak of yaws but darkfield examination and the standard serological tests for the treponematoses gave uniformly negative results, as did testing for Corynebacterium diphtheriae. On the basis of further testing it was eventually concluded that these skin lesions were caused by Staphylococcus aureus, which was isolated from almost all the lesions.

20.88 The only mammals found in significant numbers on the islands are rats (Rattus rattus). Some of these were examined to see if they were playing a role in the transmission of enteropathogenic or other bacteria or as vectors of leptospirosis. From 80 rats tested one Shigella flexneri type 3 was isolated
and five strains of enteropathogenic *E. coli*. Urine and kidney examinations of the 80 rats yielded *Leptospira* (not typed) on two occasions.

20.89 In order to ensure continuity of the work performed with WHO assistance after the microbiologist’s assignment came to an end, considerable emphasis was placed upon training of the local personnel. Two laboratory technicians and a dresser were trained in the procedures for isolating and identifying micro-organisms, particularly those associated with the diarrhoeal diseases, and all the laboratory technicians were trained in the use of the Millipore filter technique for water examination. Local medical practitioners were given refresher instruction in the application of laboratory techniques for the diagnosis of gonorrhoea—which had been found to be increasing in the islands in recent years—as well as in the examination of stools. Control of typhoid fever was also discussed in detail with the local medical staff. In addition, 24 nurses received training in the techniques for taking specimens and for their proper dispatch to the laboratory.

20.90 WHO also provided a consultant in health education to assist in the establishment of an educational programme to enlist the participation of the people of the Gilbert and Ellice Islands in community projects designed to help reduce the incidence of diarrhoeal diseases and related problems involving improvement of personal hygiene practices, environmental sanitation and nutrition.

### Training in the maintenance of X-ray and other equipment

20.91 In 1961, a radiographer was assigned to the WHO tuberculosis advisory team in the Western Pacific Region to train radiographers and X-ray technicians in the safe operation and day-to-day maintenance of their equipment, which at that time consisted mainly of photofluorographic apparatus for for taking chest radiographs. Since then, the use of X-radiation for diseases other than tuberculosis has grown and the quantity of X-ray and other electromedical equipment in the Region has increased. The equipment itself has become more complex and the personnel responsible for its operation require longer and more specialized training. In addition, its maintenance and repair involve a number of problems, including the frequent difficulty of obtaining spare parts and service manuals, lack of transportation facilities and, particularly, a shortage of qualified staff to direct the work.

20.92 In 1969, WHO accordingly initiated a project for the training of technicians in the Region in the servicing and maintenance of radiological and similar equipment and in its installation, testing and calibration. By the end of 1971, six countries had been given assistance and advice adapted to their own particular problems in this field. At the same time, data were gathered on existing provisions for radiation protection of patients and X-ray operators and suggestions made for needed improvements.

20.93 In Malaysia, X-ray units were serviced and selected operators trained in preparation for a national tuberculosis prevalence survey; the need for the maintenance of radiological equipment was assessed and advice given on the organization of a maintenance service. In the Philippines, a plan for the improvement and extension of the national X-ray engineering service was proposed. In Singapore, diagnostic X-ray plants were inspected and adjusted, and the staff in charge trained in their maintenance. In China (Taiwan), four short courses on X-ray technology, each lasting three to six weeks, were given to X-ray operators in various parts of the island; advice was also given on upkeep and repairs. In the Republic of Korea, the foundations were laid for a government maintenance and repair service for electro-medical equipment. In Western Samoa, equipment was checked and personnel trained in its operation; advice was given on servicing and on the procurement of spare parts and tools.

20.94 The project, which will be continued in 1972, has resulted in technical improvements to equipment in all the countries concerned. The training given in the servicing of this equipment should help to make it more reliable in operation, cheaper to use and maintain, and easier to handle in the future.

### Nursing education, Laos

20.95 International assistance for nursing education in Laos started in 1959, when the United States International Co-operation Administration (ICA) began a one-year training programme for auxiliary nurses. The programme was directed by an International Voluntary Service nurse in close co-operation with a WHO nurse working at that time with the WHO-assisted maternal and child health project in Vientiane. In 1961 a school offering a two-year auxiliary nursing training course was opened at Vientiane, again with ICA assistance, and in 1962 support for the school was assumed by WHO and UNICEF, the latter furnishing equipment and supplies. This operation was financed from United Nations Technical Assistance (and later from UNDP) funds. Owing to the lack of qualified nurses, the two WHO nurse-educators assigned to the project assumed operational responsibility for the
development of the course, which was aimed at the preparation of nursing-midwifery personnel for the hospitals and health services. Students were required to have successfully completed six years of elementary education, and selection was made on as wide a geographical basis as possible.

20.96 In 1964, two additional WHO nurse-educators joined the project to complement the assistance given to the school and to develop courses for hospital head nurses. In November 1966, the Government of Laos opened three provincial schools for nursing auxiliaries in Luang Prabang, Savannakhet and Pakse. There were also two private schools with essentially the same programme.

20.97 All these schools, however, were faced with a common problem—the lack of personnel with adequate training as teachers. Early in 1968, therefore, a first course was organized and conducted by the WHO nurse-educators in Vientiane to prepare a group of graduates from the two-year training programme as tutors in the nursing schools. This course has since continued on a regular yearly basis, fellowships being provided by UNICEF.

20.98 By January 1971, there were 283 graduates of the auxiliary nursing courses in government employment. However, the nursing services were manned entirely by auxiliary level personnel and there were no nurses with higher qualifications to provide them with the necessary guidance, supervision and further instruction. The need for a nursing education programme at a higher level had been obvious and urgent for some time, but the realization of such a programme was necessarily delayed owing to the limited number of candidates with sufficient secondary education, the lack of educational facilities, and the absence of qualified teachers. Thus it was not until October 1969—when enough candidates had completed 10 years of general education—that a higher level course could be initiated in Vientiane. With the establishment of this course began the second phase of WHO assistance to Laos in nursing education, which is expected to continue through 1978.

20.99 The immediate objectives of the second phase are to establish a three-year basic nursing-education curriculum at diploma (state registration) level within the School of Public Health, Ministry of Health, the minimum entrance requirement being successful completion of 10 years' general education; and to strengthen the nursing programme at the auxiliary level, which is now conducted in the three provincial nursing schools in Laos by national personnel with WHO guidance and advice. The long-term objectives are to develop post-basic nursing education programmes to prepare teachers, nurse-midwives (one year of midwifery training being given to graduates of the diploma course) and expert practitioners in other fields of nursing.

20.100 WHO is providing three long-term WHO nurse-educators who have full operational responsibility for planning, organizing and administering the curriculum and for the teaching. Auxiliary nurses who have benefited from fellowships for study abroad assist the WHO nurses in the practical work, but their preparation is still insufficient for them to function as members of the teaching faculty and as national counterparts.

20.101 The curriculum at the School of Nursing follows the modern trends in nursing education and takes into consideration the socio-economic and educational development of the country, its culture and its health needs. The learning experiences, both theoretical and practical, are aimed at providing a foundation for the effective practice of nursing and, at the same time, for more advanced nursing preparation. Efforts are made to up-grade nursing services through continuous in-service educational activities for the personnel. Public health principles are interpolated throughout the curriculum and public health nursing practice is part of the school programme.

20.102 The enrolment for the diploma course that started in October 1969 was 20 students, and that for the courses starting in 1970 and 1971 was 30 students each. The course is given in a modern building which was constructed by USAID and includes dormitory accommodation for 60 students as well as class-rooms and library space. The establishment of post-basic programmes for graduates of the diploma course is envisaged for 1973.

Planning and financing water supply and sewerage schemes

20.103 In the Western Pacific Region as a whole, 55% of the population is served with piped water; although in three countries or territories the proportion is less than 6% and in several others it is not much higher. The situation as regards sewerage facilities is rather more serious, only 13% of the population of the Region being served by a sewerage system, the proportion per country ranging from 63% to 0.5%. While most countries have more or less ambitious programmes for improving water supplies and sewage disposal, few have sufficient qualified staff for their overall planning and implementation.
20.104 The third regional seminar on environmental health, convened by WHO in Manila in May, discussed ways and means of remedying this situation, with special reference to the planning and financing of municipal water and sewerage schemes. There were 20 participants from 17 countries and territories of the Region, together with observers from UNDP, IBRD, the South Pacific Commission, USAID, and national and professional bodies concerned with waterworks and sewerage systems in the Philippines. Before the seminar, WHO consultants visited China (Taiwan), Fiji, Malaysia, Papua New Guinea, and the Republic of Korea to study local conditions and examine specific problems with the health authorities.

20.105 The seminar considered such questions as the integration of plans for water supply and sewerage systems in national plans for social and economic development; the need for a flexible master plan that will take possible future developments, such as population increase and urban growth, into account; ways of obtaining local and international funds for projects and the importance, in this connexion, of pre-investment surveys.

20.106 Aspects of organization and management were also discussed. There was general agreement on the desirability of setting up autonomous bodies to operate schemes at the local level. These bodies should, however, have the support of national agencies, such as ministries of health and public works, which should establish the necessary criteria and standards, provide technical advice and organize training programmes.

20.107 Common problems mentioned in the course of the seminar included the poor design of a number of installations, the difficulty of maintaining equipment and the establishment and collection of charges. The use of meters was advocated as an equitable method of charging that has the additional advantage of avoiding wastage of water.

20.108 Participants were reminded of the role of WHO in the promotion of water supply and sewerage projects, notably by providing advisers in sanitary engineering, courses and fellowships for local staff and, with funds from UNDP, assistance in carrying out pre-investment surveys.
PART III

PROJECT LIST
This part of the report contains a list of the projects—country, inter-country and inter-regional—that were in operation during the whole or part of the period from 1 December 1970 to 30 November 1971. Continuing projects for which the only assistance given during the period was technical advice from headquarters or regional offices are not normally shown.

In country projects, the purpose for which the government or governments undertook the projects is stated. Details of the assistance provided by the Organization and of the work done are given for completed projects and refer to the whole period over which the project was assisted by the Organization. Such details are not given for continuing projects.

As in former Annual Reports, an attempt has been made to summarize the immediate results of projects for which the Organization's assistance terminated in the period under review and, where the nature of the work has permitted, to assess or evaluate how far the project has succeeded in the purposes for which it was undertaken. It has not been possible to do this for all completed projects; there has not been time, for example, to assess those that ended late in the period covered.

The projects are grouped by region in the following order: Africa, the Americas, South-East Asia, Europe, Eastern Mediterranean and Western Pacific. In order to give a balanced account of the health programme in the Americas, the list for that Region includes the projects assisted by PAHO in addition to those assisted by WHO. For each region, projects in individual countries are given in the alphabetical order of countries; the projects that concern more than one country follow, and are lettered AFRO, AMRO, SEARO, EURO, EMRO or WPRO. Inter-regional projects are given at the end of the list. For the African, European and Western Pacific Regions, where the project numbers have been changed, the old project numbers are shown in parenthesis.

Under the heading "Fellowships" are shown those fellowships awarded during the period 1 December 1970 to 30 November 1971 that do not form part of assistance to a larger project. A table showing all the fellowships awarded during the same period, by subject of study, is given in Annex 9.

The dates given, between brackets, after the project title indicate the duration of assistance to the project, whether such assistance is continuous or intermittent. For projects not completed during the period under review, the date of estimated termination of assistance is given, where possible, in italics. Names of co-operating agencies, whether or not they have contributed funds, are given, between brackets, after the source of funds.

The abbreviations used include the following: R—regular budget; UNDP/TA—Technical Assistance component of the United Nations Development Programme; UNDP/SF—Special Fund component of the United Nations Development Programme; UNFPA—United Nations Fund for Population Activities; AID—United States Agency for International Development. Other abbreviations are explained in the list on page II.
AFRICAN REGION

Botswana 4001 (0017) Development of basic health services (1969 - ) R UNDP/TA Special Account for the Cholera Programme
To develop basic health services, with emphasis in the first instance on epidemiological surveillance and control of communicable diseases and on integration of public health in training programmes for health personnel.

Botswana 6041 Fellowships R: Nursing education (12 months), public health nursing (two for 10 months).

Burundi 1801 (0013) Smallpox eradication (1967 - ) R
WHO provided a medical officer and vehicles for the attack phase of the smallpox eradication programme. The vaccination campaign began in February 1969 in Bujumbura; it was later extended to the frontier areas and finally to the interior of the country. It ended 18 months later, by which time nearly three million persons had been vaccinated, over 95% of them successfully. Transmission of smallpox, which was still occurring in 1968, when there were 270 cases, appears to have been interrupted, since no cases have been reported since October 1970.
The epidemiological services project (Burundi 1001), due to start in 1972, will assist the eradication programme by undertaking surveillance and maintenance work.

Burundi 3201 (0010) Community water supply (1968 - ) UNDP/TA
To plan and construct water supply systems for Bujumbura, Kitega and other towns.

To plan the health service and extend and improve the basic health services, with emphasis on improvement of family health and the nutrition of mothers and children; also to train sanitation staff and auxiliary and state-diploma nurses, and instruct all categories of health staff in health educational techniques.

Burundi 4201 (0007) Health laboratory services (1971 - ) R
To establish and develop a blood bank in Bujumbura.

Burundi 6041 Fellowships R: Engineering (12 months), microscope servicing (six weeks).

Cameroon 4001 (0016) Development of nursing services (1962 - ) UNDP/TA
To develop programmes for the education of midwifery and nursing personnel and to strengthen nursing services.

To further the training of student nurses in public health through financial support of the three nursing schools at Ayos, Bamenda and Garoua.

Cameroon 6041 Fellowships R: Anaesthesiology (12 months), anatomy and surgery (12 months), psychiatry (nine months); UNDP/TA: Haematology (12 months).

Cameroon 6201 (0019) University centre for health sciences, Yaoundé (1966 - ) UN/DPSF
To develop a university centre for health sciences in Yaoundé, and to train professional and auxiliary health personnel.

To carry out a smallpox eradication programme.

Central African Republic 3301 (0017) Sanitation and drainage, Bangui (1969 - ) UNDP/SF
To plan and implement a sanitation and drainage programme for the residential districts of Bangui and to train municipal sanitation workers.

To develop the basic health services, train health staff of all categories, and plan and implement a long-term sanitation programme.

Central African Republic 4401 (0010) Nursing education (1966 - ) UNDP/TA
To upgrade and develop the programme for basic nursing education at the school of nursing in Bangui.

Central African Republic 6041 Fellowships R: Paediatrics (12 months).

Chad 1801 (0025) Smallpox eradication (1968 - ) R
To carry out a smallpox eradication programme.

Chad 4001 (0010) Development of basic health services (1964 - ) R UNDP/TA Special Account for the Cholera Programme UNICEF
To develop and strengthen the basic health services in rural and urban areas, with emphasis on maternal and child health, to plan and carry out a long-term sanitation programme, and to train personnel of all categories.

Chad 4401 (0014) Nursing education (1962 - 1974) R UNICEF
To raise the standard of nursing education to state-diploma level and to train midwives.
Chad 6041 Fellowships R: Laboratory techniques (three months), medicine (three for 10 months, one for 12 months, two for 22 months), microscope servicing (six weeks), pharmacy (two for 10 months, one for 22 months).

Comoro Archipelago 4001 (0007) Development of basic health services
(1970 - ) R Special Account for the Cholera Programme
To develop basic health services and implement mass campaigns against yaws and smallpox; also to complete the study of malaria epidemiology and prevalence and plan antimalaria measures suited to existing conditions.

Congo 4001 (0018) Development of basic health services
(1965 - ) R UNICEF
To organize health services, with emphasis on maternal and child health, tuberculosis control, environmental health, health education and nutrition, and to train staff.

Congo 4201 (0021) Health laboratory services (1971 - ) R
To strengthen health laboratory services and train the necessary auxiliary staff.

Congo 4401 (0022) Nursing education (1967 - ) R UNICEF
To upgrade training programme for nurses, midwives and social workers to the level for state registration.

Congo 6041 Fellowships R: Biochemistry (18 months), nursing education and administration (12 months), paediatrics (12 months), surgery (12 months).

Dahomey 1801 (0018) Smallpox eradication (1967 - ) R
To carry out a smallpox eradication programme.

Dahomey 3001 (0019) Health component, agricultural survey and demonstration in the Ouémé Valley
(1970 - ) UNDP/SF (FAO)
To evaluate the prevalence of schistosomiasis and study the biology of the vector in the area covered by the project being carried out in the Ouémé Valley with assistance from the United Nations Development Programme with FAO as the executing agency; to recommend measures for schistosomiasis control in the area and determine the possible impact of the project on the prevalence of the disease.

Dahomey 3002 (0021) Pilot development of groundwater
(Jan. - July 1971) UNDP/SF (FAO)
A consultant was provided for six months to study the environmental health aspects of a project for the development of water resources in Dahomey, carried out with assistance from the United Nations Development Programme, with FAO as the executing agency.
WHO assistance under this project was previously provided between 1967 and 1969.

Dahomey 4001 (0022) Development of basic health services
(1968 - ) R UNICEF
To develop the basic health services, including maternal and child health care; to develop an environmental sanitation programme in urban and rural areas; to train health personnel of all categories; and to improve methods and facilities for the diagnosis and treatment of malaria.

Dahomey 4201 (0023) Health laboratory services (1970 - ) R
To develop national health laboratory services.

Dahomey 4401 (0024) Nursing education (1969 - ) R
To revise and develop basic education programmes for nurses and midwives at state-diploma level, and for auxiliaries.

Dahomey 6041 Fellowships R: Cellular physiology and bacteriology (12 months), endemic disease control (five for 10 months), leprosy control (five for two months), pharmacy (12 months).

Dahomey 6201 (0025) University centre for health sciences
(1970 - ) R
To establish a university centre for health sciences.

Equatorial Guinea 4001 (0001) Consultant services
(1969 - ) R
To plan and develop health services, giving particular attention to general administration, medical care, environmental health, the training of health personnel of various categories and the improvement of basic health services.

Equatorial Guinea 4002 (0002) Operational services
(1969 - ) R
To operate preventive and curative health services and train health personnel of various categories.

Gabon 4001 (0020) Development of basic health services
(1969 - ) R
To develop the basic health services, with emphasis on maternal and child health, plan and implement a long-term sanitation programme, and train health personnel of all categories. (See para. 15.105.)

Gabon 4401 (0016) Nursing education (1961 - ) R
To develop basic programmes for the training of professional and auxiliary nurses.

Gabon 6041 Fellowships R: Entomology (four months), leprolog (12 months), nursing education and administration (three for 12 months).

Ghana 1201 (0011) Tuberculosis control
(1962 - 1971) UNDP/TA UNICEF
The general aim of the project was to adapt tuberculosis control measures to local conditions and to train national personnel in all aspects of tuberculosis control work. WHO provided a medical officer for the duration of the project and a statistician and a laboratory technician from 1962 to 1966. The project began in a pilot area—the port of Tema—where systematic examination of the working population was carried out. However, since conditions in Tema were not characteristic of the country as a whole, the necessary personnel were trained and a second pilot project was set up in 1966 in a rural area of the Volta Region, where a system of case-finding and treatment, integrated into the work of the general health services, was set up. At the same time, a BCG vaccination campaign was launched, starting in the Volta Region where, by 1968, 75% of the child population had been vaccinated. The tuberculosis control programme was extended gradually to the whole country, BCG vaccination being combined with smallpox vaccination carried out by mobile teams of the epidemiological service. In addition, tuberculosis control activities were co-ordinated in the Eastern Region.

The national tuberculosis control programme is to be continued under the epidemiological services project Ghana 1001, due to start in 1972.
Ghana 2101 (0005) Schistosomiasis control (1959 - 1971) UNDP/TA

The aim was to carry out a schistosomiasis control programme, based on the results of previous studies on intermediate snail hosts and local epidemiology of the disease. WHO provided a medical officer (epidemiologist) and five consultants, as well as supplies and equipment.

A pilot project was carried out in the Wa area of northern Ghana, where epidemiological and malacological surveys were made to obtain baseline data before the start of molluscicidal operations. The incidence of urinary schistosomiasis in 8304 persons examined in 43 localities was 12.4% implying 4900 infections among a total of 39 500 inhabitants of the area. Seasonal density of snails in relation to the infection indicated that transmission of the disease occurred mainly in dry seasons. Between October 1969 and April 1970 the first cycle of molluscicidal operations was effected in 30 localities, 43 120 cubic metres of water being treated with Bayluscide. After an initial assessment, the second cycle of mollusciciding was carried out from October 1970 to April 1971, 22 000 cubic metres of water being treated with Bayluscide. The final evaluation is still in progress, but monthly follow-up of treated habitats has indicated a marked reduction in the snail population. In 1969 studies were started to assess the effects of chemical control of snail habitats with Abate on the transmission of guinea worm. After the first cycle of operations, the incidence of new guinea worm infections in 1717 schoolchildren fell from 21.8% to 8.9%. Training activities under the project included 10-week courses on the theory and practice of schistosomiasis control, attended by 21 Ghanaian trainees.

Ghana 3001 (0047) Environmental sanitation (1971 - ) R

To strengthen the central environmental health unit, plan a long-term sanitation programme including the development of water supplies, and train personnel.

Ghana 3002 (0041) Health component in Volta Lake research project (1969 - ) UNDP/SF (FAO)

To conduct research as a basis for planning and co-ordinating control measures against water-borne parasitic diseases and to develop a general public health programme for the project area.

Ghana 3201 (0031) Master plan for water supply and sewerage for the Accra-Tema metropolitan area (1963 - 1972) UNDP/SF

To provide technical assistance to the Ghana Water and Sewerage Corporation for the Accra-Tema water supply and sewerage scheme, and to train personnel for responsible positions in the Corporation.

Ghana 3202 (0043) Rural water supply and environmental health (1971) UNDP/SF

A sanitary engineer (project manager), a hydrogeologist and a drilling engineer were provided to carry out initial data collection and assist the Government in preparing a revised request to the United Nations Development Programme for assistance in developing rural water supplies in four pre-selected regions, as a pilot operation.


A consultant visited Ghana to study the feasibility of implementing a medical care insurance scheme in the country.

Ghana 4401 (0027) Post-basic nursing education (1963 - ) R

To develop post-basic nursing education in the University of Ghana.

Ghana 4402 (0045) Basic nursing education (1968 - 1971) R

WHO provided a nurse educator, and supplies and equipment, to assist in improving nursing education. During the period of the project new nursing legislation was promulgated, the nursing curriculum of the schools of nursing in Accra and Kumasi was revised in accordance with the needs and resources of the country and changes were introduced in teaching methods. Improvements were made in the living accommodation for nurses.

Ghana 4501 (0039) Health education (1967 - ) UNDP/TA

To reorganize the health education service; to intensify the training of medical and paramedical staff for the health educational aspects of their work; and to improve the training in health education given to undergraduate medical students.

Ghana 6201 (0033) Medical school, Accra (1968 - ) R

To strengthen the faculty and improve the teaching facilities at the medical school.

Guinea 1801 (0024) Kindia Institute (1968 - 1971) UNDP/TA UNICEF

A laboratory technician was provided to advise the Kindia Institute on the most suitable equipment for the manufacture of freeze-dried smallpox vaccine and to assist in controlling the manufacture of the vaccine and in training personnel.

The Institute is now able to produce high quality freeze-dried smallpox vaccine at the rate of 10 million doses a year.

Guinea 1802 (0029) Smallpox eradication (1969 - ) R

To carry out a smallpox eradication programme.

Guinea 2201 (0012) Onchocerciasis control (1967 - ) R

To carry out epidemiological and entomological studies of onchocerciasis and to draw up and implement a programme for the control of the disease.

Guinea 3001 (0030) Health component in a project for the reorganization of the port of Conakry (June - July 1971) UNDP/SF (ILO)

In connexion with the project for reorganizing the port of Conakry, being carried out with assistance from the United Nations Development Programme, with ILO as executing agency, WHO provided a consultant to study the organization, management and installation of the port health services.

Guinea 4001 (0027) Development of basic health services (1968 - ) R UNDP/TA Special Account for the Cholera Programme UNICEF

To evaluate the progress made in the development of rural health services in the demonstration areas, and bring the services to the level required to support mass campaigns against malaria and other diseases; to train rural health personnel; to extend to the whole country the facilities for the diagnosis and treatment of malaria and carry out antimalarial work; and to develop a sanitation programme.

Guinea 6201 (0026) Medical school, Conakry (1969 - ) R

To develop the Conakry medical school.
Assessment of the level of immunity of the population has started. This has been carried out at the same time as vaccination against smallpox. In a neighbouring country. In 1971 an outbreak occurred, caused by cases imported from there. The vaccination campaign, which began in two provinces—Western and Nyanza—where foci of smallpox had been recently reported, has covered nine of the 11 million inhabitants of the country. The recording of vaccinations by local authorities and the notification of cases wherever possible. To carry out surveys and special studies for the preparation of master plans for water supply, sewerage and drainage for Abidjan, and train personnel. The aim was to establish a nutrition unit in the National Institute of Public Health, to assess nutrition problems of public health significance and to develop the nutrition services as an integral part of the health services. WHO provided a medical officer (nutritionist) from June 1967 to August 1968 and again from May 1969 to September 1970. In addition to the establishment of the nutrition unit, the following activities were undertaken. A clinical assessment of nutritional diseases, especially protein-calorie malnutrition, was made in certain areas. Protein-calorie malnutrition was found to be a serious public health problem, affecting a great number of children. Particular attention was paid to the area covered by the Kossou Dam project, where an assessment was made of the nutrition problems of settlers. Nutrition training, both theoretical and practical, was arranged for different categories of personnel, including students of medicine, nursing, midwifery, environmental sanitation and social sciences, and nurses were given in-service training in nutrition. Nutrition education of the public was also carried out, integrated with health education wherever possible. The vaccination campaign, which is continuing, is receiving assistance from the epidemiological services project, Kenya 1201 (0004).

Ivory Coast 3201 (0025) Environmental sanitation
(1970- ) R UNDP/SF
To formulate a programme for sewerage and storm drainage, to carry out surveys and special studies for the preparation of master plans for water supply, sewerage and drainage for Abidjan, and train personnel.

Ivory Coast 4901 (0008) Vital and health statistics
To develop the vital and health statistical unit of the Ministry of Public Health and train personnel at the National Institute of Statistics.

Ivory Coast 5101 (0004) Maternal and child health services
(1964 - ) R UNICEF
To develop the maternal and child health services and train personnel.

The aim was to establish a nutrition unit in the National Institute of Public Health, to assess nutrition problems of public health significance and to develop the nutrition services as an integral part of the health services. WHO provided a medical officer (nutritionist) from June 1967 to August 1968 and again from May 1969 to September 1970. In addition to the establishment of the nutrition unit, the following activities were undertaken. A clinical assessment of nutritional diseases, especially protein-calorie malnutrition, was made in certain areas. Protein-calorie malnutrition was found to be a serious public health problem, affecting a great number of children. Particular attention was paid to the area covered by the Kossou Dam project, where an assessment was made of the nutrition problems of settlers. Nutrition training, both theoretical and practical, was arranged for different categories of personnel, including students of medicine, nursing, midwifery, environmental sanitation and social sciences, and nurses were given in-service training in nutrition. Nutrition education of the public was also carried out, integrated with health education wherever possible.

Ivory Coast 6041 Fellowships R: Kinesitherapy (12 months), microscope servicing (two for six weeks), midwifery (six months), public health (seven for one month).

Kenya 1001 (0030) Epidemiological services
(1971 - ) UNDP/TA
To develop an epidemiological service to plan, co-ordinate and evaluate programmes for the control of communicable diseases, including tuberculosis and smallpox, to strengthen the vital and health statistics service and to train personnel. This project incorporates the former tuberculosis control project Kenya 1201 (0004).

Kenya 1801 (0040) Smallpox eradication (1968 - ) R
WHO provided a technician and vehicles for the attack phase of the smallpox eradication programme. The vaccination campaign, which began in two provinces—Western and Nyanza—where foci of smallpox had been recently reported, has covered nine of the 11 million inhabitants of the country. The recording of vaccinations by local authorities and the notification of cases where have been improved. In 1969, there were 14 indigenous cases. In 1971 an outbreak occurred, caused by cases imported from a neighbouring country. Since 1970 BCG vaccination has been carried out at the same time as vaccination against smallpox. Assessment of the level of immunity of the population has started.

The vaccination campaign, which is continuing, is receiving assistance from the epidemiological services project, Kenya 1001.
Kenya 6101 (0046) Medical training centre (1970 - ) R
To develop a training centre for health personnel.

Kenya 6201 (0034) Medical school, Nairobi (1965 - ) R
To develop the medical school, Nairobi.

Lesotho 4001 (0014) Basic health services (1968 - ) R Special Account for the Cholera Programme UNICEF
To set up in urban and rural areas integrated basic health services, with emphasis on maternal and child health, public health nursing services, organization of laboratory services and training of personnel.

Lesotho 6041 Fellowships R: Medical laboratory technology (seven months), public health nursing (two for 10 months).

Liberia 1001 (0035) Epidemiological services (1968 - ) UNDP/TA
To co-ordinate the work of existing communicable disease units, set up an epidemiological service, and organize and improve vital and health statistical services.

Liberia 1801 (0038) Smallpox eradication (1968 - ) R
To carry out a smallpox eradication programme.

Liberia 4001 (0033) Development of basic health services (1968 - ) R UNICEF
To develop basic health services in accordance with the national health plan, with emphasis on strengthening basic health service facilities that can support mass campaigns against communicable diseases and into which maternal and child health services can be integrated; to train health service personnel, develop laboratory services and carry out antimalaria activities.

Liberia 6041 Fellowships R: Communicable disease epidemiology and control (six months).

Liberia 6201 (0030) Medical school, Monrovia (1969 - ) R
To develop the medical school, Monrovia.

Madagascar 3201 (0025) Pre-investment study on water supply and sewerage, Tananarive (1971 - ) UNDP/SF
To carry out a pre-investment study for expansion and improvement of the water supply and sewerage systems and facilities in Tananarive.

Madagascar 4001 (0023) Development of basic health services (1968 - ) R UNDP/TA
To organize health services and develop rural health units, with major emphasis on maternal and child health, sanitation, nutrition and health education work; and to train staff.

Madagascar 6041 Fellowships R: Anaesthesiology and resuscitation (12 months), public health (four for 12 months), radiology (12 months).

Malawi 1801 (0011) Smallpox eradication (1968 - ) R Special Account for Smallpox Eradication
To plan and implement a smallpox eradication programme, and to develop surveillance.

Malawi 4001 (0012) Development of basic health services (1970 - ) R Special Account for the Cholera Programme
To develop the health services, with emphasis on maternal and child health, epidemiological surveys of communicable diseases, and national health planning.

Malawi 4101 (0012) National health planning (June - Dec. 1971) R Funds-in-trust
A team of consultants, consisting of a manpower/national health planning specialist, a public health administrator/epidemiologist, a hospital administrator, a statistician and a sanitary engineer, assisted the Government in formulating a national health plan.

A minimum comprehensive plan was drawn up for the first two years, during which period no substantial increase in the national budget allocation for health work can be made, in order to ensure immunization against the most prevalent communicable diseases. For the succeeding three years a plan was prepared which covers the provision of preventive and curative medical services, the establishment of a sound organizational base for preventive care and the introduction of effective health measures into the projects for economic development.

Malawi 4801 (0010) Physical rehabilitation services (1969 - ) R
To set up a workshop for the production of orthopaedic appliances and to train staff.

Malawi 6041 Fellowships R: Medicine (12 months), nursing (two for 12 months).

Mali 1201 (0005) Tuberculosis control (1967 - ) R
To organize BCG vaccination of the younger age-groups of the urban and rural population; to train staff, and to ensure the maintenance of a satisfactory level of vaccination protection of susceptible persons through the general health services.

Mali 1801 (0022) Smallpox eradication (1965 - ) R
To carry out a smallpox eradication programme.

Mali 3201 (0030) Drainage for Bamako and water supply for selected provincial towns (1971 - ) UNDP/SF
To plan the implementation by stages of a drainage programme for Bamako, to carry out water supply studies for selected provincial towns, and to train national personnel.

Mali 4001 (0032) Development of basic health services (1969 - ) R
To implement the national health plan, particularly as regards the development of a network of basic health service facilities capable of supporting mass campaigns against communicable diseases and of assuming responsibility for maternal and child health care; and to improve methods for the diagnosis and treatment of malaria, establish a central environmental health unit, improve sanitation, and train health personnel of all categories.

Mali 4401 (0014) Nursing education (1964 - ) R
To organize nursing services, improve nursing education and develop the training of midwives.

Mali 6041 Fellowships R: Endemic disease control (eight for 10 months).

Mali 6101 (0035) Medical assistants' school, Bamako (1969 - ) R
To develop the medical assistants' school, Bamako.

Mauritania 1801 (0012) Smallpox eradication (1968 - ) R
To implement the attack phase of the national smallpox eradication programme, develop epidemiological surveillance and evaluate the programme.
Mauritania 4001 (0010) Development of basic health services
(1968 - ) R UNICEF

To develop basic health services in a demonstration area, and to integrate maternal and child health work into those services; to improve the diagnosis and treatment of malaria; and to train personnel.

Mauritania 4401 (0008) Nursing education
(1963 - ) R UNICEF

To organize nursing services and improve nursing education.

Mauritania 6041 Fellowships R: Nursing education and administration (two for 12 months).

Mauritius 1201 (0002) Tuberculosis control
(1966 - 1971) UNDP/TA UNICEF

A medical officer and a bacteriologist were provided to assist in integrating tuberculosis diagnosis and treatment into the work of the health services, in intensifying case-finding and in generalizing the application of BCG vaccination.

All newborns (about 20,000 a year) and all schoolchildren now receive BCG vaccination as a routine measure. Tuberculosis case-finding is actively pursued; about 300 new cases a year are discovered, which is considered to correspond to the actual incidence. Patients under ambulatory treatment are regularly followed up, and it has been possible to achieve a rate of cure of 90%. With the assistance of UNICEF a tuberculosis laboratory has been installed in the premises of a private institution. Assistance in extending tuberculosis control work was previously given between 1959 and 1966.

Mauritius 4001 (0021) Public health services
(1969 - ) UNDP/TA

To undertake the reorganization, at all levels, of health services in which emphasis will be placed on the development of comprehensive and integrated peripheral services capable of undertaking malaria vigilance, control of other communicable diseases, a nutrition programme and health education; to train personnel and to establish a division of environmental health.

Mauritius 4301 (0024) Hospital services (1969 - ) R

To develop nursing services and an in-service training programme for the Sir S. Ramgoolam National Hospital and to establish a course for departmental supervisors.

Mauritius 4401 (0023) Nursing education (1970 - ) R

To develop a basic programme for the education of nurses and midwives.

Mauritius 5101 Maternal and child health
(1971 - ) UNFPA UNICEF

To reorganize and strengthen the maternal and child health services in order to enable them to promote family health and welfare, including family planning activities, as an integral part of the services.

Mauritius 6041 Fellowships R: Anaesthetics (two for 12 months), ear, nose and throat diseases (one for 12 months, one for 18 months), public health nursing (two for 10 months), statistics (12 months).

Niger 1201 (0005) Tuberculosis control
(1964 - 1971) UNDP/TA UNICEF

The work of the project was at first confined to the BCG vaccination of children in Niamey. Later on BCG vaccination, carried out by mobile teams, was extended progressively to the whole country. About a million vaccinations of children in the 0 - 15 age group have been effected. In 1968 a case-finding and treatment service was started in Niamey to cover patients in the capital and the surrounding areas. The project staff several times visited the interior of the country to assess the preventive and curative work being carried out in the departments. In 1969 a tuberculosis control programme was launched in a field area which, when the project ended, became the demonstration area for the tuberculosis control component of project Niger 4001 (Development of basic health services).

WHO provided a medical officer, a public health nurse and a laboratory technician, as well as transport equipment. Laboratory equipment and medicaments were supplied by UNICEF.

Niger 1801 (0030) Smallpox eradication (1966 - ) R

To carry out a smallpox eradication programme.

Niger 4001 (0025) Development of basic health services
(1969 - ) R Special Account for the Cholera Programme

To expand basic health services in accordance with the four-year health development plan, particularly with regard to maternal and child health and school health, and to train staff in the demonstration areas.

The project incorporates the former tuberculosis control and environmental sanitation projects (Niger 1201 (0005) and 3001 (0018)).

Niger 4401 (0023) National school of public health, Niamey
(1966 - ) UNDP/SF

To reorganize and develop the national school of public health, Niamey.

Niger 6041 Fellowships R: Nursing education and administration (12 months), sanitation (12 months).

Nigeria 1001 (0079) Epidemiological services, Federal
(1968 - ) R UNDP/TA

To organize epidemiological services for communicable disease control programmes, including the elimination of the residual foci of yaws; to develop a pattern for integrated laboratory services; and to train personnel.

Nigeria 1003 (0080) Epidemiological services, Western State
(1968 - ) R

To develop epidemiological services; to plan, co-ordinate and evaluate measures for the control of communicable diseases, including leprosy and tuberculosis; and to develop vital and health statistics services.

Nigeria 1005 (0102) Epidemiological services, North-Western State (1971 - ) R

To develop epidemiological services for planning and implementing programmes for the control of communicable diseases, including a programme for tuberculosis control; and to train the necessary staff.

Nigeria 1006 (0082) Epidemiological services, North-Central, Kano and North-Eastern States (1968 - ) R

To organize epidemiological services for communicable disease control programmes, including elimination of residual foci of yaws and control of leprosy; and to develop vital and health statistics services.

Nigeria 1013 (0081) Epidemiological services, Mid-West State
(1968 - ) UNDP/TA

To organize epidemiological services for communicable disease control programmes, including elimination of residual foci of yaws and control of leprosy and tuberculosis.
Nigeria 1801 (0092) Smallpox eradication (1968 - )  R
To carry out a smallpox eradication programme.

Nigeria 3006 (0071) Health component in the Kainji Lake research project (1968 - ) UNDP/SF (FAO)
To provide for co-ordination of the health components of the Kainji Lake research project, which is being undertaken with assistance from the United Nations Development Programme (Special Fund component) with FAO as the executing agency. In 1968 WHO provided a consultant who made a survey of health conditions and services in the project area.

Nigeria 3303 (0087) Master plans for wastes disposal and drainage, Ibadan (1968 - ) UNDP/SF
To carry out engineering feasibility studies required for the preparation of master plans, phased investment studies and a construction programme for sewerage, drainage and solid waste disposal systems for the city of Ibadan; and to formulate policy on related legal, managerial and financial matters.

Nigeria 4001 (0078) Development of basic health services, Federal (1968 - )  R
To co-ordinate activities for the development of basic health services and training of personnel and to organize antimalaria work as required.

Nigeria 4003 (0074) Development of basic health services, Western State (1968 - ) UNDP/TA UNICEF
To develop basic health services, with emphasis on building up the rural health infrastructure, and to train personnel, using the experience obtained in the demonstration area; to train sanitation staff, set up a sanitary engineering unit and plan a long-term sanitation programme.

Nigeria 4005 (0101) Development of basic health services North-Western State (1971 - )  R
To plan health services and develop basic health services, with emphasis on the training of all categories of health personnel in both curative and preventive medicine.

Nigeria 4006 (0075) Development of basic health services, North-Central State (1968 - ) UNDP/TA UNICEF
To plan health services; to improve health administration; to train professional and auxiliary health staff in preventive and curative medicine; to develop the rural health infrastructure; and to carry out environmental sanitation work.

Nigeria 4007 (0098) Development of basic health services, Kano State (1969 - ) UNICEF
To develop basic health services, with emphasis on training all categories of personnel in preventive and curative medicine and to build up the rural health infrastructure and strengthen its supervision.

Nigeria 4009 (0099) Development of basic health services, Benue Plateau State (1971 - )  R

Nigeria 4010 (0097) Development of basic health services, South-Eastern State (1971 - )  R
To plan health services and develop basic health services, with emphasis on the training of all categories of health personnel in both preventive and curative medicine.

Nigeria 4013 (0077) Development of basic health services, Mid-West State (1968 - ) UNICEF
To plan and develop health services, to improve health administration and to train personnel of all categories.

Nigeria 4501 (0028) Health education (1962 - ) UNDP/TA
To strengthen the federal health education and school health education bureau and to provide advisory services in these fields to the states.

Nigeria 4701 (0064) School of radiography (1968 - )  R
To train technicians in radiography and in the maintenance and repair of X-ray and electromedical equipment.

To develop vital and health statistics services for the whole country, plan and carry out epidemiological surveys, and train staff.

Nigeria 5403 (0060) Mental health, University of Ibadan (1968 - )  R
To develop postgraduate teaching in the Department of Psychiatry, Neurology and Neurosurgery of the University of Ibadan Medical School.

Nigeria 6041 Fellowships R: Cardiology (12 months), communicable disease epidemiology and control (six months), environmental sciences and public health (12 months), human nutrition (nine months), leprosy control (two for four months), microbiology (one month), nursing (12 months), parasitology (nine months), public health (12 months), tropical medicine and hygiene (five months), virology (two months).

Nigeria 6201 (0088) Medical college, Lagos (1968 - )  R
To develop the teaching of anatomy at the medical school of the University of Lagos.

Nigeria 6206 (0073) Medical school, Zaria (1967 - )  R
To develop the medical school, Zaria.

Réunion 6041 Fellowships R: Microscopy (four for one month).

Rwanda 1201 (0001) Tuberculosis control (1965 - 1971) UNDP/TA UNICEF
The aim was to plan a training programme for multipurpose health personnel and to introduce methods of tuberculosis prevention and treatment adapted to local conditions. WHO provided a medical officer, a nurse and a laboratory technician, as well as supplies and equipment. UNICEF provided supplies, including medicaments and BCG vaccine.

Work began with a tuberculosis survey, following which direct BCG vaccination of children in the 0-14 age-group was decided on. A BCG vaccination campaign was then carried out throughout the country as part of the smallpox eradication campaign. In 18 months 1 718 000 children were vaccinated—a coverage of 79.6% in the age-group 0-4 years and of 94.9% in the group 5-14 years. Microscopic sputum examination of suspected cases was undertaken in the tuberculosis clinic and uniform methods of ambulatory treatment were introduced. Personnel were trained in case-finding and registration and follow-up of patients.

The work will be continued and extended as part of the work of the general health services under the epidemiological services project Rwanda 1001.

Rwanda 1801 (0008) Smallpox eradication (1968 - )  R
WHO provided a technician, vaccine and vehicles for the attack phase of the smallpox eradication programme, which was combined with the BCG vaccination campaign carried out under the tuberculosis control project (Rwanda 1201) and directed by the medical officer assigned to that project. The smallpox vaccination campaign began in April 1969; despite an outbreak of more than 250 cases three months after the start of operation, it covered the whole country in just over a year.
Vaccination coverage was 92% for all age groups. No cases have been reported since November 1970.

Maintenance operations are continuing and will receive assistance from the epidemiological services project, Rwanda 1001.

Rwanda 4001 (0011) Development of basic health services
(1969 - ) R Special Account for the Cholera Programme
UNICEF

To extend integrated basic health services, particularly in the rural areas, with emphasis on maternal and child care and nutrition work; and to train medical students and all categories of health personnel.

Rwanda 6041 Fellowships R: Environmental sanitation (12 months), public health (12 months), radiography (12 months).

Rwanda 6201 (0005) Medical school, Butare
(1967 - ) R UNDP/TA

To develop the medical school of the University of Butare and promote the teaching of public health there and at the other institutions for training health personnel. The professor of public health assigned to the project also advises on matters of public health administration and health planning.

Senegal 1801 (0029) Smallpox eradication (1970 - ) R

To carry out a smallpox eradication programme.

Senegal 3201 (0022) Master plan for water supply and sewerage for Dakar and surrounding areas (1966 - ) UNDP/SF

To develop a phased improvement programme within a long-term plan for water supply, sewerage and storm drainage for Dakar and surrounding areas. The work also includes management, legal and finance studies for the development of a self-supporting water and sewerage authority.

Senegal 4001 (0026) Development of basic health services
(1968 - ) R Special Account for the Cholera Programme
UNICEF

To develop the basic health services to the level required to support mass campaigns against communicable diseases, paying particular attention to maternal and child health, the national tuberculosis control programme, treatment of malaria, and the training of personnel.

The project incorporates the former nutrition education project Senegal 5601 (0016).

Senegal 5501 (0027) Institute of Tropical Odontology and Stomatology, University of Dakar (1967; 1970 - ) R

To establish an institute of tropical odontology and stomatology at the University of Dakar and to train personnel in dental health.

Senegal 6041 Fellowships R: Digestive endoscopy (one month), microscope servicing (six weeks), nursing (four for three weeks, one for five weeks), orthopaedics (five and a half months), sanitary engineering (12 months).

Seychelles 4001 (0010) Development of basic health services
(1967 - 1970) UNDP/TA

The aim was to develop the health services, giving priority to the treatment and control of communicable diseases, the organization of public health nursing and environmental sanitation services and the training of personnel. WHO provided a medical officer for the duration of the project, a public health nurse until August 1968 and a sanitary from October 1968 to August 1970.

The first activities under the project centred on venereal disease and filariasis control, maternity and child welfare work and the training of nurses in public health. With the arrival of the WHO sanitarium construction of water supplies was undertaken, together with the construction of pit latrines in slum areas, and airport sanitation and food hygiene programmes.

The project, under which a fairly complete coverage of basic health services was achieved, was at the end of 1970 replaced by another project for national health planning and the further development of health services (Seychelles 4101) to which the medical officer was transferred in January 1971.

Seychelles 4101 (0014) National health planning
(1971 - ) R

To plan and develop the national health services within the framework of the national development plan.

Sierra Leone 1001 (0030) Epidemiological services
(1968 - ) R UNDP/TA

To organize and develop epidemiological services to support mass campaigns for the control of communicable diseases, including programmes to eliminate residual foci of yaws; to strengthen health laboratories and vital and health statistics services, and to train staff.

Sierra Leone 1801 (0033) Smallpox eradication
(1968 - ) R

To carry out a smallpox eradication programme.

Sierra Leone 4001 (0029) Development of basic health services
(1968 - ) R UNICEF

To implement the national health plan, particularly in relation to further development of basic health services in the demonstration area in the Port-Loko district; to train personnel; and to strengthen specialized services, integrating them into a general service which can support mass campaigns for the control or eradication of communicable diseases.

Sierra Leone 4401 (0007) Nursing education
(1961 - ) R UNICEF

To develop nursing education programmes, with emphasis on the preventive and curative aspects of nursing.

Sierra Leone 6041 Fellowships R: Clinical pathology (12 months), paediatrics (12 months).

Swaziland 4001 (0012) Development of basic health services
(1969 - ) R UNDP/TA Special Account for the Cholera Programme
UNICEF

To develop basic health services, with emphasis on the training of personnel, including laboratory assistants.

Swaziland 6041 Fellowships R: Public health administration (10 weeks).

Tanzania 1001 (0048) Epidemiological services, Tanganyika
(1969 - ) R

To develop epidemiological services for the control of communicable diseases, including communicable eye diseases and tuberculosis; and to develop vital and health statistics services and train personnel.

Tanzania 1801 (0043) Smallpox eradication, Tanganyika
(1968 - ) R Special Account for Smallpox Eradication

To carry out a smallpox eradication programme.

Tanzania 2101 (0039) Schistosomiasis control, Tanganyika
(1967 - ) R

To evaluate the extent of the schistosomiasis problem, starting in the Mwanza district, and to draw up, for that district, a control programme which could serve as a model for a future programme covering all endemic areas.
Tanzania 4401 (0052)  Nursing education, Tanganyika
(1970 - ) R
To train nursing and midwifery personnel.

Tanzania 5501 (0038)  Defluoridation of urban water supplies
(1971) R
Two consultants were provided to assess the desirability of defluoridation of the community water supply in Arusha and of introducing defluoridation of water supplies in Dar es Salaam.

Tanzania 6041  Fellowships R: Laboratory design and utilization
(three weeks), nutrition (one for nine months, one for 10 months), obstetrics and gynaecology (12 months), occupational medicine (12 months), physiology (12 months), psychiatry (12 months).

Tanzania 6201 (0022)  Medical school, Dar es Salaam
(1965 - ) UNDP/TA
To develop the medical school, Dar es Salaam.

Togo 1001 (0030)  Epidemiological services
(1968 - ) R UNDP/TA UNICEF
To establish epidemiological services for co-ordinating all communicable disease control work; to strengthen health laboratory services; and to train personnel.

Togo 1801 (0032)  Smallpox eradication (1968 - ) R
To carry out a smallpox eradication programme.

Togo 4001 (0029)  Development of basic health services
(1968 - ) R UNDP/TA UNICEF
To develop basic health services which can provide support for mass campaigns against communicable diseases; to improve facilities for improving the diagnosis and treatment of malaria; to develop a sanitation programme; and to train personnel.

Togo 4401 (0013)  Development of nursing services
(1963 - ) R
To organize nursing and midwifery education programmes and services.

Togo 6041  Fellowships R: Child health (12 months), dental prosthesis (12 months), entomology (two for four months), epidemiology (10 months), leprosy control (four for two months), medicine (12 months), occupational health (12 months), tropical ophthalmology (four for 11 months).

Uganda 1001 (0036)  Epidemiological services
(1968 - ) R UNDP/TA
To develop epidemiological services to the level required to co-ordinate measures against communicable diseases; to develop vital and health statistics services; and to strengthen health laboratory services.

Uganda 1801 (0041)  Smallpox eradication
(1968 - ) R Special Account for Smallpox Eradication
To complete the attack phase of the smallpox eradication programme, progressively develop epidemiological surveillance, and evaluate the programme.

Uganda 3201 (0028)  Master plans for water supply and sewerage for the Greater Kampala and Jinja areas
(1968 - ) UNDP/SP
To make engineering and feasibility studies required for the preparation of master plans, phased investment studies and a construction programme for water supplies and sewerage for the Greater Kampala and Jinja areas; and to formulate policies on related legal, managerial and financial matters.

Uganda 4001 (0035)  Development of basic health services
(1968 - ) R UNDP/TA UNICEF
To strengthen and expand the basic health services so as to enable them to support mass campaigns against communicable diseases, developing primarily rural health services with emphasis on family health, health education and environmental sanitation in general, as well as on training of personnel.

This project incorporates the former health education project, Uganda 0024.

Uganda 6041  Fellowships R: Hospital and medical care administration (two months), hygiene (12 months), immunology (two months), leprosy control (four months), microbiology (12 months), nursing and nursing administration (six weeks), nursing education (two weeks), occupational therapy (12 months), pharmacology (12 months).

Upper Volta 1201 (0020)  Tuberculosis control
(1968 - ) R UNICEF
To develop a decentralized national tuberculosis programme, beginning in a pilot area, with the setting up of a specialized reference centre for suspected cases and follow-up of patients who have completed their treatment; to establish a simplified recording and reporting system to facilitate continuous evaluation of the programme; and to carry out a country-wide BCG vaccination campaign.

Upper Volta 1801 (0007)  Smallpox eradication (1967 - ) R
To carry out a smallpox eradication programme.

Upper Volta 4001 (0021)  Development of basic health services
(1968 - ) R UNDP/TA Special Account for the Cholera Programme Special Account for Miscellaneous Designated Contributions UNICEF
To develop the health services, with emphasis on maternal and child health, environmental sanitation and staff training; and to extend integrated health services to rural areas by establishing a demonstration and operational research area.

Upper Volta 4401 (0011)  Nursing education
(1968 - ) UNDP/TA
To revise and upgrade programmes for the preparation of nurses and midwives; and to develop practical training facilities in hospitals, maternity units and health centres.

Upper Volta 6041  Fellowships R: Midwifery (19 months).

Zaire 1001 (0016)  Epidemiological services (1968 - ) R
To develop central epidemiological services, including services for the control of tuberculosis, leprosy and trypanosomiasis, and to strengthen health laboratories.

Zaire 1801 (0008)  Smallpox eradication
(1967 - ) R Special Account for Smallpox Eradication
To carry out a smallpox eradication programme combined with BCG immunization, develop epidemiological surveillance, and evaluate the programme. (See para. 15.89.)

Zaire 3001 (0012)  Organization and development of environmental health services (1968 - ) R
To plan and develop environmental health services, train personnel and organize a sanitation programme in which special attention will be given to water supplies and waste disposal.

Zaire 4001 (0014)  Development of basic health services
(1968 - ) R UNDP/TA
To develop the basic health services, including maternal and child health care; to assess the epidemiology of malaria and
organize malaria control measures as required; and to train all categories of personnel in centres and demonstration areas.

Zaire 4002 (0006) Operational services
(1960 - ) Funds-in-trust
To maintain the curative and preventive health services and train personnel.

Zaire 4301 (0015) Medical care services (1968 - ) R
To train hospital personnel, including hospital administrators and radiological assistants, and provide refresher courses.

Zaire 4302 (0022) Health component in Yangambi agronomic centre project (1969 - ) Funds-in-trust
To plan and provide a health service for the staff of the National Institute for Agronomic Studies and the population of the surrounding area, and to train health personnel in preventive and curative medicine.

Zaire 4401 (0011) Development of nursing services
(1968 - ) R
To train nurses and midwives at state-diploma and auxiliary levels and to set up a nursing unit at the Ministry of Public Health; to develop the nursing components of the basic health and maternal and child health services.

Zaire 5601 (0010) Nutrition programme (1968 - ) R
To develop nutrition work within the health services, with emphasis on training in nutrition at all levels.

Zaire 6041 Fellowships R: Microbiology, immunology and serology (12 months), sanitary engineering (four for 12 months).

Zaire 6101 (0018) Medical Training Institute, Kinshasa
(1968 - ) R
To train various categories of health personnel.

Zaire 6201 (0009) Medical schools, Kinshasa and Lubumbashi
(1960 - ) R
To develop the medical schools in the universities of Kinshasa and Lubumbashi.

Zambia 1801 (0013) Smallpox eradication
(1967 - ) R
Special Account for Smallpox Eradication.
To continue the smallpox eradication programme launched in 1965, and to build up an epidemiological surveillance system.

Zambia 4001 (0014) Development of basic health services
(1969 - ) R
To evaluate the health services and bring them to the level required for support of mass campaigns against communicable diseases; to improve facilities for the diagnosis and treatment of malaria, develop the sanitation programme and train health inspectors.

The project incorporates the former public health nursing services project Zambia 4401 (0009).

Zambia 4101 (0017) National health planning
(1969 - ) UNDP/TA
To plan and co-ordinate a national health programme within the framework of the national development plan.

Zambia 5601 (0018) National Food and Nutrition Commission
(1969 - ) UNDP/SF (FAO)
To take measures to improve food consumption patterns in order to raise the nutritional status of the population. FAO is the executing agency for this project, which is assisted by the United Nations Development Programme (Special Fund component).

Zambia 6041 Fellowships R: Leprosy control (two for four months), psychiatric services (11 weeks), public health and social medicine (14 months), urology (12 months).

Zambia 6201 (0010) Medical school, Lusaka
(1968 - ) R
To develop the medical school, Lusaka.

AFRO 1001 (0215) Epidemiological services
(1968 - ) R Special Account for the Cholera Programme
Special Account for Miscellaneous Designated Contributions
To assist countries of the Region in studying local epidemiological problems and to recommend remedial measures.

AFRO 1101 (0125) Consultant services in treponematoses
(1965 - ) UNDP/TA
To assist governments in assessing the public health importance of treponematoses and in evaluating the results of former mass campaigns for the control of treponematoses, especially yaws; to undertake sero-epidemiological studies of endemic diseases by means of random sampling surveys; and to help to train national personnel.

AFRO 1301 (0171) Leprosy consultative services
(1968 - ) UNDP/TA
To assist governments in assessing the leprosy situation in their countries, in planning and implementing leprosy control programmes, in standardizing methods and criteria, and in evaluating the results.

AFRO 1401 Cholera control
(1971 - ) R Special Account for the Cholera Programme
To assist in developing national and regional cholera control programmes.

AFRO 1501 (0162) Plague control
(1968 - ) R
To assist in controlling epidemics of plague in countries of the Region.

AFRO 1601 (0101) Cerebrospinal meningitis control
(1960 - ) R
To assist in controlling epidemics of cerebrospinal meningitis in countries of the Region.

AFRO 1801 (0143) Smallpox eradication
(1965 - ) R Special Account for Smallpox Eradication
To assist in planning and/or carrying out smallpox eradication projects.

AFRO 1901 (0217) Consultant services in virology
(1969 - ) R
To assist governments in carrying out epidemiological surveys as a basis for controlling virus diseases.

AFRO 2001 (0156) Malaria training of public health personnel
(1964 - ) R
To enable senior health personnel to study methods employed, in the countries of the Region, for the development of basic health services for the support of mass campaigns against communicable diseases.

AFRO 2002 (0204) Consultant services in malaria
(1967 - ) R
To provide for the assessment of the malaria situation in the countries of the Region, and to assist in the planning, implementation and evaluation of antimalaria activities feasible under local conditions.
AFRO 2101 (0094) Consultant services in schistosomiasis (1967 - ) R
To assist in assessing the schistosomiasis problem in various countries, in studying the epidemiological pattern of the disease and in evolving suitable control methods; also to carry out surveys on health problems resulting from the development of power or irrigation schemes.

AFRO 2201 (0131) Onchocerciasis consultative services (1966 - ) UNDP/TA
To assist governments in assessing the problem of onchocerciasis and in drawing up control programmes.

AFRO 2202 Control of onchocerciasis in the Volta River Basin (Preparatory Assistance to Governments Mission) (1971 - ) UNDP/TA
To provide preparatory assistance to the governments concerned, to collect and analyse essential data and to establish a work plan for the control of onchocerciasis in the Volta River Basin.

AFRO 2901 and 2902 (0053) Epidemiological surveillance centres, Nairobi and Abidjan (1960 - ) R
To assist in the technical planning and organization of epidemiological investigations and to analyse and follow up epidemiological and statistical data received from countries of the Region.

AFRO 3202 (0219) Water supply and sewerage consultative services (1969 - ) R
To assist governments in carrying out studies on water supply and sewerage programmes and to provide for the planning, organization, implementation and assessment of such programmes in the Region.

AFRO 3203 (0240) Seminar on Community Water Supply, Brazzaville (21-27 April 1971) R
The purpose of the seminar was to promote the planning and implementation of community water supply programmes in countries of the Region and to formulate guidelines for their development. (See para. 15.95.)
WHO provided two consultants and two temporary advisers and met the cost of attendance of 27 participants from Botswana, Cameroon, Central African Republic, Chad, Congo, Dahomey, Gabon, Ghana, Guinea, Kenya, Liberia, Madagascar, Mali, Mauritius, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Swaziland, Togo, Uganda, Upper Volta and Zaire.

AFRO 4107 (0056) Consultant services in health legislation (1971 - ) R
To meet requests from governments for assistance in health legislation.

AFRO 4201 (0232) Seminar on the Development of Health Laboratory Services, Brazzaville (21 - 27 July 1971) R
The purpose of the seminar was to review the situation as regards laboratory services in the Region, with a view to improving the use made of them, and to consider long-term planning for their development. The organization and administration of the services were discussed, as well as the work in the control and epidemiological surveillance of communicable diseases. Group sessions were held in which proposals for the planning, organization and administration of health laboratory services in a fictitious African country were formulated.
WHO provided the services of two consultants and two temporary advisers and met the cost of 19 participants from Cameroon, Central African Republic, Congo, Dahomey, Gambia, Ghana, Ivory Coast, Liberia, Madagascar, Mali, Mauritius, Nigeria, Senegal, Sierra Leone, Togo, Uganda and Zaire.

AFRO 4202 (0249) Health laboratory consultative services (1971 - ) R
To assist governments in developing and strengthening health laboratory services, including blood banks.

AFRO 4301 (0023) Centre for training technicians in the repair and maintenance of medical equipment (1970 - ) R
To assist in training technicians for the installation, maintenance and repair of X-ray apparatus and other electromedical equipment.

AFRO 4401 (0087) Centre for post-basic nursing education, University of Ibadan (1962 - ) R UNICEF
To develop the Department of Nursing at the University of Ibadan as a regional centre for preparing nurses of a high educational level to provide professional guidance in the improvement and extension of nursing services and education.

AFRO 4402 and 4404 (0097) Centres for post-basic nursing education, west and east-central Africa (1971 - ) R
To assist in establishing centres which will provide facilities for post-basic education in all fields of nursing for French-speaking nurses and midwives from African countries.

AFRO 4501 (00236) Consultant services in health education (1971 - ) R
To assist in evaluating and strengthening the health education services in the countries of the Region.

AFRO 4502 (0038) Seminar on the Evaluation of Health Education Programmes, Brazzaville (9 - 17 June 1971) R
The purpose of the seminar was to assess the impact of health education programmes on the attitude of communities to health problems. The health education situation in the Region was analysed and it was recognized that the shortage of qualified personnel was a major handicap. Health education methods and principles, criteria for planning of health education activities and methods of appraisal of existing situations were discussed and educational objectives were defined. There were 23 participants from Cameroon, Central African Republic, Congo, Dahomey, Gabon, Ghana, Ivory Coast, Kenya, Lesotho, Liberia, Madagascar, Mali, Mauritius, Nigeria, Senegal, Sierra Leone, Swaziland, Togo, Uganda, United Republic of Tanzania, Zaire and Zambia, and three observers from the All
AFRO 4901 (0174) Training in health statistics (1965 - ) R
To assist with courses for training middle-grade and clerical personnel in vital and health statistics at the Statistics Training Institute in Yaoundé, the East African Statistical Training Centre in Dar es Salaam and the School of Statistics in Abidjan.

AFRO 4902 (0224) Vital and health statistics (1970 - ) R
To assist governments in planning the development of vital and health statistical services, in establishing working methods for epidemiological research and in training health statistics personnel.

The Commission, jointly sponsored by FAO, WHO and the Scientific, Technical and Research Commission of the Organization of African Unity, facilitates contacts between specialists interested in nutrition problems in Africa. The Commission is also responsible for the preparation and distribution in two languages of material on all nutrition work in Africa.

AFRO 5602 (0167) Consultative services in nutrition (1965 - ) R
To assist with and advise on the development of nutrition work in national public health services; to organize nutrition units, train local staff and develop nutrition education and nutrition rehabilitation programmes.

AFRO 6041 Fellowships R: Medicine (two for 12 months).

AFRO 6101 (0234) Seminar on Auxiliary Health Personnel, Brazzaville (6-13 Oct. 1971) R
The purpose of the seminar was to define and work out solutions to the problems hampering the rational use of auxiliary health personnel in countries of the Region. There were 18 participants—administrators or directors of schools for the training of health auxiliaries—from Cameroon, Congo, Ghana, Kenya, Lesotho, Liberia, Madagascar, Mali, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Swaziland, Togo, Uganda, United Republic of Tanzania, Zaire and Zambia. After defining the term "health auxiliary", they made an analysis of the present position as regards the training and use of this type of personnel and considered what could be done in order to secure better results.

WHO provided two consultants and met the cost of attendance of the participants.

AFRO 6201 (0211) Workshops on medical education methodology (1969 - ) R
To enable medical school teachers to study teaching methods and to acquaint themselves with new educational techniques.

AFRO 6203 (0213) Staff exchanges between medical schools of the African Region (1968 - ) R
To provide the opportunity for interchange of views and experience amongst teachers in medical schools in the Region.

AFRO 6204 (0222) Medical school, Makerere University, Kampala, Uganda (1968 - ) R
To assist the medical school of Makerere University.

AFRO 6205 (0227) Schools of medicine and other teaching institutions in the health sciences (1968 - ) R
To assist in providing health teaching institutions with educational material, textbooks, and laboratory equipment.

AFRO 6401 (0105) Training centre for health service personnel (English language), Lagos (1961 - ) R
AFRO 6402 (0128) Training centre for health service personnel (French language), Lomé (1962 - ) R
To organize special courses for various categories of public health workers required for the development of basic health services, particularly in the countries of the Region, and to provide training in malarial and antimalaria measures and techniques.

AFRO 6404 (0237) Consultant group on the teaching of public health (1971 - ) R
To evaluate the present status of public health teaching in Africa and formulate recommendations for its improvement.

AFRO 6405 (0239) Departments, institutes and schools of public health (1971 - ) R
To assist in establishing and developing departments, institutes and schools of public health which will train the staff needed for the extension of health services.

AFRO 7401 (0225) Consultant services in pharmacology and toxicology (1969 - ) R
To study the scope of activities in quality control of pharmaceuticals and advise on the development of suitable control laboratory facilities on a regional basis.
REGION OF THE AMERICAS

Argentina 0200 Malaria eradication programme
(1951 - ) PAHO
To eradicate malaria from the country by stages.

Argentina 0300 Smallpox eradication (1967 - 1973) R
To eradicate smallpox from the country through vaccination of 90% of the population over a period of five years and to organize epidemiological and supporting services.

Argentina 0700 Pan American Zoonoses Centre
(1967 - 1971) UNDP/SF PAHO
The purpose was to strengthen the Pan American Zoonoses Centre and expand its technical facilities in order to provide improved advisory services, training and research in diseases of humans and animals (particularly rabies, hydatidosis, tuberculosis and brucellosis) and in food hygiene and microbiology. The Organization provided a project manager, three veterinarians, two epidemiologists, five scientists, one serologist/immunologist, three consultants, advisory services by regional headquarters staff and staff of the inter-zone Pan American Zoonoses Centre project AMRO 0700 (under which the Centre began to function in 1956), fellowships, and supplies and equipment.

Rabies is the most important of the zoonoses in Latin America. The Centre assisted in a dog vaccination programme in the Federal District of and in greater Buenos Aires, and advice was given on cattle vaccination in the northern provinces. Assistance was also given, particularly in Santiago del Estero Province, in the control of the vampire bats that propagate bovine rabies, and studies of vampire bat ecology in five northern provinces were carried out in collaboration with the Secretariat of State for Agriculture and Livestock. The Centre drew up guidelines on human post-exposure immunization, recommending the use of vaccine prepared in suckling mouse brain and comparing subcutaneous and intramuscular administration; investigated the cause of neuromuscular accidents in cases under treatment; assisted in the evaluation of different vaccines and in vaccine production; and conducted applied research to reduce the antibody test time.

Work on hydatidosis took the form of investigations on immunological and mass radiological surveying techniques, studies of the epidemiology of human infection in Chubut and Rio Negro Provinces, and a pilot control project in Neuquén Province. Serological techniques were taught to project staff and applied extensively in areas where the disease is endemic. Research was carried out to improve diagnostic antigens and develop criteria for their use in cases of human and animal infection, and to find drugs effective against Echinococcus granulosus in dogs.

Studies on tuberculosis were directed at determining the distribution of mycobacterial species in swine in Argentina and at finding the best culture methods for isolation of the organisms from raw and pasteurized milk.

Trials were conducted on vaccination methods against brucellosis in cattle, goats and swine, and by 1969 it had been found possible under test conditions to reduce the prevalence of the disease in cattle to 1% using Brucella abortus strain 19 vaccine. Research on brucellosis also included efforts to determine the efficacy of a vaccine for female goats of reproductive age, to develop a rapid diagnostic test for Brucella ovis infection, and to standardize diagnostic antigens used in suspected cases of Brucella melitensis infection.

Leptospirosis studies covered the prevalence of the disease in domestic animals, leptospirosis surveillance procedures in armadillos, and infection in swine in the slaughterhouses of Buenos Aires.

The slaughterhouses were the subject of a food hygiene and microbiology study carried out in collaboration with the United States Food and Drug Administration on transferable drug resistance in enterobacteria isolated from cattle, horses and abattoir workers. The epidemiology of salmonelloses and other diseases contracted from horse meat, and microbiological contamination of water, milk, seafood and meat (including meat for export) were also investigated.

In addition to its work on the typing of strains of various mycobacteria, the control and standardization of vaccines and biological reagents and the provision of reference biologicals, the Centre supplies vaccines, tissue-culture cells, and laboratory animals. It has trained public health officers from Argentina and other countries in zoonoses control and laboratory techniques — in 1967, in particular — and its staff have conducted or assisted in several national courses, including those on rabies and immunofluorescence techniques sponsored by the Organization in Buenos Aires, Córdoba and Tucumán in 1969 and several international courses and seminars. In 1970, staff of the Centre participated in 15 national and international technical meetings. A quarterly information bulletin, Zoonoses, is published, and several technical papers have been written by staff of the Centre.

As the result of this UNDP-supported project the centre has been supplied with modern laboratory, field and teaching equipment and its staff has more than doubled. It has been able to undertake extensive training, research and information programmes, and to increase fourfold the technical assistance that it provides to countries of the Region. A UNDP mission visited the centre in 1971 to make an evaluation of the project. Among its recommendations was one that proposals for a second phase, as a regional project, should be accepted.

Argentina 0701 Bovine rabies control
(1965 - ) Grant to PAHO: Government of Argentina
To evaluate the vaccines used for the control of bovine rabies and conduct studies on new vaccines.

Argentina 2100 Engineering and environmental sciences
(1967 - ) PAHO
To strengthen the sanitation services and increase the number of available qualified personnel at the professional, technical and auxiliary levels.

Argentina 2200 Water supplies (1960 - ) R
To prepare and implement plans for the construction and expansion of water supply and sewerage systems.

Argentina 3100 Health services (1966 - ) R PAHO
To improve the health services. Under this project assistance is provided to the Ministry of Welfare and Public Health in health planning, the supervision and evaluation of programmes, training and research.
Argentina 3101 Fellowships R: Immunology (two for four months), nutrition (three for 11 months), nutrition teaching (five and a quarter months), radiation protection (three months); PAHO: Epidemiology (three weeks), health statistics (seven weeks).

Argentina 3400 Health education planning (1970 - 1971) UNDP/TA

The purpose was to study the programme of health instruction in primary and secondary schools, the training of school-teachers for health education, and co-ordination in this field between the ministries of education and health. The Organization provided three consultants and the advisory services of staff members.

The establishment of a Health Education Department in the Secretariat of State for Public Health, and of a National Joint Advisory Commission on Health Education to co-ordinate the work of the education and health commissions existing in all provinces except Jujuy, provided a good basis for the project. A survey of knowledge, practices, opinions and attitudes among nearly 25,000 parents, teachers and children was carried out in eight provinces and greater Buenos Aires, and the findings served in the preparation of curricula for schools. Three workshops were held in La Plata, Córdoba and Santa Fe for members of the provincial commissions; 90 school superintendents, principals, teachers and health workers took part. This was the first step towards a review of health education programmes in schools and in teacher-training establishments, placing emphasis on community motivation and participation in health protection. The co-ordination of health education at primary and secondary level was planned and curriculum material prepared in order to facilitate the supervisory role of the Joint Advisory Commission.

Research on special problems affecting adolescents was carried out in two high schools in Buenos Aires with the Rawson Hospital youth centre in 1971.

Argentina 3500 Health statistics (1960 - 1973) PAHO

To improve and modernize the vital and health statistics systems and train statistical personnel.

Argentina 3504 Data processing centre (1968 - 1973) R UNDP/SF

To develop a data processing centre for collecting and processing data in the health field, effectively using computers existing in the various health agencies, training personnel in systems analysis, programming and general administration of computer systems, and carrying out research on the use of computers in the health sciences.

Argentina 4203 Nutrition studies (1971 - ) UNDP/TA

To study the extent of malnutrition, including mineral and vitamin deficiencies, and associated parasitoses, in the province of San Juan and in Buenos Aires.

Argentina 4300 Mental health (1966 - ) PAHO

To establish and implement a national programme in social psychiatry within the National Institute of Mental Health; and to plan and develop community mental health work.

Argentina 4500 Radiation protection (1967 - ) PAHO

To develop radiation protection services in hospitals and other institutions and to train personnel for these services.

Argentina 4803 Latin American Centre for Medical Administration (1967 - ) R PAHO Grants to PAHO: Government of Argentina Pan American Health and Education Foundation

To develop the Latin American Centre for Medical Administration that was set up in 1967 to study national problems in the provision and administration of medical care services, train personnel for technical and administrative posts in hospitals and other health institutions, and serve as a Latin American centre for operational research in the management of medical services and for training in medical administration.

Argentina 4804 Hospital maintenance (1971 - ) UNDP/TA

To train personnel for the establishment of hospital maintenance programmes.

Argentina 5000 Rehabilitation (1966 - 1971) UNDP/TA

The aim was to train instructors, technicians and highly skilled operators in orthotics and prosthetics and to organize a department of research for the production, from locally available materials, of orthopaedic and prosthetic devices suited to local conditions. The Organization provided a prosthetics and orthotics technician, advisory services by staff assigned to the inter-zone project AMRO 5000, fellowships, and supplies and equipment.

The extension of the School of Prosthetics and Orthotics was completed; all its departments, workshops and classrooms were fully equipped and the stockrooms were reorganized. In 1968 six rehabilitation technicians and six equipment operators graduated. In 1969, 13 technicians, there orthotics and prosthetics operators and two orthopaedic footwear specialists completed their studies. In 1970, 11 students finished their final year. Five instructors who had completed the school's course in teaching methods started work there in 1969.

Argentina 6100 School of public health (1958 - ) R

To strengthen the School of Public Health of the University of Buenos Aires, in order to enable it to prepare professional and auxiliary health workers for the country's developing health programmes.

Argentina 6200 Medical education (1958 - 1972) R

To improve the teaching in the schools of medicine.

Argentina 6201 Health manpower study (1968 - 1973) R

To make a study of health manpower requirements and the means of meeting them; and to collect data to enable the medical education and health personnel training programmes to be reoriented.

Argentina 6202 Centre for Biostatistics and Demography (1968 - 1973) PAHO

To develop the Centre for Biostatistics and Demography that was set up in 1969 in the Faculty of Medical Sciences of the University of Buenos Aires.

Argentina 6203 Faculty training programme (1971 - ) R

To improve teaching methods, curriculum design and general planning of teaching in the schools of health sciences.

Argentina 6400 Sanitary engineering education (1960 - 1975) PAHO

To strengthen the teaching at the Institute of Sanitary Engineering of the University of Buenos Aires.
Argentina 6700  Training of statistical personnel
(1965 - 1973) PAHO
To train statistical personnel for work in local and regional health statistics offices and departments of statistics, and for hospital and medical records.

Barbados 2100  Engineering and environmental sciences
(1970 - 1973) PAHO
To determine the magnitude of the problems in all fields of environmental sanitation, including water supply and sewerage, and to take measures for dealing with them in the order of their urgency.

Barbados 2201  Water supply and sewerage services administration
(1971 - ) PAHO Community Water Supply Fund
To improve the administration and management of water supply and sewerage services.

Barbados 2300  Aedes aegypti eradication (1968 - 1971) R PAHO
To eradicate Aedes aegypti.
This project continues assistance with Aedes aegypti eradication previously provided under the inter-country project AMRO 2300.

Barbados 3100  Health services (1968 - ) PAHO
To improve, expand and integrate the curative and preventive health services and to train health personnel.

Barbados 3300  Laboratory services (1970 - ) PAHO
To train laboratory technicians, as part of a programme for improving and expanding the laboratory services.

Barbados 4801  Hospital administration
(1965 - 1972) UNDP/TA PAHO
To organize and operate the Queen Elizabeth Hospital as the central medical care institution of Barbados and as a teaching hospital for the University of the West Indies.

Bolivia 0100  Epidemiology (1968 - 1973) UNDP/TA PAHO
To determine the prevalence and characteristics of the communicable diseases in the country, and to undertake measures for their control.

Bolivia 0200  Malaria eradication programme
(1957 - ) PAHO
To eradicate malaria from the country.

Bolivia 0300  Smallpox eradication (1962 - 1973) R
To carry out a programme of combined smallpox and BCG vaccination which started in 1969 and which is aimed at covering 2,170,000 people in five years.

Bolivia 0400  Tuberculosis control (1963 - 1973) PAHO
To organize the available resources for the application of tuberculosis control procedures, with a view to using them better and obtaining a maximum yield from them; and to incorporate tuberculosis control work into the regular work of the local health services.

Bolivia 0901  Typhus (1968 - ) PAHO
In preparation for a typhus control programme, to make a serological survey of a representative sample of the rural population in the affected areas and to carry out trial vaccinations in a population group.

Bolivia 2100  Engineering and environmental sciences
(1969 - ) PAHO
To improve the environmental health and sanitation levels of the urban and rural population.

Bolivia 2201  Water supply and sewerage services administration
(1971 - 1972) PAHO Community Water Supply Fund (Inter-American Development Bank)
To improve the administration and management of water supply and sewerage for communities served by the Bolivian Water Corporation.

Bolivia 3100  Health services (1955 - 1975) R UNDP/TA PAHO
To improve the national health services at the central and local levels; and to train professional and auxiliary personnel.

Bolivia 3102  Fellowships R: Sanitary engineering (one for nine months, one for 12 months), water supply systems (two for two months).

Bolivia 3104  Extension of local health services
(1966 - ) UNDP/TA UNICEF
To develop the health services in several departments.

Bolivia 3500  Health statistics (1968 - 1973) UNDP/TA
To reorganize biostatistical services at the national and local levels and train hospital statistical clerks.

Bolivia 4200  Nutrition (1971 - ) PAHO
To reduce the prevalence of protein-calorie malnutrition, endemic goitre, and other nutritional deficiency diseases by strengthening the nutrition services, training specialized personnel, and developing nutrition education and supplementary feeding programmes.

Bolivia 4600  Occupational health (1971 - 1974) UNDP/TA
To expand the industrial hygiene programme in order to reduce mortality, morbidity, and economic losses due to occupational diseases and accidents in mining areas.

Bolivia 6200  Medical education (1968 - ) R
To revise the programme of the three medical schools and incorporate concepts of social and preventive medicine into the curricula.

Bolivia 6400  Sanitary engineering education (1964 - ) PAHO
To strengthen the teaching in the schools of engineering in order to increase the number and improve the training of professional and auxiliary sanitary engineering personnel.

Bolivia 6500  Veterinary medical education (1967 - 1973) R
To improve the teaching at the school of veterinary medicine of the University of Santa Cruz de la Sierra.

Bolivia 6600  Dental education (1968 - 1973) R
To reorganize the curriculum of the schools of dentistry of La Paz, Tarija, and Sucre.

Brazil 0100  Epidemiology (1969 - 1972) PAHO
To organize an agency for the co-ordination, registration and analysis of epidemiological information and to establish a system for surveillance of communicable diseases.
The project incorporates the former projects Brazil 1000 (Schistosomiasis) and 1001 (Chagas' disease).
Another sampling station participates in the work of the Pan Inter-Municipal Commission for Air and Water Pollution in an industrial area of 680 square kilometres, established an advisory services of staff members, supplies and equipment, Organization provided a sanitary engineer, two consultants, control of air and water pollution in the State of São Paulo, Brazil.

The municipalities of Santo André, São Bernando, São Caitano and Mauá, which have a total population of a million and three fellowships. To establish and operates 40 air sampling stations. Another sampling station participates in the work of the Pan American Air Pollution Sampling Network. The State of São Paulo enacted new air and water pollution legislation and provided new laboratories for water pollution control tests. More than 100 of the 2500 industrial establishments in the area have been required to undertake measures to reduce air pollution and are kept under observation.

The consultant assigned to the Commission in 1970 also assisted in the preparation of a request for support from the Special Fund component of the United Nations Development Programme. This request has been approved and the project, which is the first of its kind in the Region, has been incorporated in the environmental pollution control project Brazil 2103.


The Organization provided consultants, one in 1969 and one in 1970, to study the health aspects of the river basin development project assisted by the United Nations Development Programme with FAO as the executing agency; to investigate the effects of implementation of the planned irrigation schemes on health conditions in the Basin; and to assess the incidence of diseases that could be affected by the resulting ecological changes, particularly schistosomiasis.

In 1970, on completion of the investigations, consultants carried out a study with a view to the execution of a shistosomiasis control programme in the River Basin area, and the relevant reports were submitted to the authorities in charge of the survey.

Brazil 2103 Environmental pollution control, São Paulo State (1971 - 1974) UNDP/SF

To develop an environmental pollution control programme (covering air, water, and soil pollution) for São Paulo State.

Brazil 2200 Water supplies (1962 - 1973) R (Inter-American Development Bank)

To intensify the development of water and sewerage services in urban and rural areas.

Brazil 2201 Water supplies, São Paulo (1969 - 1974) PAHO Community Water Supply Fund

To strengthen the management of the São Paulo water and sewerage authority.

Brazil 2202 Water supplies, Belo Horizonte (1970 - ) PAHO Community Water Supply Fund

To improve the organization and administration of the Belo Horizonte water and sewerage department.

Brazil 3100 General health services (1971 - ) PAHO

To develop the health infrastructures for the provision of integrated medical services and the preservation and improvement of the environment.

Brazil 3101 Health services in states and territories (1958 - 1973) R PAHO UNICEF

To establish, for the states in the north-east, a general programme into which can be integrated programmes of health, basic sanitation, training of personnel and development of biomedical research, whilst permitting the operation of specific programmes in individual states or institutions.

Brazil 3108 Health services in rural areas (1969 - ) R UNICEF (FAO)

To extend health and nutrition services to the rural population.
Brazil 3109  Health services, Amazon Basin (1971 - ) PAHO
To implement the health plan forming part of the integration project for the Amazon region.

Brazil 3110  Health services, south-eastern states (1968 - 1973) R PAHO
To improve and expand the health services in the states of Paraná, Rio Grande do Sul and Santa Catarina, as part of the process of socio-economic development.

Brazil 3302  Yellow fever laboratory (1950 - 1973) PAHO
To support the continent-wide campaign against yellow fever by providing laboratory diagnostic services and supplying yellow fever vaccine.

Brazil 3400  Health education (1968 - ) R
To develop well-planned and organized health education services as essential elements of federal and state health programmes; and to improve and extend health education training for all categories of health personnel.

Brazil 3500  Health statistics (1963 - 1973) R
To improve the vital and health statistics services, especially those related to the notification of communicable diseases; and to train personnel in vital and health statistics and in medical records and hospital statistics.

Brazil 3701  Planning for health services, north-eastern states (1958 - ) UNDP/TA
To strengthen health planning and administration in the states of the north-east, and to train officials in the techniques of planning and administration of services.

Brazil 4100  Training centre in nursing and midwifery (1967 - 1970) R PAHO
The purpose was to establish an international nursing and midwifery training centre under the Ana Neri School of Nursing of the University of Brazil. The Organization provided an adviser in nursing education in 1968 and 1969, an adviser in nursing services in 1969 and 1970, and four short-term consultants; advisory services by zone office staff members; and those of the inter-zone nursing and midwifery project AMRO 4109; two grants, one in 1968 and one in 1969, four fellowships, and supplies and equipment for three seminars.

The programme of studies was prepared and courses in clinical subjects started in 1968. A revised curriculum was elaborated for the Maternal and Child Health Department set up in the School of Nursing. A total of 195 nurses and 40 midwives attended refresher courses and seminars between 1968 and 1970, most of them operational staff who were later assigned to the north-east, south and central-west regions and the State of Guanabara, where they helped to introduce measures for improved teaching and nursing care in maternal and child health and midwifery departments and schools of nursing. In 1971, 10 nurses and eight midwives received teacher training.

It did not prove possible to develop the centre's activities on an international scale as originally planned and the project was terminated in 1970.

Brazil 4101  Maternal and child health (1971 - ) R
To improve the planning of maternal and child health programmes and train personnel, particularly nurses and nurse/midwives, in maternal and child health care.

Brazil 4203  Institute of Nutrition, Recife (1964 - 1973) PAHO
To strengthen the structure and activities of the Institute of Nutrition of the Federal University of Pernambuco (formerly the University of Recife), to enable it to contribute more effectively to the solution of regional nutrition problems.

Brazil 4300  Mental health (1966 - ) PAHO
To reorganize mental health services, establish national and state programmes for the improvement of mental health care, and train personnel.

Brazil 4500  Radiation protection (1971 - ) R
To improve protection against ionizing radiation in hospitals and other health establishments.

Brazil 4602  Toxicology of pesticides (1968 - ) UNDP/FAO
To expand the pesticide work of the Biological Institute of São Paulo. The Organization helps with the mammalian toxicology aspects of this project, which is assisted by the United Nations Development Programme (Special Fund component), with FAO as the executing agency.

Brazil 4800  Medical care services (1966 - 1973) R PAHO
To plan and organize medical care services, integrating as far as possible the services provided by the general health programmes, social security agencies and social welfare institutions, and to train personnel.

Brazil 4804  Cancer control (1971 - ) PAHO
To establish centres for teaching uterine exfoliative cytology, increase facilities for training radiotherapists, radiophysicists, and radiotherapy technicians, and train professional and technical personnel in cancer registration practices.

Brazil 6100  School of public health, Rio de Janeiro (1957 - 1971) PAHO
The purpose was to improve the training given by the School of Public Health by engaging full-time teaching staff, creating better practice areas and reorganizing the laboratory and library services. The Organization provided a consultant, laboratory equipment and supplies, reference books and subscriptions to technical journals, advisory services by staff members, and two fellowships for teaching staff.

For the first two years a visiting professor advised on the organization of the School. In 1959 a decree established the National School of Public Health in Rio de Janeiro and the School was attached to the Health Manpower Foundation, which in 1970, under the new name of President Castello Branco Institute, became part of the Oswaldo Cruz Institute. A plan for the study of health manpower and medical education was designed, and a study of the conditions and needs of the public health schools of Curitiba, Belo Horizonte, Porto Alegre and Salvador was conducted, ending in 1969. Courses were given in general public health, public health engineering, health planning, health statistics, phthisiology, virology, malaria entomology and biological research, and in 1971 the curriculum was prepared for a course in public health dentistry. In 1969 the School received assistance in revising its instruction in health education and behavioural sciences in the course leading to the Master's degree in public health. Preparatory work was undertaken with a view to co-ordinating programmes in the various schools and establishing a national public health training policy.

Brazil 6102  Development of human resources (1971 - ) R PAHO
To increase the number and improve the quality of health personnel, collect data on the supply of and demand for health personnel, and formulate and implement a plan for the development of human resources for health services.
Brazil 6200 Medical education (1965 - 1974) R

To strengthen medical education in the country, particularly as regards the teaching of preventive and social medicine.

Brazil 6202 Paediatric education, Recife
(1963 - 1970) PAHO UNICEF

The purpose was to improve the teaching of paediatrics in the School of Medicine of the University of Pernambuco (formerly the University of Recife) and provide training in paediatrics, outside the regular medical courses, for professional and auxiliary personnel. The Organization provided two medical officers, three consultants and a grant.

Teaching of paediatrics and preventive medicine was integrated and courses and seminars were organized for 212 physicians, 43 nutritionists, 40 nurses, 80 nursing auxiliaries and 404 third, fourth and fifth year medical students and interns. Eighteen students followed a residency programme.

The Institute of Paediatric Medicine in Pernambuco was reorganized; outpatient services were expanded and 20 beds were put into service for paediatric surgery. The teaching programmes of the Pernambuco paediatric department were co-ordinated with the programmes of the state Ministry of Health, the Brazilian Welfare Association and the National Social Assistance Institute.

Brazil 6203 Research training (1965 - 1970) PAHO

The aim was to develop training, teacher training and research in microbiology, using the facilities of the Institute of Microbiology of Rio de Janeiro. The Organization provided advisory services, six grants and supplies and equipment to the Institute.

Specialized training was given to 57 Brazilian doctors and other health workers, and to doctors from Argentina, Bolivia, El Salvador, Guatemala (one each) and Peru (two). Fellowships were awarded in connexion with this project to candidates from Argentina, Chile, Colombia, Ecuador, El Salvador, Mexico, Paraguay, Peru and Uruguay.

Brazil 6302 Training of nursing auxiliaries
(1963 - 1973) PAHO UNICEF

To increase the number and improve the quality of the training of nursing auxiliaries.

Brazil 6400 Institute of Sanitary Engineering, Rio de Janeiro
(1964 - 1971) UNDP/SF

The purpose was to develop the Institute of Sanitary Engineering, strengthen its field and laboratory work and research in the monitoring of environmental pollution, and assist in arranging courses for sanitary engineers and other sanitation personnel. The Organization provided a sanitary engineer, 19 consultants, technical advisory services by staff members, 15 fellowships and supplies and equipment.

The Institute, which occupies part of the premises of the State University of Guanabara, has a staff of about 170, with 37 professionals, 15 of whom were the recipients of fellowships for studies abroad. Ten of the 22 technicians were transferred from the Sewerage Department Laboratory and equipment was taken over from the Superintendency of Urban Development and Sanitation of the State of Guanabara. Research was carried out on environmental pollutants, sewerage systems and water treatment and supply services, and advisory services were extended to city services and a number of public and private agencies in Guanabara and other states and the federal district of Brasilia. Studies on pollution of Guanabara Bay and of fresh water bodies in the state are to serve as a basis for control programmes. Analyses were made of water from the Rio de Janeiro distribution system, and air samples taken by 21 stations in the city's metropolitan area were also analysed with the co-operation of the national Atomic Energy Commission. The Institute organized 50 courses and seminars, half of them for professional sanitary personnel, and a total of over 1300 participants attended. The major subject was water treatment, and new methods were demonstrated whereby low-cost transformations of treatment plants could be effected to increase their capacity. Subsequent to one such course, it was estimated that the capacity of the principal plant in Rio de Janeiro could be doubled at a fraction of the cost of construction of a new plant. Two courses were organized for students of the School of Engineering of the University of Guanabara, for which the Institute also provides teaching staff.

Brazil 6700 Demographic and population dynamics
(1966 - ) PAHO Special Fund for Health Promotion

To develop research and teaching, at the School of Hygiene and Public Health of the University of São Paulo, regarding the relationships between health and the distribution, growth, structure, and natural dynamics of populations in the process of economic and social development.

British Honduras 0200 Malaria eradication programme
(1956 - 1974) PAHO UNICEF

To eradicate malaria from the country.

British Honduras 2100 Engineering and environmental sciences
(1971 - 1974) PAHO

To develop a national programme of environmental sanitation, including the provision of water supply and sewerage services to urban and rural communities.

British Honduras 3100 Health services
(1962 - 1973) R PAHO UNICEF

To reorganize, expand and improve the general health services, including environmental sanitation services, and to strengthen statistical services.

British Honduras 6400 Sanitary engineering education
(1966 - ) PAHO

To develop short courses in sanitary engineering and environmental sanitation subjects.

Canada 3101 Fellowships R: Public health administration (nine months), public health education (one month).

Chile 0400 Tuberculosis control (1964 - ) PAHO

To develop a tuberculosis programme throughout the country as part of the general health services.

Chile 0600 Venereal disease control (1965 - 1973) R

To control venereal diseases in five provinces and establish a demonstration area for the training in control techniques of health personnel from Chile and other countries.

Chile 0700 Veterinary public health (1971 - 1973) PAHO

To reduce the number of human cases of hydatidosis, trichinosis, anthrax, and brucellosis and control these zoonoses in the animal populations that are sources of infection; and to eradicate canine rabies.

Chile 2100 Engineering and environmental sciences
(1968 - 1973) R

To improve general environmental sanitation conditions and to train professional and auxiliary personnel.
Chile 2200  Water supplies (1970 -  ) PAHO
To plan, organize and implement national programmes for the construction or expansion of public water supply and sewerage systems in urban and rural areas, including the extension of the water supply system of the Santiago metropolitan area.

Chile 3100  Health services
(1961 - ) UNDP/TA PAHO  Grant to PAHO: Organization of American States
To implement the 10-year health plan, improve the organization and administration of the health services, train staff, and carry out research on the epidemiological, social and administrative factors related to health problems and studies of investment for all types of health establishment.

Chile 3101  Fellowships R: Medical librarianship (two months), mycology (nine and a half months).

Chile 3105  Health manpower studies (1968 - ) PAHO
To make a study of health manpower requirements, of health manpower performance in programmes for the expansion of services provided for in the national health plan, and of the relationship between the health manpower needs and the financial situation of the health services in the public sector, with the aim of increasing productivity of the available resources.

Chile 3106  Rural development
(1970 - ) PAHO UNICEF (UN) (FAO) (ILO) (UNESCO)
To improve the health conditions in the central regions of the Provinces of Valdivia and Osorno by stimulating the communities to participate in an integrated health programme as part of the national socio-economic development programme.

Chile 3200  Nursing services (1960 - 1970) R
The purpose was to improve the quality of nursing care given by the health services, and to train professional and auxiliary personnel in basic and advanced (including in-service) courses. The Organization provided a nurse from 1960 to 1965, six consultants between 1963 and 1970, advisory services by staff of the Zone VI nursing project AMRO 3206, small amounts of supplies and, from 1965, five fellowships.

An initial survey of resources and needs in nursing services was made, the results of which were published and served as a basis for the planning of a nursing programme. The number of schools of nursing in Chile was increased from five with 350 students to 10 with 1600 (in 1970 the three schools of the national health service became attached to universities). The number of centres for the training of auxiliaries rose from six, with an output of 300, to 25 with an output of almost 1000, and a total of 8345 nursing auxiliaries were trained. In addition 184 Chilean nurses, together with many from other Latin American countries, completed the course on administration of nursing services held at the School of Public Health of the University of Chile. By 1970 the Chilean graduates of this course held 90% of the responsible positions in the nursing services. In 1965 a course in health education was started in order to train instructors for the schools of nursing and obstetrics. By 1969, 51 nurse educators had completed the course.

Other activities were the establishment of an experimental centre in a 100-bed hospital to study patient-care aspects of hospital nursing; short courses for graduates on teaching methods, manpower requirements, psychological and anthropological studies, and nursing supervision conducted by the School of Nursing of the University of Chile; in-service training for intermediate nursing staff and continuing education programmes for 60% of such staff; and 13 seminars and three technical meetings.

Chile 3300  Laboratory services (1969 - ) R PAHO
To reorganize the Institute of Bacteriology and develop a network of laboratories at the various levels of the country's health organization.

Chile 4100  Maternal and child health (1967 - 1973) PAHO
To develop a programme of training and research on biological and social aspects of human reproduction and child growth and development; and to improve maternal and child health care.

Chile 4103  Clinical and social paediatrics courses
(1967 - 1973) R
To provide intensive training in clinical paediatrics and in the administration of health services for infants and children.

Chile 4200  Nutrition (1968; 1971 - ) PAHO
To develop and implement plans for initiating or strengthening nutrition programmes and to incorporate nutrition work into local health services.

Chile 4201  Training in nutrition and human growth and development
To train research workers of Latin American countries in nutrition and human growth and development.

Chile 4300  Mental health (1965 - 1973) R PAHO
To develop community mental health techniques in a health district of Santiago, with a view to their subsequent application in the rest of the country, and to conduct epidemiological studies on mental disorders.

Chile 4500  Radiation protection (1969 - 1974) PAHO
To develop a national programme of protection against the hazards of exposure to radiation and co-ordinate the programmes of clinical research in which radioisotope techniques are used.

Chile 4601  Institute of Occupational Health and Air Pollution Research
(1961 - 1973) R
To contribute to the solution of problems of industrial hygiene and occupational health. The Institute trains personnel, carries out research, advises the Government and private organizations on subjects within its competence, and assists in matters relating to labour legislation.

Chile 4800  Medical care services (1966 - ) PAHO
To plan and organize medical care services, train personnel and carry out research on medical care.

Chile 4802  Cancer (1965 - 1973) PAHO
To extend a programme, begun in Santiago, for detection of cancer of the cervix uteri, and to train staff for the purpose.

Chile 5000  Rehabilitation (1960 - 1973) UNDP/TA
To provide training, at university level, for teachers of deaf children.

Chile 6100  School of public health (1958 - 1973) R
To strengthen the teaching at the Department of Public Health and Social Medicine (formerly the School of Public Health) of the University of Chile and expand its facilities for the benefit of students from other countries.

Chile 6200  Medical education
(1962 - 1973) PAHO Grant to PAHO: Kellogg Foundation Pan American Health and Education Foundation
To expand and strengthen medical education, and to develop a programme of medical internships in rural hospitals for students of the medical professions.
Chile 6201  Training in the medical use of radioisotopes (1962 - 1973) PAHO
To provide training in the medical use of radioisotopes and in radiation protection.

Chile 6300  Nursing education (1971 - ) PAHO
To train nurses and nursing auxiliaries; and to establish courses in specialized fields of nursing.

Chile 6400  Sanitary engineering education (1965 - 1975) R
To extend and strengthen the teaching of sanitary engineering.

Chile 6500  Veterinary medical education (1966 - 1973) PAHO
To improve the teaching programme at the School of Livestock Sciences and Veterinary Medicine of the University of Chile, particularly as regards the preventive medicine and public health aspects.

Chile 6600  Dental education (1965 - 1973) R Grants to PAHO: Kellogg Foundation
To prepare, organize, and implement a programme for the teaching of preventive and social dentistry at the School of Dentistry of the University of Concepción.

Chile 6700  Population dynamics (1968 - 1973) PAHO
To support a programme of training and research in health and population dynamics at the Department of Public Health and Social Medicine of the University of Chile.

Colombia 0200  Malaria eradication programme (1958 - ) PAHO UNICEF
To eradicate malaria from the country.

Colombia 0300  Smallpox eradication (1967 - 1973) R
To carry out a campaign aimed at vaccinating at least 80% of the population against smallpox and to organize epidemiological surveillance.

Colombia 0400  Tuberculosis control (1966 - 1970) R UNICEF
The purpose was to implement an integrated tuberculosis control programme beginning with a pilot area in the Girardot health district, which includes 12 municipalities of the Departments of Cundinamarca and Tolima, and to train personnel. The Organization provided four consultants in 1969 and two in 1970, and advisory services by staff members.

A committee on tuberculosis bacteriology was set up and a new statistical form was introduced for experimental studies of tuberculosis epidemiology. Bacilloscopic and photofluorographic examinations were carried out for diagnosis and surveillance. In addition to the control measures, which included vaccination of 3.5 million children under 15 years of age and extensive hospital treatment and home visiting activities, assistance was given in the organization of a course for specialists and a seminar for graduates of medical schools.

Colombia 0500  Leprosy control (1971 - ) PAHO
To strengthen the leprosy control programme and the treatment of patients.

Colombia 0700  Veterinary public health (1971 - ) PAHO
To control urban canine rabies, brucellosis, bovine tuberculosis, bovine rabies and Venezuelan equine encephalomyelitis, and prevent the introduction and spread of hydatidosis that may result from the import of sheep and sheepdogs from countries in which the disease exists.

Colombia 0701  Rabies control (1971 - 1974) R
To implement a national rabies control programme in which particular attention will be given to the large urban centres.

Colombia 2100  Engineering and environmental sciences (1970 - ) R.
To plan and develop environmental sanitation programmes in urban and rural areas and to train sanitation personnel.

Colombia 2201  Water supply and sewerage services administration, Palmira (1971 - 1972) PAHO Community Water Supply Fund
To improve the administration and management of the city's water and sewerage authority.

Colombia 2300  Aedes aegypti eradication (1951 - 1973) PAHO
To eradicate Aedes aegypti.

Colombia 3100  Health services (1951 - ) UNDP/TA PAHO UNICEF
To extend the coverage of the health services and improve their structure and operation.

Colombia 3101  Fellowships R: Cytology (eight months), food control (nine and a half months), immunology (four months), mental health (10 months), mycology (nine and a half months), neurology (12 months), public health nursing (six weeks).

Colombia 3301  National Institute of Health (Carlos Finlay) (1950 - ) PAHO
To strengthen the work of the public health laboratory and the production of biologicals at the National Institute of Health and improve its diagnostic and reference sections and its administrative organization.

Colombia 4101  Clinical and social paediatrics (1964 - 1973) R UNICEF
To improve the preparation of paediatricians, through the provision of three-month postgraduate courses, in order to prepare them better for dealing with problems that affect the health of children and for improving the administration of health services for children.

Colombia 4200  Nutrition (1964 - ) PAHO
To prepare teaching personnel for the schools of nutrition and dietetics.

Colombia 4601  Air pollution (1967 - 1973) R
To determine the air pollution problem in the main cities, initiate programmes of prevention and control and establish the services required for their development.

Colombia 4900  Health and population dynamics (1968 - ) PAHO Special Fund for Health Promotion Grant to PAHO: AID
To extend maternal and child health care, including family planning, to rural areas.

Colombia 6100  School of public health (1959 - 1974) R PAHO
To develop and improve the organization of the School of Public Health of the University of Antioquia.

Colombia 6201  Medical education (1965 - 1973) PAHO
To strengthen medical education and provide continuing education to practising physicians, especially those in rural areas.
Colombia 6203 Centre for the teaching of pathology
(1967 - 1973) PAHO
To strengthen the centre for the teaching of pathology set up in collaboration with the departments of pathology of the National University, the University of Valle and the University of Antioquia.

Colombia 6204 Experimental studies of health services
(1967 - ) Grants to PAHO: AID
To design an operational investigation, based on the results of the study of health manpower and medical education carried out between 1964 and 1967, of the use made of and the training provided for auxiliary personnel in health services.

Colombia 6300 Nursing education (1968 - 1975) PAHO
To improve the nursing care provided in health services through the establishment of continuing education programmes in administration and supervision, in-service training, and training in specialized fields.

Colombia 6400 Sanitary engineering education
(1964 - ) PAHO
To improve the training of sanitary engineers; to set up centres for training and applied research in environmental engineering at the National University of Colombia, the University of Los Andes and the University of Valle; and to improve the teaching of sanitary engineering subjects in the regular courses for civil engineers.

Colombia 6500 Veterinary medical education
(1969 - 1974) PAHO
To improve the teaching of public health and related subjects in the schools of veterinary medicine.

Colombia 6600 Dental and medical education
(1961 - ) PAHO
To develop dental education programmes at the National University and the Universities of Valle and Antioquia.

Costa Rica 0200 Malaria eradication programme
(1956 - ) R UNICEF (AID)
To eradicate malaria from the country.

Costa Rica 2100 Engineering and environmental sciences
(1969 - 1975) PAHO
To plan and implement environmental sanitation programmes, including programmes for water and air pollution control, solid waste disposal, industrial hygiene, vector control and food hygiene; and to train auxiliary sanitation personnel.

Costa Rica 2200 Water supplies
(1960 - ) PAHO PAHO Community Water Supply Fund (Inter-American Development Bank)
To plan and carry out programmes for the construction and expansion of water supply and sewerage systems in urban and rural areas.

To eradicate Aedes aegypti.

Costa Rica 3100 Health services
(1959 - ) R PAHO UNICEF
To prepare and implement a national health plan as part of the national economic and social development plan; and to expand the health services and improve their organization and administration.

Costa Rica 3101 Fellowships R: Public health administration (two for three and a half months), sanitary engineering (two for 11 months).

Costa Rica 3300 Laboratory services (1967 - ) PAHO
To improve and expand the health laboratory services at the central, regional and local levels.

Costa Rica 4200 Nutrition (1960 - 1973) R
To improve the nutritional level of the population by means of nutrition education, supplementary feeding, provision of agricultural activities in schools and training of professional and intermediate-level staff.

Costa Rica 4800 Medical care services (1967 - ) R
To improve the organization and administration of medical care services and train personnel.

The work done under this project between 1967 and 1970 is described in the Annual Report for 1970.1

Costa Rica 4900 and 4903 Health and population dynamics
(1971 - 1973) PAHO Special Fund for Health Promotion
To reduce maternal morbidity and mortality attributable to multiparity and cancer of the uterine cervix.

Costa Rica 4902 Evaluation of population programmes
(1971 - 1972) PAHO
To establish and organize, in the Centre for Social and Population Studies of the University of Costa Rica, a unit for the evaluation of programmes in maternal and child health and family planning.

Costa Rica 6200 Medical education (1971 - ) PAHO
To develop education in the health sciences in keeping with the country's plan for social and economic development.

Costa Rica 6300 Advanced nursing education
(1959 - ) PAHO
To establish, at the school of nursing of Costa Rica, programmes to train nurses in teaching and supervision and in specialized fields of nursing.

Costa Rica 6400 Sanitary engineering education
(1965 - 1973) PAHO
To strengthen the technical training of environmental sanitation personnel and improve the teaching of sanitary engineering at the School of Engineering of the University of Costa Rica.

Costa Rica 6700 Biostatistics education (1966 - ) R
To train medical records librarians for hospitals in Costa Rica and other Latin American countries.

Cuba 0100 Communicable disease control
(1967 - ) PAHO UNICEF
To increase the production of vaccines for the communicable disease control programme.

Cuba 0200 Malaria eradication programme
(1959 - 1971) R MESA UNICEF
The purpose was to eradicate malaria from the country and prevent the re-establishment of transmission. The Organization provided a medical officer and two sanitarians from 1962 to 1967, laboratory equipment, drugs and other supplies, and fellowships. Regional headquarters and other staff members, including staff of the inter-zone malaria technical advisory services project AMRO 0200, took part in a yearly evaluation

of the programme from 1968 to 1971, and a parasitologist reviewed the laboratory services and assisted in training activities.

An epidemiological survey was carried out between May 1959 and March 1960, and following geographical reconnaissance and the registration of 3220 cases, the attack phase started in January 1962 in the Province of Oriente and in Nuevitas in the Province of Camagüey. DDT spraying of walls of houses (1 g/m² and in certain cases 2 g/m² up to a wall height of three metres twice a year) was successful in interrupting transmission, and by the end of 1968 all originally malarious areas were in the consolidation phase. The last indigenous case of malaria was found in northern Oriente in June 1967. Integration of the activities of the national malaria eradication service with those of the general health services began in 1967 and was completed in 1968. At the end of 1970 the programme entered the maintenance phase. Subsequently the Government requested the inscription of Cuba in the WHO register of countries having eradicated malaria. A team from the regional headquarters visited the country in May 1971 to assess the situation in respect of certification of eradication. Vigilance measures will continue under the health services project Cuba 3100, and special assistance will be provided, if necessary, under the inter-zone project AMRO 0200.

Cuba 0300 Smallpox eradication (1969 - ) R
To equip a laboratory for production of freeze-dried smallpox vaccine in accordance with WHO requirements, in order to assure adequate stocks of locally available vaccine for a nationwide programme for vaccinating a minimum of 80% of the population.

Cuba 0400 Tuberculosis control (1969 - ) PAHO
To extend the national tuberculosis control programme from the pilot areas to the whole country.

Cuba 0600 Venereal diseases (1969 - ) R
To improve the epidemiological and laboratory aspects of the venereal disease control programme.

Cuba 0700 Zoonoses control (1969 - 1973) PAHO
To develop programmes for the control and prevention of the zoonoses, especially rabies, brucellosis and bovine tuberculosis.

Cuba 2100 Engineering and environmental sciences (1969 - ) R
To strengthen environmental sanitation programmes, particularly those concerned with the collection, transport and disposal of solid wastes, with the use of pesticides, and with studies on vector control.

Cuba 2200 Water supplies (1966 - 1974) R
To strengthen the national water supply programme in urban and rural areas.

Cuba 2300 Aedes aegypti eradication (1953 - ) PAHO
To intensify the Aedes aegypti eradication campaign so that it will cover all infected areas of the country simultaneously, and to incorporate it into the general health services.

Cuba 3100 Health services (1959 - ) R UNDP/TA PAHO
To improve the organization and operation of the general health services and the administration of government medical care institutions, and to develop special services at the national level.

Cuba 3300 Laboratory services (1968 - ) R
To strengthen the National Institute of Hygiene, Epidemiology and Microbiology.

Cuba 3301 Modernization of laboratory services (1971 - ) UNDP/SF
To expand the facilities of the National Institute of Hygiene, Epidemiology and Microbiology for the production of biologicals for human immunization against communicable diseases, the carrying out of research and the training of middle and higher level laboratory technicians.

Cuba 4200 Nutrition (1965 - ) UNDP/TA
To establish a training programme for nutrition personnel, and a programme of nutrition education, and to study nutrition problems.

Cuba 4600 Occupational health (1969 - ) PAHO
To plan and develop a national programme of industrial hygiene and safety and of air pollution control.

Cuba 6200 Medical education (1965 - ) R PAHO
To strengthen and develop medical education, particularly as regards the preventive and social aspects.

Cuba 6400 Sanitary engineering education (1966 - ) R
To strengthen the teaching of sanitary engineering at the University of Havana and improve the preparation of professional and auxiliary personnel engaged in the national environmental sanitation programmes.

Dominican Republic 0200 Malaria eradication programme (1952 - ) PAHO UNICEF
To eradicate malaria from the country.

Dominican Republic 0400 Tuberculosis control (1963 - ) UNDP/TA PAHO
To implement a national tuberculosis control programme.

Dominican Republic 2100 Engineering and environmental sciences (1971 - ) R Grant to PAHO: Organization of American States
To implement a programme of latrine construction in the communities covered by the rural water supply plan of the National Institute of Water Supply and Sewage Disposal.

Dominican Republic 2200 Water supplies (1962 - ) PAHO (Inter-American Development Bank)
To provide water supply facilities for 62% of the urban and 25% of the rural population and sewerage facilities for 14% of the urban population, and integrate into the National Institute of Water Supply and Sewage Disposal 40% of the systems administered by the municipalities, over a period of four years (1969 - 1972).

Dominican Republic 2201 Water supply and sewerage service administration (1971 - ) PAHO Community Water Supply Fund
To improve the administration of the National Institute of Water Supply and Sewage Disposal.

Dominican Republic 3100 Health services (1953 - ) R UNDP/TA PAHO Grant to PAHO: Organization of American States UNICEF
To develop the health services and improve their organization and functioning.

Dominican Republic 3300 Laboratory services (1968 - ) PAHO
To organize public health and clinical diagnostic laboratory services in hospitals and in five regional laboratories; to establish and standardize procedures; and to train personnel.
Dominican Republic 4200  Nutrition (1965 - ) R
To implement a national food and nutrition policy, train health service and hospital personnel in nutrition, and develop nutrition education and food supplement programmes.

Dominican Republic 6200  Medical education (1968 - ) R
To strengthen medical education, with emphasis on the teaching of preventive medicine.

Dominican Republic 6300  Nursing education (1958 - ) R  Grant to PAHO: Organization of American States
To strengthen the National School of Nursing by preparing nurses for the faculty, improving physical facilities and areas for field practice, and expanding the curriculum to include public health nursing and courses in teaching and supervision.

To revise and improve the teaching of sanitary engineering subjects in the regular civil engineering courses and organize short intensive courses in selected sanitary engineering subjects for the continuing education of professional and auxiliary sanitary engineering personnel.

Dominican Republic 6600  Dental education (1965 - ) R
To develop, in the country's two dental schools, new plans of study that will include the preventive and social aspects of dentistry.

Ecuador 0100  Communicable disease control (1968 - 1973) UNDP/TA PAHO
To implement programmes for the surveillance, control and eradication of communicable diseases.

Ecuador 0200  Malaria eradication programme (1956 - ) UNDP/TA PAHO UNICEF (AID)
To eradicate malaria from the country.

Ecuador 0300  Smallpox eradication (1958 - 1965; 1967 - ) R
To keep the country free from smallpox by maintaining the necessary level of protection of the population and improving the epidemiological surveillance service.

Ecuador 0500  Leprosy control (1968 - ) R
To intensify the leprosy control programme.

Ecuador 0600  Venereal disease control (1969 - ) PAHO
To improve the venereal disease control programme.

Ecuador 0900  Plague control (1965 - ) R
To develop, in the natural foci of plague, an effective programme for control of the disease.

Ecuador 2100  Engineering and environmental sciences (1968 - ) R
To improve environmental sanitation throughout the country by providing specialized advisory services for governmental, provincial, municipal, and university institutions.

Ecuador 3100  Health services (1953 - ) R UNICEF
To plan and develop integrated health services and train professional and auxiliary health personnel.

Ecuador 3300  National Institute of Health (1952 - ) PAHO
To promote the development of various sections of the National Institute of Health.

Ecuador 3700  Health planning (1969 - ) UNDP/TA PAHO
To establish a process of health planning, beginning with the legal and functional structure and the physical, human and administrative resources required; and to plan activities in the health sector as part of the process of economic and social development.

Ecuador 4202 and 4204  Endemic goitre and mental retardation (1966 - ) PAHO Grant to PAHO: National Association for Retarded Children, USA
To evaluate the effectiveness of iodized oil, injected intramuscularly, in the prevention of endemic goitre in rural areas, with special reference to feasibility and action on growth and development.

Ecuador 4500  Health aspects of radiation (1969 - 1973) PAHO
To develop a national programme of radiation protection, set up a film badge dosimetry service and promote research.

Ecuador 4800  Medical care services (1971 - ) PAHO
To improve medical care services and train personnel.

Ecuador 6200  Medical education (1968 - ) R
To improve the teaching programmes of the medical schools in Quito, Guayaquil and Cuenca and to introduce concepts of social and preventive medicine into the curricula.

Ecuador 6300  Nursing education (1957 - ) R
To strengthen the teaching in the schools of nursing and to expand in-service training for nurses and nursing auxiliaries.

Ecuador 6400  Sanitary engineering education (1957 - ) PAHO
To improve the quality of training in sanitary engineering in regular engineering courses and to develop short intensive courses in sanitary engineering at the Central University of Ecuador, Quito, and the Universities of Guayaquil and Cuenca.

Ecuador 6500  Veterinary medical education (1971 - ) R
To increase the number of veterinarians and improve the quality of instruction given in the schools of veterinary medicine, in order to meet the need for an increase in the production of animal protein for home consumption and export.

Ecuador 6600  Dental education (1963 - ) R
To strengthen the curricula of the Schools of Dentistry at the Central University of Ecuador, Quito, and at the University of Guayaquil.

El Salvador 0200  Malaria eradication programme (1955 - ) R PAHO UNICEF (AID) (Federal Republic of Germany)
To eradicate malaria from the country.

El Salvador 2100  Engineering and environmental sciences (1971 - 1974) PAHO
To plan and develop national environmental sanitation programmes, including programmes for water supply and sewerage, industrial hygiene, solid wastes disposal, housing and urbanization, food sanitation, and control of air and water pollution.

El Salvador 2200  Water supplies (1961 - ) PAHO UNICEF
To plan and develop national programmes of water supply and sewerage systems for urban and rural areas.
El Salvador 3100  Health services  
(1963 - )  R  UNDP/TA  PAHO  
To plan and carry out integrated health programmes as part of a national health plan.

El Salvador 3102  Emergency rehabilitation programme  
(1970) Grant to PAHO: Organization of American States  
The purpose was to provide water supply facilities and latrines to 20 rural communities and nine rural settlements affected by a national emergency. The Organization provided the advisory services of staff members, including staff of the health services project El Salvador 3100, and supplies and equipment.  
The aim of the project was achieved and the activities were extended to include five other rural communities affected by the emergency.

El Salvador 3300  Laboratory services  (1970 - 1973)  PAHO  
To develop the national laboratory services.

El Salvador 6200  Medical education  (1965 - 1973)  PAHO  
To strengthen the teaching of medicine at undergraduate and postgraduate levels, including continuing education, with emphasis on the preventive and social aspects of medicine.

El Salvador 6400  Sanitary engineering education  
(1965 - 1975)  PAHO  
To strengthen the teaching of sanitary engineering at the University of El Salvador and improve the preparation of professional and auxiliary personnel engaged in environmental sanitation programmes.

El Salvador 6600  Dental education  (1965 - )  R  
To improve the teaching of dentistry, and particularly of preventive dentistry.

French Antilles and Guiana 0200  Malaria eradication programme  
(1963 - )  PAHO  
To eradicate malaria from the departments.

French Antilles and Guiana 3300  Laboratory services  
(1967 - 1973)  PAHO  
To develop the virus laboratory on the premises of the Pasteur Institute in Cayenne.

Guatemala 0200  Malaria eradication programme  
(1955 - )  R  PAHO  PAHO Special Malaria Fund  UNICEF (Federal Republic of Germany)  
To eradicate malaria from the country.

To maintain the population's level of immunization against smallpox, improve the epidemiological surveillance service, and train personnel in vaccination techniques, diagnosis of smallpox, measures for its prevention, and epidemiological research.

Guatemala 2100  Engineering and environmental sciences  
(1969 - 1975)  PAHO  
To establish and/or improve programmes for the provision of water supplies and sewage disposal in urban and rural areas, control stream pollution, and correct environmental deficiencies in rural housing.

Guatemala 3100  Health services  (1954 - 1973)  R  UNICEF  
To formulate and carry out a national health plan which will include the extension of health services to cover the whole population; and to train professional and auxiliary personnel.

Guatemala 3200  Nursing services  
(1968 - 1973) Pan American Health and Education Foundation  
To improve nursing services and administration.

Guatemala 3300  Laboratory services  (1964 - 1973)  UNDP/TA  
To reorganize the health laboratories, train staff, and improve facilities for the production of biologicals.

Guatemala 4601  Air pollution  (1971 - 1974)  PAHO  
To install two air sampling stations in Guatemala City in order to determine the degree of atmospheric pollution; and to evaluate the data obtained so as to determine the control measures that should be applied.

Guatemala 4800  Medical care services  (1968 - )  PAHO  
To strengthen the medical care services.

Guatemala 6200  Medical education  (1966 - )  PAHO  
To reorganize the programme of medical education and improve the training of teaching staff.

Guatemala 6400  Sanitary engineering education  
(1967 - 1975)  PAHO  Special Account for Miscellaneous Designated Contributions  
To strengthen the teaching of sanitary engineering at the University of San Carlos, and improve the preparation of professional and auxiliary personnel engaged in environmental sanitation programmes.

Guatemala 6500  Veterinary medical education  
(1962 - )  PAHO  
To improve the teaching at the School of Veterinary Medicine of the University of San Carlos.

Guatemala 6600  Dental education  (1969 - 1973)  PAHO  
To improve dental education and integrate the teaching of preventive and social dentistry into the curriculum.

Guyana 0200  Malaria eradication programme  
(1961 - )  PAHO  
To eradicate malaria from the country.

Guyana 2100  Engineering and environmental sciences  
To plan and implement programmes for improving environmental conditions, and to train professional and auxiliary personnel.

Guyana 2300  Aedes aegypti eradication  (1969 - )  PAHO  
To eradicate Aedes aegypti.

Guyana 3100  Health services  (1963 - )  R  UNICEF  
To formulate and implement a national health plan, improve the administrative structure of the Ministry of Health and train personnel.

Guyana 3200  Nursing  (1965 - 1973)  UNDP/TA  
To develop the nursing services and improve nursing education and administration.
Guyana 4200 Nutrition (1968 - ) PAHO

To organize and develop a national nutrition programme, improve the production, preparation, marketing, and preservation of foodstuffs, and train personnel at the professional and subprofessional levels.

Guyana 4900 Health and population dynamics (1971 - ) PAHO Special Fund for Health Promotion Grant to PAHO: AID

To develop a maternal and child health programme that includes maternity care, care of infants and young children, school health services, and education toward family life and responsible parenthood.

Haiti 0200 Malaria eradication programme (1961 - ) PAHO Special Malaria Fund UNICEF (AID)

To eradicate malaria from the country.

Haiti 0600 Yaws control (1950 - ) R

To implement a yaws control campaign, combined with a smallpox vaccination campaign.

Haiti 2100 Engineering and environmental sciences (1971 - 1974) PAHO

To plan and develop environmental sanitation programmes, including programmes of water supply and waste disposal for urban and rural areas.

Haiti 2200 Water supplies (1960 - ) PAHO

To plan, design and finance an extension of the water supply system of Port-au-Prince and, later, to plan systems for the rest of the country.

Haiti 3100 Health services (1957 - ) R UNDP/TA PAHO UNICEF

To develop integrated public health services at the central, intermediate and local levels, to develop the services in a demonstration area set up in the Western Department, and to train personnel.

Haiti 3300 Laboratory services (1953 - ) PAHO

To strengthen and improve the national public health laboratory and the hospital and field laboratories.

Haiti 4200 Nutrition (1961 - ) PAHO Grant to PAHO: Research Corporation UNICEF (FAO) (UNESCO)

To improve nutrition by means of direct aid, education and training, and community development; and to integrate nutrition work into the general health services.

Haiti 4900 Health and population dynamics (1970 - ) PAHO

To plan and implement a national family planning programme, integrated into the general health services.

Haiti 6200 Medical education (1968 - ) PAHO

To improve medical education at the University of Haiti, with emphasis on the basic medical sciences, preventive and social medicine, and medical pedagogy.

Haiti 6300 Nursing education (1968 - ) PAHO UNICEF

To improve the teaching given in the nursing schools, and intensify the training of nursing auxiliaries.

Haiti 6400 Sanitary engineering education (1971 - 1975) PAHO

To expand and improve the teaching of sanitary engineering in the School of Sciences of the University of Haiti, and to improve the School's laboratory and library facilities.

Honduras 0200 Malaria eradication programme (1956 - ) R UNICEF (Federal Republic of Germany)

To eradicate malaria from the country.

Honduras 0400 Tuberculosis control (1962 - ) R

To plan and implement a tuberculosis control programme integrated into the health services.

Honduras 2100 Engineering and environmental sciences (1971 - 1974) PAHO

To plan and develop national environmental sanitation programmes, including programmes for water supply and sewerage and for the control of air, water, and soil pollution.

The former water supplies project Honduras 2200, assisted by the Organization since 1960, has been incorporated into this project.

Honduras 2200 Water supplies (1960 - 1970) R

The purpose was to plan and carry out national programmes for the construction of water supply systems and for improvement of supply services. The Organization provided advisory services by regional headquarters staff members and staff of the Zone III sanitary engineering and water supply projects AMRO 2103 and 2203, and one fellowship.

Advice was given on administration, operation and maintenance of water supply systems, on rates and groundwater surveys, and in connexion with the Tegucigalpa water supply project. Short courses were organized for technical and administrative staff of the National Autonomous Water and Sewerage Service, and a preliminary application was submitted to the Inter-American Development Bank for a loan to finance the construction of a water supply system for the Central District and the improvement of 15 other urban systems.

Honduras 2300 Aedes aegypti eradication (1968 - ) R

To eradicate Aedes aegypti.

Honduras 3100 Health services (1955 - ) R UNDP/TA PAHO

To organize integrated public health services at the central and local levels, and train professional and auxiliary personnel.

Honduras 3102 Fellowships R: Bacteriology (three weeks), health education (one for one month, one for 11 months), leprosy (seven weeks), medical education (12 months), medical records (five months), nursing education (one for two weeks, one for 12 months), nursing services (two months), occupational therapy (18 months), public health administration (10 months), public health planning (two for three and a half months).


The purpose was to strengthen the health infrastructure in areas bordering on El Salvador. The Organization provided the advisory services of staff of the health services project Honduras 3100 and the zone water supply project AMRO 2203, and supplies and equipment.

Twenty sets of basic medical equipment, two sets of laboratory equipment and one of surgical instruments, 30 refrigerators, 28 thermos containers, 12 jeeps, two trucks and an ambulance were supplied for the use of 35 health centres in the area affected by the emergency. In order to improve sanitation services 10 wells and 2000 latrines were dug, well-drilling machinery was repaired and work started on water supply systems for six communities. (See also El Salvador 3102.)
Honduras 3300 Laboratoy services (1967 - 1973) PAHO
To organize a central public health laboratory in Tegucigalpa, establish regional laboratories, modernize laboratory techniques and train technical personnel.

Honduras 4800 Medical care services (1965 - ) R
To improve the medical care services, including those of the social security institutions.

Honduras 6200 Medical education (1965 - ) R
To organize, in the University of Honduras, a division of health sciences responsible for the integrated teaching of health personnel.

Honduras 6300 Nursing education (1965 - 1970) R
The purpose was to strengthen the schools of nursing and to plan and implement a five-year programme of university studies, as well as to improve the basic nursing curriculum in hospital schools and train graduate nurses. The Organization provided a nurse educator from 1965 to 1969 and a consultant in 1970, advisory services by staff also working on the Zone III medical education project AMRO 6203, and supplies and equipment.

The programme of university studies, comprising one year of general studies, three years of nursing and general education and one year of internship or social service, was approved by the academic authorities for implementation by the School of Nursing of the University of Honduras. It was introduced in 1966 by three visiting nurse educators pending the completion of a Bachelor degree course by five Honduran nurses. The number of students increased from 16 in 1966 to 28 in 1970. Three nurses have obtained a Bachelor's degree and one a Master's degree.

A fellowships programme for members of the faculty and students was prepared for implementation under other projects with funds from the United States Agency for International Development and the University of Honduras. A system of national fellowships is also envisaged to strengthen the graduate training scheme instituted in February 1970, initially as a part-time course of studies.

Honduras 6400 Sanitary engineering education (1965 - ) PAHO
To improve the teaching of sanitary engineering at the University of Honduras, and the advanced professional training of personnel working in national sanitary engineering and environmental sanitation programmes.

Jamaica 2100 Engineering and environmental sciences (1968 - ) UNDP/TA PAHO
To draw up and implement plans for the extension of environmental sanitation work, including programmes for water supplies in urban and rural areas, and programmes in industrial hygiene, air pollution control and radiation protection; and to train professional and auxiliary personnel.

Jamaica 3100 Health services (1963 - ) R PAHO
To implement the national health services development programme, which provides for an appraisal of the health situation and of resources available for health work, regionalization of the health services, their reorganization and the improvement of administrative practices, extension of population coverage, and training of personnel.

Jamaica 4300 Mental health (1964 - ) UNDP/TA PAHO
To implement a mental health programme, integrated into the general health services, that includes curative and preventive services and training of personnel.

Jamaica 4500 Radiation protection (1968 - 1974) PAHO
To develop a national radiation protection programme covering both general and occupational exposure to radiation.

Jamaica 4601 Air pollution (1967; 1971 - ) PAHO
To determine the magnitude of the air pollution problem in Kingston and other cities.

Jamaica 4800 Medical care and hospital administration (1967 - 1973) R PAHO
To improve medical care and hospital administration.

Jamaica 4801 Chronic diseases (1971 - ) PAHO
To improve the care of persons suffering from chronic diseases by the organization of peripheral clinics and in-service training of personnel.

Jamaica 5000 Rehabilitation (1971 - ) PAHO
To establish a school of physical therapy at the University of the West Indies.

Jamaica 6100 Public health training centre (1967 - ) PAHO
To improve the training of health inspectors and nurses specializing in public health in the West Indies School of Public Health (formerly the Public Health Training Centre).

Jamaica 6301 Advanced nursing education, University of the West Indies (1965 - 1973) R
To develop the programme of advanced nursing education in the University of the West Indies, strengthen the basic nursing education programme, and organize in-service training for nurses.

Jamaica 6400 Sanitary engineering education (1971 - 1975) PAHO
To strengthen the teaching of sanitary engineering and related subjects at the School of Public Health, the School of Chemistry, and the College of Arts, Sciences, and Technology of the University of the West Indies in order to improve the preparation of engineers and increase the number of technical and auxiliary personnel.

Jamaica 6600 Dental education (1966 - ) R PAHO
To train dental auxiliaries for providing routine dental care to schoolchildren.

Mexico 0200 Malaria eradication programme (1956 - ) UNDP/TA PAHO Special Malaria Fund
To eradicate malaria from the country.

Mexico 0400 Tuberculosis control (1960 - ) R
To implement tuberculosis control pilot area projects in Puebla and Ciudad Juárez and subsequently to extend a full tuberculosis control programme to the rest of the country.

Mexico 0700 Zoonoses control (1966; 1970 - ) R
To control zoonoses that are important public health problems, especially rabies and brucellosis.

Mexico 2200 Water supplies (1960 - ) R PAHO
To develop national programmes for water supply and sewerage systems.

Mexico 3100 Health services (1966 - ) R UNICEF
To provide for the study of specific problems in specialized fields of health and to train technical and auxiliary personnel.
Mexico 3105 Continuing medical education (1968 - 1973) PAHO
To establish a programme of continuing education for physicians practising in rural areas who do not have ready access to new developments in medical science.

Mexico 3300 Laboratory services (1958 - 1965; 1967 - ) PAHO
To extend and improve the national health laboratory services and develop the production of biologicals.

Mexico 3301 Immunology research and training centre (1968 - 1973) PAHO
To provide postgraduate training in immunology and carry out research on immunological problems of local public health importance, particularly as they relate to infectious diseases.

Mexico 3302 Vaccine production (1968 - 1973) PAHO
To improve the quality and quantity of poliomyelitis vaccine produced in order to meet the needs of Mexico and provide a source of vaccine for other Latin American countries.

Mexico 3303 National health laboratories (1970 - 1975) UNDP/SF PAHO
To modernize the national health laboratories.

Mexico 4600 Occupational health (1966 - ) PAHO
To plan and develop programmes for reducing occupational health hazards, both in industrial plants and in the areas surrounding them, and to train the necessary personnel.

Mexico 6200 Medical education (1958 - 1973) R
To improve medical education, especially by providing teaching staff with training in the preventive and social aspects of medical practice.

Mexico 6300 Nursing education (1958 - ) PAHO
To improve basic nursing education; and to prepare graduate nurses to serve as instructors, and professional nurses for the training of auxiliary nursing personnel.

Mexico 6400 Sanitary engineering education (1961 - 1973) R
To develop sanitary engineering education and research at various universities.

Mexico 6500 Veterinary medical education (1969 - 1974) R
To develop the teaching of preventive medicine and public health in the schools of veterinary medicine.

Netherlands Antilles 2300 Aedes aegypti eradication (1969 - 1973) PAHO
To eradicate Aedes aegypti.

Netherlands Antilles 3101 Fellowships R: Public health administration (three for six weeks).

Nicaragua 0200 Malaria eradication programme (1937 - 1974) R PAHO Special Malaria Fund (AID) (Federal Republic of Germany)
To eradicate malaria from the country.

Nicaragua 2200 Water supplies (1962 - 1965; 1968 - ) R
To establish a central agency responsible for water and sewerage services and to plan a national water supply programme.

Nicaragua 2201 National water supply programme (1971 - ) PAHO Community Water Supply Fund
To improve the water supply and sewerage services throughout the country, except for the city of Managua.

Nicaragua 3100 Health services (1963 - ) R UNDP/TA PAHO UNICEF (FAO) (UNESCO)
To improve health legislation and the structure and administration of the Ministry of Public Health, improve and extend the health services, and train personnel.

Nicaragua 3101 Fellowships PAHO: Medical records (11 months), sanitary engineering (five weeks), venereal disease control (three weeks).

Nicaragua 3300 Laboratory services (1967 - 1969; 1971 - ) PAHO
To improve and develop the health laboratory services and to train personnel.

The purpose was to develop an applied nutrition programme, starting in a selected area. The Organization provided advisory services by regional headquarters staff and staff of the Institute of Nutrition of Central America and Panama—project AMRO 4203.

Between 1966 and 1971 a national survey was conducted and major problems identified with the assistance of the Institute of Nutrition of Central America and Panama and the Office of International Research of the United States National Institutes of Health. The following year a National Nutrition Commission was established, with representatives of the ministries of public health, agriculture and education and the participation of UNICEF, FAO, and the United States Agency for International Development. Thirteen education and rehabilitation services were established by 1970, and 34 community centres were operated by workers trained under this project. Basic education in nutrition was incorporated in the curricula of primary schools, and a supplementary feeding programme was implemented. By 1970 the nutrition education programme covered 234 communities.

Between 1963 and 1970 three seminars and 46 courses on nutrition were held for physicians, nurses and auxiliaries as well as teachers in elementary schools and workers in agriculture. Between 1966 and 1971, 27 fellowships were awarded under other projects for studies in nutrition.

UNICEF provided stipends for training, equipment and supplies for the supplementary feeding programme, and material for primary school education in nutrition.

Nicaragua 4800 Medical care services (1968 - 1971) PAHO
The aim was to integrate the medical care provided by social security and welfare institutions with the general health services, extend and improve the hospital system, and train personnel. The Organization provided two consultants and the advisory services of staff members.

A plan for co-ordination between the health centres operated by the Ministry of Public Health and the General Hospital operated by the National Social Welfare Board was prepared and put into effect. In the departments of Chinandega and León, the medical care services of the Board and the National Social Security Institute were integrated with those of the Ministry for a comprehensive programme of tuberculosis control. The health institutions of the city of Somoto and the mining area in the department of Zelaya were also integrated on a trial basis. The General Hospital, the Institute's Eastern
District Clinic and the health centres in Managua, the Chinandega Hospital and Masaya Hospital were expanded, new regulations for hospitals were enacted, and a drug list prepared; a drug procurement and supply centre was set up for the Institute and the Board. Four short in-service courses were organized for staff of the Ministry, the Institute and the Board in 1970; 185 nursing auxiliaries were trained for hospital services between 1968 and 1971, and in 1971 the first lectures on hospital administration were given to 36 final-year medical students.

Nicaragua 6200 Medical education (1965 - 1975) PAHO

To strengthen medical education by improving the training of teachers of basic medical sciences and of preventive and social medicine.

Nicaragua 6400 Sanitary engineering education
(1965 - 1974) PAHO

To strengthen sanitary engineering education and organize intensive short courses in sanitary engineering subjects.

Nicaragua 6600 Dental education (1966 - 1973) PAHO

To improve the training at the School of Dentistry of the National University.

Panama 0200 Malaria eradication programme
(1956 - ) UNDP/TA PAHO PAHO Special Malaria Fund UNICEF (AID)

To eradicate malaria from the country.

Panama 2100 Engineering and environmental sciences
(1970 - 1973) PAHO

To strengthen the technical and administrative structure of the Department of Sanitary Engineering of the Ministry of Public Health, to plan and develop environmental sanitation programmes, and to train sanitation personnel.

Panama 2200 Water supplies
(1960 - 1973) PAHO PAHO Community Water Supply Fund (AID)

To implement a national programme for the construction of water supply and sewerage systems.

Panama 2300 Aedes aegypti eradication (1969 - 1973) PAHO

To eradicate Aedes aegypti.

Panama 3100 Health services (1952 - ) R PAHO

To prepare and implement a national health plan providing for reorganization, extension and improvement of the health services, and to train the necessary professional and auxiliary personnel.

Panama 3300 Laboratory services (1970 - ) R

To improve and expand laboratory services and train personnel.

Panama 4100 Maternal and child health (1971 - ) R PAHO Special Fund for Health Promotion

To develop services for maternal and child health care and family welfare, including family planning, and to train personnel.

Panama 4700 Food and drug control (1968 - 1973) R

To strengthen the food and drug control section of the Department of Health and the specialized analysis laboratory of the University of Panama, which is serving as a reference laboratory for the countries of Central America; and to train personnel in food and drug control work.

Panama 4800 Medical care services (1968 - ) PAHO

To expand medical care services, and to integrate health activities so as to achieve a better utilization of the physical resources available.

Panama 6200 Medical education (1967 - ) PAHO

To revise the structure of the University of Panama in order to secure better integration of its faculties concerned with the health professions, and to revise the departmental structure of the faculty of medicine.

Panama 6300 Nursing education (1966 - ) R

To improve the training provided by the National School of Nursing of the University of Panama.

Panama 6400 Sanitary engineering education
(1965 - ) PAHO

To improve the teaching of sanitary engineering at the University of Panama and organize short intensive courses in sanitary engineering subjects.

Panama 6600 Dental education (1966 - ) R

Grant to PAHO: University of Panama

To improve and strengthen the School of Dentistry of the University of Panama.

Paraguay 0100 Communicable diseases (1965 - 1973) PAHO

To implement a communicable disease programme integrated into the general health services.

Paraguay 0200 Malaria eradication programme
(1957 - ) PAHO UNICEF (AID)

To eradicate malaria from the country.

Paraguay 0201 Economic benefits of malaria eradication
(1968 - 1971) PAHO Special Malaria Fund

To show quantitatively the effect of malaria in reducing economic productivity in a predominantly agricultural area in process of development, and the economic benefit stemming from eradication of malaria.

Paraguay 0300 Smallpox eradication (1967 - 1973) R

To carry out maintenance and surveillance operations in order to keep the country free from smallpox.

Paraguay 0700 Veterinary public health (1971 - ) R

To carry out a co-ordinated programme of epidemiological investigations, pilot projects and control measures for reducing morbidity and mortality from the zoonoses, especially rabies, bovine tuberculosis and brucellosis.

Paraguay 2100 Engineering and environmental sciences
(1969 - 1973) PAHO

To develop environmental sanitation programmes, including programmes for water supply and sewerage, industrial hygiene, waste disposal, housing, and food hygiene.

Paraguay 2200 Water supplies (1961 - ) PAHO

To plan and implement a national water supply and sewerage programme.

Paraguay 3100 Health services
(1955 - ) R UNDP/TA PAHO

To develop integrated health services throughout the country, and to train professional and auxiliary health personnel, in accordance with the 10-year health plan which forms part of the national plan for social and economic development.
Paraguay 3101 Fellowships R: Dental public health (10 months), food control (nine and a half months), maternal and child health (three for six weeks), public health administration (two for 10 and a half months, one for 11 months), water supply systems (11 and a half months).

Paraguay 3500 Health statistics (1971 - 1974) PAHO
To improve the coverage and quality of vital and health statistics and establish a system for periodic evaluation of progress.

Paraguay 3600 Administrative methods and practices in public health (1971 - ) R PAHO
To analyse the administrative structure, methods and procedures of the Ministry of Public Health and Social Welfare in order to introduce reforms for a technico-administrative reorientation of the health services.

Paraguay 4100 Maternal and child health (1970 - ) PAHO
To strengthen the maternal and child health programme and extend its coverage, especially in the rural areas, and to train technical and auxiliary personnel.

Paraguay 4800 Medical care services (1970 - ) PAHO
To expand the resources for medical care, improve their administration and utilization, and train personnel.

Paraguay 4900 Health and population dynamics (1971 - ) PAHO Special Fund for Health Promotion
To improve the quality of gynaecological and paediatric care in the clinical hospital of the National University School of Medical Sciences, Asunción, through the training of physicians and other health personnel in obstetrics, gynaecology and paediatrics.

Paraguay 6200 Medical education (1964 - 1973) PAHO
To strengthen medical education by promoting teaching programmes in preventive and social medicine at the undergraduate and postgraduate (rural internship) levels; and to improve the pedagogical approach to the teaching of medicine.

Paraguay 6400 Sanitary engineering education (1967 - 1975) R
To improve the teaching of sanitary engineering at the National University, Asunción.

Paraguay 6500 Veterinary medical education (1971 - ) R
To increase the number of veterinarians and improve the quality of veterinary medical education by expanding the curriculum to include the social and public health aspects of veterinary medicine.

Paraguay 6600 Dental education (1966 - 1973) PAHO
To strengthen the teaching at the Dental School of the National University, Asunción, particularly as regards the integration of preventive and social dentistry into basic and clinical courses, and to develop field training programmes for dental students.

Peru 0200 Malaria eradication programme (1957 - ) PAHO UNICEF
To eradicate malaria from the country by stages.

Peru 0300 Smallpox eradication (1967 - ) R
To implement a programme for maintaining a high level of immunization against smallpox in the population, producing sufficient vaccine for the country’s needs and developing an epidemiological surveillance service.

Peru 0700 Veterinary public health (1966 - ) R
To control brucellosis in goats in the Departments of Lima and Ica and the Province of Callao; and to reduce the incidence of the disease in man.

Peru 0701 Rabies control (1970 - ) R
To plan and implement a rabies control programme.

Peru 0900 Plague control (1963 - 1972) PAHO
To plan and carry out an epidemiological study of plague, and to implement a control programme.

Peru 1000 Chagas’ disease (1970 - ) R
To determine the extent of the problem of Chagas’ disease, carry out a control programme in the affected areas, and undertake ecological and biological studies of the vector.

Peru 2100 Engineering and environmental sciences (1968 - ) PAHO
To plan and carry out environmental sanitation work including the establishment and improvement of water and sewerage systems, waste disposal, air and water pollution control, housing and urbanization, food sanitation, and training of engineers and auxiliary personnel.

Peru 2202 Water and sewerage administration (1970 - ) PAHO Community Water Supply Fund
To improve the administration of the Lima Sanitation Corporation.

Peru 3100 Health services (1956 - ) UNDP/TA PAHO UNICEF
To strengthen and extend the health services in accordance with the national health plan.

Peru 3101 Fellowships R: Health facilities design (three weeks), immunology (12 months), medical librarianship (two months), water supply systems (two for nine weeks), zoonoses (two weeks).

Peru 3106 Health services, Piura and Tumbes (1970 - ) R UNICEF
To develop and extend integrated health services in the Departments of Piura and Tumbes.

Peru 4200 Nutrition (1965 - 1973) R UNICEF (FAO)
To implement an applied nutrition programme including nutrition education, measures to improve food production and increase the use of locally produced foods of high protein content, and improvement of hospital diet.

Peru 4202 Nutrition rehabilitation centres in the highlands (1967 - ) Grant to PAHO: Research Corporation
To continue the work of the nutrition rehabilitation centres that have been established in the central highlands.

Peru 4500 Radiation protection (1968 - ) R
To develop a national radiation protection programme covering both general and occupational exposure to radiation.

Peru 4601 Air pollution (1967 - 1973) PAHO
To determine air pollution levels, plan control measures, and train professional and auxiliary personnel for their implementation.
Peru 4800 Medical care services (1970 -1973) PAHO
To strengthen the administrative and technical systems of the new central air force hospital.

Peru 4802 Cancer control (1971 -1974) PAHO
To establish a comprehensive programme for the detection and control of cancer of the uterine cervix, first in metropolitan Lima and later throughout the country.

Peru 5000 Rehabilitation (1970 - ) PAHO
To organize national rehabilitation services, principally in occupational therapy, and to train personnel.

Peru 6100 School of public health (1963 -1973) PAHO
To strengthen the School of Public Health, which trains professional and middle-grade technical personnel and health auxiliaries for the public health services.

Peru 6200 Medical education (1964 -1973) PAHO
To strengthen the training of physicians at the undergraduate and postgraduate levels, improve the training of teachers, and introduce curriculum changes to place more emphasis on the preventive and social aspects of medical practice.

Peru 6201 Training programme for instructors in biochemistry and physiology (1971 -1974) Pan American Health and Education Foundation
To implement a programme for the training of teachers of biochemistry and physiology at the University of San Marcos.

Peru 6300 Nursing education (1959 - ) R
To strengthen the teaching of nursing in the five universities.

Peru 6400 Sanitary engineering education (1964 -1973) PAHO
To strengthen the teaching of sanitary engineering at the National University of Engineering by revising the curriculum, improving the laboratories and library, providing short courses and establishing research projects.

Peru 6500 Veterinary medical education (1965 -1973) R
To strengthen the School of Veterinary Medicine of the University of San Marcos, especially as regards the teaching of public health and preventive medicine.

Peru 6600 Dental education (1969 -1973) PAHO
To review the curricula of the schools of dentistry and strengthen the teaching programmes, especially as regards the social and preventive aspects of dentistry.

Surinam 0200 Malaria eradication programme (1957 -1973) PAHO Special Malaria Fund
To eradicate malaria from the country.

Surinam 1000 Schistosomiasis (1971 - ) PAHO
To implement a programme for controlling schistosomiasis in a pilot area within four years.

Surinam 2100 Engineering and environmental sciences (1971 - ) PAHO
To prepare and implement plans for improving environmental sanitation conditions.

Surinam 2200 Water supplies (1964 - ) UNDP/SF
To plan and design piped water supply and sewerage systems for communities in the Lower Surinam River Basin (excluding Paramaribo) and the heavily populated coastal area, and for selected inland communities.

Surinam 2300 Aedes aegypti eradication (1952 - 1973) UNDP/TA
To eradicate Aedes aegypti.

Surinam 3100 Health services (1965 - ) PAHO
To improve and extend the health services in accordance with the national health plan, co-ordinate health programmes with development programmes in other sectors, and train personnel.

Surinam 6200 Medical education (1968 - ) PAHO
To strengthen and improve medical education at the University of Surinam, Paramaribo.

Trinidad and Tobago 0100 Epidemiology (1969 -1972) R
To train staff in various aspects of communicable disease control.

Trinidad and Tobago 0700 Veterinary public health (1971 - ) PAHO
To control zoonoses, particularly bovine paralytic rabies transmitted by vampire bats, brucellosis, bovine tuberculosis, leptospirosis, and Venezuelan equine encephalitis; and improve the diagnostic facilities and the procedures for investigating these diseases.

Trinidad and Tobago 2100 Engineering and environmental sciences (1969 -1973) R PAHO
To strengthen and expand sanitary engineering and environmental health work, and to continue the development of the technical and administrative structure of the Water and Sewerage Authority (begun under the water supplies project, Trinidad and Tobago 2200).

Trinidad and Tobago 3100 Health services (1968 -1973) R PAHO
To implement the national health plan.

Trinidad and Tobago 3500 Health statistics (1969 - ) PAHO
To establish, in the Ministry of Health, a health statistics system to provide data for use in planning, evaluating and operating the health services.

Trinidad and Tobago 4800 Hospital administration and medical records (1965 - 1972) UNDP/TA
To reorganize the general hospital in Port-of-Spain; to organize medical records departments in the hospitals, clinics and health centres of the Ministry of Health and Housing; and to train personnel in medical record keeping.

Trinidad and Tobago 4900 Health and population dynamics (1969 -1972) Grant to PAHO: AID PAHO Special Fund for Health Promotion
To plan and carry out a national family planning programme within the basic health services.

Trinidad and Tobago 4901 and 4902 Trinidad centre for training in cervical cytology (1971 - ) PAHO Special Fund for Health Promotion
To establish a centre for training in exfoliative cytology and a programme for the detection and control of uterine cancer.

United States 2300 Aedes aegypti eradication (1971 - ) PAHO
To eradicate Aedes aegypti.
United States 3100 Consultants in specialized fields
(1958 - ) R
To provide consultant services on specialized problems in public health.

United States 3103 Fellowships R: Environmental sanitation (one for nine weeks, one for ten weeks), medical care administration (one for two months, one for 11 weeks), mental health (two months), nursing education (10 weeks), nursing services (six weeks), psychiatric nursing (two months), public health administration (two for seven weeks), public health nursing (one for five weeks, two for six weeks); PAHO: dental education (one for two months, one for 10 weeks), dental public health (one for six weeks, one for two months), drug dependence (four months), environmental sanitation (six weeks), family planning (seven weeks), health education (two for two weeks), hospital administration (six weeks), maternal and child health (two for two months), medical care administration (four for two months, one for 10 weeks), medical sociology (seven weeks), neonatology (three months), nursing education (two for two months), paediatrics (two months), preventive medicine (one for two months, one for 10 weeks), public health administration (one for one month, one for six weeks), public health education (one for six weeks, one for two months), public health planning (two months), rehabilitation of mental patients (six weeks), school health (two months), tuberculosis epidemiology (two for two months), water supply systems (three weeks).

Uruguay 0300 Smallpox eradication (1967 - 1973) R
To carry out a programme of vaccination against smallpox in order to maintain the level of immunity in the population; to organize a programme of epidemiological surveillance; and to produce smallpox vaccine in sufficient quantity to meet the country's requirements.

Uruguay 0702 Hydatidosis control (1971 - ) PAHO
To develop a hydatidosis control programme.

Uruguay 1000 Chagas' disease (1966; 1968 - ) PAHO
To carry out a programme, based on the systematic spraying of houses with insecticides, for the control of Chagas' disease.

Uruguay 2100 Engineering and environmental sciences
(1968 - ) UNDP/TA PAHO
To plan and implement environmental sanitation programmes and train personnel.

Uruguay 2200 Water supplies
(1960 - 1972) PAHO Community Water Supply Fund
To plan and carry out national water supply programmes.

Uruguay 3100 Health services (1955 - ) R PAHO
To develop the health services in accordance with a national health plan, reorganize their technical and administrative structure at the national, regional and local levels, and train the necessary health personnel.

Uruguay 3101 Fellowships PAHO: Communicable diseases (10 months), epidemiology (two for one week), hospital administration (six months), immunology (two for four months), maternal and child health (two months), medical librarianship (two months), surgery (nine months), veterinary public health (seven and three quarter months).

Uruguay 3300 Laboratory services (1971 - ) PAHO
To make an assessment of existing laboratory services and to organize a national system of health laboratory services.

Uruguay 3500 Health statistics (1965 - 1973) R
To establish a national health statistical system.

Uruguay 3600 Administrative methods and practices in public health (1970 - ) UNDP/TA PAHO
To improve the administration of the health services and organize courses designed to improve their efficiency.

Uruguay 4102 Latin American Centre for Perinatology and Human Development
(1970 - 1974) R PAHO PAHO Special Fund for Health Promotion Grant to PAHO: Ford Foundation
To reduce maternal, fetal, and infant morbidity and mortality rates, through research and training in the field of human reproduction and development.

Uruguay 4103 Human chorionic somatomammotrophin and the thymolymphatic system
(1971 - 1972) Pan American Health and Education Foundation
To develop a method for the isolation of human chorionic somatomammotrophin and study its possible action on the thymolymphatic system.

Uruguay 4104 Hypothalamic control of ovulation
(1971 - ) Pan American Health and Education Foundation
To study the effect of sympathetic and parasympathetic drugs on the production of hypophysial gonadotrophins by the hypothalamus.

Uruguay 4105 Perinatal aspects of reproduction
(1971 - ) Pan American Health and Education Foundation
To organize a course for teaching the perinatal aspects of human reproduction in specialized medical centres of Latin America.

Uruguay 4106 Studies on isolation and estimation of oxytocin
(1971 - ) Pan American Health and Education Foundation
To investigate a new method for the isolation of oxytocin by immunoadsorption.

Uruguay 4300 Mental health (1965 - 1973) PAHO
To draw up a national mental health programme as part of the general health services, modernize psychiatric hospitals, carry out epidemiological research on mental disorders, and train personnel.

The work done under this project between 1965 and 1969 is described in the Annual Report for 1970.1

Uruguay 4600 Occupational health (1967 - ) PAHO
To implement a programme for controlling occupational diseases and accidents in industry.

Uruguay 4800 Medical care services (1966 - ) R PAHO
To establish a national medical care system with the participation of public and private medical care institutions.

Uruguay 4801 Chronic diseases (1971 - ) PAHO
To control chronic diseases, especially those of rheumatic origin; and to convert the Rheumatology Institute into a centre for research and training.

Uruguay 4900 Health and population dynamics
(1971) PAHO Special Fund for Health Promotion
A consultant prepared the educational aspects of a plan for maternal and child health care for the area surrounding Montevideo.

Uruguay 6100 Training of health personnel (1971 - ) PAHO
To improve the level of training in public health of personnel of the Ministry of Public Health through a programme of short courses.

Uruguay 6101 Development of human resources (1971 - ) R
To adjust the training offered at the University of the Republic to the needs of the health sector, and establish a balance between the supply and demand for human resources for the programme of the Ministry of Public Health.

Uruguay 6201 University of the Republic (1971 - ) PAHO
To strengthen the programme of the various schools of the University of the Republic, specifically with regard to the teaching of medicine, veterinary medicine, odontology, chemistry, pharmacy, and engineering.

Uruguay 6400 Sanitary engineering education
(1965 - 1974) PAHO
To improve the teaching of sanitary engineering at the University of the Republic and implement a programme of continuing education consisting of short courses and seminars.

Uruguay 6600 Dental education (1970) PAHO
A consultant was provided for three months to assist in the strengthening of the teaching of epidemiology and statistics in the third year of dental studies at the social dentistry faculty in the School of Dentistry of the University of the Republic, and in the introduction of practical training in dentistry.

Venezuela 0701 Venezuelan encephalitis (1971 - ) PAHO
To carry out epidemiological investigations of Venezuelan encephalitis and develop a stable and effective vaccine.

Venezuela 2100 Engineering and environmental sciences
(1964 - ) PAHO
To improve waste collection and disposal services in Caracas and other main cities.

Venezuela 2101 Chemical and industrial contamination
(1971 - 1972) UNDP/TA
To draw up a programme for control of the petro-chemical pollution of water bodies by industrial wastes.

Venezuela 2200 Water supplies
(1960 - 1973) PAHO Community Water Supply Fund
To improve the organizational structure and the administrative and managerial policies and practices of the National Institute of Sanitary Works.

Venezuela 2300 Aedes aegypti eradication (1958 - ) PAHO
To eradicate Aedes aegypti.

Venezuela 3100 Health services (1964 - ) R PAHO
To improve the administration and organization of the health services and extend their coverage; and to train health personnel.

Venezuela 3300 Laboratory services (1966 - 1973) PAHO
To organize laboratory services at the national, regional, and local levels with the aim of improving diagnostic services, comprehensive medical care, and preventive medicine.

Venezuela 3400 Nursing education (1959 - ) PAHO
To develop rehabilitation services and train prosthetic technicians.

Venezuela 3600 Sanitary Engineering Education
(1964 - 1970) UNDP/SF PAHO Community Water Supply Fund Funds-in-trust
The purpose was to strengthen the teaching of sanitary engineering at the Central University of Venezuela, the University of the Andes, Zulia University and Andrés Bello Catholic University; to develop a postgraduate course at the Central University; to establish an experimental station and laboratories for research and practical training; and to ensure continuing education in sanitary engineering. The Organization provided 15 teaching and advisory staff, 28 consultants, supplies and equipment, contributions towards local costs, and 12 fellowships.
The courses of sanitary engineering studies at the four participating universities were revised and the teaching of the subject improved by the strengthening of staff and the equipment of sanitary engineering departments with laboratory facilities. Local staff received fellowships for study abroad and courses of further training. A postgraduate course was successfully started at the Central University, and 11 short courses and five seminars were held for a total of over 500 participants, most of them staff of the Ministry of Health and Social Welfare, the National Institute of Sanitary Works and other government institutions.

Venezuela 6401 Sanitary engineering research centre
(1971 - 1973) UNDP/SF
To establish a sanitary engineering research centre for quality control of air, water and soil.

Venezuela 6500 Veterinary medical education (1966 - 1973) R
To strengthen the teaching of basic veterinary sciences, and of the preventive aspects of veterinary medicine, in three universities.

Venezuela 6600 Dental education (1966 - 1973) R
To train auxiliary dental personnel and strengthen the programme for the teaching of dentistry, particularly as regards the preventive and social aspects.

West Indies 0500 Leprosy control (1970 - ) R
To implement a leprosy control programme in islands of the Eastern Caribbean.

West Indies 2200 Water supplies (1962 - 1973) UNDP/TA
To prepare plans and designs for the improvement and expansion of water supply systems in several Eastern Caribbean islands.

West Indies 2300 Aedes aegypti eradication (1969 - 1973) R
To eradicate Aedes aegypti from Antigua, the British Virgin Islands, the Cayman Islands, Dominica, Grenada, Montserrat, St Kitts, St Lucia and St Vincent.

West Indies 3100 Health services (1969 - ) R
To formulate and implement health programmes as part of plans for socio-economic development in the islands of the Eastern Caribbean.

West Indies 3108 Health services, Grenada (1969 - 1973) PAHO
To strengthen the health services and train staff.

West Indies 3300 Laboratory services (1968 - ) PAHO
To develop the laboratory services in Dominica to enable them to provide specialized pathology services for the island and for Antigua, Montserrat and St Kitts.

West Indies 3500 Health statistics (1970 - ) PAHO
To establish, in each ministry of health of the Eastern Caribbean, a health statistics unit capable of providing the administration with comprehensive and accurate data for continuous planning and evaluation of the health services.

West Indies 4200 Nutrition (1962 - ) R UNICEF (FAO)
To improve the nutritional status of the population of the islands of the Eastern Caribbean through applied nutrition programmes, nutrition education programmes and the development of nutrition services.

West Indies 4300 Mental health (1969 - 1973) PAHO
To plan and develop mental health services.

West Indies 4800 Medical care and hospital administration (1969 - ) UNDP/TA PAHO
To improve the operation of all hospitals in the Eastern Caribbean area.

West Indies 4808 Hospital administration, Montserrat (1970 - 1971) UNDP/TA
A fellowship was awarded to train a radiographer for the Glendon Hospital.

West Indies 6300 Nursing education (1970) PAHO
The aim was to improve the quality of clinical teaching and supervision of professional and auxiliary nursing students in certain Eastern Caribbean islands. The Organization provided a nursing adviser.

A four-week course on the methodology of nursing studies was organized for 14 graduate nurses and a six-week course on family health nursing care for 18 nurse educators. Nursing committees were established in Dominica and St Kitts to elaborate plans to meet local staff needs, and preparations were made in St Lucia to undertake studies prior to the establishment of a plan for nursing services.

Assistance with nursing education in the West Indies will continue under the zone project AMRO 6301.

West Indies 6302 Training of nursing assistants, Cayman Islands (1971 - 1973) UNDP/TA
To train 30 auxiliary nurses in three years, through an annual nine-month in-service programme, to work as members of the health team in both preventive and curative fields.

AMRO 0100 Epidemiology (1970) PAHO
The purpose was to prevent the introduction of cholera into the Americas. The Organization provided the advisory services of staff members, technical assistance in vaccine production to Brazil and Colombia, and supplies of vaccine to Chile, Guatemala, Haiti, Jamaica, Panama and Trinidad and Tobago.

The countries of the Region received information and advice on surveillance, control and treatment procedures, and a course on bacteriological diagnosis of cholera was held for participants from 13 countries, with the co-operation of the United States Center for Disease Control.

AMRO 0102 Epidemiology, Zone II (1965 - ) PAHO
To assist countries of the zone in developing programmes for the control of communicable diseases, in establishing epidemiological and laboratory services, and in training personnel.

AMRO 0103 Epidemiology, Zone III (1961 - ) PAHO
To assist countries of the zone in developing epidemiological services and in training personnel in epidemiological procedures.

AMRO 0104 Epidemiology, Zone IV (1966 - ) PAHO
To assist countries of the zone in developing programmes for the control of communicable diseases, in establishing epidemiological and laboratory services, and in training personnel.

AMRO 0106 Epidemiology, Zone VI (1958 - ) PAHO
To assist countries of the zone in the implementation of programmes for the control of communicable diseases, in improving epidemiological surveillance and laboratory services, and in training personnel.
AMRO 0112 Workshop-Symposium on Venezuelan Encephalitis Virus, Washington, D.C.  
(14 - 17 Sept. 1971) Grants to PAHO: United States Army Medical Research and Development Command; United States Public Health Service; Wellcome Trust  
The purpose of the workshop-symposium was to make a detailed review of the scientific information concerning Venezuelan encephalitis, following serious outbreaks that have occurred during the last five years in the equine populations of several countries of the western hemisphere. The review showed that the causative virus is capable of rapid spread into new areas, that the economic losses attributable to recent outbreaks have exceeded US $30 million, that the outbreaks have caused illness in human beings, and that a live attenuated vaccine (strain TC-83) has proved effective in preventing the disease in equines and in limiting transmission of the virus to man. The workshop-symposium had more than 120 participants from Argentina, Canada, Canal Zone, Colombia, Ecuador, France, Guatemala, Honduras, Mexico, Peru, United Kingdom, United States of America, and Venezuela. They suggested that the Organization take steps to secure a system of notification of Venezuelan encephalitis and formulate recommendations on all aspects of control, including specific vaccination. A monograph recording the proceedings of the meeting will be issued in the PAHO Scientific Publications series.  
The Organization met the cost of attendance of 52 participants and meeting costs, and provided the services of staff members.  

AMRO 0114 Surveillance and research on infectious diseases along the Trans-Amazon Highway  
(1971 - 1972) Grant to PAHO: United States Army Medical Research and Development Command  
To carry out multidisciplinary studies on (i) diseases and their causative agents introduced by the work force and colonists coming from other parts of Brazil; (ii) local diseases and infectious agents of the Amazon area which may affect the immigrants; (iii) reservoir hosts among the wild animals; and (iv) the role of certain arthropod vectors.  

AMRO 0200 Malaria technical advisory services, inter-zone  
(1955 - 1969) R PAHO  
To provide technical advisory services and local training in certain aspects of country programmes for which long-term appointments of advisers are not necessary.  

AMRO 0201 Malaria technical advisory services, Zone I  
(1957 - 1966; 1969 - 1975) PAHO  

AMRO 0203 Malaria technical advisory services, Zone III  
(1958 - 1974) PAHO  
To assist with the malaria eradication programmes in the countries of the zone.  

AMRO 0216 Research in the epidemiology of malaria eradication problem areas  
(1966 - 1973) PAHO PAHO Special Malaria Fund  
To carry out epidemiological studies for determining the factors responsible for continued transmission of malaria in areas in the attack phase of eradication programmes and to investigate the epidemiological and entomological effects of proposed attack measures in order to evaluate their potential for solving the problems in the way of achieving eradication.  

AMRO 0218 Promotion of rural health services and eradication campaigns  
(1967 - 1975) PAHO  
To encourage greater participation by the general health services in surveillance and other activities of the malaria eradication services and to assist the general health services in providing the coverage in rural areas that will enable them to assume responsibility for maintaining freedom from malaria when eradication has been achieved.  

AMRO 0300 Smallpox eradication, inter-zone  
(1951 - 1971) R PAHO  
To assist countries with their smallpox eradication programmes, particularly as regards the development of surveillance systems and maintenance programmes and the production of smallpox vaccine.  

AMRO 0304 Smallpox eradication, Zone IV  
(1968 - 1975) R  

AMRO 0306 Smallpox eradication, Zone VI  
(1967 - 1975) R  
To assist the countries of the zone with their smallpox eradication programmes.  

AMRO 0400 Tuberculosis control, inter-zone  
(1957 - 1971) R  
To assist countries in the planning, implementation and evaluation of programmes of operational studies and research in tuberculosis control and in training personnel in control methods and techniques.  

AMRO 0402 Tuberculosis control, Zone II  

AMRO 0403 Tuberculosis control, Zone III  
(1963 - 1975) R  

AMRO 0404 Tuberculosis control, Zone IV  
(1962 - 1975) R  
To assist the countries of the zone in developing tuberculosis control programmes, integrating them into the general health services, and training personnel.  

AMRO 0410 Courses on tuberculosis bacteriology  
To co-operate in providing courses for training personnel from Latin American countries in the bacteriology of tuberculosis, with particular reference to the development of epidemiological information, follow-up of treatment and evaluation of programmes.  

AMRO 0500 Leprosy control, inter-zone  
(1958 - 1971) PAHO  
To assist countries in developing leprosy control programmes, integrating them into the general health services, and training personnel.  

AMRO 0509 Courses on histopathology of leprosy  
(1971 - 1975) R  
To provide pathologists with training in the histopathological diagnosis of leprosy, to enable them to assist with the diagnosis of leprosy and to train other pathologists in this work.  

AMRO 0600 Venereal disease control, inter-zone  
(1961 - 1975) PAHO  
To assist the countries of the Region in venereal disease control and in training staff.  

AMRO 0700 Pan American Zoonoses Centre, Argentina  
(1956 - 1973) R UNDP/SF PAHO Grants to PAHO: Various  
To advise countries of the Region on the establishment and improvement of veterinary public health services and zoonoses control programmes; to carry out research on the most prevalent zoonoses; and to train technical personnel for zoonoses control work.
AMRO 0702 Veterinary public health, Zone II  
(1968 - ) PAHO

AMRO 0703 Veterinary public health, Zone III (1957 - ) R

AMRO 0704 Veterinary public health, Zone IV (1968 - ) R

To assist countries of the zone in developing veterinary public health services and education, with special reference to zoonoses control and food protection.

AMRO 0710 Rabies control, Mexico/United States border  
(1966 - ) PAHO: United States Public Health Service

To assist the Governments of Mexico and the United States of America in eliminating rabies in dogs and other animals along the border between the two countries.

AMRO 0800 Pan American Foot-and-Mouth Disease Centre,  
Rio de Janeiro  
(1951 - ) PAHO Grant to PAHO: Government of Peru

To assist the countries of the Americas in the control and prevention of foot-and-mouth disease and other vesicular diseases, the conduct of research related to the preparation and testing of vaccines, and the training of personnel.

AMRO 0805 Anchieta Island laboratory  
(1971 - ) Grant to PAHO: Government of Brazil

To co-operate in the training of laboratory personnel for Brazil's foot-and-mouth disease control programme and in research related to animal carriers of the foot-and-mouth virus.

AMRO 0806 Vaccine production plant  
(1971 - ) Grant to PAHO: Government of Brazil (Inter-American Development Bank)

To construct a plant to train professional and technical personnel in foot-and-mouth disease vaccine production and quality control on an industrial scale.

AMRO 0900 Plague control (1971 - ) R

To assist governments in developing or reorganizing their plague control programmes and in plague research.

AMRO 0918 Symposium on Shiga Dysentery in Central America, Guatemala City (27 - 28 July 1971) PAHO

The symposium was convened to review the available data on the etiology, epidemiology, clinical and pathological aspects, control and prevention of bacillary dysentery caused by Shigella, with special reference to the recent epidemics in Central America.

Twenty-five scientific papers were presented at the symposium, which had 40 participants from Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, United States of America, and Yugoslavia.

The Organization met the costs of the meeting and of attendance of 20 participants, and provided the services of staff members.

AMRO 1000 Parasitic diseases (1966 - ) PAHO

To assist countries with the planning and execution of research and control programmes related to parasitic infections, the establishment of priorities and the development of better control procedures.

AMRO 1007 Schistosomiasis (1960 - ) PAHO

To foster the development of national programmes of schistosomiasis control and research.

AMRO 1008 Chagas' disease  
(1960 - 1973) PAHO Grant to PAHO: Wellcome Trust

To determine the epidemiological characteristics of Chagas' disease, its prevalence and its severity, provide support for national control programmes and encourage related research and training activities.

AMRO 1012 Study Group on Serologic Diagnosis of Chagas' Disease, San José (14 - 17 Dec. 1970) UNDP/TA

The Study Group reviewed experimental data on the complement fixation test for Chagas' disease obtained as the result of a collaborative study undertaken in seven laboratories of the Americas, and formulated recommendations concerning the test, the preparation of antigens, and methodology for their evaluation.

The Organization provided advisory services and met the cost of attendance of 11 of the 14 participants and other costs of the meeting.

AMRO 2100 Engineering and environmental sciences, inter-zone (1958 - ) PAHO

To assist countries with various environmental sanitation activities, including collection and disposal of solid wastes, food sanitation, school sanitation, sanitation of public establishments and transports, vector control (including rodent control) and training of auxiliary personnel.

AMRO 2101 Engineering and environmental sciences, Zone I (1960 - ) PAHO

AMRO 2102 Engineering and environmental sciences, Zone II (1960 - ) R

AMRO 2103 Engineering and environmental sciences, Zone III (1960 - ) PAHO

AMRO 2104 Engineering and environmental sciences, Zone IV (1960 - ) PAHO

AMRO 2106 Engineering and environmental sciences, Zone VI (1960 - ) PAHO

To assist the countries of the zone in improving the organization of environmental sanitation, water supply and sewerage services, and in training personnel.

AMRO 2107 Engineering and environmental sciences, Caribbean area (1956 - ) UNDP/TA

To investigate and evaluate environmental conditions and provide technical advice during the development of extensive sanitation programmes in the countries and territories of the Caribbean area.

AMRO 2114 Pan American Centre for Sanitary Engineering and Environmental Sciences, Lima (1968 - ) R PAHO

To develop the Pan American Centre for Sanitary Engineering and Environmental Sciences that has been set up to provide countries of the Region with specialized technical and scientific assistance in sanitary engineering and environmental sciences, to collect and disseminate information on new developments and methods, and to carry out training and research work.

AMRO 2117 Conference on Environmental Research, Lima (31 Aug. - 4 Sept. 1971) R

The purpose of the conference was to study the problems faced by universities and official agencies in implementing environmental research programmes in Latin America and to recommend practical measures leading to the incorporation of research as a
normal component of the teaching of sanitary engineering. The proceedings of the conference, which had 52 participants from nine countries, will be published and distributed to Member States.

The Organization provided the services of eight temporary advisers, who prepared the working documents for the conference, and technical assistance through the staff of the Pan American Centre for Sanitary Engineering and Environmental Sciences.

AMRO 2118 Regional pollution monitoring network
(1970 - ) UNDP/TA
To develop practical approaches to the monitoring of environmental pollutants in the Americas.

AMRO 2200 Water supplies, inter-zone (1959 - ) R PAHO
To advise countries of the Region on the planning, financing and carrying out of national water supply programmes and on the organization and administration of central and local water supply and sewerage authorities.

AMRO 2203 Water supplies, Zone III (1964 - ) PAHO
To assist the countries of the zone in the development of water supply and sewerage programmes.

AMRO 2213 Studies and investigations of water resources
(1965 - ) UNDP/TA
To collaborate with the United Nations Economic Commission for Latin America in the study of the water resources of countries of the Region and their present and future use, and in the study of waste water disposal and the resultant pollution of surface water and groundwater.

AMRO 2215 Applied research on water supplies
(1968 - 1969; 1971 - ) PAHO
To stimulate research in environmental engineering and promote the setting up of centres for research and scientific information in Latin American universities.

AMRO 2219 Water meters
(1969 - ) Grant to PAHO: Inter-American Development Bank
To study various kinds of water meters under variable conditions and analyse the results; to publish a reference manual containing technical information, specifications, and uses of various types of meters; and to provide advice and training on the subject.

AMRO 2220 Administration of public environmental services
(1970 - ) R PAHO PAHO Community Water Supply Fund
To assist the institutions in Latin America concerned with water supply and sewerage services, and with such activities as solid waste disposal and atmospheric pollution control, in improving their operation and administration, and in training personnel for that purpose.

AMRO 2300 Aedes aegypti eradication, inter-zone
(1954 - ) R PAHO
To stimulate, co-ordinate and evaluate Aedes aegypti eradication programmes in countries and territories of the Region.

AMRO 2301 Aedes aegypti eradication, Caribbean area
(1950 - ) UNDP/TA PAHO
AMRO 2303 Aedes aegypti eradication, Zone III
(1968 - ) PAHO
To assist with Aedes aegypti eradication campaigns and with the organization of vigilance services.

AMRO 2310 Cost-benefit study on the prevention of Aedes aegypti-borne diseases
(1971 - 1972) Grant to PAHO: Office of International Health, USA
To carry out a cost-benefit study on the prevention of Aedes aegypti-borne diseases.

AMRO 2400 Public health aspects of housing and urbanization
(1962 - ) PAHO
To increase the knowledge of health and environmental sanitation of officials responsible for the planning and execution of low-cost housing and urbanization projects in the countries of the Region.

AMRO 3107 Public health administration, Caribbean area
(1963 - ) R PAHO
To assist the governments in the Caribbean area in formulating and implementing health programmes within their plans for social and economic development and to promote co-ordination of programmes and the sharing of specialized services.

AMRO 3108 Public health services, United States-Mexico border
(1952 - ) R PAHO
To co-operate in the joint study and planning of health activities along the United States-Mexico border; promote the exchange of epidemiological information between the two countries; and carry out the duties of Secretariat of the United States-Mexico Border Public Health Association.

AMRO 3110 Research development and co-ordination
(1962 - ) PAHO
To develop and implement a biomedical research programme in fields directly relevant to health problems of the Region; to promote co-operation among biomedical scientists of different countries in order to make the best possible use of existing resources for research and research training; to strengthen biomedical communications and resources; and to improve the returns from health expenditure through the application of operations research methods to the planning and administration of health programmes.

AMRO 3122 Development of the Rio de la Plata Basin
(1967 - ) PAHO
To assist with the health and sanitation aspects of the project under which the United Nations Economic Commission for Latin America, in association with the Inter-American Development Bank, is collaborating with the Governments of Argentina, Bolivia, Brazil, Paraguay and Uruguay in the socio-economic development of the Rio de la Plata Basin.

AMRO 3125 Special seminars, Zone III (1970 - ) PAHO
To co-operate with the countries of the zone in arranging seminars and meetings of working groups in various public health disciplines to analyse the relevant problems and activities and make recommendations to the Central American Public Health Council.

AMRO 3126 Operations research (1970 - ) PAHO
To promote the application of the concepts and methodology of operations research to the solution of health problems in order to derive maximum returns from investment.

AMRO 3129 Research training programme in biomedical sciences
(1969 - ) R Grant to PAHO: Wellcome Trust
To provide research training in the biomedical sciences, within the Region, for workers from countries of Latin America and the Caribbean area.
AMRO 3131  Caribbean Health Ministers’ conference  
(1970 - )  R  PAHO

To assist the countries of the Caribbean area in the establishment of a secretariat for conferences of the Ministers of Health.

AMRO 3133  First Pan American Symposium on Paracoccidioidomycosis, Medellin, Colombia  
(25 - 27 Oct. 1971) Grants to PAHO: United States Army Medical Research and Development Command; Foundation for Microbiology, USA; Cyanamid International

The symposium was convened in response to the increasing concern with the public health significance of paracoccidioidomycosis in a number of Latin American countries. The 75 participants—scientists from Argentina, Brazil, Colombia, Costa Rica, Ecuador, El Salvador, France, Honduras, Mexico, Paraguay, Peru, United States of America, Uruguay and Venezuela—made an exhaustive review of current knowledge on paracoccidioidomycosis, covering the causative organism, ecology and epidemiology, the clinical and pathological aspects, diagnosis and treatment, immunology, and pathogenesis. They recommended new approaches to improve facilities for training in the clinical, diagnostic and therapeutic aspects of the disease.

The Organization met the cost of the meeting and of the attendance of 31 participants, and provided the services of staff members.

AMRO 3200  Nursing services, inter-zone  
(1968 - )  PAHO

To assist countries in the planning, organization and administration of nursing services.

AMRO 3201  Nursing, Zone I  
(1959 - )  PAHO

AMRO 3202  Nursing, Zone II  
(1963 - )  PAHO

AMRO 3203  Nursing, Zone III  
(1963 - )  PAHO

AMRO 3204  Nursing, Zone IV  
(1952 - )  PAHO

AMRO 3206  Nursing, Zone VI  
(1963 - )  PAHO

To assist countries of the zone in planning and organizing nursing services, in developing educational programmes for professional and auxiliary nursing and midwifery personnel, and in promoting research in nursing.

AMRO 3210  Hospital nursing services  
(1966 - )  PAHO

To organize a series of educational conferences on the organization of nursing services and to stimulate the development of continuing education programmes for nurses and of courses in nursing service administration.

AMRO 3211  Seminars on planning for nursing  
(1969 - )  R

To assist countries in preparing nurses to participate in the planning of nursing activities.

AMRO 3213  Seminar on Administration of Nursing Services, Guatemala City  

The main purpose of the seminar was to contribute to the improvement of hospital nursing care by defining the role of nurses in charge of hospital nursing services at central level. In addition, discussions were held on the concept of the modern hospital and its integration with the health services. There were 29 participants, representing ministries of health and social security institutions of 18 countries, and 16 nurses from the host country attended as observers.

The Organization provided the services of staff members and reference material, and met the cost of attendance of the participants.

AMRO 3300  Laboratory services, inter-zone  
(1955 - )  R

To assist countries of the Region in improving health laboratory services and in the production and control of biological products.

AMRO 3303  Laboratory services, Zone III  
(1965 - )  PAHO

To assist the countries of the zone in improving and making better use of their health laboratories.

AMRO 3306  Laboratory services, Zone VI  
(1970 - )  R

To assist the countries of the zone in developing their health laboratory systems and to promote the training of professional, technical and auxiliary health personnel, the development of investigations for the identification of health problems and of epidemiological research, and the improvement of work methods and techniques.

AMRO 3310  International Conference on the Application of Vaccines against Viral, Rickettsial and Bacterial Diseases of Man, Washington, D.C.  
(14 - 18 Dec. 1970) Grant to PAHO: Merck Institute for Therapeutic Research

The conference was convened to consider the advances made in the application of vaccines against viral, rickettsial and bacterial diseases of man since the first international conference on the subject, held four years previously, and especially to discuss the practical problems involved in using the many vaccines that have been developed for human use. The conference was attended by some 300 scientists from countries in different parts of the world, with different problems and at diverse levels of economic development. The proceedings of the conference have been published as PAHO Scientific Publication No. 226.

The Organization met the cost of attendance of 138 participants, and meeting costs, and provided the services of staff members.

AMRO 3311  Training of laboratory personnel  
(1968 - )  PAHO

To improve the training of laboratory personnel by providing short intensive courses on specific subjects.

AMRO 3314  Trinidad Regional Virus Laboratory  
(1969 - )  R

To assist in continuing and developing the diagnostic and virus disease surveillance work of the Trinidad Regional Virus Laboratory.

AMRO 3315  Immunology research and training centre, São Paulo  
(1969 - )  R

To provide postgraduate training in basic immunology for candidates from Latin American countries, and develop immunological research projects related to public health problems in those countries.

AMRO 3400  Health education, inter-zone  
(1968 - )  PAHO

To assist governments in developing health education services and in training health personnel in health education and related disciplines.

AMRO 3401  Health education, Caribbean area  
(1963 - )  UNDP/TA PAHO

To help the countries and territories of the area in developing health education work and training personnel.

AMRO 3407  Regional Centre for Functional Literacy in Rural Areas of Latin America  
(1951 - 1953; 1960 - )  R

To co-operate in the training of students at the Regional Centre for Functional Literacy in Mexico.

AMRO 3410  Training of teachers in health education  
(1970 - )  PAHO

To assist governments in the training of teachers for health education in elementary and secondary schools.
AMRO 3500 Health statistics, inter-zone (1960 - ) PAHO
To plan a regional programme for improving basic statistical data for use in health programmes, extend education and training in the field of statistics, and develop statistical research.

AMRO 3501 Health statistics, Zone I (1964 - ) PAHO
AMRO 3502 Health statistics, Zone II (1958 - ) R
AMRO 3503 Health statistics, Zone III (1955 - ) R PAHO
AMRO 3504 Health statistics, Zone IV (1956 - ) R
AMRO 3506 Health statistics, Zone VI (1959 - ) PAHO
To assist the countries of the zone in improving their vital and health statistics systems; and to advise them on the use of statistical data in national health planning and on the statistical aspects of projects.

AMRO 3513 Inter-American investigation of mortality in childhood (1966 - 1973) PAHO Grant to PAHO: AID
To study child mortality in selected urban and rural areas of Latin America and of the United States of America, in order to obtain accurate and comparable data on death rates in relation to nutritional, sociological, and environmental factors which may be responsible for excessive mortality. (See para. 16.124.)

AMRO 3600 Administrative methods and practices in public health, inter-zone (1959 - ) PAHO
To help countries of the Region to improve the administrative practices of national health services at all levels.

AMRO 3601 Administrative methods and practices in public health, Zone I (1968 - ) PAHO
AMRO 3602 Administrative methods and practices in public health, Zone II (1968 - ) PAHO
AMRO 3603 Administrative methods and practices in public health, Zone III (1967 - ) PAHO
AMRO 3606 Administrative methods and practices in public health, Zone VI (1963 - ) PAHO
To help the countries of the zone to improve the administrative methods and practices of their health services.

AMRO 3700 Health planning, inter-zone (1961 - ) R PAHO
To co-operate with governments and other international organizations in health planning.

AMRO 3701 Health planning, Zone I (1965 - ) R
AMRO 3702 Health planning, Zone II (1971 - ) R
AMRO 3703 Health planning, Zone III (1966 - ) PAHO
AMRO 3706 Health planning, Zone VI (1963 - ) PAHO
To assist the countries of the zone in the development of health planning processes and in training personnel in this field.

AMRO 3715 Pan American programme for health planning (1968 - ) UNDP/SF PAHO
In collaboration with the Latin American Institute for Economic and Social Planning, to provide training in health planning, and to assist countries with health planning research. (See para. 16.138.)

AMRO 4000 Maternal and child health, inter-zone (1971 - ) R
To assist governments in the development of integrated maternal and child health programmes, including fertility regulation activities when called for, and in the progressive extension of such programmes to rural areas.

AMRO 4008 Clinical and social paediatrics (1961 - ) PAHO
To provide fellowships for training in clinical and social paediatrics at the regional training centres in Santiago, Chile, and Medellin, Colombia.

AMRO 4010 Nursing-midwifery (1961 - ) PAHO
To assist countries in the development of the nursing-midwifery component of the maternal and child health programme and in training nurse/midwives.

AMRO 4106 Faculty training in maternal and child health (1971 - ) R
To prepare faculty members of nursing schools for undertaking the revision of the maternal and child health component of the basic nursing curriculum, including the incorporation of family planning into the curriculum.

AMRO 4117 Staffing of maternal and child health programmes (1971 - ) PAHO
To make an investigation of the functions of midwives and nurses in maternal and child health programmes.

AMRO 4119 Maternal and child health fellowships (1970 - ) Grant to PAHO: Ford Foundation
To provide fellowships to professional health workers for study of the scientific bases of comprehensive care of the mother, the fetus, and the newborn child, at the Latin American Centre for Perinatology and Human Development.

AMRO 4200 Nutrition advisory services, inter-zone (1958 - ) R PAHO
To assist countries with various aspects of work on nutrition, including the formulation and implementation of nutrition policies, the training of nutrition specialists, the establishment or strengthening of nutrition activities in health services, and the organization of nutrition education programmes.

AMRO 4201 Nutrition advisory services, Zone I (1961 - ) R
To assist the countries of the zone in the planning, organization and implementation of nutrition programmes as an integral part of health services.

AMRO 4203 Institute of Nutrition of Central America and Panama (1949 - ) PAHO PAHO Special Fund for Health Promotion Grants to PAHO related to INCAP INCAP Member Governments Pan American Health and Education Foundation
To co-operate in developing the Institute of Nutrition of Central America and Panama (INCAP), which trains professional and auxiliary personnel from its member countries and other countries in the Americas and carries out nutrition research for solving the urgent problems created by the inadequate nutritional status of a large part of the population of the Americas.

AMRO 4204 Nutrition advisory services, Zone IV (1956 - ) R
To assist the countries of the zone in the planning, organization and implementation of nutrition programmes as an integral part of health services.
AMRO 4207 Caribbean Food and Nutrition Institute (1963 - ) R PAHO
Grants to PAHO: Research Corporation; Rockefeller Foundation; Freedom from Hunger Campaign, United Kingdom Committee Pan American Health and Education Foundation
To assist the Food and Nutrition Institute, which carries out training programmes in applied nutrition, undertakes field investigations on problems of community nutrition, and coordinates activities in food and nutrition throughout the English-speaking countries and territories of the Caribbean area.

AMRO 4211 Research in protein-calorie malnutrition (1971 - ) R
To determine the socio-economic factors in protein-calorie malnutrition and their public health significance.

AMRO 4225 Graduate course in public health nutrition (1969 - 1973) R
To develop a curriculum in public health nutrition, leading to a Master's degree, for graduate students at the School of Public Health of the University of Puerto Rico.

AMRO 4230 Nutrition training (1969 - ) PAHO
To strengthen nutrition training in university degree programmes in Latin America.

AMRO 4238 Nutrition research (1971 - 1974) PAHO
To assist with studies of protein-calorie malnutrition, nutritional anaemia, endemic goitre and hypovitaminosis A, and in the development and testing of low-cost sources of protein.

AMRO 4300 Mental health, inter-zone (1965 - ) PAHO
To assist mental health programmes in countries of the Region.

AMRO 4312 Courses in community psychiatry (1971 - ) PAHO
To promote the extension of psychiatric services by training general practitioners and physicians working in rural areas in basic community psychiatry, in order to enable them to handle psychiatric emergencies, follow up discharged mental patients, screen new cases, administer minor psychotherapy, and educate the public in mental health.

AMRO 4313 Psychiatric nursing (1971 - ) R
To assist in improving psychiatric nursing education and services.

AMRO 4400 Dental health, inter-zone (1954 - ) PAHO
To promote the development of dental health, and particularly of dental public health, in the countries of the Region, and assist in training various types of dental personnel.

AMRO 4407 Dental epidemiology (1964 - 1969; 1971 - ) PAHO
To assist in conducting epidemiological studies and applied research in co-operation with national and international agencies; in developing two regional centres for training in dental epidemiology; in conducting an annual course to train dentists in dental epidemiological methods applicable to clinical trials and health surveys; in preparing manuals; and in conducting programmes of continuing education in dental epidemiology for public health workers.

AMRO 4409 Fluoridation (1967 - ) PAHO Pan American Health and Education Foundation
To promote the use of fluoridation for the prevention of dental caries in the Region by training engineers in fluoridation techniques, carrying out surveys and studies and assisting countries in planning and improving programmes for the fluoridation of water supplies, for salt fluoridation, or for topical application of fluorides, and in initiating fluoride production.

AMRO 4410 Laboratories for control of dental products (1968 - ) PAHO Pan American Health and Education Foundation
To assist in establishing regional laboratories or centres to co-operate with countries in improving the quality of materials used in dental treatment, controlling the quality of dental products, providing training for teachers and research workers in dental materials, and conducting applied research on dental materials.

AMRO 4411 Human and material resources in dentistry (1967 - ) PAHO
To study the current position as regards human and material resources in dentistry available in Latin America; and to assist in formulating and implementing plans for the development of dental resources.

AMRO 4500 Health aspects of radiation (1958 - ) R
To co-operate with countries of the Region in the measurement of radioactivity in air, water and food samples, in the formulation of radiation protection programmes and in the use of radio-isotopes in medicine.

AMRO 4507 Radiation health protection (1964 - ) PAHO
To advise governments on protection against radiation hazards.

AMRO 4509 Radiation surveillance (1963 - ) PAHO
To assist governments in the Region in organizing radiation surveillance programmes.

AMRO 4617 and 4618 Manganese poisoning and metabolic disorders (1964 - ) Grant to PAHO: United States Public Health Service
To assist research on the mental and neurological syndrome produced by chronic inhalation of dust containing manganese.

AMRO 4700 Food and drug control, inter-zone (1959 - ) PAHO
To provide technical advice to the national services responsible for the health aspects of production and control of foods, drugs and biologicals, both locally manufactured and imported; and to assist countries in improving national control services.

AMRO 4703 Food reference laboratory, Zone III (1964 - ) R PAHO
To develop the food analysis laboratory that has been set up at the Institute of Nutrition of Central America and Panama to act as a reference laboratory for the countries of the zone.

AMRO 4708 Food hygiene and training centre, Caracas (1971 - 1973) R
To assist the centre for training in food hygiene that has been set up in the School of Public Health, Caracas, in co-operation with the Government of Venezuela, to provide advanced instruction in the basic principles of food technology for professionals, and basic courses in food hygiene, inspection, and control techniques for inspectors.
AMRO 4710  Food and drug administration, Zone III
(1964 - ) R
To assist the countries of the zone in establishing, in ministries of health, units for the registration and analysis of all foodstuffs and drugs; to provide technical advice and assist in training personnel; to promote the adoption or revision of relevant legislation; and to assist in the organization of local courses and seminars.

AMRO 4800  Medical care services, inter-zone
(1961 - ) R PAHO
To promote the development of medical care services in the countries of the Region.

AMRO 4801  Medical care services, Zone I
(1970 - ) R

To assist Latin American countries on problems of chronic diseases and on the planning of projects for prevention and control.

AMRO 4803  Medical care services, Zone III
(1962 - ) PAHO

To assist countries in improving hospital and medical care facilities, in establishing maintenance programmes, and in planning new facilities to meet the increasing demand for services.

AMRO 4815  Training for medical care and hospital administration
(1967 - ) PAHO

To develop the programmes of training in administration of medical care and hospital services at schools of public health, schools of medicine and other institutions in Latin America.

AMRO 4816  Progressive patient care
(1967 - ) Pan American Health and Education Foundation

To assist in setting up, in Latin American university hospitals, intensive care units that will also serve for demonstration and teaching purposes.

AMRO 4825  Survey on smoking patterns in Latin America
(1970 - 1972) UNDP/TA  Grant to PAHO: American Cancer Society

To investigate the smoking behaviour and attitudes of the population of eight Latin American cities where reliable mortality and demographic data are available, and to collect information on the prevalence of smoking and on the social, cultural, and demographic characteristics of non-smokers and former and current smokers, in order to assist the governments in the formulation of national policies regarding the problem and to provide the data needed for future evaluation of antismoking programmes.

AMRO 4826  Improvement of medical care administration libraries
(1971 - 1974) PAHO Pan American Health and Education Foundation
To assist the libraries of schools of public health in Latin America in improving and increasing the availability of their reference material on medical care and hospital administration.

AMRO 4900  Health and population dynamics, inter-zone
(1968 - ) PAHO Grant to PAHO: AID PAHO Special Fund for Health Promotion

To advise on planning and programming in health aspects of population problems; maintain liaison with other organizations concerned; help governments to analyse existing family planning programmes and to study the possibility of introducing family planning care and plan and organize such care; administer funds obtained for demonstration and pilot programmes to be undertaken by the Organization; promote education and training in the health aspects of population dynamics; develop programmes of education of the public in the subject; and stimulate research on the psychological, sociological, epidemiological and physiological aspects of human reproduction and fertility.

AMRO 4901  Health and population dynamics, Zone I
(1968 - ) R

To assist ministries of health in the zone in developing family planning programmes and integrating them into the health services.

AMRO 4908  Health and social welfare
(1970 - ) Grant to PAHO: University of Pittsburgh

To explore the relationship between health and social welfare, identify the main relevant problems and define a policy for the relationship.

AMRO 4909  Education and training in health and population dynamics
(1971 - ) Grant to PAHO: AID PAHO Special Fund for Health Promotion

To organize a programme of education and training in health and population dynamics, with emphasis on the integration of family planning work into the general health services, for staff of ministries of health and of other health services; to assist in developing education related to family planning in schools of nursing, midwifery and public health; and to promote the organization of programmes for training auxiliary workers in that field.

AMRO 5000  Rehabilitation
(1962 - ) R PAHO

To advise countries of the Region on problems of medical rehabilitation, and assist in the development of rehabilitation services and in the training of personnel.

AMRO 6000  Medical education: textbooks and teaching materials
(1967 - ) PAHO Special Fund for Health Promotion PAHO Textbook Fund

To provide textbooks at a lower cost to medical students; to develop a co-operative arrangement with medical schools in order to ensure the selection of textbooks of high scientific and pedagogical quality; and to establish a revolving fund to ensure continuity of the programme.

AMRO 6100  Education and training in public health
(1963 - ) R PAHO

To co-ordinate country projects relating to training of public health personnel, review the principles and standards applicable to training in public health schools and the structure and
functioning of such schools, develop a programme a short intensive courses in public health, and provide assistance to individual schools.

AMRO 6101 Human resources programme, Caribbean area (1969 - ) R Pan American Health and Education Foundation
To collaborate in programmes for the development of human resources for health work in countries of the Caribbean area.

AMRO 6107 Seminars on schools of public health (1957 - ) R
To convene meetings of deans and professors of schools of public health in Latin America for discussion of common problems and review of specialized fields of teaching.

AMRO 6200 Education in health sciences (1953 - ) PAHO
To assist the medical schools in Latin America in the solution of problems, in developing their programmes and in improving teaching methods; and to collaborate in the organization of a regional system for the collection of information relative to the training of health personnel, and in the development of studies of human resources.

AMRO 6203 Medical education, Zone III (1971 - ) PAHO
AMRO 6204 Medical education, Zone IV (1966 - ) PAHO
AMRO 6206 Medical education, Zone VI (1971 - ) PAHO
To assist medical schools in countries of the zone in improving programmes and methods of medical education.

AMRO 6210 Teaching methods and administrative organization of medical schools (1964 - 1970) PAHO
The purpose was to organize group discussions and seminars in order to assist medical schools in the Region to review and improve their teaching methods and administrative procedures. The Organization provided two medical officers, three specialists in medical pedagogy, 20 short-term consultants, three temporary advisers as well as the advisory services of regional staff, a grant, and supplies.

Medical teaching workshops were organized in 10 countries for a total of 768 participants (many other countries held similar courses independently as a result, and total participation is estimated at 2000). In addition, advisory services were extended to medical schools in 13 countries. The first Central American course on the administrative management of medical schools was held in El Salvador in joint sponsorship with the Government and University of El Salvador and the Central American Association of Medical Schools. It was attended by 38 senior administrative officers of medical schools. Seminars on definition of objectives in education and curriculum design were held in Brazil and Colombia for over 50 participants, and one on the administrative structure of schools of health sciences was held in Brazil for 18 participants.

AMRO 6214 Faculty training for medical schools (1969 - 1972) Grant to PAHO: Kellogg Foundation
To improve the standards of medical education by providing grants to fellows who, after completion of a programme for the training of teaching staff at the Medical School of the University of Antioquia in Medellin, Colombia, return to their institutions for strengthening the teaching of the particular subject in which they received training.

AMRO 6216 Medical education and the teaching of preventive medicine (1965 - ) PAHO Grant to PAHO: Milbank Memorial Fund
To make an assessment of the situation in respect of medical education and of the teaching of preventive and social medicine in Latin American medical schools.

AMRO 6221 Regional Library of Medicine (1970 - ) R PAHO Grants to PAHO: Government of Brazil; Commonwealth Fund; National Library of Medicine, USA
To assist the Library of Medicine which was set up at the Paulista School of Medicine, São Paulo, Brazil, with the help of the Organization in 1967 (under project Brazil 6221) and which provides library support for biomedical education, research and practice in Latin America, and trains biomedical librarians at advanced level. (See para. 16.142.)

The purpose of the workshop was to provide training in educational research and planning for selected members of the academic staff of schools for the health professions in Latin America. There were 15 participants from Bolivia, Brazil, Chile, Colombia, Cuba, Mexico, Peru and Venezuela.

The Organization provided a consultant and supplies, and met the cost of attendance of the participants.

AMRO 6228 Medical education, Caribbean area (1971 - 1973) PAHO
To assist the School of Medicine of the University of the West Indies in strengthening its administration, improving teaching methods and developing postgraduate training programmes.

AMRO 6300 Nursing education, inter-zone (1958 - ) R
To assist in strengthening nursing education and training programmes in countries of the Region.

AMRO 6301 Nursing education, Zone I (1963 - ) PAHO
To assist in improving nursing education in countries and territories of the Eastern Caribbean.

AMRO 6312 Seminars on nursing education, Zone I (1971 - ) PAHO
To organize seminars for establishing and applying criteria and standards for training nursing and obstetrical personnel in the countries of the Caribbean area where English is spoken.

AMRO 6315 Nursing education: textbooks (1971 - ) PAHO Special Fund for Health Promotion
To improve nursing education in nursing schools of Latin America by helping them to provide textbooks at a cost within reach of their students and to revise nursing curricula.

AMRO 6317 Seminars on nursing education (1971 - 1972) R
To establish criteria for planning and developing educational programmes to prepare professional, intermediate, and auxiliary-level nursing personnel.

AMRO 6400 Sanitary engineering education, inter-zone (1952 - 1960; 1964 - ) PAHO
To assist countries of the Region in expanding their institutions for training sanitary engineers and in revising the curricula.
AMRO 6500 Veterinary medical education (1966 - ) R
To strengthen the teaching of veterinary medicine, particularly as regards the preventive medicine and public health aspects.

AMRO 6600 Dental education (1963 - ) PAHO
To co-operate with university authorities of countries of the Region in improving teaching in schools of dentistry.

AMRO 6608 Training of auxiliary dental personnel (1965 - ) PAHO
To promote the training of various kinds of dental auxiliary personnel and their use for work for which a fully qualified dentist is not necessary, so as to permit the extension of dental services to the population and reduce their cost.

AMRO 6609 Latin American Association of Dental Schools (1965 - 1972) Grant to PAHO: American Dental Association
To assist the Latin American Association of Dental Schools in its programmes for the promotion of the teaching of dentistry in Latin America.

AMRO 6700 Biostatistics education (1952 - 1975) UNDP/TA
To improve vital and health statistics in the countries of the Region by training technical and professional personnel in specialized centres.

AMRO 6707 Latin American Centre for Classification of Diseases (1955 - ) R
To study problems of medical certification of causes of death; to give training on classification of causes of death in accordance with the International Classification of Diseases; and to assist in revising the Classification.

AMRO 6708 Training programme in hospital statistics (1961 - ) PAHO
To provide training in medical records and in hospital statistics with the aims of facilitating the planning of efficient health and hospital services, improving patient care, and obtaining information on the health status of the population.
Burma 0062.2 Maternal and child health (1969 - 1972) R UNICEF
To strengthen the departments of paediatrics and obstetrics of major hospitals and improve the teaching in these subjects, especially as regards the preventive aspects; and to improve and expand maternal and child health activities as part of the general health services.

Burma 0063 Leprosy control (1960 - 1973) R Special Account for the Leprosy Programme UNICEF
To intensify the leprosy control programme, extend it to cover all endemic areas, and train personnel for the purpose.

Burma 0067 Institute of Medicine I and School of Preventive and Tropical Medicine, Rangoon (1955 - 1959; 1961; 1963; 1966 - ) UNDP/TA
To improve the teaching of undergraduates and promote research and postgraduate study in departments of the Institute of Medicine I, and to develop the diploma course at the School of Preventive and Tropical Medicine.

Burma 0068 Antimalaria operations (1957 - 1966; 1968 - ) R
To undertake antimalaria operations throughout the country in progressive stages, with the ultimate goal of eradicating the disease.

To train personnel for strengthening mental health services and develop separate departments of psychiatry in medical institutes.

Burma 0070 Strengthening of health services (epidemiology) (1968 - 1977) UNDP/TA
To strengthen the Epidemiological Unit in the Directorate of Health Services through epidemiological surveillance of important communicable diseases for the purpose of obtaining information on the prevailing trends in these diseases as a prerequisite for sound planning of control, including vaccination, policies; to develop public health laboratory services in support of these activities.

Burma 0071 Nursing advisory services (1959 - 1966; 1969 - ) R
To develop nursing and midwifery education and services.

Burma 0072 Tuberculosis control (1964 - 1973) R UNICEF
To develop community-oriented tuberculosis control services in all divisions of the country.

Burma 0073 Health education (1966; 1968; 1971 - ) R
To develop health education services and to give training in health education to teachers and those holding key posts in the school organization and in the general health services.
Burma 0088 Rehabilitation of the handicapped (1969 - 1973) R
To expand medical rehabilitation services at the central and peripheral levels and to improve workshop facilities for the manufacture of orthopaedic and prosthetic appliances.

Burma 0089 Institute of Technology, Rangoon (1969 - 1973) R UNDP/TA
To teach sanitary engineering to undergraduate and graduate civil engineering students.

Burma 0090 Dental health services (1971 - ) R
To improve dental health and dental education.

To strengthen radiation protection services in the health institutions, first developing film-badge monitoring services in Rangoon and gradually expanding the coverage to peripheral hospitals; and to train staff for the purpose.

Burma 0092 Quality control of drugs (1970 - ) R
To formulate new legislation and develop laboratory competence in the quality control of pharmaceutical and biological preparations.

Burma 0094 Strengthening of health services (1969 - ) R UNICEF
To strengthen the health services, particularly the rural health services, and to train health personnel for basic health services. The first stage of the work will consist in the preparation of a plan of operation, followed by a national health plan.

Burma 0097 Maintenance and repair workshop for health equipment (1971 - ) R UNICEF
To establish workshops and train staff in the maintenance and repair of equipment used in health institutions.

Burma 0200 Fellowships R: Plasma production (one for two months, one for four months, one for six months).

Ceylon 0052 Venereal disease control (1964; 1966 - ) R UNFPA
To develop venereal disease control programme in all provinces of the island.

Ceylon 0026.2 Leprosy control (1967 - 1975) R
To assess the leprosy problem, develop an integrated control programme and train staff.

To develop mental health care within the framework of comprehensive health services, strengthen the teaching of mental health in the undergraduate curriculum and train various categories of health personnel.

Ceylon 0045 Health statistics (1957 - 1961; 1964 - 1975) UNDP/TA
To develop an information system geared to the requirements of national health planning and to monitoring the performance of the health services; and to train staff.

Ceylon 0047 Medical education (1959; 1963 - ) R UNICEF
To strengthen the teaching programme in the faculties of medicine of the University of Ceylon at Colombo and Peradeniya.

Ceylon 0053 Nursing advisory services (1960 - 1967; 1969 - 1974) R UNFPA
To develop nursing and midwifery education and services.

Ceylon 0056 Filariasis control (1959; 1961; 1963; 1965 - ) R UNDP/TA
To control filariasis.

Ceylon 0058 Malaria eradication programme (1960 - ) R UNICEF
To eradicate malaria.

Ceylon 0064 Community water supply and sanitation (1963 - 1975) R UNICEF
To develop programmes of water supply, sewage disposal, storm-water drainage and general sanitation, and to train personnel.

Ceylon 0066.3 Strengthening of laboratory services (1966 - ) R UNICEF
To develop specialized diagnostic and reference services in support of communicable disease prevention and control, and to train staff.

To train staff associated with the radiation protection services.

To evaluate the health education programme, and to strengthen health education services, training, communication media and studies.

Ceylon 0075 Tuberculosis control (1966 - 1974) R UNICEF
To control tuberculosis through a community-oriented programme in all provinces of the island.

To strengthen the quality control of pharmaceutical and biological preparations and to train staff.

To strengthen the epidemiological services and train personnel.

Ceylon 0084 Maternal and child health services (1968 - 1971) R UNICEF
To improve the preventive and curative maternal and child health and family health services, and to provide courses on maternal and child health for nursing and medical personnel.

Ceylon 0086 Public water supply, drainage and sewerage for the south-west coastal area (1967 - 1971) UNDP/TA
To carry out pre-investment studies for high-priority water supply and sewerage schemes in the south-west coastal area. (See para. 17.57.)

Ceylon 0087 Dental health (1970 - 1974) R
To develop the teaching and training programmes for dental personnel and expand integrated dental health services.

To establish and strengthen a national health planning unit in the Ministry of Health and train health personnel in health planning.

Ceylon 0099 Assessment and strengthening of health education in family health (1971 - ) UNFPA
To review the health education services and the training provided for the introduction and support of family health activities; and to strengthen health education in family health programmes.
India 0114.1 Paediatric education, Kerala (1970 - 1971) R UNICEF

The aim was to strengthen maternal and child health nursing services and education in Kerala State.

In order to follow up assistance in paediatric education given between 1958 and 1965, WHO provided a maternal and child health nurse educator, who made an assessment of the needs and priorities in patient care at the Sri Aurobindo Thirumal Hospital attached to Trivandrum Medical College. She investigated means of improving staffing of priority areas, reporting of nurses’ observations on patients and their medication, supply and maintenance of equipment, and food preparation and handling. An in-service training programme for nurses and auxiliary personnel of the Hospital was started and a plan for a state paediatric refresher course prepared with members of the College of Nursing; an outline for a short orientation course and booklet for new staff of the Hospital was submitted, together with plans for a model paediatric and obstetric ward; job descriptions were reviewed and monthly meetings of head nurses organized; procedures for paediatric and labour wards were formulated, and those for the premature ward established under earlier assistance were revised.

India 0114.7 Paediatric education, Rajasthan (1971 - 1977) R UNICEF

To expand and improve undergraduate and postgraduate teaching of paediatrics in certain medical colleges and to develop courses for various categories of personnel in paediatric departments.

India 0121 Indian Council of Medical Research (statistics) (1962 - 1975) R

To organize and co-ordinate medical research.

India 0136.2 Post-basic nursing education, Gujarat (1963 - 1974) R

India 0136.3 Post-basic nursing education, Punjab (1964 - 1974) R

India 0136.5 Post-basic nursing education, Madras (1964 - 1974) R

India 0136.7 Post-basic nursing education, New Delhi (1969 - 1974) R

India 0136.8 Post-basic nursing education, Bombay (1970 - 1974) R

To expand post-basic nursing education, with initial emphasis on post-basic degree programmes usually offering professional specialization in teaching, administration, public health or one of the clinical specialties.

India 0153 Malaria eradication programme (1958 - ) R (AID)

To eradicate malaria.

India 0173 Production of diphtheria/pertussis/tetanus vaccine, Kasauli (1951; 1965 - 1968; 1970) R UNICEF

The aim was to increase the production of diphtheria/pertussis/tetanus vaccine at the Central Research Institute, Kasauli. WHO provided four consultants and 11 fellowships (including one awarded under another project). UNICEF supplied equipment.

In 1961 a consultant completed a study on the feasibility of the vaccine production project, advised on its location and the method of production and testing to be used, and recommended
laboratory equipment for procurement by UNICEF. The initial plan to produce four million doses in 1962-1963 had to be revised; after project review and a further visit by a consultant in 1965, who also advised on laboratory animal management, the Institute was able to produce two million doses in 1967-1968. Storage difficulties precluded the production of greater amounts until in late 1969 and early 1970 the implementation of an immunization campaign under the central authorities' family planning programme called for an output of over three million doses. According to a recent assessment, the equipment's capacity could, with minor adjustment, rise to seven or eight million doses. In 1970, two more consultants advised on the operation of equipment for toxin production and on vaccine production procedures, and made a final assessment.

Assistance to the Institute in Kasauli will continue under the inter-country project SEARO 0117, due to begin in 1972.

India 0174 Production of freeze-dried smallpox vaccine (1964 - ) R UNICEF
To increase the production of freeze-dried smallpox vaccine.

India 0176 Central Public Health Engineering Research Institute, Nagpur (1961 - 1977) R Special Account for Community Water Supply
To develop the Central Public Health Engineering Research Institute as a major research centre for environmental sanitation problems, co-ordinate research programmes and train research workers.

Under the Special Account for Community Water Supply, courses on preventive maintenance of water distribution systems are being organized. Methodology for the investigation, testing and improvement of water distribution systems from the health, quality and hydraulic points of view are being developed.

India 0181 Applied nutrition programme (1964 - 1974) R UNICEF (FAO)
To expand and improve the health component of the applied nutrition programme assisted by FAO, UNICEF and WHO.

India 0182 Strengthening of health services (epidemiology) (1963 - ) R UNDP/TA
To establish or improve health intelligence units in state health directorates; to train staff in epidemiology, health statistics, microbiology and communicable disease control; and to develop the National Institute of Communicable Diseases, Delhi.

India 0185.2 and 3 Strengthening of health services, Punjab and Haryana (1967 - 1974) R UNICEF
To strengthen the national health services at state, district and local levels, giving particular attention to the provision of training programmes for health staff and the supervision of auxiliary staff by professional staff, and to operational studies.

India 0187 Training of radiographers (1967 - 1972) R
To raise the standard of training of radiographers at the Institute of Postgraduate Medical Education and Research, Chandigarh.

India 0188 Strengthening of laboratory services (1965 - ) R
To strengthen health laboratory services and improve the training of laboratory technicians.

India 0190 Training in health education (1968 - 1977) R
To establish and develop three postgraduate health education training centres with rural and urban field practice areas.

India 0192 Radiation Medicine Centre, Bombay (1963; 1967 - 1977) R
To strengthen the Radiation Medicine Centre, Bombay.

To expand medical rehabilitation services and establish training schools in the various disciplines.

India 0195 Course in radiological physics, Bombay (1971) R
A fellowship was awarded for attendance at the course in radiological physics given at the Bhabha Atomic Research Centre, Trombay, Bombay, in 1971. Assistance with previous courses was provided between 1962 and 1967.

India 0197 Occupational health (1964; 1970 - ) R
To conduct courses in occupational health and to initiate research projects in specific industries.

India 0199 School for training of occupational health workers (1967 - 1977) UNDP/TA
To train technicians in the installation, maintenance and repair of electrical and mechanical equipment used in health institutions.

India 0200 Fellowships R: Adolescent psychiatry (12 months), cardiology (six months), environmental health (two for four months), immunology (10 weeks), nursing administration (three for four months), orthopaedic nursing and operating theatre techniques (six months), sanitary engineering design (six months), undergraduate dental education (six months), venereal disease control (four months).

India 0208 Improvement of dental education (1966 - 1977) UNDP/TA
To improve and strengthen dental education and research in a dental college.

India 0212.1 Nursing administration, Chandigarh (1968 - 1973) R

India 0212.2 Nursing administration, Gujarat (1968 - 1973) R
To develop sound nursing administration in teaching hospitals and promote in-service training and co-ordination of nursing services.

India 0214 Virological techniques (1968 - 1977) R
To establish facilities for (i) diagnosis and epidemiological studies of virus diseases; (ii) the production of virus vaccines, including attenuated live poliomyelitis vaccine; and (iii) independent testing of vaccines.

India 0218 National Institute of Health Administration and Education (1965 - 1974) R UNICEF
To conduct studies in district health administration at Rohtak (Haryana) as a prelude to the promotion and planning of comprehensive health care services at the district level; to formulate research and teaching programmes pertaining to health administration, and to undertake teaching programmes, studies and research in the field of hospital administration.
India 0220 Seminar on the Organization and Future Needs of Mental Health Services, New Delhi (1-5 Feb. 1971) R

The seminar was a follow-up of two previous seminars on the teaching of psychiatry, held in 1968 and 1970. It took place at the All-India Institute of Medical Sciences, New Delhi, and was attended by four Directors of Health Services from different states of India, the other 16 participants being practising psychiatrists, teachers of psychiatry in medical colleges, clinical psychologists and psychiatric social workers. They discussed various aspects of the provision of care to the mentally ill and drew up proposals for guidelines for the development of services, training and research.

WHO provided the services of three consultants (specialized in psychiatry, health services administration and field research) and three temporary advisers (professors of psychiatry in Indian medical colleges) and assisted with the conduct of the seminar.

India 0221 Seminars and workshops on medical education (1965 - 1973) R

To strengthen medical teaching.

India 0222 Drug laboratory techniques and biological standardization (1967 - 1975) R

To plan facilities for the quality control of drugs and to train personnel.

India 0225 Freeze-dried BCG vaccine production (1968; 1970 - 1975) R

To produce thermostable BCG vaccine for the Indian tuberculosis programme.

India 0226 Water pollution (1969; 1971 - ) R

To provide technical advice on organizational and other matters related to the abatement and control of water pollution.


The aim was to assist the Indian Registry of Pathology in organizing a peripheral centre at the Grant Medical College, Bombay, for the purpose of preparing and distributing gross pathology and histopathology teaching material to medical colleges in the Region. In November 1966 a WHO consultant made a preliminary visit to the College and prepared a list of the supplies and equipment required. In February and March 1967 the same consultant and a laboratory technician assisted in organizing the centre and in training national staff in the necessary techniques. The Director of the centre was awarded a five-month fellowship to visit centres in Europe and America. Supplies were provided to the centres in New Delhi and Bombay. Further assistance to the Registry of Pathology will be provided under the medical education project, India 0111.

India 0232 Course in hospital physics (1967 - 1974) R

To train hospital physicists.

India 0233 Smallpox eradication (1967 - ) R

To develop the smallpox eradication programme, carry out periodic assessments and train staff.

India 0238 Cancer control pilot project, Tamil Nadu (1968 - ) R Special Account for Medical Research

To start a cancer control project and set up a training centre.

India 0244 Training in veterinary public health (1967 - ) R

To initiate studies of zoonoses at the National Institute of Communicable Diseases, Delhi, the Haffkine Institute, Bombay, the Indian Veterinary Research Institute, Mukteswar-Kumaon, and other institutions, public health laboratories and medical colleges.

India 0247 Central Health Education Bureau (1971 - ) R

To strengthen various aspects of the work of the Central Health Education Bureau.

India 0250 Integration of maternal and child health services into the general health services (1967 - 1968; 1970 - ) R

To integrate maternal and child health services, including family planning services, into the general health services in certain states.

India 0251 Groundwater training course (1970 - ) R

To train staff in groundwater development and utilization for community water supplies.

India 0257 Physical therapy school, Baroda (1968 - ) R

To establish and strengthen a physical therapy school in Baroda.


To support the National Institute of Nutrition, Hyderabad.

India 0268 Village water supply (1971 - 1974) R UNICEF

To plan and co-ordinate the development of community water supplies in rural areas, including the well-drilling programme in areas where hard rocks present special problems and in those where water is scarce; and to train professional and drilling staff.

India 0270 Air pollution (1971 - ) R

To study the problems of air pollution connected with industrial development and promote a control programme.

India 0274 Health education in schools, including family life education (1971 - 1975) UNFPA

To integrate family life education in school, college and teacher-training curricula, establish and develop a health education programme in the educational system, prepare teachers in health education, and develop teaching aids required for primary, secondary, collegiate and teacher-training institutions.

India 0275 Strengthening of the teaching of human reproduction, family planning and population dynamics in medical colleges (1971 - ) UNFPA

To strengthen the teaching and research functions of the departments of paediatrics, obstetrics and gynaecology, and of preventive and social medicine, and of other departments involved in the teaching of human reproduction, family planning and population dynamics in various medical colleges.

India 0278 Integration of maternal and child health services (including family planning services) into the general health services (1971 - ) UNFPA

To plan, organize and operate family health programmes as an integral part of the general health services; to develop and improve the teaching faculties and the facilities of training institutions; to organize training programmes for all categories of health staff in the various aspects of human reproduction, family planning and population dynamics; and to promote field studies and pilot demonstrations of integrated services.

Indonesia 0032 Malaria eradication programme (1955 - ) R

To reduce malaria endemicity to the lowest possible level, with the ultimate goal of malaria eradication.
Indonesia 0036  Paediatric and obstetric education and services (1956 -) UNDP/TA UNICEF
To expand and improve paediatric and obstetric services, and the teaching of maternal and child health to medical and nursing students, in a number of medical schools.

Indonesia 0050  Tuberculosis control (1961 -1974) R UNICEF
To integrate BCG vaccination without prior tuberculin testing into the work of the maternal and child health clinics and regency polyclinics; to train staff engaged in case-finding by microscopic sputum examination; and to provide ambulatory treatment to tuberculosis patients.

Indonesia 0060  Laboratory services (1967 -) R UNICEF
To strengthen laboratory services.

Indonesia 0061  Training in sanitary engineering (1968 -) R
To train sanitary engineers at the Institute of Technology, Bandung.

Indonesia 0062  Medical education (1964 -) R
To develop the teaching programmes of the medical faculties in keeping with national needs and the progress of medical science.

Indonesia 0069  Training of X-ray and electromedical technicians (1966 -) R
To train technicians and radiographers in the use, maintenance and repair of electromedical equipment.

Indonesia 0071  National community water supply and sanitation (1969 -) R
To plan community water supply, sewerage and storm-water drainage systems, water pollution control and general sanitation work; and to train staff.

Indonesia 0074  Nursing and midwifery education (1967; 1969 -1976) R
To strengthen and develop nursing and midwifery education.

Indonesia 0076  Malaria control, Province of West Irian (1970 -) Fund of the United Nations for the Development of West Irian
To control malaria in West Irian.

Indonesia 0079  Dental health (1968 -) UNDP/TA
To develop the programmes for training dental personnel at professional and auxiliary levels, extend dental health services within the framework of comprehensive health services, and explore the feasibility of establishing water fluoridation schemes.

Indonesia 0081  Smallpox eradication (1967 -) R Special Account for Smallpox Eradication
To eradicate smallpox.

Indonesia 0083  Vaccine and sera production (1968 -1974) UNDP/TA
To improve methods of producing bacterial and viral vaccines, antitoxins and toxoids, and develop facilities for testing the vaccines and sera produced.

Indonesia 0084  Nursing education and training, Province of West Irian (1970 -) Fund of the United Nations for the Development of West Irian
To strengthen and develop nursing and midwifery services and education in West Irian.

Indonesia 0086  Strengthening of national health services (1969 -) R UNICEF
To plan, co-ordinate and integrate health services and programmes, standardize and intensify the training programmes for health personnel, and promote studies of public health practice intended to lead to the optimum delivery of health care.

Indonesia 0087  Rehabilitation of hospitals and polyclinics, Province of West Irian (1970 -) Fund of the United Nations for the Development of West Irian
To improve facilities in hospitals and polyclinics and to train national staff in hospital administration and in selected fields of community health services.

Indonesia 0088  Goitre control, Province of West Irian (Jan.-March 1971) Fund of the United Nations for the Development of West Irian
A consultant made an assessment of the feasibility of different methods for the prevention of iodine deficiency in the highlands of the Province.

Indonesia 0089  Public health laboratory, Province of West Irian (April-May 1971) Fund of the United Nations for the Development of West Irian
A consultant was provided to assist in organizing the public health laboratory at Djajapura. He advised on the lay-out of the different units and on their functioning, staffing and equipment and trained technical staff in the bacteriological testing of water and in the bacteriological procedures involved in the primary isolation and identification of enteropathogens. A plan of action was drawn up for establishing basic laboratory services to cater for the medical and public health needs of the city of Djajapura and to provide referral services to hospitals and health centres.

Indonesia 0091  Strengthening of epidemiological services (1969 -) R
To develop epidemiological units at the central and intermediate levels and train staff in the epidemiological approach to the analysis of public health problems.

Indonesia 0099  Plague epidemiology (1969 -) R
To assess factors responsible for the persistence of plague and study any new foci of the disease.

Indonesia 0100  Veterinary public health (1971 -) R
To study the main zoonoses prevalent in the country and train veterinary public health officers.

Indonesia 0105  Occupational health and industrial hygiene services (1970 -) R
To develop occupational health and industrial hygiene services and prepare for the establishment of the National Institute of Occupational Health in Djakarta and three regional centres.
Indonesia 0107 Establishment of cytology services and training as part of the national family planning programme (1970 - 1974) UNFPA.

To establish laboratory services for cytology, initially at each of the principal medical schools, as part of the national family planning programme.

Indonesia 0111 National workshops on training of midwifery personnel (1971 - 1973) UNFPA.

To provide opportunities for nurse and midwife tutors to discuss the training of midwifery personnel in family health.

Indonesia 0112 Course on the health aspects of human reproduction (1971 - ) UNFPA.

To strengthen family health services as an integral part of the general services and prepare staff for teaching and organizational responsibilities.

Indonesia 0113 Family health services (1970 - ) UNFPA.

To plan, organize and operate maternal and child health and family planning activities as a regular function of the health services.

Indonesia 0114 Strengthening of the teaching of human reproduction, family planning and population dynamics in medical schools (1971 - ) UNFPA.

To strengthen the teaching carried out by the department of paediatrics and obstetrics and other departments concerned in the teaching of human reproduction, family planning and population dynamics in a number of medical schools, and to initiate research on these subjects. (See para. 17.68.)

Indonesia 0115 Medical school libraries (1971 - ) UNFPA.

To establish lending and reference libraries for medical students on subjects related to family health.

Indonesia 0119 Family health: manpower and resources (1971 - ) UNFPA.

To take a census of health manpower, make an inventory of health and training facilities, and develop a records system.

Indonesia 0120 Health education (behavioural studies) (1971 - ) UNFPA.

To design and initiate behavioural studies and, following analysis of the results, to plan health education measures required for achieving the objective of family health services within the context of various WHO-assisted programmes.

Indonesia 0121 Assessment and strengthening of health education in family health (1971 - ) UNFPA.

To strengthen the health education component of family health.

Indonesia 0122 Health education in family planning teaching programme (1971 - ) UNFPA.

To strengthen the health education component in the teaching of family health.

Indonesia 0125 Applied nutrition programme (1971 - ) R.

To plan and prepare for a nutrition survey to supply baseline data for the applied nutrition programme.

Maldives 0005 Public health administration (1969 - ) R.

To develop comprehensive basic health services and train personnel, including health auxiliaries; to carry out antimalaria work, and to strengthen the services provided by the hospital in Male.

Maldives 0007 Water supply and sanitation (1971 - ) R.

To develop water supply and sewage disposal systems for Male and an environmental sanitation programme; and to train staff.

Maldives 0008 Nursing services and education (1970 - 1971) UNDP/TA.

The aim was to strengthen nursing and midwifery services and education, with emphasis on (i) training programmes for nursing aides, auxiliary nurses/midwives and indigenous midwives; (ii) nursing and midwifery services in the hospital in Male; (iii) community nursing and midwifery services, initially in Male. WHO provided a nursing administrator/educator, a fellowship and supplies and equipment.

A one-year course for nursing aides that started under the public health administration project Maldives 0005 was completed under the supervision of the nurse educator transferred from that project, and 10 out of the 11 candidates were successful in obtaining the certificate awarded by the Ministry of Health. Three-month training programmes were conducted for indigenous midwives from Male and the outlying atolls, and assistance was given in the management and delivery of nursing and midwifery services.

Assistance with nursing administration and education will continue under the new training of auxiliary health personnel project Maldives 0009.

Maldives 0201 Fellowships UNDP/TA: Basic nursing and midwifery (12 months), undergraduate medical studies (12 months).

Mongolia 0001 Strengthening of health services (epidemiology) (1963 - 1972) R.

To carry out epidemiological surveys of the prevailing communicable diseases in order to plan practical control measures; to advise all branches of the medical and health services on the use of epidemiological methods, and to train personnel.

Mongolia 0002 Public health laboratory services (1964 - ) UNDP/TA UNICEF.

To develop the health laboratory services and train personnel in health laboratory work.

Mongolia 0003 Tuberculosis control (1963 - 1972) UNDP/TA.

To organize a comprehensive tuberculosis control programme throughout the country.

Mongolia 0004 Maternal and child health services (1965 - 1974) UNDP/TA.

To develop the maternal and child health services and establish referral facilities.

Mongolia 0005 Environmental health (community water supply) (1966 - 1973) UNDP/TA.

To develop water supplies and excreta disposal systems in provincial towns and rural areas.

Mongolia 0006 Medical education (1970 - ) R.

To develop and improve medical education.

Mongolia 0007 Health statistics (1967 - 1975) R.

To develop health statistical services and train personnel in health statistics procedures.

Mongolia 0008 Nursing services and education (1966; 1968 - 1977) R.

To develop schools of nursing, strengthen the training programmes for nursing personnel, and improve nursing services.
To study the epidemiology of certain cardiovascular conditions, particularly streptococcal, hypertensive and ischaemic heart disease, in order to determine further action.

To study the epidemiology of cancer, improve radiotherapy of the disease, and train personnel.

To train technicians to undertake the repair and maintenance of electromedical equipment; and to promote radiation protection practices in health institutions.

To plan and implement a health education programme.

To develop the manufacture of pharmaceutical products through improvement of the services associated with their quality control; and to train staff.

To develop integrated maternal and child health services and establish referral facilities.

To co-ordinate nursing activities; set up a basic nursing school; organize courses for assistant nurse/midwives, upgrade nursing services in Bir Hospital; improve clinical facilities for student nurses, and develop public health nursing services which will provide teaching practice for nursing and assistant nurse/midwife students.

The aim was to train staff for the basic health services and to develop integrated curative and preventive services with effective direction and supervision, capable of giving adequate support to field staff. WHO provided six medical officers (one from 1955 to 1956, one in 1957, one from 1958 to 1962, one from 1962 to 1965 and two from 1965 to 1968), three sanitarians (one from 1956 to 1958, one from 1958 to 1961, and one from 1963 to 1964), consultants in 1961, 1967, 1968 and 1969, fellowships, and supplies and equipment.

Following the establishment of a Health Assistants Training School in 1955, which later became the Auxiliary Health Workers’ School and was amalgamated with the 40-year-old Civil Medical School in 1963, successive WHO medical officers continued to advise on the running of the school and the training programme and assist in the preparation of the two-year courses, the selection of candidates and examination of students. The courses included communicable disease control, with emphasis on malaria and smallpox surveillance, nursing techniques, maternal and child health, drug therapy and minor surgery. The WHO sanitarians assisted in training in sanitary work. By 1970, 237 auxiliary health workers and 189 auxiliary nurse/midwives had been trained. Fellowships were awarded to staff of the School for training abroad. UNICEF assisted with vehicles and laboratory equipment. On the completion of a survey of community health care in the country the functions of health workers were defined and the strengthening of community health services in the country’s 14 zones started in a pilot area in Narayani Zone. Assistance was given with the establishment of new health posts and centres and zonal hospital services and guidance was given on maternal and child health, communicable disease control and statistics to staff of zonal health offices, which served as focal points for district and peripheral services, as well as for district medical officers. In May 1969, the WHO health educator working on the inter-country project SEARO 0177 assisted in the organization of an in-service workshop for 13 physicians at zonal and district level, with emphasis on integrated curative and preventive health services, including malaria eradication. Similar courses were subsequently planned for other health officers in Nepal.

Assistance is continuing under the development of health services project Nepal 0021.

To develop integrated maternal and child health services, including family planning services, to establish referral facilities and to conduct refresher and orientation courses for nurses and medical personnel at all levels.

To implement the national smallpox eradication programme and develop the communicable disease control unit in the Directorate of Health Services.

To develop maternal and child health services, including family planning services, to establish referral facilities and to conduct refresher and orientation courses for nurses and medical personnel at all levels.

To develop control services for leprosy in the Kathmandu valley and train health personnel.

To plan and implement a community-oriented tuberculosis control programme, starting with BCG vaccination in the Kathmandu valley, as part of the basic health services, and to train the health personnel required for the purpose.

To plan health education in the basic health services and in specialized projects, and to strengthen health education in schools and teacher training institutions.

To strengthen the development of the basic health services in conformity with the Government’s development plans, placing particular emphasis on the training of all categories of health workers and eventually establishing an integrated comprehensive health care service; to conduct health surveys on a sampling basis; and to co-ordinate associated projects operating in the country.
Nepal 0025 Water supply and sewerage for Greater Kathmandu and Bhaktapur (1969 - ) UNDP/SF
To improve water supply and sewerage in Greater Kathmandu and Bhaktapur.

Nepal 0029 National community water supply and sanitation (1971 - ) R
To plan, organize and implement a national environmental health programme, including community water supply and waste disposal, and to strengthen the Sanitary Engineering Bureau of the Department of Irrigation and Water Supply of the Ministry of Irrigation and Power.

Thailand 0020 Fellowships R: Biochemistry education (12 months), nursing (five for 12 months), nursing administration (two for 12 months), nursing education (one for 10 months, one for 12 months), public health administration (12 months), public health nursing (four for 10 months, two for 12 months).

Thailand 0002.2 Strengthening of health services (integration of specialized programmes) (1964 - 1973) R UNDP/TA UNICEF
To promote the integration of specialized communicable disease control programmes into the general health services and to develop the rural health services.
As from 1971, this project includes the leprosy control project, Thailand 0030, assisted by WHO since 1955.

To intensify the leprosy control programme and extend it to cover all endemic areas, and to train personnel.
This project has been incorporated, as from January 1971, in project Thailand 0002.2 (see above).

To develop a co-ordinated health statistics system and to train the staff required for this purpose and for the development of medical record offices.

Thailand 0042 Tuberculosis control (1958 - ) R UNDP/TA UNICEF
To develop an integrated national tuberculosis control programme based on the experience gained in urban and rural pilot projects, and to train health personnel in tuberculosis control techniques recommended by WHO.

Thailand 0043.2 Trachoma control (1967; 1969; 1971 - ) R UNICEF
To evaluate the progress of the trachoma control programme and to plan future development.

Thailand 0051 Hospital administration (1968 - ) R
To improve the administration of hospitals, and particularly of teaching hospitals.

To strengthen the Faculty of Tropical Medicine of Mahidol University, Bangkok.

Thailand 0059 Epidemiology (1966 - ) R UNDP/TA
To organize and strengthen a national epidemiological service, undertake studies of specific health problems and train personnel.

Thailand 0065 Malaria eradication programme (1962 - ) R
To eradicate malaria.

Thailand 0066 Food control administration (1964; 1971 - 1976) R
To establish a national food control administration in the Department of Medical Sciences, Ministry of Public Health; and to train staff in food control.

Thailand 0067 Radiation protection services (1963; 1965 - 1972) R
To establish a Division of Radiation Health Protection in the Ministry of Public Health, develop radiation protection measures and organize a radiation protection course.

To train staff in medical entomology and vector-borne disease control.

Thailand 0071 School for medical radiography, Bangkok (1965 - 1973) UNDP/TA
To train radiographers in X-ray diagnosis, radiotherapy and nuclear medicine at Ramathibodi Hospital, Bangkok.

Thailand 0075 Strengthening of laboratory services (1968 - 1977) R
To develop a national health laboratory service.

Thailand 0076 Health education (1966; 1969; 1971 - ) R
To develop and strengthen health education services.

To strengthen legislation and laboratory competence in the quality control of pharmaceutical preparations and train drug analysts and drug inspectors.

Thailand 0081 Water pollution (1966 - ) R
To solve organizational and technical problems related to the prevention and control of water pollution.

Thailand 0082 Venereal disease control (1967 - ) R
To organize a programme for the control of venereal diseases.

Thailand 0086 Dental health (1967 - 1975) R
To improve the education of professional and auxiliary dental staff, and to strengthen dental services.

Thailand 0089 Nursing education and services (1968 - ) R
To study nursing needs and resources, strengthen nursing services and education, develop university-level courses for nurses and organize and conduct studies related to nursing services and education.

Thailand 0090 National community water supply, drainage, sewerage and pollution control (1969 - ) UNDP/TA UNICEF
To plan, organize and administer a national environmental health programme, including the extension of community water supplies, and to train personnel.

Thailand 0093 Medical rehabilitation (1968 - ) R
To strengthen orthopaedic and rehabilitation services and continue training programmes in physical therapy.

Thailand 0097 Medical education and training (1971 - ) R
To develop the teaching and training programmes of the four medical faculties at Chiangmai, Chulalongkorn, Mahidol and Thonburi Universities, and of the Faculty of Postgraduate Studies of Mahidol University and the Faculty of Dentistry at Chiangmai University.
Thailand 0098 Health planning and administration (1970 - ) R

To strengthen and improve national health planning and health administration, with primary emphasis on the phased integration of disease-control and special health programmes, eventually leading to the development of a comprehensive health care service.

Thailand 0105 Production of biologicals (1971 - ) R

To develop the production of vaccines and sera and their testing in accordance with WHO minimum requirements, and to prepare national standards and reference reagents for vaccines and sera.

Thailand 0106 Improvement of anaesthesiology (1971 - ) R

To develop training programmes in anaesthesiology at Mahidol University, Bangkok.


To establish a new school of dentistry as part of Mahidol University.

Thailand 0109 School for medical physicists (1971 - 1974) UNDP/TA

To train medical physicists.

Thailand 0111 National Seminar on Urban and Rural Integrated Services (Maternal and Child Health/Family Health), Hua Hin (13-17 Sept. 1971) UNFPA

The purpose of the seminar was to enable senior public health administrators in urban and rural areas to discuss integrated maternal and child health/family planning services and the in-service training of their staff. There were 40 participants.

WHO provided the services of a consultant, a temporary adviser and two staff members and met the cost of attendance of participants.

Thailand 0115 Teaching of human reproduction, family planning and population dynamics in medical schools (1970 - ) UNFPA

To strengthen the teaching and research in departments of paediatrics, obstetrics and gynaecology and preventive and social medicine, and in other departments involved in the teaching of human reproduction.

Thailand 0120 Bio-environmental engineering (1971 - ) UNDP/TA

To review the curriculum of the Sanitary Engineering Department of Chulalongkorn University and introduce improvements in teaching and research in bio-environmental engineering at both undergraduate and graduate levels.

Thailand 0200 Fellowships R: Biochemistry of the thyroid hormones (12 months), clinical pathology (18 months), hospital administration (three months), national health planning (12 months), nursing (five for 12 months), nutrition and food sciences (10 months), nutritional anaemia (12 months), rehabilitation of narcotic drug addicts (three months), sanitary engineering (12 months).

Thailand 0201 Fellowships UNDP/TA: General surgery (12 months).

SEARO 0007 Regional assessment team on malaria eradication (1959 - 1961; 1963 - ) R

To make an independent appraisal of the status of malaria eradication and of any special aspects of the eradication programme in countries of the Region.

SEARO 0030 Smallpox eradication and epidemiological advisory team (1962 - ) R UNDP/TA Special Account for Smallpox Eradication

To assist the countries of the Region in the eradication of smallpox, in the development of epidemiological services and in training.

SEARO 0038.2 Production of freeze-dried smallpox vaccine (1967 - 1974) R

To assist countries of the Region with the production of freeze-dried smallpox vaccine.

SEARO 0064 Development of community water supply programme (1965 - ) R

To assist countries of the Region in developing their urban and rural community water supply projects.

SEARO 0066 Community water supply (1971 - ) Special Account for Community Water Supply

To assist countries in the Region in the managerial, financial and design aspects of community water supply programmes.

SEARO 0094.2 External cross-checking of blood films (1968 - 1977) R

To develop and strengthen facilities in the countries of the Region for independent cross-checking of blood films from malaria eradication and control programmes.

SEARO 0096.2 Medical education (1969 - ) UNDP/TA

To assist in developing medical education at all levels and adjusting teaching and training programmes to the needs of the countries of the Region and the progress of medical science, train medical educators and promote inter-country exchange of experience in educational matters.

SEARO 0097 Nutrition training and advisory services (1963 - 1974) R UNICEF

To assist with the training of medical personnel in nutrition, and to advise on public health measures in nutrition.

SEARO 0099.3 Epidemiology of virus diseases (1967; 1969; 1971 - ) R

To assist in the development of regional epidemiological surveillance of haemorrhagic fever and in national and international studies to find effective methods of control.

SEARO 0102 Asian Institute for Economic Development and Planning (1964 - ) R (ECAFE)

To strengthen the faculty of the Asian Institute for Economic Development and Planning, established with the help of the United Nations Development Programme (Special Fund component) and UNICEF, and to assist with the training in health aspects of planning and public health administration.

SEARO 0104 Planning and design of hospitals and health centres (1968 - ) R

To assist in the planning and designing of hospitals and health centres, in the co-ordination of medical care with preventive services and with training in hospital administration.
SEARO 0113 Regional tuberculosis training and evaluation team (1967 - 1977) R

To provide training in the operations and techniques of national tuberculosis control; assist in the operational assessment and evaluation of integrated national tuberculosis control programmes in the Region; and provide practical assistance to national tuberculosis programmes as required.

SEARO 0123 Malaria advisory services (1969 - 1970) R

In January and February 1969 three consultants (a malarialogist, an entomologist and a public health administrator) carried out an assessment of the malaria eradication programme in Indonesia. Their recommendations formed the basis of a plan of action for antimalaria activities in Java and Bali during the year.

Between October 1969 and December 1970 a sanitary engineer assisted the National Anti-Malaria Campaign in Ceylon in training spraying teams in the techniques of spraying and supervision and took part in the training of public health inspectors in geographical reconnaissance.

Through advisers and short-term consultants the project furnished the requirement of assisting governments in evaluation and in planning and organization of malaria eradication programmes in the Region. Its functions have partly been incorporated in those of project SEARO 0007 and partly in those of the regional office malaria unit.

SEARO 0139 Short courses for nurses and other health personnel (1967 - 1974) R

To assist in conducting short courses for nurses and other health personnel in order to acquaint them with new concepts and skills, particularly as regards patient care and family health, and in preparing reference and teaching materials; and to assist countries in areas of nursing services and education that require study.


To assist countries in producing sufficient rehydration fluid for their needs and in establishing rehydration centres, first in children's hospitals and subsequently at the peripheral level; and to organize courses for relevant categories of health personnel. (See para. 17.63.)

SEARO 0148 Strengthening and development of health services (1970 - 1974) R

To assist in the analysis of WHO-assisted health projects and programmes; to help to identify areas in which operational and cost-benefit studies are needed and participate in the design, conduct and evaluation of such studies; and to assist in coordinating all operational studies undertaken by the Regional Office.

SEARO 0150 Seminars and training courses in sanitary engineering (1970 - 1977) R

To assist countries in the Region in training sanitary and civil engineers in specific aspects of environmental health requiring urgent attention, including problems of solid wastes.


To assist countries of the Region in establishing or strengthening their quality control services and in improving laboratory competence; and to organize seminars on the quality control of biological and pharmaceutical products.

SEARO 0161 Hospital statistics and medical records (1969 - 1974) R

To assist governments of the Region (i) in organizing an efficient system for the maintenance and flow of records in hospitals, (ii) in the collection, processing and presentation of hospital statistical data and (iii) in training medical records and hospital statistics personnel.

SEARO 0178 National health planning and manpower studies (1970 - 1973) UNDP/TA

To promote the development of national health planning in the countries of the Region through regional and national training courses, meetings and study groups and consultants to assist in the formulation of national health plans, in delineating the health aspects of development plans, and in strengthening health planning units.


The purpose of the meeting was to assist countries where family planning is a national policy to strengthen the teaching of human reproduction, family planning and population dynamics in medical schools. Agreement on a series of measures required to achieve this objective was reached by the 17 participants—deans and principals (or their representatives) of medical schools in Ceylon, India, Indonesia and Thailand.

WHO provided the services of four consultants (in curriculum development, human biology, obstetrics and child health) and of staff members, and met the cost of attendance of the participants.

SEARO 0184 Seminar on School Health, Rangoon (8-13 Feb. 1971) R

The purpose of the seminar was to promote the improvement of school health services. There were 20 participants—senior health officials concerned with school health programmes in Burma, Ceylon, India, Indonesia and Thailand—and nine resource persons and 20 observers from the departments of health, education and social welfare of Burma. Views were exchanged on the status of health of children of school age in the Region and agreement was reached on the areas in which improvement of school health services was most urgently needed and on measures to be adopted for the purpose.

WHO provided the services of three consultants (in school health administration, nursing and health education) and of a temporary adviser and met the cost of attendance of the participants.

SEARO 0185 Education in public health (1971 - 1974) R

To promote postgraduate education in public health.


To build up competence in serum reference procedures in the Region, and ultimately to assist in establishing a regional centre.

SEARO 0192 Regional team on family health (1970 - 1973) UNFPA

To support national and international activities concerned with family health services and with training, evaluation and research in the subject.

SEARO 0193 Regional epidemiological surveillance team (1966 - 1969) R

To assist in strengthening epidemiological surveillance programmes covering the most important communicable diseases, in introducing epidemiological surveillance work into the normal functions of local health services, and in training staff.
SEARO 0194 WHO-sponsored training centre for nurses, Wellington, New Zealand (1970 - ) R

To provide a training programme for nurses from the Region who cannot obtain admission to regular post-basic courses because of lack of secondary education and/or the language skills required.

SEARO 0195 Regional symposium on vesical calculus (Feb. - March 1971) R

A consultant assisted in making preparations for a regional symposium on vesical calculus, planned to be held in 1972.

SEARO 0198 Regional documentation centre: human reproduction, family planning and population dynamics (1970 - ) UNFPA

To establish a regional centre for basic literature on aspects of human reproduction, family planning and population dynamics, for the use of countries of the Region.

SEARO 0199 Group education in service, teaching and research aspects of human reproduction, family planning and population dynamics (1971 - ) UNFPA

To develop education and studies in human reproduction, family planning and population dynamics.

SEARO 0211 Public health advisory services, Mekong Committee (1968 - ) Funds-in-trust

To provide technical advice to the Co-ordinating Committee for the Development of the Lower Mekong River Basin, including advice on the prevention of communicable diseases resulting from changes in environment due to man-made lakes and other irrigation works. (See para. 17.54.)

SEARO 0213 Health education materials and communication media with particular reference to family planning (1971 - ) UNFPA

To develop and improve the quality of informational, educational and teaching materials used in educational activities, and to plan for more effective utilization of various communication media for the education of the public and for preparation of staff in health education.

SEARO 0218 Workshop on the Promotion of Public Health Information, New Delhi (19-23 April 1971) R

The purpose of the workshop was to consider how to increase the effectiveness of public health information provided through the press, radio and television in the Region for the purpose of health education of the general public. There were 16 participants—information officers of ministries of health and of information, health educators and programme directors of radio and television services—from Ceylon, India, Indonesia, Nepal and Thailand, who contributed statements on the objectives of their national information policies in the field of public health and on the use of the material provided by WHO.

WHO provided the services of two temporary advisers and met the cost of attendance of the participants.
EUROPEAN REGION

Albania 1001 (0006) Vaccine production (1966 - 1972) R
To develop adequate facilities for the production of the vaccines and sera necessary for preventing and controlling communicable diseases.

Albania 1002 (0007) Central Institute of Epidemiology, Microbiology and Immunology (1965 - 1972) UNDP/TA
To promote the further development and expansion of epidemiological studies on communicable diseases and of specialized training for various categories of personnel.

Albania 4301 (0008) Resuscitation centre (1967 - 1972) UNDP/TA
To establish a centre to strengthen the organization of resuscitation and casualty services and to train the necessary staff.

Albania 6041 Fellowships R: Allergy (six months), cancer radiotherapy (six months), oncology and gynaecology (six months).

Albania 8101 (0005) Cancer control (1962 - 1971) UNDP/TA
To develop a specialized cancer programme by building up a central institute with up-to-date equipment, and by training physicians, physicists and engineers for the medical and technical aspects of the programme.

Algeria 4001 (0500) Development of public health services (1963 - ) R UNICEF
To plan and organize public health services, with emphasis on extending and improving the basic health services, on training public health personnel at the National Institute of Health and the schools for health personnel, and on some specialized activities such as nursing education and mental health services.

Algeria 4101 (0501) Public health administration (1963 - ) R
To plan and organize public health services, co-ordinate specialized activities and integrate them into the public health services, and train public health personnel.

Algeria 4201 (0509) Public health laboratories (1968 - ) UNDP/TA
To organize laboratory services at various levels of the health administration and train laboratory staff.

Algeria 4901 (0506) Epidemiology and health statistics (1963 - ) UNDP/TA
To organize health statistical services and train national personnel in health statistics; to use the statistical data collected for determining priorities in public health planning.

Algeria 5101 (0510) Family protection (1963 - ) UNDP/TA UNFPA UNICEF
To reorganize and extend maternal, child and family health work in health centres throughout the country, and to develop training facilities for maternal and child health workers and related personnel.

Algeria 5401 (0017) Mental health services (1969 - 1971) R
To provide training for medical and nursing personnel in connexion with the reorganization of the mental health services.

Algeria 5601 (0505) Malnutrition and dietary deficiencies control (1963 - 1971) R UNICEF
To conduct nutrition surveys, review programmes for the prevention of malnutrition and train personnel.

Algeria 6041 Fellowships R: Entomology (12 months), epidemiology (six weeks), kinesitherapy (six months), nursing education (four months), nutrition (10 months), public health nursing administration (six and a half months).

Algeria 6101 (0513) Training of health personnel (1970 - ) R
To improve the training programme for all categories of health personnel.
This project is a reorientation of project Algeria 0015, assisted by WHO between 1965 and 1969.

Algeria 6102 Institute of technology, Constantine (1971 - ) UNDP/SF
To establish an institute of technology for the training of medical assistants and public health midwives to meet the country's urgent requirements.
Austria 4401 (0015) Nursing education and administration (1968; 1970 - ) R
To prepare nurses for administrative and teaching posts.

Austria 6041 Fellowships R: Chemical engineering safety (one month), drug control (one month), environmental sanitation (one month), food bacteriology (one month), food control (one month), hospital planning, construction and administration (one month), public health administration (one month), rabies vaccine (one month), radiation protection (three weeks), tropical medicine (one month), virus vaccines (three weeks), water and milk control (three weeks).

Belgium 6041 Fellowships R: Computers in health statistics (seven weeks), ear surgery (two months), electromyography and kinesiology (three months), epidemiology of road accidents (six weeks), health education (12 months), hospital administration (six weeks).

Bulgaria 3041 Sanitary, hygienic and environmental problems (1971) UNDP/TA
A five-month fellowship in air pollution control was awarded.

Bulgaria 3341 (0017) Sewage treatment (1971) UNDP/TA
A three-month fellowship was awarded.

Bulgaria 4001 (0012) Scientific Centre for Hygiene and Epidemiology (1968 - ) UNDP/SF
To establish a central technical and scientific body grouping a number of formerly independent specialized institutions. The functions of the Centre will be to collect, process and evaluate information as a basis for planning the development of health services; and to train medical and allied personnel and carry out research as a faculty of the postgraduate medical school.

Bulgaria 6041 Fellowships R: Biochemistry (one for two months, one for three months), clinical chemistry (three months), electron microscopy in dental health (one for one month, one for two months), experimental allergology (two months), histochemistry (one month), histology and embryology (two months), histology of experimental tissue and organ transplantation (two months), hormonal steroid analysis (two months), infant haematology (one month), sanitary engineering (11 months), tumour biology (three months).

Bulgaria 8441 Study of the human visual system (1970) UNDP/TA
A five-month fellowship was awarded for studies in visual information processing.

Bulgaria 9041 Biochemical and medical research (1971) UNDP/TA
Three fellowships were awarded—one of five months in pathophysiology (stomach secretion), one of four months in cytohaematology, and one of three months in cholinesterase biochemistry.

Bulgaria 9241 Immunology (1971) UNDP/TA
Three fellowships were awarded—one of four months in tissue immunopathology, one of four months in the technology of semi-synthetic antibiotics, and one of five months in kidney transplantation.

Czechoslovakia 3101 (0011) Federal research and development centre for environmental pollution control (1969 - ) UNDP/SF
To establish a federal research and development centre for environmental pollution control.

Czechoslovakia 4841 Planning and organization of technical development of electronic medical devices (1971) UNDP/TA
A two-month fellowship was awarded for study of the use of computers in medicine.

Czechoslovakia 6041 Fellowships R: Environmental dermatology and detergents (one month), epidemiology and control of communicable diseases (three months), hospital administration (one month), nephrology and urology (10 weeks), nursing education (one month), organization of computer research data for coronary care units (six weeks), radiation protection (two for two months), statistical methodology (four months), tropical parasitology (two months), virology (one month).

Czechoslovakia 6201 (0009) Medical training institutes (1960 - 1970) R
The aim was to assist medical schools in studying systems and methods of undergraduate and postgraduate medical education. Seminars were arranged in 1967, 1968 and 1969. For each of them WHO provided a team of three temporary advisers to lecture. The participants were medical teachers, mainly professors, from universities in different parts of the country. At the last of the seminars the participants formulated recommendations for the establishment of a curriculum committee in each medical school, for modifications in the procedure for selecting students, and for new methods of teaching, examining and assessing the knowledge of students.

Thirty-eight fellowships, totalling 65 months, were awarded for studies of various medical subjects. Most of the fellowships were for one month or less. Supplies and equipment were provided, including laboratory and photographic equipment and books.

Project activities were planned to support various reforms undertaken in undergraduate and postgraduate medical education, including revision of curricula. A number of institutions carried out experiments in the evaluation of students and of applicants for admission to medical schools.

At the Government's request the project will be followed up by a seminar in 1972 on the relationship between undergraduate and postgraduate medical education.

Denmark 6041 Fellowships R: Drug dependence (two months), drug administration (two months), epidemiology and veterinary public health (two months), health statistics (two months), nursing administration (three months), psychiatry (one month).

Finland 6041 Fellowships R: Child and adolescent psychiatry (one month), clinical psychology (two months), computers in pathology (one month), geriatric rehabilitation (one month), mental health (one month), paediatric neurology (one month), physical therapy (three months), psychiatric rehabilitation (one month), public health administration (one month), public health administration and public health nursing (two months), public health nursing administration (two for one month), radiation measurement and protection (one month), rehabilitation (one for two months, one for one month).

France 6041 Fellowships R: Cardiovascular surgery (two for one month), cerebral and cardiac circulation (one month), epidemiology of communicable diseases (one month), health statistics (one month), hospital administration (one month), hospital medical data processing (one month), methodology of public health surveys (two weeks), obstetrics and paediatrics (two for one month), re-education after head injuries (one month).

Germany 6041 Fellowships R: Air pollution (two months), drug dependence (one month), environmental health (two months), health statistics (three weeks), medical care and hospital admi-
nistration (two for two weeks), public health administration (one month), social psychiatry (two for six weeks), virology (one for one month, one for two months), vital and health statistics (two for three months).

Greece 3401 (0025) Environmental sanitation (1967 - ) UNDP/TA

To assess solid waste disposal problems in urban areas through a general review, followed by a specific study of one or two cities where the situation is more acute.

Greece 4001 (0025) Development of public health services and training of personnel (1958 - ) UNDP/TA UNICEF

To organize comprehensive and co-ordinated health services in a rural area where new methods of public health administration can be tested, practical training can be given to all categories of public health personnel, and demonstration and research can be carried out. Services for vital and health statistics, maternal and child health, dental health, medical care, mental health and environmental health are being organized in the demonstration area.

Greece 4201 (0036) Public health laboratory services (1968 - 1970) UNDP/TA

The aim was to modernize and expand the central laboratory services and improve the regional and peripheral services, in accordance with recommendations contained in a study made by a WHO consultant in 1965. In 1969 a consultant advised on the preparation and control of various vaccines and another advised on general and special mechanical installations. Some equipment and supplies were provided.

Greece 4441 (0017) Nursing education and administration (1970) UNDP/TA

A four-month fellowship was awarded under this project, which was previously assisted by WHO between 1956 and 1962.

Greece 6041 Fellowships R: Air pollution (three months), cancer chemotherapy (three months), chromosome analysis (six months), maxillofacial surgery (three months), thyroid cancer (three months).

Hungary 1041 (0020) Treatment of tropical diseases (1971) UNDP/TA

A five-month fellowship was awarded.

Hungary 3001 (0008) Training of sanitary engineers (1965; 1967 - 1969; 1971) UNDP/TA

To organize the training of sanitary engineers and to train sanitary engineers as teachers.

Hungary 3101 (0019) Pilot zones for water quality management (1971 - ) UNDP/SF

To establish pilot zones for water quality management, with a view to collecting data and developing a rational basis for investment in water quality improvement.

Hungary 4201 (0018) Public health laboratories (1971 - ) R

To improve health laboratory facilities by introducing or extending the application of new diagnostic procedures and investigating the possibility of producing new biological substances.

Hungary 4901 (0013) Health statistics (1971) UNDP/TA

A fellowship on the use of computers in medicine was awarded under this project during the period under review.

Hungary 6041 Fellowships R: Bacteriology (one month), child psychiatry (one month), clinical psychopharmacology (two months), clinical toxicology (three months), cytogenetics (three months), entomology and insecticides (three and a half months), food hygiene and chemical food additives (six weeks), forensic medicine (one month), haematology (two months), heart surgery (two months), human genetics (three months), medicine (12 months), nephrology and use of radioisotopes (four months), obstetrics (three months), radioisotopes (two months).

Hungary 6201 (0007) Medical training institutes (1966 - 1972) R

To develop new teaching programmes in medical schools.

Iceland 6041 Fellowships R: Bacteriology (six months), physical therapy (four months), public health nursing (four months).

Ireland 6041 Fellowships R: Child health services (one month), drug control (two weeks), haemophilia (one month), hospital administration (two for one month), hospital administration and organization (one month), medical health aspects of drug dependence and alcoholism (two for one month), public health paedodontics (one month), regional laboratory organization (one month), rehabilitation of physically handicapped children (one month), respiratory and metabolic problems of head injuries (one month).

Italy 4401 (0023) Nursing education and administration (1960 - ) R

To prepare nurses for teaching and administrative posts and develop basic and post-basic nursing education programmes.

Italy 6041 Fellowships R: Environmental sanitation (one month), first aid service organization (one month), legislation on hospitals (three for one month), medical and allied education (one month), medical education (one month), medical electronics (one month), organization and operation of cytology hospital services (two weeks), orthopaedics (one month), paediatric intensive care (one month), public health administration (one month), rehabilitation (one month), sanitary engineering for hospital buildings (one month), training of paramedical personnel (one month), vascular surgery (one month).

Luxembourg 4001 (0007) Public health services (1971 - ) R

To further the development of the public health services.

Luxembourg 6041 Fellowships R: Rheumatology (one month).

Malta 3201 (0014) Wastes disposal and water supply (1966 - 1972) UNDP/SF

To carry out engineering and feasibility studies and draw up a construction and investment programme for immediate and phased long-term plans for the improvement and development of waste disposal and water supply facilities; also to investigate the legal, managerial and financial aspects of the programme.

Malta 5401 (0007) Mental health services (1965 - 1972) UNDP/TA

To plan and develop the psychiatric services, and especially the training of nursing personnel.

Malta 6041 Fellowships R: Occupational medicine (10 months).


To assess the extent of the communicable diseases which are major public health problems in the country, especially salmonellosis, venereal diseases, cerebrospinal meningitis and leprosy, with a view to implementing effective and economical measures.
To train sanitary engineering teaching personnel and specialists at university level.

Morocco 3003 Environmental hygiene (1971 - ) UNDP/TA

To reinforce the environmental sanitation services, promote environmental health programmes and train personnel.

This project provides also for follow-up of the environmental health aspects of programmes for socio-economic development, particularly those receiving assistance from UNDP or other agencies.


To prepare a master plan for national and regional water supplies, and pre-investment studies on water supply and waste disposal in the coastal region between Kenitra and Casablanca and on water supply for one or two towns in the remainder of the country. The project includes economic and organizational studies as well as the training of personnel.

Morocco 4401 (0504) Nursing services and education (1967 - 1970) UNDP/TA

The aim of the project, which replaced the two projects Morocco 0502 (Nursing education) and Morocco 0503 (Training of health auxiliaries) was to develop nursing and midwifery education and services in accordance with the country's needs. WHO provided a nursing adviser for the duration of the project. Four fellowships in nursing were awarded under other projects. Priority was given to the establishment of sound professional education and to in-service training. Correspondence courses were organized for nurses and other professional health workers to help them to keep their knowledge up to date. Teachers and administrators in nursing, midwifery and social work were trained at the School for Advanced Nursing Education in Rabat. Since the project began, 265 nurses and 720 nursing auxiliaries have been trained; in all, 1105 nurses and 8988 nursing auxiliaries have been trained under WHO-assisted nursing projects in Morocco. A survey of needs and resources in health manpower (covering nurses, midwives and workers in the allied health professions) was conducted in the provinces of Safi and Marrakesh prior to health planning for these provinces. Manuals for nurses and midwives on maternal and child care and tuberculosis control were published and have been extensively used. When the project ended, the WHO nursing adviser was transferred to the project for the development of public health services and training of personnel (Morocco 4001).

Morocco 4501 (0017) Health education services (April - May 1971) R

A consultant assisted in training various health workers in health education, with emphasis on working out health education methods and on production of teaching material adapted to the needs of the country.
Morocco 4901 (0211) Epidemiology and health statistics

The purpose of the project was to strengthen the national health statistical services and to train national statistical personnel. The ultimate aim was to obtain information on the health status of the population necessary for the planning and evaluation of public health services. WHO provided a medical officer between 1961 and 1968, fellowships and supplies and equipment.

A Central Office of Health Statistics was established and in 1968 the Government appointed as Director a qualified statistician who had received further training abroad on a WHO fellowship. When the project ended the Office had a qualified statistician (who also received a WHO fellowship) in addition to the Director, as well as three intermediate-level statisticians and 10 statistical clerks. Since 1964 there has been a gradual development of health statistical services in the provincial health administrations and the larger hospitals. Fifty statistical clerks have been trained in annual courses for service in the central and provincial health statistical offices; several of the students were given additional training. A manual of health statistical methods was prepared by the WHO medical officer, and statistics of causes of death and hospital morbidity statistics were gradually improved.

Morocco 5603 Nutrition deficiencies control
(June - July 1971) R

A consultant was provided for one month to assist the Ministry of Public Health's office for maternal and child health and nutrition in drawing up a nutrition map of the country, in training staff, and in controlling nutritional deficiencies in infants and young children.

Morocco 6041 Fellowships R: Haematology (two months), malaria eradication training (two for seven weeks).

Morocco 6201 (0023) Medical education (1960 - ) R

To strengthen teaching and research in preventive and social medicine and in the basic medical sciences at the Faculty of Medicine, Rabat, and to train national staff.

Netherlands 6001 (0015) Fellowships R: Control of pharmaceuticals (two weeks), dental education (six weeks), food control (one for two weeks, one for six weeks), geriatrics (one month), medical care and medical education (two for one month), mental health—family therapy (six weeks), neurology (six weeks), occupational health (one month), organ storage and organ perfusion (five weeks), social paediatrics (one month), water pollution laboratory (five weeks).

Norway 6041 Fellowships R: Public health (two for four months, one for eight months).

Poland 1201 (0016) Tuberculosis control
(1960 - ) UNDP/TA UNICEF

To carry out tuberculosis control work and to follow up the results of the studies carried out since 1964 on the detection and treatment of new cases in pilot tuberculosis control areas. Studies on the epidemiology of tuberculosis in Poland and tests on the immunogenic value of BCG vaccine are also envisaged.

Poland 3001 (0031) Comprehensive development of the Vistula River system (1970 - ) UNDP/SF (UN)

Consultants on water pollution are being provided under this project, which is assisted by the United Nations Development Programme (Special Fund component) with the United Nations as the executing agency.

Poland 3101 (0026) Protection of river waters against pollution
(1965 - 1971) UNDP/SF

To develop scientific and research work for the control of water pollution by domestic wastes, industrial effluents, saline waste waters and waste waters from thermal power stations in the Upper Silesia region.

Poland 3102 Environmental pollution control
(1971 - ) UNDP/SF

To establish an environmental pollution abatement centre in the Cracow/Silesia industrial area. The Centre will initiate, carry out and co-ordinate research and will provide advice on and develop methods and techniques for monitoring and evaluating environmental pollution and its effects on man and his environment, as well as on the technology of pollution abatement and the training of personnel.

Poland 3142 Water and sewage purification (1971) UNDP/TA

A six-month fellowship was awarded.

Poland 5401 (0027) Mental health (1967 - ) UNDP/TA

To provide training in child mental health and the rehabilitation of psychiatric patients in order to strengthen the mental health services.

Poland 6041 Fellowships R: Air pollution (one month), communicable disease prevention and control (one month), communicable diseases, air pollution and food control (one month), environmental health, food control and pesticides (one month), environmental sanitation (one month), gastroenterology (two weeks), hospital administration (one month), intensive care units (one month), malaria chemotherapy (10 weeks), non-specific immunity (two months), orthopaedic surgery and rehabilitation for scoliosis (two weeks), otolaryngology (two weeks), parasitology (one month), paediatric neurology (three months), public health administration (two for one month), radiobiology (six months), radiological diagnosis in otorhinolaryngology (one month).

Poland 6201 (0015) Medical faculties (1958 - 1970) R

The aim of the project was to improve the standard of training in basic medical sciences at the medical academies at Lublin and Lodz, and to improve scientific research in the basic medical sciences. WHO provided 10 lecturers (temporary advisers) in basic medical sciences for national seminars in 1967, 1968 and 1969, and some laboratory equipment, and awarded 81 fellowships (totalling 217 months) to teachers and research workers, mainly from the Lublin and Lodz academies. A Polish doctor (temporary adviser) studied medical education in Scandinavia for two and a half weeks.

Poland 6202 (0029) Training in social medicine (1971 - ) R

To develop curricula in social medicine and public health in medical faculties and to train teachers in methods of teaching these subjects.

Poland 7441 Pharmacology (1970 - 1971) UNDP/TA

Two nine-month fellowships were awarded.

Romania 3101 (0009) Studies on air and water pollution control
(1969 - 1971) UNDP/SF

To carry out laboratory and field studies on air and water pollution, develop control methods and train personnel.

Romania 4841 (0005) Rehabilitation (1967 - ) UNDP/TA

To provide training facilities in connexion with studies in rehabilitation.
Romania 5141 (0011) Maternal and child health care
(1970 - 1972) UNDP/TA
To provide training in maternal and child health care.

To provide facilities for study abroad in order to assist the development of the psychiatric services for children.

Romania 6041 Fellowships R: Air pollution (two months), anaesthesiology (two months), cardiovascular disease epidemiology (three months), chemotherapy and hormonotherapy of cancer and malignant haemopathies (one month), chronic degenerative disease prophylaxis and treatment (two months), group psychotherapy techniques (three months), industrial hygiene (two months), nutrition and control of foodstuffs (three months), occupational health and occupational diseases (three months), ophthalmology (three months), organization of teaching in schools of public health (two months), urology and nephrology (three months).

Romania 6301 (0007) Training of health personnel
(1970 - ) R
To develop post-basic teaching institutions and prepare teachers for various groups of health personnel.

Romania 9041 (0008) Electronic microscopy and cytochemistry
(1969 - 1972) UNDP/TA
Two three-month fellowships were awarded during the period under review for study of histochemical techniques in electron microscopy.

Romania 9042 (0012) Transplantation of tissues and organs
(1970 - 1972) UNDP/TA
To train doctors in the transplantation of tissues and organs.

Spain 1901 (0025) Epidemiological studies of virus diseases of public health importance (1964 - ) UNDP/TA
To study methods for the prevention and control of enteric, respiratory and other virus diseases of public health importance and to provide training facilities.

Spain 3101 (0036) Pollution in the Bilbao district
(1971 - ) UNDP/TA
To investigate the problem of air pollution in the metropolitan area of Bilbao, particularly as regards emissions from the steel and chemical industry.

Spain 3141 Purification of water in the Ribarroja basin
(1971 - 1972) UNDP/TA
To provide facilities for training in water purification.

Spain 4001 (0030) Health demonstration and training area
(1965 - 1971) UNDP/TA
To set up, as part of the general plan for socio-economic development, a public health demonstration and training area with a complete network of co-ordinated rural health services. The area will be used for testing administrative and technical methods, for carrying out surveys, and, in collaboration with the National School of Public Health, for training various categories of health staff.

Spain 4401 (0019) Nursing education and nursing service administration
(1971 - ) R
To develop post-basic nursing education and strengthen basic education programmes by preparing nurses for administrative and teaching posts in basic and post-basic schools of nursing.

Spain 5401 (0031) Mental health services
(1966 - 1971) UNDP/TA
To develop the mental health services, especially those for the rehabilitation of psychiatric patients.

Spain 6041 Fellowships R: Air pollution (two for one month), bacteriological and serological diagnosis of enteric bacterial diseases (one month), cancer registration (one month), dental health (one month), environmental sanitation for tourist regions (one month), food microbiology (one month), immunology and serology (10 weeks), laboratory techniques relating to brucellosis (one month), metabolic diseases of children (two for one month), rheumatology and rehabilitation for articular lesions of the hands (two months), thoracic kinesitherapy (one month).

Spain 6201 (0035) Medical education (1971 - ) R
To improve medical education by developing curricula and methods of teaching and evaluation, with emphasis on new faculties, carrying out relevant studies, and providing training facilities abroad for the study of medical education.

Sweden 6041 Fellowships R: Child health (one month), communicable diseases (one month), health education (six weeks), maxillofacial surgery (two months), nephrology and home dialysis (one month), nursing in cases of drug dependence (six weeks) paediatric surgery (one month), physical therapy (three months), tropical veterinary medicine (eight months).

Switzerland 4401 (0018) Study of the functions of nursing personnel (1965 - 1971) R Funds-in-trust
The aim of the study was to determine the responsibilities and differentiate the functions of the various categories of nursing personnel required by the health service. A description of the work done up to and including 1970 is given in the Annual Report for that year.1

In 1971 the consultant who had worked in the earlier phases of the study assisted with preparations for its final phase, which is the application of the findings in pilot wards in five hospitals in Switzerland. She helped with a course for nurses from these hospitals, which was designed to provide them with a method, adaptable to different situations, for introducing changes in the organization of nursing services.

Turkey 1401 Cholera vaccine
Cholera vaccine was supplied in connexion with the cholera pandemic.

Turkey 2001 (0023) Malaria eradication programme
(1957 - ) R
To achieve malaria eradication throughout the country.

Turkey 3001 (0503) Environmental sanitation (1964 - ) R
To develop the environmental sanitation services and train sanitation personnel.

Turkey 3002 (0501) Promotion of training and programmes in sanitary engineering, Middle East Technical University
(1970 - ) UNDP/TA
To train environmental health personnel at professional and subprofessional levels at the Middle East Technical University, Ankara, and to promote specific environmental health programmes in various government agencies.

Turkey 3003 (0053) Promotion of training and programmes in sanitary engineering, Istanbul Technical University (1970 - ) UNDP/TA

To train environmental health personnel at professional and subprofessional levels at the Istanbul Technical University and to promote specific environmental health programmes in various government agencies.

Turkey 3041 Environmental health (1971) UNDP/TA

A three-month fellowship was awarded for studies in public health engineering (diploma course).

Turkey 3201 (0046) Master plan for water supply and sewerage for the Istanbul region (1965 - ) UNDP/SF

To prepare a master plan, and feasibility and preliminary engineering and other organizational studies, for the extension and improvement of the water and storm drainage systems of Greater Istanbul and the rapidly developing industrial areas in the vicinity.

Turkey 4001 (0500) Development of public health services and training of personnel (1970 - ) R UNICEF

To strengthen national health services at the central, regional, and peripheral levels.

Turkey 4201 (0508) Training of public health laboratory technicians (1969 - ) R

To train laboratory technicians required for the development of country-wide public health laboratory services and prepare an expanded teaching programme.

Turkey 4241 (0507) Public health laboratory services (1971) UNDP/TA

A three-month fellowship was awarded for studies in virology.


A consultant was provided to advise the Government on measures to combat malnutrition, especially in children, and to assist in drawing up a national nutrition policy.

Turkey 6041 Fellowships R: Drug control laboratory work (12 months), gastroenteric surgery (two months), paediatric haematology (two months), statistics and epidemiology (six months), tuberculosis (three weeks).

Turkey 6201 (0050) Training in preventive and social medicine (1969 - ) R

To develop undergraduate and postgraduate medical education. The project provides for continuation of assistance to the School of Public Health, Ankara, and for assistance, chiefly in preventive and social medicine, to new medical schools.

Turkey 8441 Ophthalmology (1971) UNDP/TA

A 12-month fellowship was awarded.

Turkey 9041 Biology (1971) UNDP/TA

A 12-month fellowship was awarded for studies in endocrinology.

United Kingdom 6041 Fellowships R: Biomedical engineering (one month), clinical pharmacology and therapeutics (one month), computers in hospital administration (one month), health education for limitation of smoking (one month), hospital and medical care administration (two weeks), orthodontics (two weeks), smallpox and other communicable diseases (five weeks), student health services (one month), tissue typing and transplantation (two weeks), undergraduate medical education (one month), virology (one month).

USSR 6041 Fellowships R: Biochemistry (six months), blood and bone marrow preservation (six months), cardiology (one for six weeks, one for six months), molecular biology of cancer (12 months), nephrology (six months), neurosurgery (three months), radiation detection (six months), tropical medicine (four months), virology (two for three months, one for six months).

Yugoslavia 1901 (0038) Epidemiological studies of virus diseases (1965 - 1970) UNDP/TA

The aim was to assist the Government in initiating serological surveys and isolating viruses from cases of active respiratory illness in children in hospitals, nurseries and the community, with a view to assessing the extent of the problem and evolving suitable control measures.

The project started in the city of Belgrade and the Republic of Serbia in 1966. Field operations began in 1967, with the participation of the Institute of Public Health of Serbia, the Maternal and Child Health Institute of Serbia, and the Paediatric Clinic of the Faculty of Medicine in Belgrade. Project activities were extended to Skopje, Macedonia, in 1969, where the Institute of Health undertook the epidemiological and virological investigations required, while the Department of Paediatrics, Faculty of Medicine, University of Skopje, undertook the clinical investigations. The experience gained so far confirms the involvement of respiratory viruses in the respiratory illnesses of preschool children. This knowledge has been of service in the design of treatment schedules and control measures.

One six-month and five three-month fellowships were awarded to the members of two teams (each consisting of a paediatrician, a virologist and an epidemiologist) from Belgrade and Skopje respectively, to give them the necessary training for the work foreseen in the plan of action for the project. Laboratory equipment was supplied to the laboratories in Belgrade and Skopje.

Though the UNDP assistance to the project terminated at the end of 1970, the plan of action outlines the activities to be carried out until mid-1974. WHO will give technical advice for the continuation of the programme.

Yugoslavia 4101 (0020) Public health administration (1969 - 1972) UNDP/TA

To provide training facilities and equipment for the federal and republic institutes of public health.

Fellowships were provided under this project between 1956 and 1968.

Yugoslavia 5141 Paediatric cardiology (1971) UNDP/TA

A six-month fellowship was awarded.

Yugoslavia 6041 Fellowships R: Dental health (four months), drug control and toxicology (two weeks), histochemistry (one month), medical education in maxillofacial and dental surgery (one month), medical rehabilitation (one month), mental health of children (one month), neurophysiology (one month), psycho-pharmacology (one month), thyroid autoimmunity (six weeks).

Yugoslavia 8001 (0037) Chronic and degenerative diseases (1969 - 1972) UNDP/TA

To provide training facilities and equipment for the chronic and degenerative disease centres to be set up in certain republics.

Fellowships were provided under this project between 1965 and 1967.
EURO 2001 (0165) Malaria eradication evaluation and epidemiological assessment (1962 - ) R
To meet requests for the certification of malaria eradication and to assist malaria epidemiological assessment within the Region.

To provide entomological advice for the malaria projects in Algeria and Morocco and, if necessary, for those in Turkey and other countries.

EURO 3001 (3361) Training of sanitary engineers (Russian language) (1966 - ) R
To assist the annual postgraduate course in sanitary engineering in Poland.

For the third course, arranged from 1 November 1971 to 31 July 1972, WHO provided fellowships for six trainees from Bulgaria, Czechoslovakia, Union of Soviet Socialist Republics, and Yugoslavia. A fellowship for a trainee from Mongolia was provided from other funds.

EURO 3002 (3362) Training of sanitary engineers (French language) (1967 - ) R
To assist in the development of an academic course for sanitary engineers and provide training for teaching staff.

EURO 3004 (0402) Study on the environmental health aspects of tourism development (1971) R
To follow up ad hoc assistance to some Member States of the Region in assessing environmental health problems arising from the rapid development of the tourist industry and to prepare a programme of further activities in this field.

EURO 3101 (0347) Courses on air pollution and water pollution (1967 - 1973) R
To promote, in national institutions, short courses on air and water pollution, with special reference to public health, to enable personnel from interested countries to bring their knowledge up to date and to acquaint them with new developments.

EURO 3103 (0424) Study on trends and developments in air pollution control (1971) R
The aim was to review the present situation in air pollution control in Europe and consider trends and future activities for coping with the growing problems in this field.

A working group met in Copenhagen from 19 to 22 January 1971. WHO met the cost of attendance of the 12 participants (temporary advisers) from Belgium, Czechoslovakia, Federal Republic of Germany, Finland, France, Netherlands, Switzerland, Union of Soviet Socialist Republics, and United Kingdom. Four representatives of ECE, the Organization for Economic Co-operation and Development and the Commission of European Communities also took part in the meeting.

To prepare a regional long-term programme of environmental pollution control.

EURO 3105 (0446) Conference on Accidental Pollution of Inland Waters, Bucharest (27 Sept. - 1 Oct. 1971) R
The purpose of the conference, which had about 120 participants, was to follow up studies on trends and developments in water pollution control in Europe, carried out in 1969 and 1970. The conference was organized in co-operation with other United Nations agencies and European intergovernmental organizations interested in this field and discussed problems created by new pollutants and new methods.

WHO provided a consultant and nine temporary advisers and met the cost of attendance of 15 participants from Algeria, Austria, Bulgaria, Denmark, Greece, Hungary, Monaco, Morocco, Norway, Poland, Portugal, Romania, Spain, Turkey,
and Yugoslavia. The following organizations sent representa-
atives: ECE, FAO, UNESCO, WMO, IAEA, the Commission of
European Communities, the European Atomic Energy
Community, the Committee for Mutual Economic Aid, and the
Stichting Concawe, Netherlands.

EURO 3106 (0447) Study of guides and criteria of air pollution

A consultant was provided to follow up the study on trends 
and developments in air pollution (project EURO 3103), and to
implement the recommendation of the symposium on the health
effects of air pollution, held in 1967, by compiling and analysing
documentation required for the development of guidelines and
criteria for air pollution, so as to enable Member States to
establish or complete their national air pollution standards.

EURO 3109 (6214) Health hazards arising from the persistence
of certain organic substances in water

(1971 - ) Special Account for Miscellaneous Designated
Contributions

To assist collaborating institutions in investigating health
hazards arising from the persistence in water of organic sub-
stances from domestic and industrial sewage effluents and, in
particular, from the synthetic organic chemicals, and to determine
the levels at which such substances have no detectable effect on
health.

EURO 3114 (6300) Study on the long-term effects of air pol-
lution

(1971 - ) Special Account for Miscellaneous Designated
Contributions

To carry out a physiological and epidemiological investiga-
tion on the long-term effects on health of air pollution.

EURO 3119 (6226) Seminar on Automatic Water Quality
Monitoring, Cracow, Poland (29 March - 2 April 1971) R

The aim was to review the situation as regards automatic water
quality monitoring, with particular reference to the experience
gained in the project for the protection of river waters against
pollution (Poland 3101) and to discuss further developments
in this field. There were 25 participants from Austria, Belgium,
Bulgaria, Czechoslovakia, Federal Republic of Germany,
Finland, Hungary, Netherlands, Norway, Poland, Romania,
Sweden, Switzerland, Turkey, Union of Soviet Socialist Repub-
lics, United Kingdom and Yugoslavia. (See para. 18.81.)

WHO provided three consultants and four temporary advisers
and met the cost of attendance of three participants. WMO
and the Committee for Mutual Economic Aid each sent a
representative.

EURO 3126 Physical methods of analysis

(1971) Special Account for Miscellaneous Designated Con-
tributions

To survey the newer physical methods of analysis and their
application to water pollution control.

EURO 3301 Health hazards due to the discharge of sewage into
the sea (Sept. - Oct. 1971)

Special Account for Miscellaneous Designated Contributions.

A consultant was provided to assess the risks to health arising
from the discharge of sewage into the sea and the effects of
treating such sewage to different standards and of the location
of discharge points.

EURO 3402 (0426) European model code of practice for the
land disposal of solid wastes

(1970 - ) Special Account for Miscellaneous Designated
Contributions

To review current trends with regard to the public health
aspects of waste reclamation, disposal practices in congested
areas and disposal of refuse into sewage, and to make proposals
for further activities in conjunction with the headquarters
programme in this field.

As from 1971, the study has become an integral part of the
regional long-term programme on environmental pollution
control. A working group met at Bilthoven, Netherlands, from
4 to 6 May to formulate recommendations for further develop-
ment of the solid wastes component of the long-term programme.
WHO provided two consultants and met the cost of attendance
of the nine participants (temporary advisers) from Austria,
Federal Republic of Germany, France, Greece, Italy, Nether-
lands, Poland, Switzerland and United Kingdom.

EURO 3901 Working Group on Noise Control, The Hague
(5-8 Oct. 1971) Special Account for Miscellaneous Designated
Contributions

The purpose of the meeting was to review the present situation
and trends in noise control in Europe and to consider what
activities the Regional Office could undertake in this field in the
context of its long-term programme of environmental pollution
control.

WHO provided two consultants and met the cost of attendance
of the nine participants (temporary advisers) from Austria,
Czechoslovakia, Denmark, Federal Republic of Germany,
France, Switzerland, Union of Soviet Socialist Republics,
United Kingdom and United States of America. The Organiza-
tion for Economic Co-operation and Development and the
International Association against Noise each sent a representa-
tive.

EURO 4001 (0340) Study on the role of central institutes of
hygiene or public health (1970 - ) R

To study the organization of national and regional institutes
of public health or hygiene conducting technical, educational
or research activities in certain countries of the Region.

EURO 4003 (0436) Study on the health aspects of labour
migration (1971) R

Three WHO consultants made a study of the health aspects
of the widespread migration of labour that has affected certain
European countries in recent years.

EURO 4101 (0407) Advanced Training Course on Health

The purpose of the course, which was given in French, was to
introduce methods of health planning within the framework of
national economic development.

WHO provided eight lecturers, and some senior staff members
also gave lectures. Fellowships were awarded to 11 trainees
from Algeria, Belgium, France, Italy, Luxembourg, Poland,
Romania, Spain and Switzerland, while one trainee from the
Federal Republic of Germany participated at his Government's
expense.

EURO 4102 (0423) Information on health planning in the
European Region (1970 - ) R

To follow up the work of the Regional Office by reviewing in
documented form, for the guidance of national and regional
health administrators, experience acquired on short- and long-
term health planning in the Region.

The aim was to follow up the symposium on methods of estimating health manpower, held in 1968, by an exchange of views on demographic characteristics and trends relating to health manpower, to summarize and assess the findings of studies made in this field and indicate, in the light of demographic and social influence on manpower, where further studies are needed.

WHO provided a consultant and met the cost of attendance of the 10 participants (temporary advisers) from Denmark, Federal Republic of Germany, France, Netherlands, Poland, Romania, Union of Soviet Socialist Republics, and United Kingdom.


To study recent development and follow up national studies on the efficiency of health care which have been made since the 1966 symposium on the efficiency of medical care and to prepare for a conference on the subject in 1972.


The purpose of the symposium was to appraise experience thus far gained in the development of hospital computing systems, especially in relation to the improvement of patient care, the advantages for related health care facilities, the impact on hospital organization and procedures and the effect on human relationships in hospitals. There were 16 participants from Belgium, Czechoslovakia, Denmark, Finland, France, Italy, Luxembourg, Netherlands, Poland, Sweden, Switzerland, Union of Soviet Socialist Republics, and United Kingdom. The International Hospital Federation and the International Federation for Information Processing each sent a representative. (See para. 18.91).

WHO provided 13 temporary advisers and met the cost of attendance of 11 participants.


A consultant was provided to examine and evaluate nursing education programmes in some countries of the Region and to define criteria and devise methods applicable to the assessment of such programmes. The study will be followed in 1972 by a seminar on higher education in nursing (EURO 4408).

The consultant also helped to prepare a directory of basic schools of nursing, which has been distributed to Member States, schools of nursing and individuals.

EURO 4402 (0774) International school of advanced nursing education (Russian language), Poland (1969 - ) R

To give assistance to advanced nursing education in Russian, similar to that previously given to nursing education in English and French, for preparing nurses for leading positions in specialized branches of nursing, for nursing education and administration, and for research.


The purpose of the meeting was to examine recent trends in the organization and staffing patterns of nursing services with a view to finding ways of utilizing available nursing staff which will relieve the shortage of nursing personnel. The participants included both nurse educators and nurse administrators.

WHO provided a consultant and met the cost of attendance of 12 participants (temporary advisers) from Belgium, Czechoslovakia, Denmark, Federal Republic of Germany, Finland, France, Poland, Switzerland, and United Kingdom. Two participants from Switzerland attended the meeting at the expense of their Government.

EURO 4406 (0462) Course for psychiatric nursing tutors on new approaches to psychiatric nursing care, Edinburgh (28 June - 17 July 1971) R

The purpose of the course, which was given in English, was to provide training in modern psychiatric nursing practice and instruction in the use of audiovisual equipment essential for teaching all grades of psychiatric nursing personnel.

WHO provided three lecturers and fellowships for 12 trainees from Austria, Denmark, Federal Republic of Germany, Finland, Hungary, Malta, Netherlands, Norway, Sweden, United Kingdom and Yugoslavia.

EURO 4501 (0330) Training courses and national studies in health education and related social sciences (1970 - ) R

To assist certain postgraduate courses for training in health education and to help countries interested in organizing national studies in health education.

EURO 4502 (0331) National courses, conferences and seminars in health education for physicians and leading health personnel (1968 - ) R

To assist national courses, conferences and seminars for physicians and leading health personnel responsible for promoting health education and to facilitate the attendance of similar staff from neighbouring countries by the award of fellowships.

EURO 4701 (0464) Study of the health effects on personnel of ionizing radiations and other physical factors, The Hague (15 - 17 Nov. 1971) R

A meeting was held with the aim of reviewing the risks to personnel working in places where ionizing radiation and other physical phenomena are present owing to the introduction of certain types of new ultrasonic and electromagnetic installations, of studying the results of exposure, even to small doses, taking into account harmful genetic effects, and of working out prophylactic measures.

WHO met the cost of attendance of the six participants (temporary advisers) from Denmark, Federal Republic of Germany, Netherlands, United Kingdom, and United States of America. ILO and the Organization for Economic Co-operation and Development each sent one representative, and the Commission of European Communities sent two.

EURO 4802 (0467) Conference on Education and Training in Medical Rehabilitation, Konstancin, Poland (10 - 16 Nov. 1971) R

The purpose was to bring together clinical teachers from undergraduate and postgraduate medical schools and other health personnel, including nurses, physical therapists and occupational therapists, to consider the findings of the study on education and training in medical rehabilitation carried out in 1970, with a view to formulating conclusions and recommendations for promoting undergraduate and postgraduate teaching of the subject. The conference was attended by 37 participants from countries of the Region and by representatives of UNICEF, UNESCO, the International Social Security Association, the World Confederation for Physical Therapy, the International Federation of Physical Medicine, the International Committee of Catholic Nurses, and the International Council of Nurses.

WHO provided two consultants and six temporary advisers and met the cost of attendance of 23 participants from Belgium, Bulgaria, Czechoslovakia, Denmark, Federal Republic of
Germany, Finland, France, Greece, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, Turkey, Union of Soviet Socialist Republics, and United Kingdom.

EURO 4901 (0215) Health statistical services (1962 - ) R

To support and conduct studies on various subjects, including the accuracy and comparability of statistics on causes of death, the epidemiology of home accidents, methods of surveillance of congenital pathological conditions, the use of continuous population samples in health surveys, the use of social security records as sources of health statistical information, the measurement of the consumption of psychotropic drugs, and the linkage of child health records. This project is linked with projects EURO 4905 and EURO 4906.

EURO 4902 (2161) Course on vital and health statistics (in English), London (24 Sept. - 17 Dec. 1971) R

A course on vital and health statistics has since 1962 been given by the London School of Hygiene and Tropical Medicine and the General Register Office, London. For the 1971 course WHO provided fellowships for two trainees from Hungary and Poland and (under another project) for two trainees from the Federal Republic of Germany.

EURO 4903 (2162) Course on methods of medical statistics and epidemiology (in French), Brussels (1 Feb. - 28 May 1971) R

The annual course has been held by the Free University of Brussels since 1962, to provide training in medical statistics and epidemiology. In 1971, the standard course was followed by a special course, from 1 to 4 June, devoted to the epidemiology of cardiovascular diseases.

WHO provided two temporary advisers for the special course (under another project) and, for the entire course, fellowships for three trainees from France, Romania, and Switzerland and (under other projects) for four trainees from Czechoslovakia, Romania, Spain and Switzerland.

EURO 4904 (2163) Course on the application of statistical and epidemiological methods to medicine and public health (in Russian), Bratislava (9 Sept. - 17 Dec. 1971) R

A course to give physicians and health statisticians training in the application of statistical methods to public health and to epidemiological and clinical studies. In 1971 the standard course was followed by a one-week course dealing with the epidemiology of cardiovascular diseases.

WHO provided three lecturers for the standard course (under another project) and, for the entire course, fellowships for two trainees from Bulgaria and Poland, and (under other projects) for six trainees from Czechoslovakia, Hungary, Poland, Romania and Union of Soviet Socialist Republics.

EURO 4905 (0350) Epidemiology studies (1966 - ) R

To study and report on specific aspects of mortality and morbidity of particular interest to the Region, starting with a study among cases of stomach cancer. If appropriate, the findings will be presented to the annual sessions of the Regional Committee for Europe. Also, to co-ordinate and assist limited inter-country studies on relevant epidemiological subjects. This project is linked with project EURO 4901 (see above).

EURO 4906 (5012) Study on medical certification of causes of death (1968 - 1972) R (IARC)

To study the evidence on which the diagnosis of the cause of death is based, and the way in which it is interpreted in different European countries. Special emphasis is being placed on the diagnosis of ischaemic heart disease, but attention is also being paid to cancer of the gastrointestinal tract. This project is a follow-up to the study of the accuracy and comparability of statistics on causes of death made as part of the health statistical studies project EURO 4901 started in 1962.

EURO 4907 (2160) Evaluation of courses on epidemiology and medical statistics, Bratislava (16 - 17 June 1971) R

A meeting of the directors of the courses on epidemiology and statistics assisted by WHO in Bratislava, Brussels and London, and of the course on public health statistics given by the School of Public Health, Rennes, France, was held for the discussion of curricula and teaching methods.

WHO met the cost of attendance of the six participants.

EURO 4908 (0440) Study of the identification and measurement of risk factors (1971) R

To study ways of identifying those factors which indicate a higher-than-average risk of developing certain chronic diseases and to recommend methods for the surveillance of high-risk population groups or individuals.

EURO 4909 (0451) Preparation of the Ninth Revision of the International Classification of Diseases (1971 - ) R

In co-operation with WHO headquarters, to hold three working groups at the WHO centres for the classification of diseases in France, the Union of Soviet Socialist Republics, and the United Kingdom.

The first meeting was held from 5 to 8 October 1971 in London. WHO met the cost of attendance of six participants (temporary advisers) from Federal Republic of Germany, Sweden, United Kingdom and Yugoslavia. Two representatives of the WHO centre in London, one of the centre in Paris and two headquarters staff members also participated.

EURO 4910 (2173) Third European Conference on Health Statistics, Turin, Italy (25 - 29 May 1971) R

The purpose of the conference, which followed up similar meetings in 1962 and 1965, was to provide a forum for the presentation and discussion of new developments in health statistical methods and in their application. There were 40 participants from 30 countries.

WHO provided eight temporary advisers and met the cost of attendance of 30 participants from Albania, Algeria, Austria, Belgium, Bulgaria, Czechoslovakia, Denmark, Federal Republic of Germany, Finland, France, Greece, Hungary, Ireland, Italy, Luxembourg, Malta, Monaco, Morocco, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, Turkey, Union of Soviet Socialist Republics, United Kingdom and Yugoslavia.

EURO 4913 (0488) Study on the integration of health statistics with social and economic statistics (1971 - 1972) R (ECE)

In preparation for this study, a joint ECE/WHO meeting on health statistics, with 51 participants, was held in Geneva from 29 March to 2 April 1971.

WHO provided four temporary advisers from France, the Union of Soviet Socialist Republics and the United Kingdom.

EURO 5101 (0299) International Children's Centre training courses (1965 - ) R UNICEF

Course on social paediatrics, Paris
29 April - 8 July 1971: Fellowships for three trainees from Algeria, Poland and Sweden.

Course on mother and child care, Paris
(i) 7 - 28 October 1971: Fellowships for four trainees from Morocco, Spain, Switzerland and Yugoslavia.
(ii) 18 Nov.-9 Dec. 1971: Fellowships for two trainees from Greece and Italy.

EURO 5102 (0386) Postgraduate training in social aspects of gynaecology and obstetrics (1971 - 1975) R

To assist international courses on the preventive and social aspects of gynaecology and obstetrics and to enable medical educators in this field to obtain further training for the solution of new problems.

EURO 5202 (0411) Study on the teaching of occupational health and safety (1969 - 1971) R (ILO)

Consultants were provided to make a review of the teaching of occupational health in some European countries. Their reports will serve as working papers for a conference on this subject to be held in Milan, Italy, in 1972.


The purpose of the meeting was to promote the collection of better mental health statistics by improving communication between psychiatrists and statisticians through discussion of common problems. There were 11 participants (psychiatrists, statisticians, a public health officer and a psychologist) from Bulgaria, Czechoslovakia, Denmark, Federal Republic of Germany, France, Italy, Netherlands, Norway, Poland, Sweden and Yugoslavia. Two observers, from the Federal Republic of Germany and Yugoslavia, also attended.

WHO provided a consultant and met the cost of attendance of the participants.


The aim was to assist in preparing for a conference to be held in 1972, by reviewing co-ordination between mental health and public health services and the role of community, social and welfare agencies in the care of the mentally disordered.

WHO provided a consultant and met the cost of attendance of 10 participants (temporary advisers).

EURO 5408 (0460) Symposium on Trends in Psychiatric Care—Day Hospitals and Units in General Hospitals, Salzburg, Austria (7 - 11 June 1971) R

The purpose of the symposium was to consider the staffing of day hospitals and psychiatric units in general hospitals, the criteria for the admission of patients and the therapeutic results achieved, and to discuss the role of such hospitals and units as part of the network of psychiatric services for a community. (See para. 18.75.)

WHO provided seven temporary advisers and met the cost of attendance of 29 participants from Albania, Algeria, Austria, Belgium, Bulgaria, Denmark, Federal Republic of Germany, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Morocco, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, Turkey, Union of Soviet Socialist Republics, United Kingdom and Yugoslavia. The World Psychiatric Association and the International Council of Nurses each sent a representative.

EURO 5409 (4201) Symposium on Classification and Evaluation of Mental Health Service Activities, Geneva (15 - 19 Nov. 1971) R

The aim was to consider the results of a questionnaire on administration, facilities and personnel in mental health services, completed by all Member States of the Region. Previous stages of the project were considered in working groups that met in Copenhagen in November 1969 and in Düsseldorf in November 1970.

WHO provided a consultant and two temporary advisers and met the cost of attendance of 29 participants from Austria, Belgium, Bulgaria, Denmark, Federal Republic of Germany, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Morocco, Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, Turkey, United Kingdom (one each from England and Wales, Scotland, and Northern Ireland), Union of Soviet Socialist Republics, and Yugoslavia, while 14 participants attended at the expense of their respective governments. The World Federation for Mental Health sent a representative.

EURO 5411 (4001) Steering Committee on the Planning and Control of a Long-term Programme on Alcoholism and Drug Dependence, Copenhagen (3 - 4 Feb. 1971) R

The purpose of the meeting was to allocate priorities in the future development of the alcoholism and drug dependence component of the regional long-term programme in mental health.

WHO met the cost of attendance of seven participants (temporary advisers) from Denmark, Finland, Norway, Sweden, Switzerland, and United Kingdom. The Council of Europe sent a representative.


The purpose of the meeting was to define the potential individual and combined effects of legal, social, medical and educational measures for controlling the spread of drug abuse.

WHO provided a consultant and met the cost of attendance of the seven participants (temporary advisers) from Czechoslovakia, France, Sweden, Switzerland, United Kingdom and Yugoslavia. The Council of Europe, UNESCO, and the International Union for Child Welfare sent representatives.


The purpose of the meeting was to discuss the methodology of data collection in the field of psychogeriatric services.

WHO provided a consultant and met the cost of attendance of the nine participants (temporary advisers) from Bulgaria, Czechoslovakia, Federal Republic of Germany, France, Ireland, Norway, Sweden, United Kingdom and Yugoslavia.

EURO 5422 Study on terminology and criteria in drug dependence and abuse (1971) R

With the assistance of two consultants, a study has been initiated on the terminology and criteria in drug dependence and abuse, with the aim of promoting standardization of the data collected on drug abuse patterns, thus enabling valid comparisons to be made of the data provided by different countries of the Region.

EURO 5423 Study on existing methods of treatment and rehabilitation for drug dependent persons (1971 - ) R

To obtain a conspectus of the different methods of treatment and rehabilitation of drug-dependent persons in countries of the Region.
EURO 5501 (1514) Study on child dental health services in Europe (1970 - 1972) R

To follow up the survey on child dental health in Europe and prepare for projects on the organization of child dental health services as from 1973 in order to determine the conditions required for systematic treatment of children and for effective use of dental manpower.

EURO 5503 (3903) Course on dental public health (in Russian), Moscow (1 - 28 April 1971) R

The purpose of the course was to give dental officers working in public health services additional training in the epidemiological approach to oral health problems, the prevention and control of dental and periodontal diseases and the organization of dental health programmes. The course was attended by 18 trainees.

WHO provided two lecturers and fellowships for seven trainees.

EURO 5504 (0458) Study on the evaluation of dental health services (1971) R

To ascertain the data being used and the most suitable data for use in analysing statistically the results of work done by national dental health services, and to suggest simple objective methods of evaluation, based on epidemiological and other data.

EURO 5505 (0459) Working Group on the Use of Epidemiological Methods in Dental Public Health Services, Oslo (7 - 11 June 1971) R

The purpose of the meeting was to define the types of epidemiological data which would best serve the planning, development and evaluation of dental health services.

WHO provided a consultant and met the cost of attendance of the six participants (temporary advisers) from Czechoslovakia, Netherlands, Norway and United Kingdom. The International Dental Federation sent a representative and eight observers from Denmark, Federal Republic of Germany, Finland, France, Italy, Poland, Switzerland and Yugoslavia attended the first three days of the meeting.


The purpose of the seminar was to review the present state of training in nutrition in the countries of the Mediterranean basin and to propose ways of achieving a better adaptation of the theoretical and practical training programmes to the specific nutritional problems in these countries. The following subjects were dealt with in group discussions: the teaching of nutrition in the basic sciences, in internal medicine, in paediatrics, and in preventive and social medicine; the role and training of dietetic technicians working in hospitals and in the community; and the role of these technicians in training other personnel. At the conclusion of the group discussions, one day was devoted to consideration of means of preventing malnutrition in children, with particular reference to the provision of weaning foods. There were 21 participants from Algeria, Czechoslovakia, Egypt, France, Greece, Italy, Lebanon, Malta, Morocco, Spain and Turkey. Representatives of UNICEF and FAO also attended.

WHO and UNICEF jointly provided a consultant and 10 temporary advisers and met the cost of attendance of the participants.

EURO 5602 (0457) Study on nutrition status in some Mediterranean countries (1971) R

To complete and compile information already collected in several Mediterranean countries by nutrition surveys carried out under country projects over a period of more than six years.

EURO 5701 (0444) Study on the contribution of WHO to a joint European programme in road accident prevention and control (1971) R

The project followed up the symposium on human factors in road accidents held in 1967, the European liaison meeting on the same subject, held in 1968, and the Technical Discussions that took place during the session of the Regional Committee in 1969. Its aim was to review the road accident situation with a view to promoting the co-ordination of work in European countries for the prevention and control of road accidents. A working group on priorities in the development of a long-term programme in road accidents met in Copenhagen on 29 and 30 March 1971 and discussed the possibilities of future inter-organizational co-operation. The report of the group will provide the basis for the formulation of a long-term programme in this field. A second European liaison meeting took place in Copenhagen from 4 to 6 October 1971. Sixteen associations and organizations were represented, among them the Economic Commission for Europe, the Organization for Economic Co-operation and Development, the Council of Europe, and WMO.

EURO 6001 (0211) Exchange of information on placement, supervision and follow-up of WHO fellows (1968 - ) R

To supervise the placement of trainees from the African Region for studies in countries of the European Region.

EURO 6201 (0207) Undergraduate education for the health professions (1961 - ) R

To stimulate improvements in undergraduate medical teaching and particularly the introduction of preventive and social medicine at various stages and in various sections of the curriculum.


The purpose of the meeting was to enable persons responsible for planning and implementing medical education programmes to discuss medical school admission requirements and procedures and to consider ways of limiting student wastage.

WHO met the cost of attendance of the 13 participants (temporary advisers) from Czechoslovakia, Federal Republic of Germany, France, Hungary, Israel, Netherlands, Spain, Sweden, Switzerland, Union of Soviet Socialist Republics, United Kingdom, and United States of America. UNESCO sent a representative to the meeting.


The purpose of the meeting was to promote collaboration between professional associations and organizations concerned with medical education in Europe in preparation for the Fourth World Conference on Medical Education in 1972.

WHO provided a consultant and met the cost of attendance of 12 participants (temporary advisers) from Austria, Federal Republic of Germany, Finland, France, Greece, Italy, Netherlands, Norway, Poland, Turkey and Union of Soviet Socialist Republics. UNESCO, the International Federation of Medical Student Associations and the Panamerican Federation of Associations of Schools of Medicine each sent a representative.

EURO 6301 (0302) Postgraduate education in the health professions (1965 - ) R

To stimulate improvements in postgraduate medical training and to assist national efforts in this field, mainly by the provision of consultants, lecturers, fellowships and supplies to postgraduate training institutes, schools of public health and schools.
of tropical medicine. It is also planned to support some inter-
country activities concerned with postgraduate training.

The project is a continuation, in a modified form, of project
EURO 110—European Schools and Training Centres in Public
Health—which was completed in 1964.

A meeting to discuss teacher-training programmes in Europe
was held at the Regional Office from 29 November to 1 December
1971. WHO met the cost of attendance of seven participants
(temporary advisers) from Denmark, France, Netherlands,
Switzerland, Union of Soviet Socialist Republics, United
Kingdom and United States of America. A participant from
France attended at the expense of his Government.

EURO 6401 (1383) Course on hospital and medical administra-

To assist in training medical administrators at a one-year
postgraduate course at the Central Institute for Advanced
Medical Studies by providing visiting lecturers and fellowships
and to arrange for follow-up and refresher activities. Similar
assistance was given to courses in 1969 and 1970.

Eight lecturers were also provided for the second session of the
course for public health administrators, held at Varna, Bulgaria,
from 26 to 30 May 1971.

EURO 6402 (0373) Postgraduate training in public health
(1970 - ) R

To assist schools of public health and other institutions res-
ponsible for postgraduate education in organizing basic,
advanced and continuing education in public health and in
promoting the use of effective educational methods.

EURO 7401 (0468) Training in the quality control of drugs
(1971 - 1972) R

To provide for the advanced industrial training of analytical
technicians selected from graduates with long practical expe-
rience in the quality control of pharmaceutical preparations.

EURO 7901 (0441) Study on the epidemiology of intoxica-
tions in industry (1971 - ) R

To co-ordinate the efforts being made in several countries of
the Region to introduce epidemiological research to define, in
physiological parameters, subclinical and pathological changes
arising from occupational hazards.

EURO 7902 (0473) Conference on Modern Trends in the
Prevention of Pesticide Intoxications, Kiev, USSR
(1 - 4 June 1971) R

The purpose of the conference was to (i) disseminate informa-
tion on and to discuss the hazards to health in producing,
distributing and using pesticides in agriculture, with emphasis
on acute poisoning; (ii) discuss preventive methods against
pesticide poisoning of occupational groups and to collect
information on international systems of pesticide control; and
(iii) identify weaknesses in present systems and lack of informa-
tion and knowledge and to make suggestions for research and
possible future activities by WHO (See para. 18.68.)

There were 30 participants. WHO provided temporary
advisers and met the cost of attendance of 17 participants from
Algeria, Austria, Bulgaria, Czechoslovakia, Denmark, Federal
Republic of Germany, Finland, France, Hungary, Ireland,
Netherlands, Norway, Poland, Romania, Sweden, Union of
Soviet Socialist Republics, and Yugoslavia. ILO and FAO
each sent a representative.

EURO 8101 (1345) Cancer control (1968 - 1972) R

To encourage the efforts now being made in various European
countries to initiate programmes for the early detection of cancer
of different sites and for cancer registration, by providing
advisory services and training. This project is a follow-up of
previous activities in the field of cancer epidemiology (1967),
studies on cancer control and treatment (1966 - 1967), and the

EURO 8201 (S010) Establishment of ischaemic heart disease
registers (1968 - ) R

To prepare a registration system suitable for the notification
and surveillance of ischaemic heart disease in the population of
a selected area (or possibly in an occupational group) with a
view to obtaining accurate and comparable data on a number of
aspects of the disease. When methods have been worked out,
model registers, which can serve also for training purposes, will
be set up in certain areas.

EURO 8202 (S011) Epidemiological studies on the prevalence
and incidence of ischaemic heart disease and hypertension
(1968 - ) R

To follow up previous prevalence surveys, stimulate activities
and achieve a better knowledge of the etiology and prevention
of ischaemic heart disease.

EURO 8203 (S013) Training in epidemiological methods
(1968 - 1972) R

To provide facilities for training doctors in epidemiological
methods applicable to cardiovascular diseases in view of the
shortage, in some countries of the Region, of medical personnel
trained in this field.

EURO 8204 (S020) Study on the evaluation of coronary care
(1968 - ) R

To assess the value and cost to the community of coronary care
services by estimating the frequency of cardiac emergencies
requiring such services in defined areas, assessing the cost and
staffing needs, and evaluating reports on the reduction of
mortality.

EURO 8205 (S021) Training in coronary care (1968 - ) R

To provide for the individual training of doctors and other
health personnel in intensive coronary care and its organization
in selected units; and for the participation of lecturers in national
courses on coronary care.

EURO 8206 (S030) Study on the effects of rehabilitation in
patients with cardiovascular diseases (1968 - ) R

To carry out controlled co-ordinated studies of the effects of
rehabilitation in cardiovascular disease patients, beginning with
convalescence from acute disease (or with the patient's first
consultation), covering possible influence of rehabilitation on
prevention of later incapacity, and of factors causing relapse or
affecting length of life.

EURO 8207 (S031) Development of training centres for the
rehabilitation of patients with cardiovascular diseases
(1968 - ) R

To organize courses in a few research centres to enable doctors,
nurses and other technical staff to study the problems connected
with the rehabilitation of cardiovascular disease patients.

EURO 8208 (S032) Training in the rehabilitation of patients
with cardiovascular diseases (1968 - ) R

To provide for training in the rehabilitation of patients with
cardiovascular diseases.
EURO 8209 (5040) Health education of the public in cardio-vascular diseases (1968 - ) R

To assess the impact of advice and recommendations by physicians, scientific bodies and governmental agencies aimed at preventing various cardiovascular diseases.

EURO 8210 (5000) Evaluation of the progress of the regional cardiovascular diseases programme (1969 - ) R

To evaluate, by means of consultant services and an hoc meetings, the progress of work on cardiovascular diseases and to suggest changes in the programme in the light of new advances in the field of cardiology.

EURO 8212 (0454) Study on cerebrovascular diseases (1971 - ) R

The purpose of the study, which follows the meeting on prevention, treatment and rehabilitation in cerebrovascular diseases, held in 1970 (Inter-regional 0659), is to develop methods that will enable public health authorities to assess the extent of the problem of cerebrovascular diseases in the community and plan the provision of treatment and rehabilitation facilities.

A working group on community control programmes for stroke and hypertension was organized in Geneva in February. WHO met the cost of attendance of 12 participants (temporary advisers) from Austria, Denmark, Finland, France, Ireland, Netherlands, Sweden, Union of Soviet Socialist Republics, and of five from other regions. A one-month fellowship was provided for a trainee from Poland for studies on hypertension in three European countries.

EURO 8213 (0456) Working Group on Congenital Heart Diseases in Europe, Copenhagen (13 - 16 Sept. 1971) R

The purpose of the meeting was to establish as accurately as possible the prevalence of congenital heart disease in the countries of the Region, to give guidance on the best methods of organizing its early detection and on diagnostic procedures, including indications for operation, and to forecast surgical care needs in the coming years.

WHO met the cost of attendance of a consultant and six participants (temporary advisers) from Bulgaria, Finland, France, Federal Republic of Germany, Netherlands and United Kingdom.

EURO 8401 (0184) Trachoma control and prevention of loss of vision (1958 - ) UNDP/TA

To provide specialized technical advice on the further development of communicable eye disease control projects in several countries of the Region, and to study the need for general sight-saving programmes in these and other countries.

EURO 8402 (0328) Study of methods for the early detection of potentially blinding eye conditions (1968 - ) R

To study possible methods of screening for potentially blinding eye conditions, and to obtain information as a basis for comparison of procedures and for discussion on the most suitable methods for European countries to adopt.

EURO 8403 (0452) Study on the role of the public health services in the prevention of loss of vision (1971 - 1973) R

To assess the role and responsibilities of the various public health services and of specialized ophthalmological institutions in the prevention of loss of vision, in the light of experience and information gained in the study of methods for the early detection of potentially blinding eye conditions (EURO 8402).

EURO 9601 (0455) Working Group on Induced Abortion as a Public Health Problem, Helsinki (19 - 23 April 1971) R UNFPA

The aim was to review the occurrence of induced abortion and morbidity and mortality arising therefrom, to discuss the place of induced abortion within the general framework of birth control, different types of legislation and their demographic and health consequences, and the role of the physician and other health staff, and of maternal and child health services, in this field.

WHO provided a consultant and met the cost of attendance of 15 participants (temporary advisers) from Austria, Denmark, France, Hungary, India, Italy, Norway, Poland, Sweden, Union of Soviet Socialist Republics, United Kingdom, United States of America, and Yugoslavia, while four participants from Finland, France and Union of Soviet Socialist Republics attended at the expense of their Governments.

The United Nations Division of Social Affairs and the International Planned Parenthood Federation each sent a representative.

EURO IC 01 (0185) Follow-up of inter-country activities on a national basis (1958 - ) R

To assist governments in developing national activities arising out of the inter-country programmes of the European Region.

EURO SC 01 (0183) Participation in seminars and conferences (1959 - ) R

To assist with seminars and conferences conducted by the United Nations, specialized agencies, medicosocial organizations and agencies whose work is of special interest to the Regional Office.

EURO SC 02 (0275) Preparatory arrangements for conferences (1964 - ) R

To make preparations and preliminary arrangements for conferences, seminars, etc., to be held in the following year.
Avenge an eradication programme (1956 -1974) R UNICEF
To eradicate malaria from Afghanistan north of the Hindu Kush, and to continue antimalaria “holding” operations to conserve the gains achieved south of the Hindu Kush, with the ultimate objective of achieving the eradication of malaria from the whole country.

To draw up structural plans for the premises of a vaccine institute.

To develop the Institute of Public Health for service, research and training of public health workers and to reinforce the teaching of sanitary engineering subjects in the undergraduate civil engineering course.

Afghanistan 0033 Tuberculosis advisory services (1958; 1961 - beyond 1973) UNDP/TA UNICEF
To formulate and implement a national tuberculosis programme that will be carried out along with the strengthening of the health services.

Afghanistan 0035 Nursing advisory services (1957 -1974) UNDP/TA
To strengthen nursing administration at national and local levels, and develop and co-ordinate nursing and midwifery education and services.

To make a detailed study of the water supply, sewerage and drainage situation in Greater Kabul and formulate a master plan and a phased programme of development.

Afghanistan 0059 Development of basic health services (1965 - 1975) R UNICEF
To establish, throughout the country, basic health services co-ordinated with malaria eradication services; to ensure adequate supervision and guidance to health personnel in the basic health services through the strengthening of provincial health administration; to further the development of the health aspects of rural development projects in the whole country; and to train personnel.

Afghanistan 0064 Smallpox eradication (1967 -1974) R
The aim is to achieve smallpox eradication through mass vaccination, and the operation of a reporting and surveillance/containment system.

Afghanistan 0066 Environmental health (1966 - 1974) R
To establish an environmental sanitation unit in the Ministry of Public Health and plan and implement a long-term programme of community water supply, waste disposal and general sanitation.

Afghanistan 0067 School of radiography (1969 - 1974) R
To develop the school of radiography in Avicenna Hospital, Kabul, and train personnel.

Afghanistan 0068 Nursing administration and education (1967 - beyond 1974) R
To improve nursing services administration in order to provide better clinical experience for student nurses.

Afghanistan 0071 Maternal and child health, Kabul (1971 - 1974) UNDP/TA
To establish and organize a maternal and child health unit in the Ministry of Public Health for guidance, development, supervision and co-ordination of maternal and child health activities, including family planning, in the country.

Afghanistan 0074 Health planning (1971 -1972) R
To plan health services, draw up a national health plan and train personnel.

To strengthen the Division of Co-ordination, Planning and Evaluation in the Ministry of Public Health, develop the national vital and health statistical service, and train staff.

Afghanistan 0100 Medical education (1952 - beyond 1974) R
To strengthen departments of the faculties of medicine of the Universities of Kabul and Nangarhar, develop teaching programmes and train staff.

Afghanistan 0200 Fellowships R: Communicable diseases (six months), dermatology (12 months), internal medicine (12 months), laboratory techniques (12 months), mental health (16 months), prosthetics (18 months), public health (12 months), radiography (three for 12 months), sanitation (12 months), surgery (12 months), tuberculosis (three weeks), vaccine control and production (two for six months).

Bahrain 0200 Fellowships R: Child dental health (one for 10 weeks), laboratory techniques (two for 11 months), medical records (12 months), medical social work (12 months), operating theatre techniques (12 months), physical therapy (two for 12 months), public health (one for three months, one for 12 months), public health nursing (11 months), repair of instruments (12 months).

To establish a cancer register and raise the standard of performance of the histopathology department.

Cyprus 0018 Sewage disposal (1971 -) R
To study environmental health conditions, especially as regards waste-water and solid wastes disposal, with a view to their improvement.

Cyprus 0019 Vital and health statistics (April - May 1971) R
The aim was the development of health statistical services and the organization of medical records departments in the hospitals.
A consultant statistician visited several hospitals in Nicosia, Limassol, Larnaca, Paphos and Famagusta. The hospital statistics system was reviewed in detail, particularly as regards reporting procedures and tabulation programme. Other aspects of health statistics, as well as vital and demographic statistics, were also reviewed.

**Cyprus 0023** Pharmaceutical quality control  

To develop the laboratory for the quality control of pharmaceutical preparations, and to provide the national pharmaceutical services with an efficient control system comprising legislation, inspection, registration and licensing of pharmaceutical products.

**Cyprus 0027** Strengthening of veterinary services  
(May - Sept. 1971) UNDP/SF (FAO)

Consultants in the surveillance and control of zoonoses (including hydatidosis) and in food hygiene were provided for three months to assist in improving the veterinary services and food hygiene and in developing surveillance for the control of zoonoses.

**Cyprus 0028** Survey on Cooley’s anaemia  
(Nov. - Dec. 1971) R

A consultant in medical genetics advised on the methodology for diagnosing Cooley’s anaemia in Cyprus, the procedures for assessing the prevalence of the disease and measures for limiting its incidence.

Data collection was organized in five hospitals and the incidence of disease in Cyprus between 1960 and 1971 was calculated, with approximate gene frequencies. Five-year and ten-year projections have been prepared, based on a systematic management of patients.

**Cyprus 0200** Fellowships R: Air pollution (nine months), central sterile supply services in hospitals (three weeks), dental hygiene (12 months), dietetics (18 months), foodstuffs and quality control of drugs (three months), health visitors course (12 months), hospital pharmacy administration (three months), medical records (10 months), pharmaceutical quality control (12 months), physical therapy for spastic children (six months), undergraduate medicine (12 months).

**Cyprus 0201** Fellowships UNDP/TA: Undergraduate medical studies (three for 12 months).

**Egypt 0023** Malaria eradication programme  
(1957 - beyond 1974) R

To carry out studies on malaria in the country, with particular emphasis on the bionomics of the vectors and their susceptibility to insecticides, and to make studies of spraying equipment.

**Egypt 0027** High Institute of Public Health, University of Alexandria  
(1956 - beyond 1974) R

To develop the High Institute of Public Health so that it may promote the training of professional health workers in all fields of public health, promote research and field work and contribute to the solution of health problems in Egypt.

**Egypt 0029** Family planning  

To plan and implement the health components of the national family planning programme, and to train technical personnel for the programme.

**Egypt 0035** Nutrition Institute  

The aim was to develop the Nutrition Institute in Cairo. WHO provided consultants, fellowships, and supplies and laboratory equipment.

Studies of specific nutritional problems, surveys of conditions of nutrition and malnutrition in different parts of the country, and analyses of local foods and diets were organized and a number of field programmes in nutrition were implemented. Trials of weaning foods and various other experimental products such as enriched bread were conducted with satisfactory results, but many data from the other studies have still to be analysed. The training of several categories of health personnel was organized and courses were held at the Institute. Its staff also participate in nutrition courses in other training institutions in Cairo and Alexandria.

**Egypt 0038** Sanitary engineering research  
(1971 - 1973) R

To set up an institute for research in sanitary engineering at the Sanitary Engineering Research Centre, Alexandria University.

**Egypt 0040** Intensive care unit, Alexandria University Hospital  

To develop an intensive care unit at the Alexandria University Hospital.

**Egypt 0041** Shigella and Salmonella survey  

To establish a reference centre for the classification of Shigella and Salmonella.

**Egypt 0048** Pharmaceutical quality control  

To develop specific aspects of drug control for locally manufactured and imported pharmaceutical preparations, and to carry out research and train specialists in this field.

**Egypt 0049** Schistosomiasis control pilot project and training centre  
(1961 - beyond 1973) R UNICEF

To test measures for controlling schistosomiasis, so as to find those cheapest and most effective under conditions in the country. The project serves as a field demonstration and training centre for the Region.

**Egypt 0050** Nursing education  
(1961 - 1975) UNDP/TA

To develop full post-basic courses for nurses in teaching, administration and special fields of nursing.

**Egypt 0058** Physical therapy department, Poliomyelitis Institute, Cairo  
(1967 - 1973) R

To develop the physical therapy department in the Polio-myelitis Institute, Cairo.

**Egypt 0059** Cairo sewage disposal  
(1969 - 1972) R

To improve the operation and management of the Zenein sewage treatment plant and of the Cairo sewerage system in general.

**Egypt 0060** High Institute of Nursing, Cairo University  
(1965 - 1975) R

To develop a four-year degree programme in basic nursing, designed to prepare nurses for leading posts in nursing service and educational programmes.

**Egypt 0063** Virus research, training and vaccine production centre, Agouza  
(1966 - beyond 1973) R UNDP/SF

To set up a vaccine production centre for poliomyelitis, measles and other virus vaccines. (See para. 19.99.)
Egypt 0064 Lake Nasser Development Centre (health aspects), Aswan (1966 - beyond 1973) UNDP/SF (FAO)
To examine the public health problems arising from environmental changes associated with the comprehensive Lake Nasser development scheme in the Aswan region, which is being carried out with assistance from the United Nations Development Programme (Special Fund component), and to suggest remedial measures.

Egypt 0065 Cancer Institute, Cairo (1967 - 1974) R
To establish a statistical service for collection of epidemiological information on cancer at the Cancer Institute, develop techniques for early detection and treatment of cancer, and undertake research and training of personnel in various aspects of cancer control.

Egypt 0071 Health data processing (1970 - beyond 1974) R
To improve the use made of computers for vital and health statistics and research, and to train national staff.

Egypt 0075 Establishment of a centre for the treatment of burns, Cairo (Feb. 1971) R
A consultant advised on the establishment of a specialized centre for the treatment of burns and reviewed the availability of technical personnel and equipment.

Egypt 0076 Centre for allergic diseases of the respiratory system (1971 - 1972) UNDP/TA
To establish a centre for allergic diseases of the respiratory system.

Egypt 0077 Neurosurgical centre, Shoubra Hospital, Cairo (1971 - beyond 1973) UNDP/TA
To establish a new neurosurgical centre in Shoubra Hospital, Cairo, and develop satellite neurosurgical centres in other governorates.

Egypt 0100 Medical education (1970 - beyond 1974) R
To develop undergraduate and postgraduate medical education, and scientific research, in the medical schools.

Egypt 0200 Fellowships R: Air pollution control (three months), cerebral palsy in children (five months), chemical analysis of insecticides (six months), co-ordination of health services (10 weeks), drug dependence treatment (10 weeks), electroencephalography (six months), family planning (one month), hospital design (Six months), hospital establishment and equipment (three months), maintenance of laboratory equipment (10 weeks), nursing (one month), ophthalmology (six months), orthopaedic surgery (two months), periodontology (12 months), psychiatric social work (three months), public health (three months), respiratory disease epidemiology (three months), sports medicine (four months), trachoma control (six months), tuberculosis (one for two weeks, one for three weeks), zoonoses (three months).

Ethiopia 0003 Advisory services on vital and health statistics (1966 - 1973) UNDP/TA
To strengthen the health statistical unit in the Ministry of Public Health, improve the collection, compilation and publication of vital and health statistical data and train statistical personnel of various categories at central and provincial levels.

Ethiopia 0006 Tuberculosis control (1959 - beyond 1973) UNDP/TA UNICEF
To formulate and implement a comprehensive national tuberculosis control programme, integrated in the general health services.

To train health personnel to staff the expanding health services, particularly in rural areas.

Ethiopia 0024 Advisory services in epidemiology (1966 - beyond 1973) UNDP/TA
To plan, develop and operate epidemiological services at all levels of the health services.

Ethiopia 0025 Development of provincial health services (1962; 1970 - 1975) R UNICEF
To establish a network of integrated health services, initially in one province; to reorientate the work of provincial health departments and health centres towards the provision of integrated preventive and curative services; and to build up a system of effective supervision within the framework of health services at provincial level.

Ethiopia 0032 Community water supply (1967 - 1972) UNDP/TA
To investigate, design and supervise the construction of community water supplies in the small towns of Ethiopia, starting in Tigre Province.

Ethiopia 0036 Environmental health services (1967 - beyond 1973) R
To plan and administer a national environmental health programme.

Ethiopia 0037 Health planning (1968 - beyond 1974) UNDP/TA
To plan national health services and co-ordinate health programmes as a part of the national five-year development plan.

Ethiopia 0039 Malaria eradication training centre (1959 - beyond 1973) R
To train various categories of personnel for the malaria eradication programme.

Ethiopia 0040 Malaria eradication programme (1967 - beyond 1973) R (AID)
To eradicate malaria from those areas in which technical and administrative conditions ensure its feasibility.

Ethiopia 0042 Smallpox eradication (1968 - 1974) R Special Account for Smallpox Eradication
To achieve the eradication of smallpox through a system of reporting and surveillance/containment operated with the co-operation of the health services.

To establish a division of pharmacy and medical supplies in the Ministry of Public Health; and to develop the quality control laboratory for the analysis and assay of pharmaceutical preparations and administrative control measures such as legislation, licensing and registration of locally manufactured and imported drugs.

Ethiopia 0046 Public and environmental health control, Awash Valley (1971 - 1973) UNDP/SF
To review the epidemiological situation and assess the health and environmental hazards in the area covered by the Awash Valley development programme, to plan a network of basic health services and to improve sanitary facilities, especially as regards community water supplies, disposal of domestic and industrial wastes and control of schistosomiasis.
**Ethiopia 0048** National health laboratory service (1971 - 1974) R

To establish a national health laboratory service by strengthening and modernizing the Imperial Central Laboratory and Research Institute and expanding the services to cover the provinces; and to train the necessary personnel.

**Ethiopia 0049** Health legislation (Oct. 1971) R

A consultant made a review of health legislation in Ethiopia, and assisted in drafting new regulations and legislation.

**Ethiopia 0053** Maternal and child health services (1971 - ) R

To develop a maternal and child health division which will be in charge of establishing policy, co-ordinating all maternal and child health activities, supervising health institutions in the maternal and child health field, assisting in the training of personnel and advising governmental agencies as required.

**Ethiopia 0100** Medical education (1964 - 1974) R

To develop the medical faculty at the Haile Selassie I University in Addis Ababa.

**Ethiopia 0200** Fellowships R: Medical stores (three months), nursing (three for 12 months), ophthalmology (four weeks), pharmacy (one for three months, two for 12 months), public health (12 months), tuberculosis (three for 12 months), undergraduate medical studies (two for 12 months).

**Iran 0001** Malaria eradication programme (1956 - 1971) R MESA UNICEF (AID)

The aim was to eradicate malaria from the country. WHO provided a statistician/malariologist from 1960 to 1963, a sanitary engineer from 1960 to 1964, and the advisory services of a malariologist between 1964 and 1968; an administrative officer was provided from 1959 to 1963 and a secretary from 1961 to 1970, and consultants visited the project in 1959, 1960, 1963, 1965, 1967 and 1968. In all, 32 fellowships were awarded. Antimalarial drugs, chemicals, medical literature, laboratory equipment and motor vehicles were supplied.

Government activities in the field of malaria control date back to 1944, when a malaria control scheme was initiated in Khoramebad. During the previous decade some antilarval operations had been undertaken in the oil refinery areas. In 1949, following extensive malaria surveys, WHO assistance was requested and consultative visits were made in preparation for the arrival of the WHO control advisory team in 1950.

These surveys carried out in 1948 and 1949 showed the disease to be a serious health problem deserving high priority in the country's health programme. Malaria was heavily endemic in the Caspian littoral and in the southern coastal areas but less severe or sporadic in the central plateau; the higher regions of the Elborz and Zagros mountain ranges were thought to be free from malaria. With the assistance of the WHO malaria control advisory team, which worked in the country from 1950 to 1953, and the United States Agency for International Development, DDT spraying was gradually extended, and the control measures, backed up by malarriometric surveys and surveillance, achieved considerable success. UNICEF assistance was made available in 1954. Following further WHO advisory visits in 1954 and 1955, a joint Government/WHO/UNICEF malaria eradication programme, within the Government Seven Year Plan, was initiated in 1956 on a phased basis, for which purpose the country was divided into four zones. However, resistance to DDT of the vector *Anopheles stephensi*, which had been reported in Saudi Arabia in 1955, was found in southern Iran in 1957 and a severe epidemic occurred in Khuzistan, necessitating re-zoning. Further re-zoning took place in 1961, when *A. stephensi* became resistant also to dieldrin. In the north (Zone I) the vector (*A. maculipennis messae*) remained susceptible to DDT, and the programme made satisfactory progress. However, a considerable parasite reservoir was built up in the south, which began to affect the cleared areas in the north, so that protective spraying had to be reintroduced around Lake Rezaieh, in some foci in the provinces of Gilan and Mazandaran and in the governor-generalships of Hamadan and Teheran.

Between 1962 and 1967, the Institute of Public Health Research, Teheran, and the Iranian Malaria Eradication Organization, in collaboration with WHO, tested new attack methods against *A. stephensi* in field research trials and many of the factors causing persistent transmission in the problem areas around the southern foothills of the Zagros mountains were investigated. In 1968 malariatitis spraying was introduced in the plain areas of the south following satisfactory evidence obtained from a pilot project carried out in the Bandar Abbas area between 1964 and 1967.

Since 1968 the programme has made steady progress. In 1970, out of a population of 24.5 million exposed to the risk of malaria, 14.2 million were in areas in the consolidation phase and 10.3 million in areas in the attack phase. As a result of the attack measures, supplemented by larviciding and biological control using *Gambusia* fish where indicated, the incidence of malaria fell by 36.7% between 1969 and 1970, when it reached 0.24 per thousand in attack-phase areas and only 0.03 per thousand in consolidation-phase areas. The prospects of malaria eradication are good. The national Malaria Eradication Organization set up to administer the programme has become a valuable asset to the public health services; it has assisted in the control of cholera and in smallpox and BCG vaccination campaigns, and its network provides a basis for rural health development throughout the country.

**Iran 0029** Cancer control (1967 - 1974) R

To develop the programme of the Research Department of the Teheran Cancer Institute.


To develop teaching and research in the department of occupational health of the School of Public Health, University of Teheran, and carry out a field survey for assessment and control of the working environment in a selected sample of Iranian industry.

**Iran 0043** Postgraduate education in public health (1964 - 1974) R

To develop postgraduate training in public health and allied fields at the faculty of public health, University of Teheran.

**Iran 0045** Air pollution control (1965; 1971 - 1973) R

To study air pollution sources in Greater Teheran and determine the technical and administrative measures necessary for their control, and to train staff in the techniques of pollution measurement and control.

**Iran 0047** Rehabilitation of the physically handicapped (1969 - beyond 1973) R

To train students at the school of physical therapy, University of Teheran.

**Iran 0049** High Institute of Nursing, Teheran (1967 - 1974) UNDP/TA

To develop basic nursing education at university level.

**Iran 0052** Post-basic nursing education (1963 - 1974) R

To develop a two-year post-basic programme leading to a degree of Bachelor of Science in nursing at the Department of Nursing, College of Arts and Sciences, Pahlavi University, Shiraz. (See para. 19.106.)
Iran 0053 Laboratory for pharmaceutical quality control
(1966 - 1973) UNDP/TA

To develop the quality control laboratory for the analysis and assay of pharmaceutical preparations, chemicals and dependence-producing drugs, revise legislation governing the trade, and train local staff in modern techniques of drug analysis.

Iran 0070 Pre-investment survey of sewerage needs and facilities in Teheran (1968; 1970 - beyond 1973) UNDP/TA

To undertake a pre-investment survey for sewerage and storm drainage in the Greater Teheran area and to draw up master plans and first-stage feasibility studies to assist in securing investment for construction. The survey will also cover the treatment and re-use of waste water for agricultural purposes.

Iran 0080 Health aspects of family planning
(1970 - beyond 1974) UNFPA

To plan and implement the health components of the national family planning programme, and to train technical personnel for the programme.

Iran 0100 Medical education (1971 - 1974) R

To develop training and research work in the medical faculties of the seven universities of Iran, particularly in the basic medical sciences and in public health, and to establish the radiotherapy department at the University of Isfahan.

The activities started under project Iran 0059 (Medical faculty, Isfahan) are being continued under this project.

Iran 0200 Fellowships R: Child mental health and psychiatry (12 months), environmental health (12 months), mycology (three months), nursing (nine months), public health (one for two months, one for 12 months), radiology (12 months), rehabilitation centre administration (two for three months), rural health (six weeks), tuberculosis (three weeks).

Iran 0011 Malaria eradication programme
(1957 - beyond 1974) R UNICEF

To eradicate malaria from the whole country, as an extension of the malaria control programme with which WHO has assisted since 1952.

Iran 0015 Schistosomiasis control
(Sept. - Nov. 1971) UNDP/TA

A consultant malacologist followed up the progress of the schistosomiasis control project since the last consultant visit in 1968 when an evaluation was made, with particular attention to the mollusciciding methods in use.

Iran 0037 College of Nursing, Baghdad (1962 - 1974) R

To prepare nurses for leading posts in nursing service administration and in nursing education.

Iran 0040 Hospital services administration (1966 - 1974) R

To strengthen hospital administration services at the Medical City (General Teaching Hospital), Baghdad. (Specific activities in 1971 were essentially concerned with the administration of the nursing services in the hospital.)

Iran 0043 Cancer control (1968 - 1974) R

To develop the radiotherapy department of the Institute of Radiation and Nuclear Medicine, Baghdad, and to train radiotherapy technicians.

Iran 0049 Rural health advisory services
(1964 - 1975) UNDP/TA UNICEF

To provide a comprehensive health service for the rural population. The project covers the establishment of a network of local health units, the development of health programmes that include medical care, preventive and environmental health services, and the training of professional and auxiliary health personnel in public health practice.

Iraq 0070 Rural water supply programme

To appraise the community water supply situation in the rural areas, prepare a master plan for rural water supplies and establish a national rural water authority.

Iraq 0061 Public health laboratory services (1969 - 1974) R

To develop microbiological diagnostic facilities adequate for the needs of the curative and preventive health services and also to develop the production of vaccines.

Iraq 0065 Visceral leishmaniasis control (1971 - 1973) R

To undertake epidemiological/parasitological studies on kala-azar at the Institute of Endemic Diseases, Baghdad, and to devise measures for control of the disease.

Iraq 0068 Family planning aspects of maternal and child health
(1970 - 1974) UNFPA

To develop family planning activities within the health services, organize the family planning programme, with particular emphasis on the maternity-centred approach, to be carried out through maternal and child health centres; and to train personnel.

Iraq 0069 Air pollution control (Nov. - Dec. 1971) R

A consultant made a survey of the situation regarding air pollution and advised on monitoring and control measures.

Israel 0100 Medical education (1971 - beyond 1973) R

To strengthen the departments of basic medical sciences and public health in the colleges of medicine in Baghdad, Mosul and Basra, which have been assisted since 1958, 1959 and 1968 under projects Iraq 0033, Iraq 0058 and Iraq 0053.

Israel 0200 Fellowships R: Clinical pathology (12 months), communicable diseases (six months), dentistry (12 months), embryology (12 months), fluorescent antibody techniques (one month), malaria eradication (six weeks), medical education (two months), medical librarianship (eight weeks), medical record keeping (12 months), mycology and medical microbiology (14 months), nutrition (three months), physical medicine (12 months), public health (one for three months, one for 12 months), rabies vaccine production control (six weeks), radiology (two for 12 months), sanitary engineering (12 months).

Israel 0007 Nursing education (1965 - 1974) R

To prepare plans for the further development and strengthening of nursing education and services.


A consultant helped to establish a course for dental assistants in the dental division of the Tel Aviv University Faculty of Continuing Medical Education.

Israel 0038 Air pollution control (1965 - 1973) R

To assess the importance of air pollutants in certain areas and plan a programme of investigation and research.


To improve the dosimetry in therapeutic X-ray installations and increase the protection of personnel occupationally exposed to ionizing radiation by the introduction of thermoluminescent dosimeters; to train hospital physicists; and to carry out surveys
of environmental radioactivity in the Central Laboratory for Prevention of Air Pollution and Radiation Hazards at the Tel Hashomer Government Hospital.

Israel 0045  Coronary care unit (1969 - beyond 1973) R
To develop the coronary care unit of the Tel Hashomer Government Hospital for use as a training centre.

Israel 0100  Medical education (1957 - 1974) R
To develop teaching and research at the medical faculties.

Israel 0200  Fellowships R: Cardiac surgery (14 weeks), coronary heart diseases (six months), drug and food analysis (one month), endocrinology (two months), hospital and clinical pharmacy (six weeks), intensive care of premature infants (two months), isolation of viruses (10 weeks), organization of community health services and medical records (two months), orthopaedics (one for seven weeks, one for four months), psychiatry (two months), rheumatology (12 months).

Israel 0201  Fellowships UNDP/TA: Pneumology (12 months).

Jordan 0002  Nursing education (1965 - beyond 1974) UNDP/TA
To strengthen nursing services and develop programmes for professional and auxiliary nursing education.

Jordan 0006  Malaria eradication programme (1958 - beyond 1974) R UNDP/TA
To eradicate malaria from the whole country and prevent its re-establishment.

To extend the work of the histopathology department and to develop an oncology register.

Jordan 0022  Consultative group on medical education (1971 - 1973) R
To plan a new medical faculty.

Jordan 0023  Vaccine production (1959 - beyond 1974) R UNICEF
To develop the production of diphtheria and tetanus vaccines, initiate the production of triple (diphtheria/pertussis/tetanus) vaccine and train technical personnel.

Jordan 0028  Rehabilitation services (1967 - beyond 1973) R
To develop the rehabilitation centre and introduce modern methods of physical therapy; also to plan and develop training programmes for physical therapists and establish a prosthetic workshop.

Jordan 0029  Tuberculosis control (1963 - 1973) R
To formulate and implement a comprehensive national tuberculosis control programme, integrated in the general health services.

To develop a virology diagnostic section in the central public health laboratory, Amman.

Jordan 0034  Hospital planning and administration (1971 - 1973) UNDP/TA
To organize and develop a hospital administration unit in the Ministry of Health and review the planning of facilities and the organization and management of hospitals with a view to improving the medical care services.

Jordan 0040  Radiotherapy, Radiology Department, Amman (1970 - ) R
To reorganize the radiotherapy unit of the Radiology Department in Amman and provide training for radiotherapy and nuclear medicine specialists.

Jordan 0200  Fellowships R: Blood tests (four weeks), cancer surgery (three months), child health (one for 11 months, three for 12 months), clinical pathology (12 months), dermatology (12 months), forensic medicine (12 months), maintenance of medical equipment (four months), medical librarianship (12 months), mental health (six months), nursing (12 months), nutrition (three months), pathological anatomy (12 months), pharmaceutics (12 months), public health (10 months), public health administration (nine months), radioisotopes (12 months), tuberculosis (eight months), vesicovaginal fistula (three months).

To develop nursing education and nursing services, define standards of nursing care, and organize in-service education programmes for nursing personnel.

The aim was to strengthen the central vital and health statistics section of the Ministry of Public Health; to assist in developing a national system of health statistics; to reorganize the system of medical records in hospitals and health centres; to improve recording and reporting procedures in health institutions, and to train national health statistics and medical records personnel. WHO provided a medical records officer from August 1969 to December 1970 and a statistician from April 1969 to December 1970.

The medical records officer assisted in the reorganization of the medical records system in the orthopaedic and mental hospitals. The statistician took part in the in-service training of hospital and health centre staff and prepared a summary inpatient record sheet that was put to practical trial in two hospitals. Both the medical records officer and the statistician took part in meetings of the Ministry committee for the evaluation of vital and health statistics and its subcommittee which were attended by technical staff of the Ministry and its health institutions. The medical records officer and the statistician helped in arranging a two-year combined training course for health statistical technicians and medical records technicians which started in October 1969. The statistician participated in conducting the course and the medical records officer in supervising the practical work of students. Eleven of the students entered the second year of study in October 1970 after practical training, during the summer, in various hospitals and in the vital and health statistics section of the Ministry.

Kuwait 0200  Fellowships R: Food technology (two months), medical biochemistry (12 months), pharmaceutical analysis (three for 12 months), prosthetics (four for six months).

To organize nursing education and nursing services at the national level.

Lebanon 0021  Hospital administration (1971 - 1972) R Funds-in-trust
To assess the efficiency of hospital services and review administration and staffing practices.
**Lebanon 0031** Rehabilitation of the physically handicapped (1963 - beyond 1973) R

To develop physical therapy services at the rehabilitation centre at Ouzai, Beirut.


To develop the blood bank.

**Lebanon 0044** Pharmaceutical services (1967 - 1974) R

To develop pharmaceutical services. The work includes the organization of a pharmacy department in the Ministry of Public Health, the planning and implementation of measures for quality control of pharmaceutical preparations, and the establishment of a laboratory for this purpose.

**Lebanon 0046** National waste management plan (Jan. 1971) UNDP/SF

The consultants whose services were provided in 1970 paid a second visit to Lebanon in connexion with the formulation of a request to the United Nations Development Programme for Special Fund assistance for pre-investment studies in respect of drainage, sanitary sewerage and solid wastes disposal.

**Lebanon 0200** Fellowships R: Anaesthesiology (12 months), chromatography (six months), cytology techniques (12 months), food and drug control (three months), health education (two for 15 months), laboratory techniques (one for three months, one for six months), malaria eradication (one month), maternal and child health (12 months), nursing (nine months), parasitology (five weeks), premature infants (three months), sanitary engineering (12 months), undergraduate sanitary engineering studies (12 months), venereal diseases (three weeks).

**Libya 0002** Maternal and child health demonstration and training centre, Tripoli (1965 - 1971) Funds-in-trust

This project, under which WHO provided assistance, between 1954 and 1961, for strengthening and expanding maternal and child health activities in the western province and in establishing a maternal and child health demonstration and training centre in the Suk-el-Juma district of Tripoli, was reactivated in 1965 to provide for further assistance in strengthening maternal and child health care and in training maternal and child health assistants at the Suk-el-Juma centre. WHO provided a medical officer and a nurse/midwife for two years and three public health nurse/midwives for five years, as well as supplies and equipment. Between 1965 and the end of 1970 the centre trained 50 maternal and child health assistants and organized four refresher courses for assistants working in maternal and child health centres in the western province. Since 1969 efforts have been made to recruit somewhat older students with better general education (some of those admitted to the earlier courses were only 13 or 14 years of age and had received only five or six years of primary education). The training given to the students has been improved and emphasis has been placed on their practical training in hospital wards and maternal and child health clinics and in home visiting. Since, for various reasons, home delivery by maternal and child health assistants is rarely possible, they have been given more training in hospital delivery. Improvements have also been made in the maternal and child health work carried out by the centre, which has included prenatal and postnatal care, infant and child care, blood tests of expectant mothers and smallpox, BCG, diphtheria/pertussis/tetanus and poliomyelitis vaccinations. Good results have been obtained from health and nutrition education of mothers.

Although the centre is adequately staffed with medical and auxiliary personnel, it has few qualified nurses, and no qualified Libyan midwives are yet available. A WHO consultant who visited the maternal and child health demonstration centres in both Tripoli and Benghazi has submitted recommendations for the further improvement of the centre's training programme.

**Libya 0003** Nursing education, Tripoli (1956 - 1971) R Funds-in-trust

The aim was to develop a nursing education programme adapted to local needs and resources in order to provide professional nurses and assistants for the country's expanding health services. WHO provided a total of 12 nurses for varying periods to fill the three posts of nurse educator and that of senior nurse educator, and two fellowships were awarded.

From its establishment in 1956 the nurse educators assisted the staff of the School of Nursing in Tripoli with the organization of courses and preparation of curricula for the training of diploma nurses and auxiliary nurses. The qualifications required for admission to the diploma course were initially completion of secondary education, but in view of the low standard of general education and owing to recruitment difficulties and language problems, it became necessary in 1961 to set the requirement at six years of primary education; in the same year the course for auxiliary nurses was discontinued, while the proposal to add a fourth year of training for midwifery studies could not be implemented. Plans were later made for the reintroduction of these courses, and meetings were held with other schools in Tripoli and Benghazi on standardization of nursing curricula and establishment of policies. In addition to public health nursing and nursing administration, the diploma course included practical and surgical nursing studies at Tripoli General Hospital and at the Ophthalmic Hospital. A total of 101 diplomas have been awarded since the project began. In 1970 the requirements for admission were raised again, adding a year of preparatory education to the six years of primary schooling.

Two graduates of the School received fellowships, one a national award for studies at the Institute of Administration, the other a WHO fellowship for further specialization in Copenhagen.

**Libya 0006** Communicable eye disease control (1969 - beyond 1974) Funds-in-trust

To set up services within the developing public health infrastructure to enable the communicable eye disease control activities to be maintained on a permanent basis as an integral part of routine public health duties.

**Libya 0007** Health Training Institute, Benghazi (1955 - 1972) Funds-in-trust

To train health auxiliaries and sanitarians, radiographers, laboratory technicians and male nurses for hospital and health centres, particularly in rural areas.

**Libya 0008** Nursing education, eastern province (1967 - 1974) R

To strengthen the nursing services in Libya through the establishment in Benghazi of a nursing school which will prepare nurses to meet the needs of the country.

**Libya 0009** Malaria eradication programme (1960 - 1971) R Funds-in-trust (United States International Co-operation Administration)

The aim was to eradicate malaria from the whole country. WHO provided a laboratory technician from 1960 to 1964, a medical officer from 1965 to 1970, and a sanitarian from 1967 to 1970, as well as short-term advisory services in 1962 and 1963 and fellowships, supplies and equipment.

Malaria control using DDT started in Libya in 1954 with the assistance of the United States of America and was restricted...
first to the Tauorga oasis in Tripolitania. On the completion of these operations in 1957, parasite surveys, which were repeated in 1958, 1959 and 1960 gave negative results. Similar operations were launched in Fezzan in 1957, and some pockets of malaria in coastal areas were brought under control in 1958. Following a pre-eradication survey carried out with WHO assistance in 1958 and 1959 it was estimated that only 2.5% of the total population lived in malarious areas, mostly in a few fertile valleys and a large number of widely scattered oases in Fezzan. There were a few foci in the other provinces, but out of the 31 known malarious areas, 25 were in Fezzan.

In 1959, DDT spraying coverage of all known malarious areas was reintroduced by the malaria services operating from Tripoli and Sebha, and epidemiological surveys and geographical reconnaissance were carried out. By 1963 it appeared that malaria transmission had been interrupted and DDT spraying was stopped in 1964. In the eastern and western provinces transmission remained interrupted except in one focus in a village called Hisha, which was resprayed in 1965. In the southern province, however, cases again occurred possibly due to importation from Chad and Niger, and DDT spraying was stopped in 1965; it was continued until 1968, when surveillance operations indicated that transmission had again been interrupted, except in a few circumscribed foci. A survey in 1970 confirmed the favourable situation, and spraying stopped except in the known foci, while antimalaria measures were concentrated on finding and treating cases of imported malaria.

Libya 0012 Maternal and child health, Benghazi (1965 - 1970) Funds-in-trust
To train auxiliary maternal and child health personnel for maternal and child health and basic health centres in the eastern province.

Libya 0020 Food and nutrition services (1965 - 1970) Funds-in-trust (FAO)
To define the main food and nutrition problems in the country, establish services for the development of a co-ordinated food and nutrition programme, and train medical and auxiliary personnel in nutrition.

Libya 0021 Maternal and child health advisory and supervisory activities (1965 - 1972) Funds-in-trust
To improve and expand maternal and child health activities as an integral part of the general health services; to give health education to mothers and children; to increase the efficiency of all maternal and child health workers; and to strengthen and co-ordinate the organization, administration and operation of all services related to the care of mothers and children.

The molluscicide Bayluscide recommended by WHO is being used for further control operations.

The aim was to assess the health problems in the country and establish priorities for dealing with them; to appraise the efficiency of the health services in meeting the health needs of the population and to draw up guidelines for their future development; to determine the facilities needed in the health services for planning and evaluation and for co-ordination with overall planning for social and economic development; and to improve the collection of vital and health statistics required for the planning of health services.

For the first phase of the project, in 1966, a team of WHO consultants (a public health administrator, a statistician, a sanitarian and a public health nurse) was provided to advise the Ministry of Planning and Development and the Ministry of Health on the preparation of a plan for the development of national health services during the period of the second five-year plan (1968-1973). Following this visit, the Government decided to make planning for health services a continuous function of the Ministry of Health and associated ministries and organizations.

For the second phase WHO provided a public health adviser from December 1966 to December 1970 and a medical statistician from December 1968 to December 1970. During this phase the second five-year health plan (1968-1973) was prepared and its final revision was approved in March 1969. Assessment reports were made of the efficiency of the health services, and of some hospitals, and the health services provided by the health centres were improved and extended, particularly as regards the control of tuberculosis and trachoma, immunizations, and maternal and child health care. A planning and evaluation unit was set up in the Ministry of Health in 1970. Co-ordination between the Ministry of Health and the Directorate of Civil Status of the Ministry of Interior was improved and an agreement was signed for the Ministry of Health to receive copies of the Directorate's notifications of vital statistics. Steps were taken to improve the receipt of statistics of notifiable diseases by the Ministry of Health and to improve inpatient morbidity statistics. The training of statistical staff was hampered by administrative and financial difficulties but a total of 47 statistical clerks were given training in two one-month courses held in July and August 1970.

In addition to its direct achievements, the project had an influence on other developments in the health field in the country. Thus, a medical school has been established which is expected to admit its first students in 1972; training facilities for nurses, sanitarians, laboratory technicians and X-ray technicians have been expanded; environmental health services have been extended and improved; the health education programme has been expanded; and a substantial increase has been made in the allocation for programmes to control tuberculosis, schistosomiasis and other communicable diseases.
Libya 0030 Environmental health services (1968 - 1973) Funds-in-trust
To develop a national environmental health programme and environmental health services, including water and sewerage laboratories in the Ministry of Health and in the three provinces.

Libya 0033 Community water supply (Feb. - April 1971) UNDP/TA
Three consultants (a sanitary engineer, a hydrogeologist and an expert on legal, financial and administrative matters) helped to formulate a request to the United Nations Development Programme (Special Fund) for assistance in the preparation of a master plan and feasibility studies for a nationwide water supply programme.

Libya 0034 Epidemiological services (1971 - 1975) R
To establish in the Ministry of Health a department of epidemiology with the functions of collecting, analysing and interpreting data on diseases of public health importance and applying modern techniques for their control or eradication.

Libya 0035 Waste management and disposal (1971) R
WHO provided two consultants, each for one month, to assist in studying and to advise on the problems related to the collection, transportation and disposal of solid wastes. They made analyses of various samples of solid wastes in Benghazi and Tripoli and submitted recommendations.

Libya 0036 Dental health services (May - June 1971) R
A consultant reviewed the organization of the dental health services and advised on their future development.

Libya 0200 Fellowships R: Bacteriology and biochemistry (12 months), dietetics (12 months), food sciences (12 months), food technology and inspection (nine months), haematology (12 months), health education (two for nine months), hospital administration (21 for six months), laboratory techniques (nine months), public health (12 months), radiotherapy techniques (12 months), sanitary engineering (12 months), statistics (one for six weeks, one for 12 months), tropical public health (10 months), undergraduate medical studies (three for 12 months).

Libya 0204 Fellowships Funds-in-trust: Undergraduate medical studies (12 months).

Pakistan 0011 Institute of Hygiene and Preventive Medicine, Lahore (1966 - beyond 1974) R
To reorganize the teaching programme and administration of the Institute of Hygiene and Preventive Medicine.

Pakistan 0030 Nursing advisory services, East Pakistan (1971 - 1973) R
To develop programmes for the education of health visitors and nurses at professional and auxiliary levels and strengthen the practical training of students in these disciplines.

Pakistan 0033 Epidemiological services, East Pakistan (1961 - 1973) UNDP/TA
To develop epidemiological and virological departments in the Public Health Institute, Dacca.

Pakistan 0034 Teaching of sanitary engineering, Lahore (1968 - beyond 1974) R UNICEF
To strengthen the postgraduate sanitary engineering course at the University of Engineering and Technology, Lahore.

Pakistan 0036 Malaria eradication programme (1961 - beyond 1974) R (AID)
To eradicate malaria from the whole country, by stages.

Pakistan 0037 Medical education, East Pakistan (1967 - 1974) R
To develop a department of social and preventive medicine at the Dacca Medical College, East Pakistan, for teaching, research and demonstration purposes.

Pakistan 0038 Nutrition Institute, Islamabad (1967 - beyond 1973) R UNICEF (FAO)
To organize the Nutrition Institute, Islamabad, for collecting, processing and disseminating information in relation to human nutrition in the country, and conducting systematic investigations on various aspects of malnutrition in children and on its effects in later life; and to develop programmes for the prevention of malnutrition.

Pakistan 0039 Leprosy control (1961 - beyond 1974) R
To collect epidemiological data on leprosy, study the methodology of leprosy control in a pilot area, assess the results of the programme already undertaken and prepare a comprehensive plan of leprosy control, integrated in the general health services.

Pakistan 0041 Smallpox eradication (1967 - 1974) R Special Account for Smallpox Eradication
To accelerate the smallpox eradication programme through an active reporting and surveillance system and to establish a maintenance system.

To reorganize the work of the occupational therapy unit of the Department of Physical Medicine and Rehabilitation, Jinnah Postgraduate Medical Centre, Karachi, and to improve the orthopaedic workshop.

Pakistan 0048 National health laboratories, Islamabad (1964 - beyond 1974) R
To develop national health laboratories in Islamabad, with a view to making them the reference laboratories for the whole country.

Pakistan 0050 Tuberculosis control (1962 - 1974) R UNDP/TA UNICEF
To implement a national tuberculosis programme and integrate tuberculosis control activities into the general health services.

Pakistan 0054 Community water supply and rural sanitation, West Pakistan (1964 - 1973) R
To develop the organization and management of community water supply programmes and study their technical, legal and financial aspects; and to improve rural sanitation.

Pakistan 0061 School of Tropical Medicine and Hygiene, Dacca (1966 - 1974) R
To develop postgraduate training and research at the School of Tropical Medicine and Hygiene in Dacca.

Pakistan 0064 Advisory services in epidemiology and health statistics (1971 - 1972) R
To improve epidemiological and statistical services.

Pakistan 0070 Freeze-dried BCG vaccine production laboratory (1967 - 1972) R
To organize the production of freeze-dried BCG vaccine for the tuberculosis control programme.

To develop services for the quality control of pharmaceutical preparations, both locally manufactured and imported, through the establishment of a central laboratory and the training of staff in modern techniques of drug testing and analysis.

A consultant assessed the facilities available for establishing a unit for research on diseases of the liver at the Jinnah Postgraduate Medical Centre, Karachi, and helped to draw up a plan of operation.

Pakistan 0079 Family planning (1970 - beyond 1974) UNFPA

To plan and implement the health aspects of the national family planning programme and to train technical personnel for the programme.

Pakistan 0200 Fellowships R: Biostatistics (two months), cancer—visits to institutions for treatment and schools of public health (three days), hospital administration (two for three months), medical institutions—observation visits (10 days), mental health (three weeks), nutrition (16 months), ophthalmology (12 months), pharmaceutical chemistry (12 months), public health (10 months), rehabilitation techniques (nine months), tuberculosis (one for three months, one for one month).

Pakistan 0201 Fellowships UNDP/TA: Tropical medicine and hygiene (13 months).


To plan and implement a national tuberculosis programme to include improvement of co-ordination, integration of control work in the general health services, training of national staff and reorientation of specialized institutions.


To establish an institute for training the technical personnel (nursing staff and middle-grade personnel of various categories) required for the health services.

People's Democratic Republic of Yemen 0007 Public health advisory services (1968 - beyond 1974) R

To strengthen the administration of the health services and develop health programmes.


To carry out anti-malaria measures and co-ordinate the development of the malaria service with that of the rural health services.


To carry out mass vaccination against smallpox and to organize and intensify reporting and surveillance, in order to maintain the country free from smallpox.


To establish a central public health laboratory that will serve as the nucleus for the development of national health laboratories.

People's Democratic Republic of Yemen 0200 Fellowships R: Bacteriology (12 months), child health (12 months), clinical pathology (12 months), dermatology and venereal diseases (18 months), ear, nose and throat conditions (one for six months, one for eight months), hospital administration (nine months), malaria (two for two months), mental health (12 months), nursing (two for 12 months), public health (12 months), radiology (12 months), tropical medicine and hygiene (two for three and a half months, one for five and a half months), undergraduate medical studies (eight for 12 months), undergraduate pharmacy studies (12 months).

Qatar 0002 Training of health personnel (1969 - beyond 1974) R

To train auxiliary health personnel, including assistant sanitarians, assistant male nurses, laboratory assistants and others from Qatar and neighbouring countries for staffing health services and hospitals; also to develop in-service and refresher training of health personnel already in government employment.

Qatar 0200 Fellowships R: Health education (nine months), statistics (two months), X-ray techniques (12 months).

Saudi Arabia 0004 Malaria pre-eradication programme (1963 - beyond 1974) R

To build up the technical, administrative and operational facilities for a control programme as a step towards malaria eradication, and at the same time to develop the rural health services, so that they may provide efficient support to the control and eventual eradication operations.


To provide the country with adequate national health laboratory services, starting with a central public health laboratory in Riyadh.

Saudi Arabia 0013 Tuberculosis control (1963 - 1973) R

To test, through the tuberculosis centre in Riyadh and the mobile units, practical and effective methods of case-finding, and of treatment and follow-up of tuberculosis patients, to be extended later to the whole country; to develop the immunization programme; and to train personnel.


To improve the administration of the public health services and the planning, co-ordination, evaluation and follow-up of health programmes.

Saudi Arabia 0030 Smallpox eradication (1968 - 1973) R

To carry out mass vaccination against smallpox and intensify reporting and surveillance, in order to maintain the country free from smallpox.

Saudi Arabia 0038 Sanitary engineering and municipal programming (1963 - 1973) Funds-in-trust

To develop the municipal environmental health programmes, especially as regards water supplies, disposal of sewage and other wastes, housing and town planning; and to organize, in the Ministry of Interior, an environmental health engineering service to undertake the programme.


A consultant was provided to advise on the establishment of a model unit for the care of mentally retarded children and to review available information on the causes and prevalence of mental retardation among children. During his assignment he made a survey of the situation and recommended a number of measures for the further development of services.

Saudi Arabia 0200 Fellowships R: Biochemical analysis (12 months), public health (12 months), undergraduate medical studies (two for 12 months).
Somalia 0008 Health training institute (1959 - 1974) R UNICEF

To train various categories of health auxiliary personnel, and provide in-service training and refresher courses.

Somalia 0011 Tuberculosis control (1960 - 1974) R UNDP/TA UNICEF

To consolidate the main tuberculosis centre in Mogadishu, establish a rural demonstration area in Balad, extend simple tuberculosis control methods in other areas and integrate the activities into the general basic health services.


To develop, in the Balad district, integrated basic health services that will provide the pattern for comprehensive local public health services throughout the country.

Somalia 0015 Nursing education (1961 - 1974) R

To strengthen the nursing and midwifery services through provision of a three-year diploma course at the nursing school in Hargeisa, followed by a one-year programme in midwifery for graduate nurses.

Somalia 0019 Smallpox eradication (1967 - 1974) R Special Account for Smallpox Eradication

To carry out mass vaccination against smallpox and intensify reporting and surveillance in order to maintain the country free from smallpox.

Somalia 0020 Organization of medical care (1962 - ) R

To improve the medical care services, particularly as regards surgery and anaestheiology; and to provide clinical training facilities for health personnel, especially student nurses.

Somalia 0023 Public health laboratory services (1966 - 1973) R

To develop sound technical methods for laboratory investigation and to provide training facilities, including in-service training for all grades of technical staff.

Somalia 0020 Fellowships R: Anaesthesiology (12 months), ear, nose and throat conditions (12 months), nursing (one for six weeks, one for 11 months), obstetrics and gynaecology (12 months), orthopaedics and traumatology (12 months), public health (12 months), radiology (12 months), undergraduate medical studies (five for 12 months), undergraduate pharmacy studies (12 months).

Somalia 0021 Fellowships UNDP/TA: Undergraduate medical studies (12 months).

Somalia 0002 Malaria pre-eradication programme (1962 - beyond 1973) R UNDP/TA

To co-ordinate the development of the national malaria service and that of the rural health services, and to carry out malaria control measures as a step towards malaria eradication.

Somalia 0008 Health training institute (1959 - 1974) R UNICEF

To train various categories of health auxiliary personnel, and provide in-service training and refresher courses.

Somalia 0011 Tuberculosis control (1960 - 1974) R UNDP/TA UNICEF

To consolidate the main tuberculosis centre in Mogadishu, establish a rural demonstration area in Balad, extend simple tuberculosis control methods in other areas and integrate the activities into the general basic health services.


To develop, in the Balad district, integrated basic health services that will provide the pattern for comprehensive local public health services throughout the country.

Somalia 0015 Nursing education (1961 - 1974) R

To strengthen the nursing and midwifery services through provision of a three-year diploma course at the nursing school in Hargeisa, followed by a one-year programme in midwifery for graduate nurses.

Somalia 0019 Smallpox eradication (1967 - 1974) R

To carry out mass vaccination against smallpox and intensify reporting and surveillance in order to maintain the country free from smallpox.

Somalia 0020 Organization of medical care (1962 - ) R

To improve the medical care services, particularly as regards surgery and anaestheiology; and to provide clinical training facilities for health personnel, especially student nurses.

Somalia 0023 Public health laboratory services (1966 - 1973) R

To develop sound technical methods for laboratory investigation and to provide training facilities, including in-service training for all grades of technical staff.

Somalia 0020 Fellowships R: Anaesthesiology (12 months), ear, nose and throat conditions (12 months), nursing (one for six weeks, one for 11 months), obstetrics and gynaecology (12 months), orthopaedics and traumatology (12 months), public health (12 months), radiology (12 months), undergraduate medical studies (five for 12 months), undergraduate pharmacy studies (12 months).

Somalia 0021 Fellowships UNDP/TA: Undergraduate medical studies (12 months).

Somalia 0002 Malaria pre-eradication programme (1962 - beyond 1973) R UNDP/TA

To co-ordinate the development of the national malaria service and that of the rural health services, and to carry out malaria control measures as a step towards malaria eradication.

Somalia 0008 Health training institute (1959 - 1974) R UNICEF

To train various categories of health auxiliary personnel, and provide in-service training and refresher courses.

Somalia 0011 Tuberculosis control (1960 - 1974) R UNDP/TA UNICEF

To consolidate the main tuberculosis centre in Mogadishu, establish a rural demonstration area in Balad, extend simple tuberculosis control methods in other areas and integrate the activities into the general basic health services.


To develop, in the Balad district, integrated basic health services that will provide the pattern for comprehensive local public health services throughout the country.

Somalia 0015 Nursing education (1961 - 1974) R

To strengthen the nursing and midwifery services through provision of a three-year diploma course at the nursing school in Hargeisa, followed by a one-year programme in midwifery for graduate nurses.

Somalia 0019 Smallpox eradication (1967 - 1974) R

To carry out mass vaccination against smallpox and intensify reporting and surveillance in order to maintain the country free from smallpox.

Somalia 0020 Organization of medical care (1962 - ) R

To improve the medical care services, particularly as regards surgery and anaestheiology; and to provide clinical training facilities for health personnel, especially student nurses.

Somalia 0023 Public health laboratory services (1966 - 1973) R

To develop sound technical methods for laboratory investigation and to provide training facilities, including in-service training for all grades of technical staff.

Somalia 0020 Fellowships R: Anaesthesiology (12 months), ear, nose and throat conditions (12 months), nursing (one for six weeks, one for 11 months), obstetrics and gynaecology (12 months), orthopaedics and traumatology (12 months), public health (12 months), radiology (12 months), undergraduate medical studies (five for 12 months), undergraduate pharmacy studies (12 months).

Somalia 0021 Fellowships UNDP/TA: Undergraduate medical studies (12 months).

Sudan 0006 Malaria control programme (1963 - beyond 1974) R

To build up the technical, administrative and operational facilities for a control programme as a step towards malaria eradication, and at the same time to develop the rural health services, so that they may provide efficient support to the anti-malaria operations.


To develop co-ordinated food and nutrition programmes through health, agriculture and other public services.

Sudan 0026 Onchocerciasis control (1963 - beyond 1974) R

To carry out a survey of onchocerciasis infection in the main section of the Nile north of Khartoum and in Bahri-el-Ghazal and Equatoria Provinces, so as to determine the reasons for the prevalence of the infection, in particular the relationship between the disease in man and the breeding places of the insect vector; to develop a programme for the control and prevention of onchocerciasis and train personnel.

Sudan 0027 Sanitary engineering course, University of Khartoum (1967 - beyond 1973) R

To improve the teaching of sanitary engineering subjects to students of civil engineering at the University of Khartoum, to provide additional optional courses for senior students and ultimately to organize a postgraduate course in sanitary engineering.

Sudan 0028 Smallpox eradication (1967 - beyond 1974) R

To carry out a smallpox eradication programme including mass vaccination and a system of reporting and surveillance/containment.

Sudan 0032 Malaria eradication training centre (1963 - 1973) R

To train staff for the malaria service, and to provide training in antimalaria measures to staff of the general health services.


To establish a laboratory for the quality control of pharmaceutical preparations, introduce modern techniques for the analysis of drugs and train personnel in various aspects of quality control.


To establish a national public health laboratory service.

Sudan 0036 Environmental health (1965 - 1972) R

To plan and develop a national environmental health programme and to organize, in the Ministry of Health, a sanitary engineering service to undertake it.


To train X-ray technicians from Sudan and neighbouring countries.


To improve the teaching of sanitary engineering subjects to students of civil engineering at the University of Khartoum, to provide additional optional courses for senior students and ultimately to organize a postgraduate course in sanitary engineering.

Sudan 0039 Teaching of paediatrics (1966 - 1973) R UNICEF

To strengthen teaching and research work in the Department of Paediatrics, established in 1967 in the Faculty of Medicine of the University of Khartoum.

Sudan 0045  Community water supply in rural areas
(1968 - 1972) R
To provide a safe piped water supply to Rahad town, provide potable water from hafirs and boreholes throughout the rural area, and solve problems in the field of rural water supplies as and when they occur.

To define the extent of the mycosis problem, teach diagnostic techniques, and stimulate the interest of medical and health officers in case-finding, diagnosis, treatment and control of mycoses.

Sudan 0100  Medical education (1971 - 1973) R
To develop medical education at undergraduate and postgraduate levels.

Sudan 0200  Fellowships R: Cardiology (six months), child psychiatry (12 months), electroencephalography (12 months), general medicine (four and a half months), hospital administration (12 months), leprosy (three months), medical records (eight months), nursing (12 months), occupational health (10 months), parasitology (10 months), pharmaceutical chemistry (12 months), port health services (three months), radiotherapy (12 months), radiotherapy nursing (12 months), serology (six months), tropical public health (three for 10 months), tuberculosis (three weeks).

Syria 0001  Malaria eradication programme
(1956 - beyond 1974) R UNDP/TA
To eradicate malaria from the whole country and prevent its re-establishment. (See para. 19.89.)

Syria 0017  Malaria eradication programme
(1966 - 1974) R UNDP/TA
To eradicate malaria from the country and prevent its re-establishment.

Syria 0018  Environmental health services
(1962 - 1973) UNDP/TA
To develop a national environmental health programme and train personnel for its implementation.

Syria 0023  Training of sanitarians (1970 - 1971) R
The aim was to strengthen the preventive aspect of the health services in Syria by training sanitarians to staff the various levels of the health services in the country.
A WHO sanitarian was provided from March to May 1971. He assisted in reviewing the curriculum of the training school and in giving lectures to the students. This project has been discontinued at the request of the Government.

Syria 0032  Family planning aspects of maternal and child health (1971 - beyond 1973) UNFPA
To develop the family planning programme and integrate it into the maternal and child health programme, to train all categories of health personnel in the pilot centre for family planning, and provide laboratory facilities and research at the centre.

Syria 0034  Nursing education (1964 - 1973) R UNDP/TA
To strengthen the nursing services and nursing schools through the provision of post-basic courses designed to prepare qualified nurses to become administrators, supervisors and teachers.

To carry out an epidemiological and malacological survey of schistosomiasis, intensify control measures and train personnel.

Syria 0037  Vital and health statistics
(1968 - 1973) UNDP/TA
To develop a system of vital and health statistics through the establishment of a permanent statistical service in the Secretariat of State for Public Health and the training of national staff in health statistics techniques.

Syria 0041  Community water supplies
(1970 - 1972) R
To improve community water supplies. Under this project advice is being provided particularly in connexion with the design of distribution systems, the control of water quality and the legal, administrative and financial aspects of water management.

Syria 0049  Leprosy control
(Sept. - Oct. 1971) R
A consultant reviewed the leprosy problem, assisted in organizing orientation courses and discussed ways of integrating leprosy control into the work of the general health services in areas where the epidemiological situation justifies such a measure.
Yemen 0016  Smallpox eradication  
(1968 - 1974) R  Special Account for Smallpox Eradication  
To carry out mass vaccination against smallpox and organize a reporting and surveillance system in order to maintain the country free from smallpox.

Yemen 0017  Community water supply and environmental health services  
To develop the national community water supply programme, investigate and design various types of water supply systems, particularly for towns and rural areas, and take measures for the solution of environmental health problems.

Yemen 0018  Public health laboratory services  
(1971 - beyond 1974) R  
To establish public health laboratory services, starting with a central public health laboratory in Sana’a and provincial laboratories in Taiz and Hodeida; and to train personnel.

Yemen 0020  Organization of medical care  
(1969 - 1972) R  
To co-ordinate and develop hospital and medical care services.

Yemen 0023  Water supply, Sana’a and Hodeida  
(1970 - 1973) UNDP/SF  
To prepare a master plan and carry out preliminary engineering and feasibility studies in respect of the water supplies for Sana’a and Hodeida. (See para. 19.102.)

Yemen 0026  Food and nutrition programme  
(1971 - 1973) UNDP/SF (FAO)  
To organize and expand school feeding and hospital food and dietary services, and promote nutrition education, as part of a programme being implemented with assistance from the United Nations Development Programme (Special Fund) for which FAO is the executing agency.

Yemen 0200  Fellowships R: Anaesthesiology (three for 12 months), laboratory techniques (12 months), ophthalmology (two for 12 months), physical therapy (three for six months), smallpox—visits to projects (one month), undergraduate dental studies (12 months), undergraduate medical studies (20 for 12 months, two for 13 months, three for 18 months), undergraduate nursing studies (two for 12 months), undergraduate pharmacy studies (12 months), X-ray techniques (seven months).

EMRO 0043  Advisory services  
(1958 - 1974) R  
To meet urgent requests from the countries of the Region for consultant services on subjects for which no budgetary provision had been made under the country programmes.

EMRO 0045  Participation in educational meetings  
(1959 - beyond 1974) R  
To enable countries of the Region to participate in seminars, conferences and training courses organized in other regions and by other agencies.

EMRO 0049  Assistance to regional institutes  
To assist scientific institutes in the Region which are engaged in work of importance in the field of public health, especially in education and training of medical and health personnel.

EMRO 0057  Malaria co-ordination meetings  
(1968 - 1974) R  
To facilitate participation in inter-country malaria co-ordination meetings for discussion and exchange of information between national authorities responsible for malaria eradication programmes.
EMRO 0058 Malaria eradication evaluation team
(1961 - 1971) R

The aim was to assist governments in the evaluation of malaria eradication programmes, to co-ordinate the exchange of information and programme activities among neighbouring countries, and to undertake special epidemiological studies of eradication programmes, especially in areas of persistent transmission. WHO provided a malarialogist, an entomologist, a secretary and a driver for the duration of the project, an epidemiologist in 1965 and 1966 and a laboratory technician in 1966, as well as supplies and equipment.

Throughout the duration of the project, the team provided assistance to Iraq, Jordan, Lebanon and the Syrian Arab Republic, and in the initial period, also to Iran, in evaluating various aspects of their malaria eradication programmes, in carrying out epidemiological studies and in making special investigations on malaria vectors. Particular attention was given to investigation of the problems in areas of persistent transmission. The team regularly followed up the level of resistance to insecticides of the main vectors of malaria in these areas and assessed the efficacy of the measures taken to interrupt transmission. The team also assisted in improving co-ordination of malaria eradication work in the four countries, particularly in frontier areas, and promoted the exchange of epidemiological information. In 1965 Jordan, Lebanon and the Syrian Arab Republic set up a malaria co-ordination board, of which Iraq and Turkey later became members. The senior adviser of the project has acted as secretary of the board, which meets once a year, while border meetings of two or more of its members are held as required.

Some members of the project team, acting as part of a certification team, visited Cyprus in 1967, prior to that country being placed on the WHO Official Register of countries where malaria has been eradicated. In 1971 one member again visited Cyprus to assess the efficacy of vigilance activities.

EMRO 0079 Advanced training for sanitariums
(1966 - beyond 1974) UNDP/TA

To provide advanced training in sanitation and supervision of sanitation services, and training for experienced national sanitarians from selected countries.

EMRO 0084 Medical education (1965 - beyond 1974) R

To assist countries in the Region in developing undergraduate and postgraduate medical education, and in establishing new medical faculties.

EMRO 0088 Smallpox eradication (1967 - beyond 1974) R Special Account for Smallpox Eradication

To assist countries of the Region in the planning, implementation and assessment of their smallpox eradication programmes, and also to assist national laboratories in developing diagnostic methodology and in improving the production of freeze-dried smallpox vaccine.

EMRO 0101 Medical records advisory services
(1966 - beyond 1974) UNDP/TA

To provide advice on medical records in hospitals and health centres to countries in the Region that are developing medical records units, and to train national medical records officers.

EMRO 0103 Group Meeting on Cancer Control, Baghdad
(27 Nov. - 2 Dec. 1971) R

The purpose of the meeting was to draw the attention of the public health authorities to the need for organizing cancer control services. It also defined guidelines for the initial steps leading to the organization of such services and provided some idea of the scope and extension of the services required to cope with national needs. There were 17 participants from Afghanistan, Cyprus, Egypt, Ethiopia, Iran, Iraq, Jordan, Kuwait, Lebanon, Pakistan, Syrian Arab Republic and Tunisia.

WHO provided two consultants and three temporary advisers and met the cost of attendance of the participants. Two WHO staff members attended the meeting.

EMRO 0121 Exchange of professors of medical faculties and schools of public health in the Region (1969 - 1974) R

To assist in the exchange of professors for short periods following agreements between schools.

EMRO 0123 Training course on cholera bacteriology, Beirut

The course provided training in cholera bacteriology to 17 laboratory technicians from Bahrain, Cyprus, Ethiopia, Jordan, Kuwait, Lebanon, Libyan Arab Republic, People's Democratic Republic of Yemen, Saudi Arabia, Sudan, Syrian Arab Republic and Yemen. Emphasis was placed on the practical aspects of the work; after one hour of lectures each morning the students practised isolation and identification of cholera strains under strict supervision.

WHO provided a consultant bacteriologist for two weeks, fellowships for the trainees and supplies and equipment.


The aim is to co-operate with the UNESCO-sponsored World Literacy Programme in incorporating health components in the training programme of the Arab States Functional Literacy Centre in Sirs-el-Layyan, Egypt, and in those of a certain number of countries within the Region.

EMRO 0135 Seminar on Sanitation Problems of Rapid Urbanization, Lahore
(7 - 14 Oct. 1971) R

The purpose of the seminar was to consider the sanitation problems caused by rapid urbanization and review the progress made in solving them in the countries of the Region. The subjects discussed included the socio-economic aspects of slums, sanitary codes and public health law, and the financing of water and sewerage schemes. There were 22 participants from Afghanistan, Cyprus, Egypt, Ethiopia, Iran, Iraq, Jordan, Libyan Arab Republic, Pakistan, Qatar, Sudan, Syrian Arab Republic, Tunisia and Yemen, 13 observers from Pakistan and representatives from the United Nations, the United Nations Development Programme, UNICEF and the United States Agency for International Development.

WHO provided a consultant and two temporary advisers and met the cost of attendance of the participants.

EMRO 0140 Coronary heart disease: epidemiology and treatment (Oct. - Nov. 1971) R

A consultant visited Egypt, Iran and Sudan to obtain information on the prevalence of the most important cardiovascular diseases and the factors influencing them, and to make an epidemiological analysis of the situation with a view to prevention and control. The information gathered will be used for the preparation of a seminar on the prevention and control of major cardiovascular diseases (project EMRO 0142).

EMRO 0146 Course on virology, Cairo

The course provided instruction in virological techniques, with emphasis on diagnosis.

WHO provided a consultant and fellowships for seven trainees from Afghanistan, Ethiopia, Iraq, Jordan, Pakistan, Saudi Arabia and Syrian Arab Republic.
EMRO 0150  Maintenance and repair of X-ray equipment (1971 - ) R
To service and maintain X-ray and other electromedical installations, recommend improved procedures for maintenance and repair and train national staff in this work.

EMRO 0157  Rodent control (1967 - 1974) R
To investigate problems of rodent infestation, to propose control measures and to train municipal, port and quarantine officers responsible for rodent control in the principles and practice of rodent control operations.

EMRO 0161  Training in nutrition (1971 - 1974) UNDP/TA
To promote the organization of national nutrition services by providing advisory services and training nutrition personnel.

EMRO 0163  Training centre in educational sciences and medical pedagogy (1971 - beyond 1974) R
To develop a centre at the Faculty of Medicine, Pahlavi University, Shiraz, where courses of short duration will be organized for medical teachers from the Region.

The purpose of the conference was to enable representatives of the faculties of medicine in the Region to discuss the objectives and methods of undergraduate medical education with special advisers and experts from other parts of the world. There were 108 participants from Afghanistan, Algeria, Egypt, Ethiopia, Iran, Iraq, Jordan, Kuwait, Libyan Arab Republic, Morocco, Pakistan, Saudi Arabia, Sudan, Syrian Arab Republic, Tunisia and Turkey. The conference was also attended by representatives from the United States, the United Nations Development Programme and UNICEF and by observers from various organizations and from the host country, Iran, as well as by 10 WHO staff members. The main subjects discussed were the teaching of basic sciences, the training of medical teachers, community-centred medical education, and planning the establishment of new medical schools. Recommendations were formulated on these subjects and on premedical education, the place of paediatrics and of preventive medicine in the medical curriculum and medical libraries.
WHO provided eight temporary advisers and conference services and met the cost of attendance of the participants.

EMRO 0179  United Nations Development Programme (Special Fund) co-ordinating services (1970 - ) UNDP/SF
A special service, under the direct supervision of the Regional Director, to help countries in the Region with the utilization of the UNDP Special Fund resources for assistance in the health field and with the formulation of requests.

To assist governments in developing their epidemiological services in order to be able to cope with epidemics or natural disasters such as earthquakes and floods.

To establish within the Region adequate facilities for the training of nutrition workers and high-level government personnel from ministries of health, agriculture and planning and from other ministries in various aspects of nutrition, with a view to promoting the formulation of nutrition policies and the execution of food and nutrition programmes.

EMRO 0188  Regional training programme in child health and midwifery (1970 - 1973) R UNICEF
To assist the American University of Beirut in strengthening and improving the teaching of child health to medical and other health personnel, and in planning and initiating a programme for the training of graduate and public health nurses in midwifery. The regional training programme includes a one-year post-basic midwifery course and short refresher courses in child health, school health and family health.

EMRO 0194  Integration of family planning activities into health services (1970 - ) UNFPA
To assist countries of the Region in the planning, organization, management and evaluation of family planning programmes as part of the health services, in the training of all categories of personnel and in the upgrading of institutions for training and research in human reproduction and population dynamics.

EMRO 0195  Industrial hygiene course, Zagreb (1970 - 1972) R
To provide a training programme especially designed to meet the needs of industrial hygienists from developing countries.

EMRO 0196  Maternity-centred family planning programme (1971 - beyond 1974) UNFPA
To develop family planning aspects of maternal and child health work in countries of the Region. The project is aimed at providing opportunities for improved maternity care including family planning guidance and related services, upgrading and extending the provision of maternity and related care, and organizing the training of technical personnel.

EMRO 0198  Course on health and manpower planning (25 Nov. 1971 - 10 Jan. 1972) R
To train national health staff from some countries of the Region in the principles of socio-economic and manpower planning, with special emphasis on health and manpower planning; in research in and evaluation of public health programmes and practices; and in the management of health organizations and institutions.

To provide an opportunity for maternal and child health personnel from the Region to attend courses in maternal and child health and social pediatrics at the International Children's Centre, Paris, or to participate in courses, seminars and other educational activities organized by the Centre in countries of the Region.
During the period under review three fellowships were awarded—one of 10 weeks, for a course on social paediatrics, to a candidate from the Syrian Arab Republic, and two of three weeks, for a course in genetics applied to social paediatrics, to candidates from Israel and Tunisia.
WESTERN PACIFIC REGION

Australia 4041 Fellowships R: Epidemiology, mental health and public health (12 months).

Australia 5141 Fellowships R: Maternal and child health (10 weeks).

Australia 7441 Fellowships R: Radio-pharmaceuticals quality control (three months).


To eradicate malaria from the country. This project follows the malaria eradication pilot project (1960 - 1964) and the malaria pre-eradication programme (1965 - 1969).

British Solomon Islands Protectorate 4001 (0502) Development of basic health services (1965 - 1975) R UNDP/TA UNICEF

To expand and strengthen the network of local health services and train auxiliary health personnel.

British Solomon Islands Protectorate 4041 Fellowships R: Public health (10 months).

British Solomon Islands Protectorate 4441 Fellowships R: Nursing (two for 12 months).

British Solomon Islands Protectorate 4501 (0505) Health education advisory services (1971 - 1972) R

To strengthen the health education service in the Medical Department, establish a pattern for health education activities to be carried out at village level by health personnel, improve the teaching of health education in schools and teacher-training colleges, and organize seminars, conferences and meetings on health education for other services, government departments and non-governmental organizations.

British Solomon Islands Protectorate 4841 Fellowships R: Physical therapy (12 months).

Brunei 4201 (0010) Public health laboratory services (Jan. 1971) R

A consultant assessed the public health laboratory needs and advised on the development of a training programme of health laboratory services, including the training of national personnel.

Brunei 4901 (0011) Hospital records and statistics (June - Aug. 1971) R

WHO provided a consultant for three months to review the present system of medical records in the hospitals, including their statistical content; to assist in the organization of a practical system of recording data for medical care, hospital administration, hospital statistics and teaching and research in the hospitals and in promoting the establishment of a medical records committee which will have responsibility for initiating the revision of forms and improvement of hospital records: and to train a national counterpart and ancillary personnel.

China 1001 (0046) Communicable disease control centre, Taiwan (1965 - ) R

To set up an epidemiological service, including laboratory facilities; to study local epidemiological patterns of prevailing causes of morbidity and mortality as a basis for the planning of specific disease control programmes; and to develop procedures, suited to local conditions, for the investigation, diagnosis, control and prevention of the most prevalent communicable diseases.

China 1101 (0001) Venereal disease control, Taiwan (1971) R

Two fellowships were awarded under this project, which was assisted by WHO between 1953 and 1970.

China 1301 (0045) Leprosy control, Taiwan (1965 - 1970) R

The aim was to establish, for demonstration and training purposes, a pilot project for the rehabilitation of leprosy patients, and to prepare a plan for a national leprosy control programme, integrated into the leprosy control work of the peripheral health stations and general hospitals. WHO provided a medical officer, a consultant and four fellowships.

During the period of assistance the Leprosy Control Committee, which advises on matters of leprosy control, co-ordinates the activities of voluntary agencies, and centralizes records and reports from all leprosy institutions in Taiwan, was reorganized and strengthened. Since 1969 the Committee has been conducting leprosy case-finding in several endemic areas. The decision to operate leprosy control through the out-patient departments of the peripheral health stations, and to admit to the leprosy institution only infectious lepromatous patients, and also those showing lepra reaction or needing reconstructive surgery, has resulted in a decrease in the number of in-patients and a corresponding rise in the number of out-patients. Leprosy control has been integrated into the work of 10 peripheral health stations and four general hospitals. A rehabilitation department has been set up in the leprosy institution with services for reconstructive surgery, physical therapy and occupational therapy. Facilities for reconstructive surgery and physical therapy have been provided at four centres.

China 3001 (0066) Environmental health advisory services, Taiwan (1970 - ) R

To plan a programme for the improvement of environmental sanitation in urban and rural communities and ensure liaison among various agencies with jurisdiction over environmental health matters.

China 3202 (0074) Comprehensive water supply and sewerage development programme, Taiwan (1971 - ) UNDP/TA

To provide water supply and sewerage facilities to the largest possible number of urban dwellers. The project includes the review and reformulation of long-term comprehensive water supply and sewerage development plans; the preparation of plans and feasibility studies for water and sewerage services for several cities; the strengthening of the organization and management of the water supply and sewerage operational agencies; and the training of key personnel for the development programme.
China 3301 (0067) Sewerage system planning for the Greater Taipei area (1969 - 1971) UNDP/SF

The aim was (i) to prepare a master plan for sanitary sewerage for the Greater Taipei area, including interim, first-stage and long-term proposals; (ii) to train local personnel in planning, design, construction supervision and management, operation and maintenance of the sewerage system; and (iii) to prepare related legal, organizational and financial bases for the operation of the system. WHO, as executing agency for the project, provided a project manager, consultants, the services of a consulting engineering firm, fellowships, supplies and equipment, and miscellaneous local operating costs.

The consulting engineering firm entrusted with the studies prepared a preliminary report, issued in July 1970, and, in May 1971, the master plan report, which includes preliminary engineering and feasibility studies on the immediate and short-term sewerage construction programme. It also prepared a supplementary report on a proposed model project, issued in March 1971. The study area comprised 94,000 hectares with a population of some 3 million in 1970, the estimated population for 2000 being 6 million. The master plan is based on two long-term aims (i) the improvement of environmental sanitation in individual households and (ii) the control of water pollution in the river system of the Taipei region. The immediate and short-term construction programme will serve about 500,000 inhabitants of the Taipei City area. The master plan, in addition to a detailed staging and financial plan, makes recommendations on the establishment of an organization to administer the planning, design, construction and operation of the sewerage programme.

China 3641 Fellowships, Taiwan R: Industrial waste treatment (three months), water supply and sewerage engineering (three months).

China 3701 (0068) Vector control, Taiwan
(April - June 1971) R

A consultant compiled and analysed all available information on vector control in Taiwan, and helped to assess the vector control work being carried out, particularly in Taipei Municipality, with a view to the expansion of the vector control programme.

China 4041 Fellowships, Taiwan R: Hospital administration and medical insurance (three months), urban health administration (six weeks).

China 4401 (0055) Nursing administration, Taiwan
(1967 - ) R

To strengthen the nursing division of the provincial department of health and increase its participation in the development of health programmes; to improve nursing organization, administration and supervision; to carry out studies in nursing practice; and, in collaboration with the education authorities, to improve the programmes and the practical training facilities for student nurses.

China 4441 Fellowships, Taiwan R: Nursing (two for 12 months), nursing education (nine months).

China 4501 (0048) Health education advisory services, Taiwan
(1971) R Special Account for Miscellaneous Designated Contributions

In January 1971 a consultant reviewed the family planning aspects of the curricula for health education specialists at the Institute of Public Health of the Taiwan University and the health education department of the Normal University and the field training for health education students provided by the provincial Institute of Health. Between July and September 1971 another consultant reviewed the functions of the health education division of the provincial health department and advised on a programme for increasing the competence of some 60 health education specialists employed by the department. He also advised on the placement and use of health education specialists and their supervision, and the internship and in-service training provided for them by the provisional Institute of Health.

Consultant services were provided under this project in 1966.

China 4801 (0049) Physical and occupational therapy, Taiwan
(1966 - ) R

To organize, at Taiwan University, collegiate courses for training physical therapists and occupational therapists and to improve professional standards.

China 5201 (0058) Industrial health, Taiwan (1970 - 1972) R

A consultant was provided between September 1970 and January 1971 to review and develop the functions of the industrial health centres, as well as those of the relevant departments at the central and intermediate levels of the occupational health administration system, to advise on the establishment of an occupational health and safety demonstration project, and to train industrial health personnel in industrial hygiene practices and methodology. A second consultant was provided from October 1971 to January 1972 to assist in establishing training schemes for medical and paramedical personnel engaged in occupational health work and to review the clinical and clinical laboratory aspects of medical undergraduate and graduate teaching in occupational health.

China 5401 (0020) Mental health programme, Taiwan (1971) R

Two 12-month fellowships—one in child psychiatry and the other in mental health—were awarded under this project, which was assisted by WHO between 1955 and 1968.

China 5541 Fellowships, Taiwan R: Dental health education (three months).

China 6401 (0069) Education and training of health personnel, Taiwan (1970 - ) R

To provide a consolidated programme of assistance for the education and training of health and medical workers.

China 8101 (0079) Cancer control, Taiwan (1971) R

Two fellowships were awarded under this project.

China 9604 (0084) Study of relationship between family size and health of family members, Taiwan
(Aug. 1970; Aug. 1971) UNFPA

In August 1970 a WHO consultant discussed with officials and university professors in Taipei and Taichung the WHO collaborative programme of epidemiological studies on human reproduction, which is principally concerned with investigation of (i) the relation between health on the one hand, and family size and the tempo of family building on the other, and (ii) the relation between childhood mortality and reproductive patterns. As a result of these discussions, Taichung was selected as a study area and the Institute of Maternal and Child Health as the study centre. A return visit was made by the consultant in August 1971 to review the progress of the study.

Cook Islands 6041 Fellowships R: Medical studies (two for 12 months).
Fiji 1641 Fellowships R: Epidemiological survey of streptococcal infections (three months).

Fiji 3041 Fellowships R: Food technology and inspection (12 months).

Fiji 4041 Fellowships R: Biochemistry (six months), public health administration (10 months).

Fiji 4201 (0013) Central pathological laboratory (1971 - 1972) R

To establish a modern bacteriological department at the central pathological laboratory and train personnel in bacteriological techniques.

Fiji 4441 Fellowships R: Nursing (10 months), nursing administration (12 months), nursing education (12 months), nursing and midwifery education (12 months).

Fiji 5541 Fellowships R: Dental public health (12 months), prosthetics and children's dentistry (six months).

Gilbert and Ellice Islands 1001 (0008) Communicable diseases: advisory services (1968 - 1971) R

To study the epidemiology of the main communicable diseases, particularly diarrhoeal diseases, in order to determine the most appropriate measures for their control. (See para. 20.82.)


To develop training programmes for preparing nursing and midwifery personnel for the hospital and health services and to strengthen the public health nursing aspects of the basic curricula of the School of Nursing attached to the Central Colony Hospital, Tarawa.

Gilbert and Ellice Islands 4441 Fellowships R: Public health nursing (12 months).

Gilbert and Ellice Islands 5141 Fellowships R: Midwifery (six months).

Gilbert and Ellice Islands 6041 Fellowships R: General surgery (six months).

Gilbert and Ellice Islands 9601 (0013) Family planning advisory services (1971 - 1974) UNFPA

To organize and make available to the whole population services related to human reproduction and fertility, including services for spacing and limitation of births and for treatment of subfertility, and to carry out a programme of information and education of the public.

Hong Kong 4041 Fellowships R: Public health (12 months).

Hong Kong 4841 Fellowships R: Paraplegia (six months).

Hong Kong 5541 Fellowships R: Dental nursing (seven for 12 months), dental nursing education (12 months).

Japan 1941 Fellowships R: Organization and operation of serum reference banks (two months).

Japan 4041 Fellowships R: Hospital administration and medical care (three months), medical care of the aged (three months), medical rehabilitation (two for three months), public health administration (three months).

Japan 4941 Fellowships R: Health statistics (three months).

Japan 5441 Fellowships R: Medical care system for emotionally disturbed children (three months).

Japan 7441 Fellowships R: Food control (three months), pharmacists—qualifications, functions, professional training and licensing (three months), poison control and control of powerful drugs (three months).

Khmer Republic 1201 (0503) Tuberculosis control (1965 - 1971) R UNICEF

To set up the nucleus of a national tuberculosis control service with emphasis on preventive measures, and to carry out an effective control programme, so as to reduce, and finally to eliminate, tuberculosis as a major public health problem.


To extend antimalarial activities progressively in order to protect the 2.3 million people living under malaria risk; and to promote the development of an integrated health service by training malaria personnel for the provincial and district health organization and involving the rural health services in malaria case-detection and treatment.

Khmer Republic 3001 (0024) Environmental health advisory services (1968 - 1973) R

To establish a public health engineering unit in the Ministry of Public Health and co-ordinate its work with the work of other units of the Ministry; and to draw up and implement country-wide environmental health programmes.


To conduct preliminary investigations for the development of a surface water supply and initiate a well-drilling programme in areas of known water yield; to review current proposals for the construction of a diversion weir on the Tuk Sap River and a transmission water line to the existing treatment plant; and to develop a programme for a full-scale project.

Khmer Republic 4201 (0507) Health laboratory development (1968 - 1974) UNDP/TA

To improve the organization and technical services of the provincial laboratories and to train staff.

Khmer Republic 4401 (0013) Nursing administration (1963 - 1972) R

To survey and evaluate training resources, and prepare short-term and long-term plans for meeting the nursing needs of the health services; to organize and improve nursing services and education programmes throughout the country; and to review nursing legislation, personnel policies, and terms of service.

Khmer Republic 4901 (0505) Epidemiology and health statistics (1966 - 1975) R

To establish in the Ministry of Public Health an epidemiological and health statistical service which will be responsible for planning and guiding national disease control programmes; to study local epidemiological patterns of prevailing causes of morbidity and mortality as a basis for the formulation of such programmes; to reorganize the health statistics systems in hospitals, health centres, dispensaries and other institutions providing health care; and to train personnel of the health services in epidemiological and health statistics.

Khmer Republic 5601 (0511) National nutrition service (1967 - 1971) R

The aim was to improve nutritional levels in the community; to study the etiology and epidemiology of nutritional diseases and deficiencies affecting the population; to establish patterns
for practical nutrition programmes that can be adapted for any part of the country and to train national staff for their implementation and evaluation. WHO provided a nutrition biochemist.

A summary of the work done up to the end of 1970 is given in the Annual Report for that year.1 During 1971, owing to military operations, it was not possible to continue the field work in the pilot rural areas. The WHO biochemist made a survey of anaemias among pregnant women in Phnom-Penh and advised the Institute of Biology on general health laboratory services and on the training of laboratory personnel.

The nutrition problems in certain areas have been more clearly defined as a result of the project, which has also enabled guidelines to be drawn up for nutrition education (particularly with regard to the diet of young children) and for the nutrition training of health personnel. Closer integration of nutrition activities into the basic health services and the Ministry of Public Health's training programme is being encouraged.

The work of the project is to be continued under the family health advisory services project (Khmer Republic 5101).

Khmer Republic 6041 Fellowships R: Anaesthesia and reanimation (12 months).


To develop and strengthen the centres for the training of all categories of health personnel and to develop a community health centre to serve as a model for centres to be established later in other parts of the country.

Korea 1201 (0019) Tuberculosis control (1962 - 1973) R UNICEF

To develop an effective and comprehensive national tuberculosis control programme, so as to reduce, and finally to eliminate, the disease as a public health problem.

Korea 2001 (0013) Antimalaria programme (1962 - ) R

To survey the malaria situation, organize a national malaria service and train staff, so as to enable an eradication programme to be planned and implemented.

This programme follows the pre-eradication survey that began in June 1959.

Korea 2901 (0033) Epidemiology and statistics advisory services (1968 - 1978) R

To organize and develop a central epidemiological service and a disease intelligence network in the Ministry of Health and Social Affairs; to improve the collection, recording and utilization of health statistics; and to co-ordinate health laboratory services with the epidemiological services.

Korea 4001 (0025) General health services development (1963 - 1977) R UNICEF

To develop the public health services in the demonstration province (Chungchong Namdo) and the local health services in other provinces; and to train local health personnel at the Division of Training of the National Institute of Health.

Korea 4041 Fellowships R: Entomology and taxonomy of arthropods of public health importance (two for six months).


To formulate a national health plan within the framework of the national economic development plan, improve co-ordination between the national health planning unit and other units and organizations concerned with health activities and train personnel in health planning techniques.

Consultant services were provided under this project between 1966 and 1969.

Korea 4241 Fellowships R: Serological tests for Japanese encephalitis virus (three weeks).

Korea 4301 (0035) Organization of medical care (1971 - ) R

To improve the organization of medical care services throughout the country and to strengthen the network of hospitals at national, provincial and local levels as part of the general health services.

Korea 4401 (0021) Nursing education (1968 - 1971) R

The aim was to develop a nursing education section in the Ministry of Education and to formulate and implement short-term and long-term plans for strengthening and developing nursing education. WHO provided a nurse educator from August 1968 to January 1971.

In 1968 all schools and colleges of nursing except the Army School were under the control of the Ministry of Education —six colleges offering a four-year Bachelor's degree course, 25 schools with a three-year course for students having completed high-school education, and nine technical high schools with a three-year course—but there was no administrative nursing post in the competent section of the Ministry for co-ordination and supervision of the three types of nursing education programme. Although no senior nurse educator with administrative experience was available, a lower-grade post was created and a nursing adviser appointed; recommendations were made for her advanced training as well as for the establishment of an advisory committee on nursing education. In order to promote the development and co-ordination of curricula, workshops and seminars were organized for teaching staff of the schools and colleges of nursing. These resulted in steps being taken by individual schools to revise and improve their curricula. The Ministry of Education made preparations for co-ordinating the courses of the schools providing a diploma course with the system of general education; these schools have been included in the new programme of advanced technical education for students leaving high school, with an optional third year.

In spite of the improvements made, it was not possible, during the period of the project, to develop a system of nursing education that will ensure an adequate supply of nursing personnel for the health services, partly because it has not been possible to give this task very high priority in the overall government programme, and partly because there is a tendency for trained nurses to emigrate. Consequently nurses have to be trained as quickly as possible not only to meet the demands of the expanding health services but also to replace those whose services have been lost to the country, so that emphasis has to be placed on quantity rather than quality.

A number of recommendations have been made which, if they can be implemented, should help to secure further improvement in nursing education, assistance with which is continuing under the project for the education and training of health personnel (Korea 6401).

Korea 5101 (0003) Maternal and child health advisory services (1968 - 1971) R UNICEF

The aim was to develop and strengthen maternal and child health activities as part of the general health services, to integrate family planning into the services and to train health personnel in maternal and child health care. WHO provided a medical officer from February 1968 to December 1971, fellowships and supplies and equipment.

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During the course of the project the Government considerably increased the budget for maternal and child health activities and provided subsidies to nurses and midwives appointed to rural health centres. Since there were not enough candidates to fill all the posts in the subcentres, health aides, trained under the WHO-assisted project for the education and training of health personnel (Korea 6401) were recruited. The number of staff increased from 284 in 1968 to 778 in 1971. Seminars on maternal and child health work were organized for a total of 384 medical and administrative staff and workshops were held for a total of 700 provincial and rural health personnel. In 1970 the National Institute of Health started refresher courses for nurse/midwives, nurses and midwives; these had 115 participants in the first year of operation. Three health centres were upgraded to function as demonstration and training areas for the integration of maternal and child health and family planning into the general health services. A manual on maternal and child health techniques and procedures, later to be incorporated in a public health manual, was prepared and distributed to all health personnel concerned with maternal and child health. Through the Bureau of Women and Children of the Ministry of Health and Social Affairs, health care was provided to children in day-care centres, beginning with those used for demonstration and training purposes. In 1970, surveys were made of the maternal and child health work in rural areas, and of the mothers' knowledge and practice of health care for their children and themselves.

The project was successful in increasing the numbers of mothers and children reached by the health services and in improving the preparation of the staff, although in the rural areas the family planning aspects of their work did not develop as fully as had been planned.


To provide education and training for health and medical workers, including undergraduate and postgraduate training for physicians and basic and post-basic training for nurses, sanitarians and other health workers.

Korea 7341 Fellowships R: Drug control (one for one month, one for three months, one for six months).

Korea 7441 Fellowships R: Drug safety and efficacy (15 weeks).

Korea 9601 (0055) Workshops in family planning for teachers in nursing/midwifery schools (1971 - 1974) UNFPA

To organize workshops for teachers in nursing/midwifery schools with the purpose of securing well-qualified staff for the teaching of family planning and its integration into the basic curriculum.

Laos 1101 (0506) Venereal disease control


A consultant assessed the nature and extent of the venereal disease problem, the diagnostic, treatment and control facilities available and made recommendations on measures to strengthen the venereal disease control service.


To build up the administrative and operational facilities of the Central Malaria Service to the level required to carry out an antimalaria programme, in the first place in the Vientiane plain.

Laos 3001 (0507) Environmental health advisory services

(1970 - 1974) UNDP/TA

To establish a division of sanitary engineering in the Ministry of Public Health, define its functions and phase its programme of work, and to establish a protocol of liaison between the Ministry and the other ministries and governmental agencies with jurisdiction over environmental health activities.

Laos 4001 (0503) Development of health services

(1968 - 1979) UNDP/TA

To plan and develop the general health services at provincial and district levels, with particular attention to the Province of Vientiane, which will serve as a pilot area; and to assess the health manpower requirements for the pilot area and plan measures for meeting them.

Laos 4002 (0501) Public health administration advisory services

(1969 - 1979) R UNICEF

To organize, at the central level, an advisory body which will review the organization, programmes and co-ordinating mechanism of the health services, including the various forms of assistance being received by the Ministry of Public Health; to plan and implement by phases a programme of health service expansion throughout the country; to establish a pilot area for health service development which will be articulated with the national social and economic development plan; and to formulate and carry out a programme for the training of the health manpower for the health and medical facilities.

Laos 4101 (0027) National health planning


A consultant was provided to review information on the needs and services relevant to planning for health, to prepare, in the light of his findings and the progress made since his last visit (December 1966-January 1967), guidelines on planning for health, including the immediate and long-term objectives, and to advise the Ministry of Public Health on the organization and administration of national health planning activities.

Laos 4201 (0509) Health laboratory services, Vientiane

(1953 - 1975) R UNICEF

To establish a public health laboratory service and train laboratory personnel.

Laos 4401 (0112) Nursing education


To set up a school of nursing and midwifery for training personnel for the country's hospital and health services, which are to be extended and improved. (See para. 26.95.)

Laos 4801 (0018) Rehabilitation of the physically handicapped


To assess the extent of the problem of the physically handicapped, plan and operate rehabilitation facilities and train staff for them, and review legislation dealing with the physically handicapped.

Laos 4901 (0512) Vital and health statistics advisory services

(1968 - ) R

To establish a vital and health statistics service in the Ministry of Public Health and to train staff.

Laos 5601 (0511) Nutrition advisory services

(1968 - 1972) R UNICEF

To improve nutritional levels in the community and to co-ordinate, under a national nutrition policy, all food and nutrition work carried out by international and national governmental and non-governmental agencies.

Laos 6201 (0015) Royal School of Medicine (1967 - 1978) R

To strengthen the faculty of the Royal School of Medicine.
Laos 9601 (0517) Maternal and child health/family welfare (1971 - ) UNFPA

To provide effective maternal and child health care and advice on family planning with the ultimate objective of securing a higher standard of living for the family as a whole.

Malaysia 1201 (0070) Tuberculosis control (1968 - 1971) R UNICEF

The aims were to develop a practical, comprehensive and integrated tuberculosis control service within the general public health services in all states; to train various categories of personnel for the service; to study the epidemiological patterns of tuberculosis in the country; and to continue field trials in order to find more effective methods, applicable under local conditions, for the public health control of the disease. WHO provided a medical officer for three years, a fellowship and supplies and equipment.

Direct WHO assistance under this project was concentrated in Sarawak, East Malaysia, where the medical officer was stationed. Despite difficulties due to poor communications, a widely scattered population and security restrictions in many areas, a tuberculosis control project has been carried out, based on case-finding, supervision of domiciliary treatment from chest clinics attached to district hospitals and rural dispensaries, direct BCG vaccination of persons under 19 years of age, and health education. In 1970, 1970 new cases were found, of which 796 (82%.) were sputum positive. At the end of 1970, 1788 tuberculosis patients were receiving chemotherapy. Between 1961, when field operations began, and the end of June 1971, a total of 719,033 children (about 80% of the susceptible population of the state) had been vaccinated with BCG. The programme of direct vaccination of the whole population under 19 years of age was completed early in 1970; the policy was then adopted of vaccinating newborns, primary school entrants without BCG scar and primary school leavers.

In addition to the assistance provided in Sarawak, the regional adviser in tuberculosis visited Malaysia in February and March 1971 to observe the progress made in the national tuberculosis programme in the past few years and discuss with the government authorities how the programme could be improved.

Malaysia 2001 (0020) Malaria eradication programme, West Malaysia (1967 - 1979) R

To eradicate malaria from the country. This follows the malaria pre-eradication programme started in July 1964.


To eradicate malaria from Sabah. The eradication programme follows antimalaria operations for which WHO has provided assistance since July 1955.


To eradicate malaria from Sarawak. This follows the malaria pilot project started in 1952.


To establish, in the Division of Communicable Disease Control, Ministry of Health, an epidemiological and health statistical service which will be responsible for planning and guiding national disease control programmes; to study local epidemiological patterns of prevailing causes of morbidity and mortality as a basis for the formulation of such programmes; to improve liaison and collaboration among the communicable disease control, medical records and health statistics sections of the Ministry, the laboratory services (in particular the Institute for Medical Research) and other peripheral government units concerned with disease control; to train health staff in epidemiological activities.

Malaysia 3001 (0041) Environmental health advisory services (1966 - 1973) R UNICEF

To develop a national environmental health scheme, to implement sanitation projects, including water supplies for rural communities, through the health authorities and other governmental agencies, and to train sanitation staff.

Malaysia 4001 (0035) Development of health services (advisory services) (1964 - 1978) R UNICEF

To strengthen and expand the basic health services in East and West Malaysia and to train personnel according to a consolidated plan, which includes phasing of expansion and the development of uniform standards throughout the country.

The plan of operation for this project was redefined in 1971 and the health practice research activities transferred to project Malaysia 4002 (see below).

Malaysia 4002 (0093) Development of health services (operational research) (1971 - 1978) R

To undertake health practice research with a view to developing suitable methods and practices for the efficient organization and administration of local health services; from the knowledge and experience gained, to establish a health policy and programme for local health services development under the second five-year development plan.

Malaysia 4441 Fellowships R: Intensive nursing care (six months).

Malaysia 4501 (0030) Health education advisory services (1971 - 1972) R

To develop the health education components in various special programmes (family planning, school health, applied nutrition, etc.), establish a one-year certificate course in health education for health education personnel, including personnel from the Ministry of Health and the Ministry of Education, develop the school health programme and expand the health education services in East Malaysia.

Assistance to this project was previously provided between 1962 and 1968 and in 1970.

Malaysia 5141 Fellowships R: Child health services (six weeks).


To plan and carry out nutritional surveys in a pilot area where an applied nutrition programme is being launched, develop nutrition education and supplementary feeding programmes, and train the personnel needed for implementing and evaluating the health aspects of the programme.

Malaysia 6201 (0040) University of Malaya (1965 - 1973) R

To strengthen the teaching staff of the Faculty of Medicine of the University of Malaya, particularly in the fields of preventive medicine, public health, nursing and medical recording.


To develop the Public Health Institute, whose functions are to provide a high standard of training for health personnel, geared to the needs of the country; to undertake studies in public health and disseminate the knowledge thus gained; to provide services, not otherwise available, for the improvement of health programmes and for demonstration purposes; and to assist the Ministry of Health in the co-ordination of its various health training programmes.

To build up the operational facilities for an antimalaria programme and organize antimalaria operations within the framework of the general health services.


To plan and develop the general health services, with particular attention to the peripheral health services; to establish suitable methods and practices for the efficient operation of the rural health programme, particularly as regards maternal and child health, tuberculosis control and antimalaria and environmental sanitation work; to plan and carry out in-service training for health service personnel; and to establish field practice areas for the training of staff.

New Hebrides 4002 (0501) Public health administration advisory services (1971 - 1975) UNDP/TA

To expand the health services at all levels, plan and carry out programmes for the training of health staff and make surveys and assessments of health conditions and programmes.

New Hebrides 4041 Fellowships R: Radiography (12 months).


To formulate and implement short-term and long-term plans for the strengthening and development of a system of nursing education in the country.

New Hebrides 6241 Fellowships R: Undergraduate dental studies (12 months), undergraduate medical studies (12 months).

New Zealand 4041 Fellowships R: Hospital administration (two for three and a half months).

New Zealand 5441 Fellowships R: Psychiatric nursing (three for one month).

Niue 4041 Fellowships R: Public health (10 months).

Niue 6041 Fellowships R: Advances in medicine and surgery (six months).

Niue 6241 Fellowships R: Undergraduate medical studies (12 months).


An assessment of the antimalaria project in Papua New Guinea was carried out by two WHO consultants—a malarialogist/epidemiologist and an economist—who submitted recommendations for the reorganization of the antimalaria services and for the improvement of operations.


To strengthen the public health nursing aspects of the curricula of the schools of nursing and establish a post-basic course in public health nursing.

Papua New Guinea 4501 (0008) Health education advisory services (June - Aug. 1971) R

A consultant assisted in the organization of an advanced workshop in health education for health education workers and other health workers. The workshop is part of the Government's staff development programme in health education.

Papua New Guinea 5441 Fellowships R: Clinical psychology (four months), psychiatric nursing (12 months).

Papua New Guinea 5501 (0012) Port Moresby Dental College (Feb. - Sept. 1971) R

Three consultants assisted the Port Moresby Dental College in the design of curricula for various categories of students, particularly for preventive and public health dentistry, oral pathology and diagnosis, and basic sciences (with integration into clinical subjects). They also advised on matters relating to the construction, facilities and equipment of the College.

Papua New Guinea 6141 Fellowships R: Dispenser training (six months).


To strengthen the faculty of the School of Medicine (formerly the Papua Medical College) and raise the standard of teaching.


To plan, implement, and evaluate various types of courses in training institutions under the jurisdiction of the Division of Medical Training and other institutions designated by the Government for the purpose of training government personnel.

Philippines 0111 Master plan for a sewerage system for the Manila metropolitan area (1966 - 1970) UNDP/SF

Assistance was provided to the Government in studying waste water problems in metropolitan Manila, and in drawing up a long-term programme of construction of sewers, as well as in preparing preliminary engineering and economic feasibility studies for a first-stage construction programme, planned to be carried out in the next 10 years. Assistance was also provided in organizing sewerage operation and maintenance services. Special oceanographic studies, using radioisotopes, were made to check proposed outfall locations.

WHO provided the services of experts and of a consulting firm, as well as fellowships and supplies.

Philippines 1041 Fellowships R: Epidemiology and control of communicable diseases (six months), quarantine practice (one month).


The aims were to review the tuberculosis control programme and ensure that it is practical, efficient and economic, under local conditions, and that it employs accepted tuberculosis control methods; to train health personnel in the various aspects of tuberculosis control; and to obtain data on which to base plans for the integration of tuberculosis control activities into the general health services. During the first phase, WHO provided the assistance of the regional tuberculosis control team and, from 1965, a medical officer and a public health nurse. For the second phase, which started in 1966, WHO provided a statistician, four consultants and the continued services of the regional tuberculosis control team. In all, nine fellowships were awarded to national staff on the project, for the study of various aspects of tuberculosis control.

In the first phase, a pilot area project was established in the province of Cebu where epidemiological data were collected, studies of keloid formation following BCG vaccination were carried out, and various methods of case-finding were assessed in cost-benefit studies. From 1966, in the second phase, case-finding by sputum examination was intensified and general health personnel were increasingly involved in treatment. In 1967, Cavite became the first demonstration province, and 21 rural health units and three city health centres were each equipped...
with a microscope, chemicals and antituberculosis drugs. Early in 1968 two members of each unit, including the medical officer, were trained in sputum microscopy techniques. By the end of 1970, 261 positive cases had been found in 3303 sputum examinations. There were 435 patients receiving treatment, of whom 268 were either sputum positive or showed cavitory lesions on X-ray examination. In 1969, Pampanga became the second demonstration province with 34 rural health units and four city health centres involved in the scheme. They send their sputum samples to eight microscopy centres for examination. By November 1970, 3114 sputum examinations had been carried out and 482 patients, 328 of them sputum positive or showing cavitory lesions, or both, were receiving treatment. A course for the provincial tuberculosis co-ordinators was held in March 1970 and comprehensive tuberculosis control programmes were then extended to seven more provinces. Although the rate of extension was slower than had been foreseen, by the end of 1970 the basis had been laid for an integrated and co-ordinated tuberculosis control programme operated at the provincial level.

Philippines 2001 (0503) Malaria eradication programme
(1958 - 1976) R (AID)

To eradicate malaria from the country and prevent its re-establishment.

Philippines 2101 (0505) Schistosomiasis control
(June - July 1971) R

A consultant assisted in making a comparative assessment of the schistosomiasis situation in selected endemic areas and in drawing up a framework for the collection and compilation of baseline data from the pilot areas covered by a project for the control of schistosomiasis through agro-engineering measures (assisted by the World Food Programme), so that the adequacy of the measures taken can eventually be evaluated.

Philippines 3001 (0513) Environmental health advisory services

A consultant was provided to assist and advise the Department of Health on the environmental health programme and on sanitary legislation.

Consultant services were provided in 1970 and further assistance is planned.

Philippines 3003 (0113) Institute of Planning, University of the Philippines (Feb. - May 1971) UNDP/SF

WHO provided a consultant to advise the Institute of Planning on the role of public health engineering in the teaching of environmental planning; to assist in a review of the relevant course content of the graduate programme of the Institute of Planning and of the courses of the Institute of Public Health; to prepare an outline of basic principles, objectives and standards for environmental health which might be incorporated in the revision of the Administrative Code, in the framing of rural-urban land policy, and in environmental planning.

Philippines 3201 (0100) Community water supply
(1969 - 1972) UNDP/TA

To improve and extend provincial water supply systems. The work includes the review of plans for the short- and long-term extension of the water systems in certain cities and municipalities with a view to establishing criteria and good engineering practices for design and extension; the study, in general terms, of the cost of extensions and additions to existing water systems required to meet estimated demands for the immediate future and the study of various methods of financing; and the review of management, operation and maintenance practices.

Philippines 4001 (0500) General health services development

To strengthen, develop and promote a balanced organization and administration of the general health and medical care services; to undertake national health planning in the context of overall planning for development; to review education and training schemes for health manpower; to develop co-operative working relationships in the area of health between the national health administration and other agencies, both public and private.

Philippines 4241 Fellowships R: Fluorescent treponema antibody absorption techniques (three weeks).

Philippines 5201 (0103) Occupational health
(1970 - 1973) UNDP/TA (ILO)

To establish the legal, administrative and operational framework for a co-ordinated national programme of occupational health and safety; develop all the technical components of such a programme, including university facilities for postgraduate medical and paramedical education and training, and, on the basis of an assessment of the present situation and of projected industrial developments, plan for future expansion of occupational health and safety activities.

Philippines 5241 Fellowships R: Occupational therapy (12 months).

Philippines 5401 (0506) Mental health advisory services

The long-term aim was to plan and implement an effective national mental health programme as part of the general health services. The intermediate aims were to ascertain the mental health needs of the country; to improve and develop mental health services; mainly by strengthening the national mental hospital and its extension services, and to train local personnel. WHO provided three consultants for the first phase, 1949 - 1956; two consultants and 12 four-month fellowships for the second phase, 1957 - 1960; and a medical officer, two consultants (one in mental health and the other in mental health nursing) and nine fellowships for the third phase, 1963 - 1971.

During the first phase of the project, long-term plans were formulated. At the beginning of the second phase, the national mental hospital was still the only institution of any size and capacity for the treatment of mental illness and activities were concentrated on strengthening it.

The third phase started with epidemiological surveys at provincial level and both in-service training of personnel and training courses to increase their number. In the face of the growing demand both for mental health services in the community and for in-patient accommodation, decentralization became necessary and began in 1966. Collaboration was then instituted with other bodies engaged in mental health activities. Thus, agreements for the delivery of mental health services from 1970 onwards were concluded between the Department of Health and the City of Manila (for the comprehensive care of the mentally ill) and between the Department of Health, the Department of Social Welfare, the University of the Philippines and the Philippine Mental Health Association (for comprehensive treatment and rehabilitation). A pilot mental health programme involving 14 bodies in the Greater Manila area also began during this phase.

The intermediate aims have been attained and the mental health services thus developed have been administratively incorporated into the general health services. The training provided has produced more and better qualified personnel. So far as funds permit, efforts to increase the coverage of mental health services are continuing at the national and city levels in co-operation with the Philippine Mental Health Association.
Philippines 5541 Fellowships R: Dental public health (12 months).

Philippines 5602 (0510) Nutrition advisory services
(April - June 1971) R

A consultant was provided for six weeks to study the nutrition laboratory facilities available at the Department of Health, the National Children’s Hospital and other places where malnutrition wards are being developed; to advise on the equipment needed for each laboratory, on the training of the personnel required, on the repair and maintenance of equipment and on the functional and structural relationships with other laboratory services. Consultant services in the same field were provided in 1970.

Philippines 6401 (0091) University of the Philippines

To strengthen the staff of the University of the Philippines, in particular that of the Institute of Public Health, which is the only school of public health in the country and which serves as the regional training centre and is used by WHO in the organization of courses in national health planning.

Consultant services and fellowships were provided to the Institute of Public Health between 1953 and 1964.

Philippines 9601 (0519) Assistance to family planning training clinics with teaching equipment (1971) UNFPA

Assistance, including supplies and equipment, was provided in connexion with the remodelling of two health centres in the suburbs of Manila so that they could serve as training and demonstration clinics for the family planning training activities of the Institute of Public Health, University of the Philippines.

Philippines 9602 (0517) Study of relationship between family size and health of family members
(Sept. 1970; Aug. 1971) UNFPA

In September 1970 a WHO consultant discussed with officials the WHO collaborative programme of epidemiological studies on human reproduction, which is principally concerned with investigation of (i) the relation between health on the one hand, and family size and the tempo of family building on the other, and (ii) the relation between childhood mortality and reproductive patterns, but which will also include studies of the nutrition, growth and development of children of pre-school age. The work is being carried out at the Institute of Public Health. A return visit was made by the consultant in August 1971 to review the progress of the study.

Philippines 9603 (0520) Maternity-centred family planning
(1971 - 1973) UNFPA

To establish family planning as part of maternal and child health care at the designated training and teaching hospitals, and to improve the maternal and child health care provided by these hospitals; to provide better post-partum follow-up of family planning needs through home visiting programmes; to improve the work and co-ordination of all units concerned with maternity-centred family planning activities; to strengthen programmes in maternal and child health and family planning at the teaching institutions associated with the designated training and teaching hospitals; and to provide for evaluation of the extent and effectiveness of the provision of family planning education and contraceptive methods through maternity care.

Philippines 9604 (0521) Nursing education in family planning
(Oct. - Nov. 1971) UNFPA

A national workshop on the strengthening of the teaching of the health aspects of family planning, population dynamics and human reproduction in nursing education programmes was held, with 41 participants from 25 schools and colleges of nursing. The WHO nurse attached to the family planning field advisory team (project WPRO 9603) served as a consultant.

Philippines 9605 (0518) Assistance to the teaching programme of the Institute of Public Health, University of the Philippines, in family planning, human reproduction and population dynamics (1971 - 1973) UNFPA

To expand the teaching facilities and activities of the Institute of Public Health in family planning; to strengthen the long-term academic programme of the Institute in family planning; and to develop leadership of the Institute in curriculum planning in the field of family planning, human reproduction and population dynamics.

Ryukyu Islands 1241 Fellowships R: Tuberculosis control (two for three months).

Ryukyu Islands 4441 Fellowships R: Nursing education (12 months), public health nursing education (two for 12 months).

Ryukyu Islands 4541 Fellowships R: Health education (one for two months, one for 12 months).

Ryukyu Islands 4841 Fellowships R: Social and vocational rehabilitation (12 months).

Ryukyu Islands 5441 Fellowships R: Public health practices in mental health (two months).

Ryukyu Islands 5541 Fellowships R: Dental public health (three months).

Ryukyu Islands 6401 (0003) College of Health Science, University of the Ryukyus (1970 - 1973) R

To strengthen the College of Health Science, which was established in 1969 for the training of clinical nurses, public health nurses, school nurses, midwives, medical technologists, biostatisticians, health education workers and epidemiologists.

Singapore 1001 (0030) Communicable diseases: advisory services (1971) R

Two fellowships were awarded under this project. Consultant services are planned for 1972.

Singapore 1201 (0015) Tuberculosis control (1968 - 1971) R

The aims were to conduct field trials on problems involved in case-finding, treatment and prevention of tuberculosis; to study the epidemiological pattern of the disease in the country, to start a comprehensive tuberculosis control programme integrated into the general public health programme; and to provide facilities for training various categories of public health workers in tuberculosis control work.

WHO provided a medical officer from June 1968 to June 1971 to assist with clinical studies on tuberculosis being carried out by government services and co-ordinated by the Singapore Tuberculosis Research Committee, established in 1962.

A study was made of the bacteriological status, after one year of treatment, of 3422 tuberculosis patients registered during 1969. The results showed that 88% of culture-positive cases had become negative, while 5% remained positive; 5% of the cases died and the remaining 2% could not be traced.

In addition, a controlled trial of two drug regimens was carried out: one regimen consisted of fully supervised administration of streptomycin and isoniazid twice weekly, and the other of daily self-administration of PAS and isoniazid; both were continued for one year and preceded by daily administration of streptomycin, isoniazid and PAS under supervision for 12 weeks. Although the supervised regimen apparently gave slightly better
results, the unsupervised treatment also proved highly effective. It was therefore concluded that, as a general policy, supervised treatment cannot be recommended, from an operational point of view, under the conditions prevailing in Singapore.

**Singapore 3001 (0018) Environmental health advisory services (1971 - ) R**

In October and November 1971 a consultant reviewed the feasibility study report on refuse disposal plants (prepared by a consultant firm), assisted the Ministry of Health in evaluating the recommendations contained therein and advised the Ministry on the drafting of detailed specifications for the proposed refuse disposal plants. A further consultant was provided in November 1971 to advise on measures needed to control trade effluents more effectively. His mission is expected to end in February 1972.

Further assistance is planned for 1973.

**Singapore 3301 (0026) Management and operation of sewage treatment plants (1970 - 1971) UNDP/TA**

The aim was to improve the management and operation of sewage treatment plants and to train supervisory staff for the plants. WHO provided a sanitary engineer between August 1970 and August 1971 and reference books, manuals and teaching aids for the training of staff.

The sanitary engineer assisted the Public Works Department in organizing a course for staff of sewage treatment plants which, during the course of the project, was attended by a total of 55 staff members, and which is being continued by the Department. He also advised the Department on the standardization of laboratory analysis and reporting procedures, reviewed the laboratory facilities and sampling techniques, and made recommendations on management practices and on the deployment of staff.

**Singapore 3302 (0027) Planning for sewerage development and water pollution control (1970 - 1972) UNDP/TA**

To prepare a long-term master plan for the development of sewerage facilities, co-ordinated with plans for physical development, and for the expansion of the sewerage system; and to conduct studies on river and coastal water pollution, with a view to developing a programme for its abatement and control.

**Singapore 3501 (0025) Urban renewal and development programme (March - May 1971) UNDP/SF (UN)**

A consultant was provided for the urban renewal and development programme, for which the United Nations is the executing agency. He advised on sanitary engineering standards for the area covered by the programme and also advised the Ministry of Health on the investigations which should be made in connexion with the projects undertaken by the Housing and Development Board and the Urban Renewal Department.

A consultant on noise control was provided in 1970.

**Singapore 3601 (0028) Food sanitation (Oct. - Dec. 1971) R**

WHO provided a consultant to assist in assessing the overall standard of food hygiene in Singapore and in identifying areas where improvement is needed. He reviewed the food sanitation programme, advised on inspection routines, food hygiene regulations and control measures for adoption by the Ministry of Health and, following study of the staffing position, made recommendations on the training of technical and professional personnel.

**Singapore 4441 Fellowships R: Nursing (two for 12 months).**

**Singapore 4501 (0012) Health education advisory services (Sept. - Dec. 1971) R**

WHO provided a consultant for three months to assist in reviewing the development of the health education aspects of the various programmes of the Ministry of Health, the Ministry of Education, other government departments and non-governmental organizations; in reviewing the health education components of training programmes for medical and other health personnel and for schoolteachers; and in implementing the long-term plan for developing the health education components of Singapore's urbanization/industrialization programme.

A health education adviser, a consultant and fellowships were provided under this project between 1965 and 1970.

**Singapore 4701 (0013) Radiation health advisory services (1971) R**

Two twelve-month fellowships—one in radiotherapy and the other in radioisotopes (calibration, dosimetry and medical application)—were awarded under this project, for which consultant services were provided in 1968 and 1969.

**Singapore 4841 Fellowships R: Rehabilitation (three months).**

**Singapore 4941 Fellowships R: Medical records and hospital statistics (one for six months, two for 12 months).**

**Singapore 5201 (0023) Occupational health (April - May 1971) R**

The WHO industrial hygienist attached to the occupational health and safety project in the Philippines made a preliminary visit to Singapore on order to ascertain specifically the assistance required by the Government's Occupational Health Unit and the Department of Preventive Medicine in the Medical School, University of Singapore.

**Singapore 5241 Fellowships R: Industrial nursing (12 months).**


The aim was to define more closely the nature and causes of some nutritional problems in Singapore and to intensify nutrition education and other measures for improving the situation, mainly through the education and health services. WHO provided a consultant between August and October 1968, a public health nutritionist as from mid-1970, and a fellowship in postgraduate nutrition education for a senior medical officer.

The WHO consultant helped with a survey, mainly of protein-calorie malnutrition, growth retardation, and associated infection, in low-income sections of the population. The WHO public health nutritionist assisted with further dietary studies in children under two years of age, living in the area served by the Institute of Health and with socio-economic surveys in households where anthropometric surveys were being carried out as part of a global study assisted by the Organization. The surveys were completed by mid-1971. In the second half of the year the results were analysed and guidelines were drawn up for scientifically-based measures of nutrition education, in accordance with the socio-economic and cultural conditions in the community. During 1970 and 1971 household data were collected concerning 50 cases of malnutrition admitted to the paediatric wards of the University General Hospital.

**Singapore 6041 Fellowships R: Cardiology (12 months), dietetics (three months), electron microscopy in renal diseases (six months), exfoliative cytology (three months), non-tuberculous chest diseases (six months), open heart anaesthesia (six months), physical medicine (12 months), venereal disease serology (six months).**
To establish and organize specialist units in hospitals and to train in advanced techniques staff to man these units.

Singapore 8941 Fellowships R: Urogenital surgery (six months).

Tonga 4301 (0009) Hospital administration (1968 - 1973) R
The aim of the second phase is to develop at the new 200-bed hospital in Nuku'alofa a system of hospital operation and management that will enable the hospital to meet the medical care needs of the population more effectively.

To strengthen the basic nursing curriculum of the Queen Salote School of Nursing, improve the quality and increase the quantity of nursing and midwifery personnel for the expanding health services, and prepare nursing legislation.

Tonga 4441 Fellowships R: Nursing (12 months).

Tonga 5141 Fellowships R: Obstetrics and gynaecology (12 months).

Tonga 5541 Fellowships R: Dental health (12 months).

Tonga 6041 Fellowships R: Undergraduate medical studies (two for 12 months).

Tonga 9601 (0015) Maternal and child health/family planning (1971 - 1973) UNFPA
To organize and make available to the whole population, through the general health services and, particularly, the maternal and child health component, services related to human reproduction and fertility, including spacing and limitation of births and treatment of subfertility; to conduct surveys on the influence of high fertility and high birth rate on the health of mothers and children and undertake field research on organizational and technical methods to meet the needs of the people in family planning; and to co-ordinate the family planning programme with relevant activities outside the Department of Health.

Trust Territory of the Pacific Islands 4041 Fellowships R: Hospital administration (12 months), public health administration (one for 12 months, one for 15 months).

Trust Territory of the Pacific Islands 4441 Fellowships R: Nursing education and service systems (two months), public health nursing (one for three months, three for six months).

Trust Territory of the Pacific Islands 5541 Fellowships R: Dental health (two for three months), dental nursing (two for three months).

Trust Territory of the Pacific Islands 6041 Fellowships R: Internal medicine (12 months), paediatrics (12 months).

Viet-Nam 1101 (0026) Venereal disease control (1966 - 1973) R UNICEF
To reduce the incidence of the venereal diseases, and strengthen and improve the syphilis serological work carried out in national laboratories.

To set up a nucleus of a national tuberculosis control service, with emphasis on measures to be integrated into general public health services; to strengthen the role of the centre in Saigon as a national tuberculosis centre; and to continue the UNICEF/WHO-assisted BCG vaccination programme on an integrated basis.

Viet-Nam 1701 (0043) Trachoma control (May - July 1971) R
WHO provided a consultant to establish criteria for the diagnosis of trachoma, as a basis for case-finding and for the organization of treatment, and to study the possibilities of undertaking a control project.

Viet-Nam 2001 (0016) Malaria pre-eradication programme (1959 - ) R (AID)
To train national staff and make preparations for the implementation of a malaria eradication programme.

To develop epidemiological services at the central and regional levels, strengthen the application of the International Health Regulations (1969) and train staff for the purpose.

Viet-Nam 3001 (0033) Environmental health advisory services (1966 - 1974) R
To strengthen the environmental sanitation service in the Ministry of Health and introduce improvements in public water supply, human excreta disposal, refuse disposal, food hygiene and vector control in urban and rural areas.

WHO is providing a consultant to assist in making an assessment of existing and potential health manpower resources, in reviewing facilities for the education and training of health personnel and in making short-term and long-term projections, by categories, of the country's total health manpower requirements; and to advise on measures for meeting the needs, taking into account available national resources, and on the establishment of a mechanism for continuing study, adjustment and projection of the country's health manpower goals and the health sector's objectives.

Viet-Nam 4201 (0018) Health laboratory services (1964 - 1974) R UNICEF
To establish a central health laboratory service and to train health laboratory workers; later, to organize regional and peripheral health laboratory services.
Consultant services were provided under this project in 1962.

Viet-Nam 4441 Fellowships R: Public health nursing (three months).

To organize an efficient and up-to-date system of collecting and recording vital and health statistical data so as to produce vital and health statistics which will meet national and international needs; and to train national personnel in the administration and operation of a national health statistical service.
Advisory services were provided under this project between 1960 and 1963 and again in 1966 and 1967.

A description of this project was given in the Annual Report for 1970.1

Viet-Nam 5541 Fellowships R: Dental auxiliary training (12 months), dental nursing education (12 months).

Viet-Nam 6041 Fellowships R: Health institutions organization and operation (two for three weeks), nursing education (12 months), tuberculosis control (one for three months, one for four months).


To build up a national institute of public health, which will serve as a centre for the planning, standardization, organization, co-ordination, implementation and evaluation of training programmes for various categories of medical and other health workers.

Consultant services were provided under this project in 1966 and 1967.

Viet-Nam 9601 Maternal and child health/family welfare (1971 - ) UNFPA

To provide effective maternal and child health care, including family planning, with the ultimate objective of securing a higher standard of living for the family as a whole.

Western Samoa 1201 (0507) Tuberculosis control (1971 - 1973) R

To consolidate and assess the tuberculosis control service in the demonstration area of Leulumoea; to standardize the methods and procedures used by all districts; and ultimately to integrate the tuberculosis control services into the general health services throughout the country.

Assistance was previously provided under this project between 1960 and 1968.

Western Samoa 2201 (0501) Filariasis control (1965 - 1971) R UNICEF

A filariasis control project was launched in 1965 in order to determine the most feasible method or combination of methods of attacking the disease. The aim was to collect baseline data and undertake the parasitological examination of a 10% sample of the total population of 135 000; to treat everybody over two years of age with a dose of 5 mg of diethylcarbamazine per kg body weight once a week for six weeks, then once a month for 12 months (18 doses in all); and to determine the mosquito vectors and investigate their ecology with a view to finding the most effective measures for controlling them.

WHO provided short-term consultants during the first three years, an epidemiologist from 1968 and an entomologist from 1969, and supplies and equipment. Drugs were supplied by UNICEF.

At the end of 1965 the mass distribution of diethylcarbamazine to the whole population was started, through the women's committees, under the supervision of district medical officers. An analysis of the available records of 65 796 persons showed that 21.4% took the full drug schedule of 18 doses; and 84% took at least 12 doses. Dissection of the vector mosquitoes collected from the areas where mass drug administration had been undertaken, but where no vector control measures had been applied, showed that the rate of infection (with mature filaria larvae) had dropped from 2.5% to 0.08%. Blood surveys revealed that the microfilarial rate in the whole country had dropped from 19% to 1.6% after mass drug administration. In order to reduce the rates further it was planned to undertake a second round of drug administration, with a modified dosage, early in 1970; however, since the drugs arrived in an unsatisfactory condition, this had to be postponed until 1971. In the ar-
Western Samoa 6241 Fellows R: Undergraduate dental studies (12 months), undergraduate medical studies (four for 12 months).

Western Samoa 9601 Maternal and child health/family planning (1971 - 1973) UNFPA

To organize a family planning programme, including advice on the spacing and limitation of births and the treatment of subfertility; to plan and implement training programmes for the staff responsible for providing family planning care; to conduct surveys on the influence of high fertility and high birth rate on the health of mothers and children; and to undertake operational research on methods of meeting the needs of the country with regard to family planning.

WPRO 0901 (0079) Advisory services (1961 - ) R

To meet requests from countries of the Region for advisory services in connexion with the planning of long-term projects or with specific problems. The following assistance was provided during the period under review:

Regional teacher training centre for health personnel. In March and April 1971 two consultants undertook a feasibility study in connexion with the establishment of a regional teacher training centre for health workers, which was endorsed by the Regional Committee at its twenty-first session. On the basis of a recommendation made by a consultant who visited several countries in the Region between April and October 1970, the feasibility study was carried out in Sydney, Australia, and a report has been submitted to the Australian Government.

WPRO 1001 (0137) Regional communicable diseases team (1967 - 1971) R

The aim was to assist countries and territories in the Region in assessing the situation with regard to communicable diseases, in planning epidemiological and laboratory surveys of the most important of them, in planning and organizing control and preventive measures, and in strengthening epidemiological and laboratory services. WHO provided a microbiologist between 1967 and 1970 and an epidemiologist between 1967 and 1971. Visits were made to the following countries:

China (Taiwan). In 1969 assistance was provided in strengthening the health laboratory services and in raising the technical level of the staff.

Fiji. In 1967 advice was given on some aspects of health laboratory service.

Gilbert and Ellice Islands. In 1967 a study was made of the situation as regards communicable diseases (particularly diarrhoeal diseases) and the terms of reference of the WHO-assisted communicable disease advisory project (Gilbert and Ellice Islands 1001 (0008)) were discussed. In 1969 a survey was made of the prevalence of diarrhoeal, bacterial and parasitic infections and associated manifestations that might indicate nutritional deficiencies, and emergency assistance was provided in connexion with an outbreak of septic sores. In 1970 an investigation of the typhoid fever situation was made.

Khmer Republic. In 1968 information was obtained on the major communicable disease problems and advice was given on the control of diarrhoeal diseases and plague, including temporary arrangements for the disinfection of public water supplies and the strengthening of the quarantine services at Kompong Som, and on the production of cholera vaccine.

Laos. In 1969 the smallpox vaccination programme was evaluated and a preliminary assessment of the venereal disease problem was made. Emergency assistance was provided in connexion with an outbreak of malaria at the site of the Mekong River dam.

Malaysia. In 1968 an assessment was made of the problem of the diarrhoeal diseases and advice was given on their control.

Papua New Guinea. In 1971 assistance was provided in reviewing the nature and extent of the venereal disease problem and the diagnostic and control aspects of the venereal disease control programme.

Philippines. In 1966 and 1967 assistance was given for a study of capillariasis on the west coast of Northern Luzon. In 1968 the team collaborated in the joint Philippines/Japan/WHO study on cholera.

Republic of Korea. In 1968 information was obtained on the major communicable disease problems and advice was given on their control.

Republic of Viet-Nam. In 1968 information was collected on the situation as regards plague and cholera.

Singapore. In 1968 information was obtained on communicable disease problems, with particular reference to the control of diarrhoeal diseases.

Tonga. In 1967 a study was made of the typhoid fever situation and advice was provided on the detection of carriers and on procedures for the diagnosis of enteric diseases.

Western Samoa. In 1967 an epidemiological investigation of typhoid fever was made. Further investigations were made in 1970 in preparation for a cost-benefit study of typhoid fever control and a control programme. (The study was designed later in 1970 and the control programme was started in 1971.) In 1971 a course on cholera prevention was given.

In addition to the above, supplies were provided for national laboratory services in the Gilbert and Ellice Islands, the Khmer Republic, Laos, the Philippines, the Republic of Korea, Tonga, and Western Samoa.

The project is being replaced by a project for epidemiological and surveillance services (WPRO 2902) in which particular attention will be given to the strengthening of disease intelligence networks.

WPRO 1201 (0075) Regional tuberculosis control team (1961 - 1975) R

To assist countries of the Region in assessing their tuberculosis programmes.

WPRO 1202 (0125) Tuberculosis course, Tokyo (31 May - 1 Oct. 1971) R

The course, which was the sixth course on tuberculosis held in the Region, was sponsored by the Government of Japan and WHO. Its purpose was to provide assistance in training national workers in the application of modern methods of tuberculosis control. It was also designed to stimulate the provision of practical training and demonstration in national institutions.

There were 19 participants from Afghanistan, China (Taiwan), Egypt, Ethiopia, India, Indonesia, Pakistan, Philippines, Republic of Korea, Republic of Viet-Nam, Sudan, Thailand and Turkey.

WHO provided three temporary advisers, the cost of post-course country visits for all participants, two instructors (from Japan) and reference material. Four staff members served as lecturers.

WPRO 1203 (0190) Regional Seminar on Tuberculosis Control, Seoul (5 - 11 Oct. 1971) R

The objectives of the seminar were to discuss the organization and administration of national tuberculosis programmes, their co-ordination with other health programmes, and measures for the integration of tuberculosis services into the general public
health services. There were 31 participants from American Samoa, Australia, British Solomon Islands Protectorate, Brunei, China (Taiwan), Cook Islands, Fiji, French Polynesia, Gilbert and Ellice Islands, Hong Kong, Japan, Khmer Republic, Laos, Malaysia, New Caledonia, New Hebrides, New Zealand, Papua New Guinea, Philippines, Republic of Korea, Republic of Viet-Nam, Ryukyu Islands, Singapore, Tonga, Trust Territory of the Pacific Islands, and Western Samoa. Nineteen participants attending the sixth tuberculosis course in Tokyo attended the seminar as observers.

WHO provided the services of two consultants, two temporary advisers and resource persons, and met the cost of attendance of the participants.

**WPRO 1801 (0152) Smallpox eradication (1969 - 1972) R**

To train national staff in the production of freeze-dried smallpox vaccine and in the laboratory diagnosis of smallpox.


To provide training in the theory and techniques of malaria eradication for various categories of personnel needed by countries of the Western Pacific Region and other regions,


To make independent appraisals of the status of malaria eradication and of any special aspects of the malaria programmes in the Region


To assess the distribution and importance of schistosomiasis in the area; to identify the snail intermediate hosts and establish their distribution and the mode of disease transmission; and to formulate and recommend measures for preventing the spread of infection, taking into account such factors as population movement, irrigation schemes and other activities connected with the development of the Mekong River Basin. Activities under this project are initially limited to Laos.

**WPRO 2201 (0192) Filariasis advisory services (1971 - 1975) R**

To assist governments, especially in the South Pacific area, in studying the epidemiology of filariasis and in carrying out or evaluating programmes for controlling the disease by means of mass drug administration and measures against the mosquito vectors.

**WPRO 3001 (0135) Environmental health advisory services, South Pacific area (1965 - 1977) UNDP/TA**

To assist countries and territories in the South Pacific area to improve community water supplies and environmental sanitation in general.

**WPRO 3201 (0169) Advisory services on water supply and sewerage and other environmental sanitation matters (1968 - 1977) R**

To assist governments in carrying out studies on water supply, sewerage and other environmental health programmes, and in developing such programmes.

**WPRO 3202 (0178) Seminar on Planning and Financing of Municipal Water and Sewerage Works, Manila (18 - 27 May 1971) R**

The objectives of the seminar were to give personnel concerned with the planning and financing of water supply and sewerage works an opportunity to exchange experience and information and to stimulate the improvement of present procedures concerning (i) the setting up, utilization and maintenance of water supply and sewerage statistics; (ii) criteria for the establishment of priorities; (iii) the development and formulation of national planning in the field of water supply and sewerage programmes; (iv) the means of securing local and international funds for the development of water supply and sewerage projects; (v) the structure of water supply and sewerage management and supporting legislation; (vi) the structure of operational practice; (vii) the role of ministries of health in the setting of quality standards, the enforcement of safeguards and the stimulation of programmes; (viii) the availability and development of training programmes for different categories of staff. There were 20 participants from Australia, British Solomon Islands Protectorate, China (Taiwan), Fiji, Guam, Japan, Khmer Republic, Laos, Malaysia, Papua New Guinea, Philippines, Republic of Korea, Republic of Viet-Nam, Ryukyu Islands, Singapore, Trust Territory of the Pacific Islands, and Western Samoa. Seven observers from the South Pacific Commission, the United States Agency for International Development, Department of Health, Philippines, National Waterworks and Sewerage Authority, Philippines, the Philippine Society of Sanitary Engineers, the World Bank and the United Nations Development Programme also attended the seminar. (See para. 20.103.)

WHO provided three consultants and met the cost of attendance of the participants.


To assist countries in the South Pacific area in strengthening and developing their general health services, particular attention being given to maternal and child health work integrated into the general health services. The project began as a maternal and child health advisory services project and its terms of reference were broadened in 1970.

**WPRO 4101 (0159) Course on national health planning, Manila (1 July - 24 Sept. 1971) R**

The course was the fourth of a planned annual series designed to acquaint national health administrators from countries of the Region with the general principles of national planning for socioeconomic development and to familiarize them with the principles and methods of national health planning within the framework of such development planning and as an integral part of health administration. There were 11 participants from China (Taiwan), Japan, Philippines and Republic of Korea.

WHO provided a consultant, a temporary adviser, honoraria for lecturers, and supplies and equipment, and met the cost of attendance of the participants.

**WPRO 4102 (0164) Advisory services on national health planning (1968 - 1977) R**

To assist governments, not otherwise receiving long-term assistance in planning, in formulating national health and manpower plans as part of their national development plans. Areas of assistance include the various phases of planning, such as appraisal of country planning facilities, assessment of the country health situation and its projection over the planning period, formulation of health policy and development of the national health plan, programming and implementation, and evaluation and revision of country plans.
WPRO 4201 (0204) Health laboratory services (1971 - ) R.
To assist in the organization and development of public health laboratory services, co-ordinated with other laboratory facilities, that can support epidemiological work, rural health services and sanitation projects.

WPRO 4301 (0156) Training in the maintenance of X-ray and other equipment (1969 - 1972) R.
To assist governments in assessing the needs for the maintenance of radiological equipment; to advise on the organization of maintenance services as part of the technical services to health and medical institutions; and to assist in organizing, directing and supervising the training of selected X-ray operators in the installation, testing, calibration, servicing and maintenance of X-ray equipment, and in the proper use of radiographic and photofluorographic equipment. (See para. 20.91.)

WPRO 4302 (0162) Regional centre for the training of anaesthetists (1970 - 1979) R.
To provide instruction and experience in the training of anaesthetists in order to meet the need for trained personnel in the countries of the Region.

WPRO 4303 (0150) Seminar on Hospital Administration and Planning, Manila (19 - 29 Nov. 1971) UNDP/TA.
The objectives of the seminar were to review and assess the situation as regards the planning and administration of hospitals in countries and territories of the Region; to discuss modern concepts and formulate guidelines for adapting the hospital to the medical care demand of countries at different stages of development; to explore means of mobilizing resources for the development and efficient management of hospitals; and to consider the role of the international and bilateral organizations in hospital affairs, particularly in developing countries.
There were 24 participants from Australia, China (Taiwan), Cook Islands, Fiji, French Polynesia, Hong Kong, Japan, Khmer Republic, Laos, Malaysia, New Zealand, Papua New Guinea, Philippines, Republic of Korea, Republic of Viet-Nam, Tonga, Trust Territory of the Pacific Islands, and Western Samoa. Observers from the Philippines, UNICEF, the Inter-Church Commission on Medical Care and Operation Brotherhood also attended.
WHO provided three consultants and two temporary advisers and met the cost of attendance of the participants.
Before the seminar, two of the consultants visited six countries of the Region to obtain first-hand information on hospital matters and, during the seminar, participants visited four different types of hospitals in or adjacent to Manila.
Five major working papers were presented and 10 other topics were covered in special presentations.

WPRO 4401 (0138) Nursing advisory services, South Pacific (1967 - 1977) R.
To assist countries and territories in the South Pacific area in strengthening nursing education and administration and in developing nursing services.

WPRO 4901 (0193) Health statistics and records advisory services (1971 - 1975) R.
To assist governments to develop a system of basic health statistics and records to meet the needs of the countries concerned and facilitate international comparison; and to train personnel.

WPRO 5501 (0160) Dental health advisory services (1971) R.
In February and March 1971 a staff member (dental epidemiologist) advised the Ministry of Health, Republic of Viet-Nam, on the establishment of a school for dental auxiliaries. In the latter half of March he made a brief survey of dental health problems, the facilities for dental education and training, dental manpower requirements and the organization of public dental services, and the needs for external assistance, in the Khmer Republic. He also visited Singapore to study the provision of dental services and advise on the utilization of UNICEF assistance. In May 1971 a consultant assisted the Republic of Korea in the planning and implementation of a dental epidemiological survey and in the analysis of the results.
Consultant services were provided under this project in 1969 and 1970.1

The objectives of the seminar were to review the available epidemiological data on dental diseases in the South Pacific; to consider the implications of these data for dental public health services and basic health services, especially for the control of caries and periodontal diseases; to consider the staffing of dental services and the training requirements for dental staff; and to make recommendations on the role of basic health services and school health services in relation to dental health, especially dental health education. There were 20 participants from American Samoa, Australia, Cook Islands, Fiji, French Polynesia, Gilbert and Ellice Islands, Guam, New Caledonia, New Hebrides, New Zealand, Norfolk Islands, Papua New Guinea, Tonga, Trust Territory of the Pacific Islands, and Western Samoa.
WHO provided the services of three consultants, two temporary advisers and two resource persons, and met the cost of attendance of the participants.

To conduct in-service nutrition courses and/or to strengthen the teaching of nutrition in the basic training of public health and other workers in South Pacific island territories, and to undertake surveys where necessary. The team is based in Suva and makes visits as required to other territories.

WPRO 6001 (0114) Participation in educational meetings (1964 - ) R.
Between December 1970 and November 1971 the following fellowships were awarded for participation in educational meetings: (i) for the meeting of directors or representatives of schools of public health, New Delhi—seven one-week fellowships to candidates from Australia, China (Taiwan), Japan, New Zealand, Philippines, Republic of Korea and Singapore; (ii) for the seminar in advanced techniques for programming in tuberculosis, Oslo—a two-week fellowship for a candidate from Singapore.

WPRO 6401 (0109) Institutions for the training of health personnel (1966 - ) R.
To enable professors or senior lecturers of schools and institutes of public health and senior teaching staff from post-basic schools and colleges of nursing to visit countries of the Region to gain an insight into the public health problems in those countries and observe the type of courses being given. Between December 1970 and November 1971 two fellowships were awarded to candidates from China (Taiwan) and the Republic of Korea.

WPRO 9201 (0180) Course on immunological techniques (WHO Immunology Research and Training Centre), Singapore
(1 Feb. - 9 April 1971) R

Five participants, from Fiji, Malaysia, the Philippines and the Republic of Korea, attended the course for training public health and university laboratory personnel in immunological techniques, held at the WHO Immunology Research and Training Centre, Singapore.

WPRO 9602 (0302) Workshop on Statistical Methods in National Family Planning Programmes, Taichung
(19 Oct. - 1 Nov. 1971) R

The main purposes of the workshop were to familiarize national health statisticians in the Western Pacific Region with the statistical methods and techniques applicable in family planning programmes, human reproduction studies and studies of health aspects of population dynamics; to prepare them for their contribution to such programmes and studies; and to enable them to advise on statistical questions related to family planning through all phases (from the formulation of objectives and establishment of relevant statistical services to the evaluation of observations). There were 20 participants from China (Taiwan), Cook Islands, Fiji, Guam, Japan, Malaysia, Papua New Guinea, Philippines, Republic of Korea, Republic of Viet Nam, Ryukyu Islands, Singapore and Western Samoa.

WHO provided the services of two consultants, a temporary adviser and four staff members, and supplies, and met the cost of attendance of the participants.

WPRO 9603 (0303) Family planning field advisory team
(1971 - 1974) UNFPA

To provide advisory services to governments in connexion with the strengthening and development of family planning programmes and their integration within the framework of the basic health services. Special emphasis will be given to planning, organization, education and training.


The purpose of the seminar was to enable professors and senior lecturers in medical schools in the Region to review the coverage of family planning, human reproduction and population dynamics in the curriculum of medical schools in the light of present-day health needs. There were 16 participants from Australia, China (Taiwan), Fiji, Khmer Republic, Laos, Malaysia, New Zealand, Papua New Guinea, Philippines, Republic of Korea, Republic of Viet-Nam, and Singapore, and observers from the United States Agency for International Development, the Public Health Institute, Kuala Lumpur, and the University of Malaya.

WHO provided three consultants, including a seminar director, and met the cost of attendance of the participants. As a follow-up to this seminar, consultant services and supplies and equipment are planned in the following four years.
Inter-regional 0051 Field research on seroepidemiology of treponematoses (1968 - ) R

To participate in epidemiological research on patterns of regression and recrudescence of endemic treponematoses (yaws, pinta and endemic syphilis) and advise on the epidemiological surveillance of these conditions; to assist health administrations in assessing the outcome of previous mass penicillin campaigns against them; to undertake immunological surveys to determine low-level transmission and the recrudescence potential for the invasion by venereal syphilis of previously endemic treponematoses areas; to furnish representative serum collections for use in immunological studies of treponematoses by collaborating laboratories and assess the suitability for field use of immunological tests for the treponematoses; and to provide serum collections for multipurpose immunological studies in other WHO programmes.

Inter-regional 0052 Field investigations on schistosomiasis (1967 - ) R

To carry out investigations on schistosomiasis. Activities under the project include the collection and analysis of data, the stimulation of inter-regional contacts between research and control programmes, assistance to governments and WHO operational research. These activities are carried out by experts representing various disciplines (e.g. epidemiology, parasitology, ecology, malacology, medical pharmacology, biochemistry, seroimmunology, statistics, economics and social anthropology), who are called as required and who work either individually or in groups.

Inter-regional 0070 Malaria eradication : advisory services (1961 - ) R MESA

To make provision for technical advisers who can be assigned at short notice to assist in the planning, implementation and evaluation of malaria control and eradication programmes and advise on special technical problems.

Project Inter-regional 0078 (Malaria eradication: technical consultants) has been incorporated into this project.

Inter-regional 0079 Malaria eradication : training programme (1958 - ) R

To prepare international and national staff of professional and subprofessional categories for advisory, executive, and teaching responsibilities in malaria control and eradication projects by providing teaching aids, courses of instruction, facilities for field training, and group visits to antimalaria programmes.

Inter-regional 0110 Training programme for French-speaking nurses (1964 - ) R

To prepare French-speaking nurses for WHO assignments in administrative and teaching posts in basic and post-basic schools of nursing and midwifery and in nursing services in various countries where the French language is used.

Inter-regional 0113.1 International course on the epidemiology and control of tuberculosis, Prague (1 April - 1 July 1971) R UNDP/TA

The tenth in a series of annual courses organized in cooperation with the Postgraduate Medical and Pharmaceutical Institute, Prague, to acquaint tuberculosis workers in key positions with modern concepts of controlling the disease on a national scale within the framework of the general health services and to familiarize them with relevant knowledge in epidemiology and managerial sciences. The three-month course in Prague (in English), which included lectures and practical work, was followed by a month of field training in India. There were 15 trainees — physicians from Argentina, Chile, Costa Rica, Hong Kong, India, Indonesia, Iraq, Japan, Kuwait, Philippines, Poland, Thailand and Uganda.

WHO provided fellowships for the trainees, the services of lecturers (including WHO staff members) and supplies and equipment.

Inter-regional 0172 Field research on special epidemiological problems of malaria (1962 - 1975) R MESA

To study all aspects of epidemiology of malaria in a savanna area of Africa; to prepare from the baseline data a mathematical model which will assist in indicating the attack measures of choice aiming at the interruption of transmission of malaria and against which the results obtained may be assessed; to recommend the future approach to malaria control in savanna areas of Africa; and to provide training facilities for research and laboratory workers on the methods and techniques applied in this project.

Inter-regional 0190 Leprosy/BCG trial team, Burma (1964 - 1974) R

To carry out a trial to assess the value of BCG vaccination in the prevention of leprosy in the child population and obtain information on epidemiology, immunology, bacteriology, therapy and clinical aspects of leprosy.

Inter-regional 0228 Course on cholera control, Malaysia and Philippines (9 - 23 Oct. 1971) UNDP/TA

The purpose of the course, which was given in English, was to provide information on the organization and planning of cholera control programmes. There were 29 participants, most of them public health administrators, from Afghanistan, Cyprus, Egypt, Ethiopia, Ghana, India, Indonesia, Iran, Iraq, Jordan, Kuwait, Lebanon, Libyan Arab Republic, Malaysia, Nigeria, Philippines, Republic of Korea, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Thailand, Tunisia, Uganda and United Republic of Tanzania. Various cholera control measures were demonstrated and their cost-benefit aspect was discussed in order to assist the public health administrators in planning national control activities.

WHO provided the services of two consultants and two staff members and met the cost of attendance of the participants.

Inter-regional 0234 Economic Commission for Africa (1964 - ) R

WHO is providing a sanitary engineer to assist the Economic Commission for Africa on the environmental health aspects of its economic and social development programmes.

Inter-regional 0266 Field investigation on filariasis (1968 - ) R

To carry out fundamental and applied research on problems of major importance in regions where filariasis is most prevalent.
Investigations are made by consultants representing various disciplines (e.g., epidemiology, parasitology, medical entomology, ecology, medical pharmacology, biochemistry, serology and immunology), working individually or in groups. Where possible, emphasis is placed on problems of a priority nature. An effort is made to ensure that results obtained will be more directly applicable to control methods.

**Inter-regional 0270 Anopheles Control Research Unit No. 1, Kaduna, Nigeria (1960 - ) R**

To carry out hut trials and village-scale field trials of new insecticides of potential value in malaria eradication and perform research on the ecology, biology and control of anopheline mosquitoes.

**Inter-regional 0276 Cholera control team (1964 - ) UNDP/TA**

To assist countries in developing and improving their national cholera programmes, train medical and allied personnel in the surveillance, diagnosis and treatment of cholera, and assist in promoting the local production of rehydration fluid and cholera vaccine.

**Inter-regional 0306 Aedes Research Unit, Bangkok (1966 - ) R**

To carry out research on the ecology and population dynamics of the *Aedes* vectors of haemorrhagic fever and dengue, particularly *A. aegypti* and *A. albopictus*, with the objective of developing effective methods of interrupting transmission of these diseases; also to carry out field trials on the control of *A. aegypti*, using organophosphorus, carbamate and other insecticides and biological control procedures; and to examine new techniques which are now only at an experimental stage.

**Inter-regional 0308 Epidemiology and biology of mental disorders (1971 - ) R**

To assist programmes of research in the epidemiology and biology of mental disorders and to work with the WHO regions in evaluating the effectiveness of mental health services and in training personnel.

**Inter-regional 0374 Community water supply: consultant services (1965 - ) UNDP/TA**

To advise governments on the development of community water supplies at local and national levels. The work includes assessment of resources and needs, stimulation of the establishment of national programmes where these do not exist, advice on the technical, managerial, organizational, legislative and budgetary aspects of community water supplies and, where necessary, assistance in the preparation of formal requests to the United Nations Development Programme for the financing of pre-investment surveys and to the International Bank for Reconstruction and Development, or other international or bilateral sources of investment funds, in connexion with the financing of water supply systems.

**Inter-regional 0403 Anopheles Control Research Unit No. 2, Kisumu, Kenya (1966 - ) R MESA**

To carry out extended field evaluation of insecticides for use in malaria programmes.

**Inter-regional 0439 Seminar on Health and Manpower Planning, Yugoslavia and Poland (6 Sept. - 23 Oct. 1971) R**

The purpose of the seminar, which was conducted in English, was to encourage the integration of health and manpower planning in the public health training curriculum, and to enable senior public health workers and teachers to study (i) the role of the health service system in economic and social development, the organization of the planning machinery, and the health planning process and (ii) the elaboration of curricula for the training of health professionals.

The 15 participants, from Australia, Brazil, Colombia, Czechoslovakia, Egypt, Finland, Iran, Iraq, Mexico, Netherlands, New Zealand, Pakistan, Philippines, Poland and Thailand, included physicians with a public health diploma or Master's degree, nurses with postgraduate qualifications, and sociologists from medical and public health teaching institutions.

For the first five weeks the seminar was held at the Andrijà Stampar School of Public Health in Zagreb, where there were discussions on health aspects of general socio-economic development, on health service systems and health planning, and on the introduction of those subjects in training courses in schools of public health. This mainly theoretical part also included lectures and demonstrations, and continued for a further week in Belgrade, where lectures were given on the strategy of health services in Serbia, on data collection for health planning, and on the progress of the international collaborative study on medical care utilization. For the last week the participants went to Poland, where, in addition to further lectures on health planning, including one on the role of the medical school in regional planning, they visited Cracow, Myelenice and the Silesia region, as well as the regional planning board in Katowice, to observe the conditions and effects of planning at the local and regional levels.

WHO provided two consultants and the services of four staff members, and met the cost of attendance of the participants.

**Inter-regional 0458 Cancer control (1968 - ) R**

To assist in the development of pilot projects in cancer control, including the setting up of cancer registries, and the organization of mass screening campaigns for the early detection of cancer.

When fully constituted, the team provided for under this project will consist of three medical officers, one each for countries of Africa, Asia and the Americas.

**Inter-regional 0465 International pilot study of schizophrenia (1971 - ) Special Account for Medical Research (National Institute of Mental Health, United States of America) (Field research centres in Aarhus (Denmark), Agra (India), Cali (Colombia), Ibadan (Nigeria), London, Moscow, Prague, Taipei and Washington, D.C.)**

To develop reliable methods for the identification and evaluation of patients suffering from functional psychiatric disorder—particularly schizophrenia—and for the description and study of the cause of the disease. Also to produce simple and reliable screening instruments for the identification and assessment of patients with psychiatric disorders, and particularly schizophrenia, in various cultures, in order to prepare for large-scale investigations of social, cultural, biological and genetic factors that can cause, influence or prevent schizophrenia, and for large-scale epidemiological studies of mental disorders.

**Inter-regional 0467 Special studies in virology, Africa (1968 - ) R**

To conduct research on virus problems, collect and disseminate information, train local personnel, provide facilities for visiting scientists, and provide limited facilities for the diagnosis of virus diseases.

**Inter-regional 0469 Sanitary engineering centre, Rabat (1969 - 1978) R**

To assist in developing a centre for advanced and postgraduate training of French-speaking sanitary engineers from countries of the African, European, Eastern Mediterranean and Western Pacific Regions.
Inter-regional 0475 Assistance to national radiation health programmes (1968 - ) R
To assist governments in planning and implementing radiation health programmes and in training national personnel.

Inter-regional 0478 Development of research and training in immunology (1967 - ) R
To advise on training, organize courses in immunology and immunological techniques, and to collaborate in research and in developing regional training centres for research in immunology, especially as related to parasitic and other tropical diseases.

Inter-regional 0521 Anaesthesiology course, Copenhagen (Jan.- Nov. 1971) Special Account for Miscellaneous Designated Contributions
A course, similar to those that have been held yearly since 1951 at the Anaesthesiology Training Centre, Copenhagen, for training medical personnel.
WHO provided fellowships for 10 trainees from Indonesia, Iran, Iraq, Pakistan, Philippines, Poland, Sudan, Thailand, Turkey and Yugoslavia.

Inter-regional 0522 Refresher course in anaesthesiology, Copenhagen (5 - 25 Sept. 1971) Special Account for Miscellaneous Designated Contributions
A course, the eighth of a series, for WHO trainees having attended one of the annual courses at the Anaesthesiology Training Centre, Copenhagen.
WHO provided three lecturers and fellowships for 20 trainees from Bulgaria, Colombia, Egypt, Finland, Greece, Hungary, Iran, Iraq, Japan, Malta, Pakistan, Philippines, Republic of Korea, Syrian Arab Republic, Thailand, Turkey and Yugoslavia.

Inter-regional 0524 Course on radiation protection, supervision and inspection, Holte, Denmark (2 - 28 Aug. 1971) Special Account for Miscellaneous Designated Contributions
The purpose of the course was to provide training for medical officers, health physicists and sanitary engineers from public health authorities in problems of radiation protection, supervision and inspection of radiation departments in hospitals and of radiation laboratories, administration of radiation protection services and their relation to the general health services, training needs and facilities, and interpretation of data. The Danish authorities appointed a course director who, with the assistance of WHO, planned the syllabus and chose the lecturers. There were 20 trainees from Barbados, Brazil, China (Taiwan), Cyprus, Ghana, Guatemala, Hungary, Indonesia, Iran, Israel, Kenya, Malaysia, Malta, Republic of Korea, Ryukyu Islands, Singapore, Spain, United Republic of Tanzania, and Zambia.
WHO provided the services of lecturers (including staff members), and fellowships for the trainees. The services of other lecturers were provided by IAEA.

Inter-regional 0528 East Africa Aedes Research Unit, Dar es Salaam (1968 - ) R
To study the ecology, behaviour and distribution of the urban and peri-urban mosquito vectors of yellow fever in East Africa.

Inter-regional 0529 Research Unit on the Genetic Control of Culicine Mosquitoes, India (1969 - ) R Special Account for Medical Research
To conduct research into the feasibility of controlling Culex fatigans and Aedes aegypti on an operational scale by genetic manipulation.

Inter-regional 0538 Seminar on the Structure and Synthesis of Antibodies, Moscow (4 - 16 Oct. 1971) UNDP/TA
The purpose of the seminar was to provide biomedical scientists with information on the latest developments in immunology. The seminar covered antibody structure, heterogeneity and function, genetics and mechanisms of antibody synthesis, immunoglobulin isolation, antibody determination, avidity, antigen structure, theories of antibody formation, cells of the immune system, cellular immunity, cell-membrane antigen receptors, regulatory factors, unresponsiveness, and application of basic research to public health problems.
WHO provided the services of the director of the course, a consultant, an immunologist and seven temporary advisers, and met the cost of attendance of 20 participants from Bulgaria, Colombia, Egypt, Hungary, India, Iran, Japan, Lebanon, Mexico, Nigeria, Philippines, Poland, Singapore, Spain, Thailand and Yugoslavia.

Inter-regional 0546 Assistance in epidemics (1971 - ) R
To assist countries where epidemics of communicable diseases occur, or threaten to occur, by providing advice, facilities for diagnosis and assessment, emergency supplies of vaccine, and other requirements.

Inter-regional 0547 Smallpox surveillance and assessment team (1970 - ) R
To carry out regular independent assessments of the individual programmes in smallpox endemic countries; to identify, as the programme progresses, the specific operational problems and assist health administrations in carrying out the programmes; to collect further information that is required for the future development of the global programme, and to conduct special epidemiological studies with a view to defining the patterns of transmission of residual smallpox, particularly with reference to nomads and other migrant groups.

Inter-regional 0559 Iran/WHO International Epidemiological Research Centre (1968 - ) R
A centre, set up by the Government of Iran in collaboration with WHO, for multidisciplinary research in epidemiology and communications science. Consultation on research between the relevant scientific organs of the Government of Iran and WHO is carried out through the centre, which proposes, implements and co-ordinates research projects, and provides research teams with the necessary technical and operational facilities.

Inter-regional 0560 Comparative ecological studies on certain small-mammal-borne infections in Iran (1969 - 1971) R
The aim was to study the role of small mammals in the maintenance and transmission of various human pathogens. The work was carried out through the Iran/WHO International Epidemiological Research Centre (see project Inter-regional 0559 above).
A summary of the work carried out in 1969 and 1970 is given in the Annual Report for 1970.1 In 1971 no field work was conducted. Laboratory work continued for the identification of certain ectoparasites collected in the study. Serological evidence of several infections new to Iran (tularemia, scrub typhus and Crimean haemorrhagic fever) has been obtained. Computer-based techniques for mapping have been worked out and data on distributions obtained in the study and from the available literature can be plotted. Correlations between observed infections, distribution of species and certain environmental features are being examined.

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Inter-regional 0565 Field research on cardiovascular diseases (1968 - 1973) R

To undertake field investigations in specific areas of Africa and Asia where natural conditions are suitable for studying the etiology of ischaemic heart disease and primary diseases of the heart but where personnel for undertaking such work are lacking; and to assist in the cardiovascular research training programme. The team provided under this project, which is composed of a cardiologist, an epidemiologist and a technician, works in co-operation with the WHO Research and Training Centre for Cardiovascular Diseases, Kampala, on research into the prevalence and control of valvular heart disease in primary school children in Uganda and into cardiovascular status in elderly Africans.

Inter-regional 0567 Immunology: courses at international reference centres (1969 - ) R

The third of a series of courses was given at the PAHO/WHO Immunology Research and Training Centre, Mexico City, from 9 to 20 August 1971. The course, which was given in Spanish, dealt with the techniques and concepts of clinical immunology.

WHO provided the services of four temporary advisers and met the cost of attendance of 13 participants from Argentina, Chile, Colombia, Costa Rica, Cuba, Panama, Paraguay, Peru, Philippines, Spain, Uruguay and Venezuela. Seven places were reserved for local students.


The purpose of the seminar was to present to professors of obstetrics and gynaecology the current situation of, and recent developments and advances in, certain clinical and public health aspects of human reproduction, family planning and population dynamics. There were 44 participants from Afghanistan, Australia, Ceylon, China (Taiwan), Hong Kong, India, Indonesia, Iran, Japan, Khmer Republic, Malaysia, New Zealand, Pakistan, Papua New Guinea, Philippines, Republic of Korea, Singapore and Thailand.

WHO provided the services of four consultants (faculty members) and four staff members and met the cost of attendance of the participants.

Inter-regional 0574 and 1002 Consultant team on health aspects of family planning (1969 - ) UNFPA

To develop guidelines for the provision of family planning within health services, and to build up expertise within WHO and national health administrations ensuring the multidisciplinary approach required by family planning health services.


The purpose of the seminar was to review the techniques for and feasibility of surveillance, in various populations, of side-effects induced by fertility-regulating agents; to discuss the possibility of surveillance in relation to specific adverse effects; to stimulate communication between investigators engaged in surveillance in different areas; and to discuss the facilities available for research and the results of research already carried out in different regions. There were 26 participants from Australia, Canada, Colombia, Denmark, France, Hungary, India, Iran, Japan, New Zealand, Pakistan, Sweden, Thailand, United Kingdom, United States of America, and Zambia.

WHO provided the services of two temporary advisers and five staff members and met the cost of attendance of the participants.

Inter-regional 0577 Japanese Encephalitis Vector Research Unit, Republic of Korea and China (Taiwan) (1969 - ) R

To investigate the distribution, density and ecology of the mosquito vectors of Japanese encephalitis, carry out observations on the epidemiology of the disease and the interrelationship between the vectors, man and animals, and investigate the reservoirs of infection.

Inter-regional 0581 Course in epidemiology and control of communicable diseases (in English), Moscow and Alexandria (Aug. 1971 - March 1972) R UNDP/TA

The purpose of the course is to provide fellows from developing countries with training in epidemiology and modern epidemiological methodology and health statistics, especially with regard to communicable diseases. There are seven participants from Afghanistan, Egypt, Iraq, Nigeria, Singapore, Spain and Syrian Arab Republic.

The course was held in Moscow from 19 August to 17 December 1971. Lecturers from the Gamaleja Institute of Epidemiology and Microbiology, Moscow, and from other institutes in Moscow and elsewhere in the USSR assisted with the course, together with WHO staff members.

The course is continuing in Alexandria from 20 December 1971 and will end in mid-March 1972. Diseases prevalent in the tropics and subtropics, not discussed in the Moscow part of the course, are being dealt with and practical field training is being given.

WHO met the cost of attendance of the participants and other expenses of running the course.

Inter-regional 0594 Travelling seminar on the collection and utilization of statistical information in the planning and evaluation of health services at intermediate and local levels, Union of Soviet Socialist Republics, and Finland (4 - 25 Aug. 1971) R

The purpose of the seminar was to enable leading specialists in national health services to familiarize themselves with the collection of various health statistical data and their practical utilization in the work of the health services. There were 19 participants from Argentina, Ceylon, Chile, Cyprus, Egypt, Federal Republic of Germany, Guyana, India, Indonesia, Iran, Iraq, Liberia, Nigeria, Philippines, Singapore, Sudan, Thailand, Union of Soviet Socialist Republics, and Venezuela.

WHO provided the services of consultants and fellowships for the participants. Staff members from two WHO regional offices attended the seminar.

Inter-regional 0615 Training in BCG vaccine production (1971) Special Account for Miscellaneous Designated Contributions

Three-month fellowships for training in the techniques of BCG vaccine production at the Statens Seruminstitut, Copenhagen, were awarded to national experts engaged in the production of BCG vaccine, from Colombia, Iran and Romania.

Inter-regional 0616 Course on water pollution control, Copenhagen and Aarhus (19 July - 13 Aug. 1971) Special Account for Miscellaneous Designated Contributions

The purpose of the course, which was the second on the subject organized by WHO, was to meet the need for personnel trained in the most up-to-date techniques for controlling pollution of coastal waters and coastal areas. The course included lectures, field surveys and laboratory work covering the following subjects: sources of pollution; specific pollutants; physical oceanography; turbulent dispersion and tracer engineering; marine biology and toxicology; food chains; fisheries; epidemiology and statistics; survey planning; microbial pol-
lution indicators; waste treatment for marine disposal; water quality management. There were 14 participants from Australia, Chile, China (Taiwan), Greece, Iran, Iraq, Nigeria, Philippines, Poland, Syrian Arab Republic, Thailand, Uruguay, Venezuela and Yugoslavia.

WHO provided the services of three temporary advisers and two staff members and met the cost of attendance of the participants and of 14 Danish lecturers.

Inter-regional 0618 Course on rodent and vector ecology, Dar es Salaam
(18 - 29 Oct. 1971) Special Account for Miscellaneous Designated Contributions

The purposes of the course were to present the principles and give practical information on the ecology and control of rodents (particularly rats) of public health importance, and on the control of rodents in plague foci; and to demonstrate modern methods of control, with special reference to conditions in Africa. In addition, the biology of the most important urban vector and pest mosquitoes was reviewed and methods of their control discussed and demonstrated, with emphasis on the organization of municipal vector control services. Fifteen trainees from Botswana, Gambia, Ghana, Liberia, Mauritius, Nigeria, Sierra Leone, Uganda and United Republic of Tanzania, as well as two Danish experts and lecturers from the United Republic of Tanzania and the WHO East Africa Aedes Research Unit, attended the course.

WHO provided the services of a scientist/entomologist and a technical officer and fellowships for the participants.

Inter-regional 0620 Course in child dental health, Aarhus, Denmark
(20 Sept. - 26 Nov. 1971) Special Account for Miscellaneous Designated Contributions

The purpose of the course, which was held at the Royal Dental College, Aarhus, was to provide instruction in epidemiological methods for assessing the prevalence of dental diseases, in various aspects of preventive dentistry, and in the organization of public health dental services, particularly for children.

WHO provided fellowships for 12 trainees from Colombia, Egypt, Ghana, Hungary, India, Indonesia, Pakistan, Peru, Republic of Viet-Nam, Sudan, Turkey and Western Samoa. Two observers, from Bahrain and Colombia, also attended the course.

Inter-regional 0621 Course on modern trends in the care of psychiatric patients, with special emphasis on psychiatric nursing care, Slagelse, Denmark
(4 Sept. - 16 Oct. 1971) Special Account for Miscellaneous Designated Contributions

The purpose of the course, which was the eighth course in nursing to be financed by the Danish International Development Agency, was to assist countries in improving the care of patients with mental diseases and in preventing these diseases by promoting and strengthening the therapeutic action of the team formed by the psychiatrist and the psychiatric nurse and their auxiliaries and technicians. The programme of the course covered (i) the principles of psychiatric patient care (medical and nursing) and new patterns and systems of the organization and administration of psychiatric services; and (ii) community mental health services, their co-ordination and their integration into public health services. There were 19 trainees — nine psychiatrists and 10 psychiatric nurses — from countries in the six WHO regions.

WHO provided the services of a temporary adviser and a staff member for the faculty of the course and met the cost of attendance of the participants and local costs.

Inter-regional 0622 Course on epidemiology, prevention and treatment of malnutrition in young children, Chiangmai, Thailand
(30 Nov. - 11 Dec. 1971) Special Account for Miscellaneous Designated Contributions

The purpose of the course, which was organized with the cooperation of the Danish Government for participants from the South-East Asia and Western Pacific Regions, was to improve the methods of diagnosis, treatment and prevention of protein-calorie malnutrition, and to encourage the integration of nutrition work in the activities of health services. The participants were 25 physicians from Burma, Ceylon, Fiji, India, Indonesia, Malaysia, Nepal, Papua New Guinea, Philippines, Republic of Korea, Singapore and Thailand.

WHO provided a consultant, six temporary advisers and the services of staff members from headquarters and the two participating Regions.

Inter-regional 0629 Workshop to prepare a manual on the teaching of epidemiology, Nieborow, Poland
(19 - 23 April 1971) R

The purpose of the workshop, which was organized in cooperation with the International Epidemiological Association, was to produce a guide suitable for teachers of epidemiology at both graduate and postgraduate levels throughout the world. There were 19 participants from Australia, Czechoslovakia, France, India, Japan, Nigeria, Poland, Union of Soviet Socialist Republics, United Kingdom, United Republic of Tanzania, United States of America, and Venezuela. Four WHO staff members also attended. The guide will be published in several languages, including English, French, Polish and Russian.

WHO contributed to the cost of attendance of five participants.

Inter-regional 0630 Travelling Seminar on Public Health and Sanitation Aspects of City Planning, Union of Soviet Socialist Republics
(19 - 23 April 1971) UNDP/TA

The seminar, which took place in Moscow, Tashkent and Samarkand, was similar to that held in May and June 1968 (Inter-regional 0487), but was conducted in French and Russian. The aims were to enable government officials in charge of environmental health, housing and city planning programmes to study the principles of public health and sanitation applied to city and regional planning in the USSR and to observe the application of those principles in newly built towns and neighbouring districts; and to provide them with information on the scientific research work on health requirements that forms the basis for the establishment of standards and regulations on housing and town planning, and on the structural organization that assures the control over and collaboration of the Ministry of Health in housing and town planning and construction work carried out by other ministries and governmental agencies. The subjects dealt with included the organization, functions and responsibilities of the sanitary and epidemiological services of the Ministry of Health and of the agencies under the State Committee for Construction; the health principles applied to the planning of urban centres and rural communities; the influence of climatic factors in the design of cities and villages; the health importance of zoning and land use, of green open spaces, of recreation grounds, cultural and rest centres, etc.; the provision of water supply, sewerage and solid wastes disposal as basic health requirements; measures for preventing environ-
mental pollution and abating noise in cities; and particular problems of town planning and construction in seismic zones, in areas where natural foci of disease exist, etc. WHO provided the services of a consultant and a staff member, and met the cost of attendance of the 14 participants, who came from Algeria, Argentina, Central African Republic, Dahomey, Iran, Laos, Romania, Syrian Arab Republic, Togo, Tunisia and Zaire.

Inter-regional 0631 Travelling Seminar on the Purification and Disinfection of Drinking Water, Union of Soviet Socialist Republics (6 - 28 May 1971) UNDP/TA

The purpose of the seminar was to provide training in the theory and practice of the purification and disinfection of drinking water, and to provide technical data on methods utilized in the USSR, and information on theoretical considerations arising from research that has been completed, as well as on the practical applications of the knowledge obtained from research work. There were 13 participants from Argentina, Fiji, Hungary, India, Iraq, Libyan Arab Republic, Malaysia, Mexico, Nepal, Thailand, Turkey, Western Samoa and Yemen. The seminar was held in Moscow, Kiev and Leningrad, where participants were given the opportunity to visit laboratories and treatment plants. WHO provided the services of a consultant and met the cost of attendance of the participants.

Inter-regional 0632 Travelling Seminar to demonstrate Methods of Vector Control, Union of Soviet Socialist Republics (1 - 23 July 1971) UNDP/TA

The purpose of the seminar was to demonstrate methods of vector control, with emphasis on the evaluation of vector populations prior to control programmes and to the application of control measures, both environmental and chemical. The seminar provided training in the methodology of treatment with pesticides and in the assessment of results of control measures. It was held in Moscow, Kalinin, Krasnodar and Stavropol. There were 20 participants from Afghanistan, Argentina, Bulgaria, Ceylon, Egypt, Indonesia, Japan, Malaysia, Philippines, Sierra Leone, Singapore, Sudan, Turkey, United Republic of Tanzania, Venezuela and Yugoslavia.

WHO provided the services of a consultant/director and met the cost of attendance of the participants.


The purpose of the seminar was to assist countries in promoting the improvement of nursing services through (i) consideration of the participation of nurses in national health planning; (ii) the examination and analysis of different organizational structures and educational programmes; and (iii) the exploration of systems and methods for the collection of information that will enable nurses to contribute to the planning process. The seminar had 18 participants from Australia, Botswana, Canada, Cyprus, Denmark, Ecuador, Ethiopia, India, Indonesia, Iran, Israel, Malaysia, Peru, Poland, Republic of Korea, Thailand, Uganda and United Kingdom.

WHO provided the services of four temporary advisers and six staff members, and met the cost of attendance of the participants and seminar costs.

Inter-regional 0635 Conference on the Integration of Maternal and Child Health Activities, including Family Planning, into Basic Health Services, Cairo (23 - 28 Nov. 1971) UNFPA

The purpose of the conference, which was conducted in English, was to discuss trends in maternal and child health and family planning and to exchange views on the most effective methods for their integration in the work of basic health services in developing countries. The 27 participants, including nurses and midwives as well as health education, maternal and child health and family planning workers, were from Ceylon, Egypt, Ethiopia, India, Indonesia, Iran, Iraq, Japan, Kuwait, Pakistan, People's Democratic Republic of Yemen, Philippines, Saudi Arabia, Singapore, Sudan, Syrian Arab Republic, Turkey, Yemen and Yugoslavia.

WHO met the cost of attendance of the participants.

Inter-regional 0636 Travelling Seminar on Protein Problems with particular reference to Weaning Foods, Ethiopia and Algeria (23 - 29 Sept. 1971) R (FAO)

The purpose of the seminar was to promote the concept of the development of local weaning foods in African countries where such programmes could be implemented in the near future. WHO provided two consultants, eight fellowships and the services of staff members, and shared with FAO the cost of attendance of 13 participants from Cameroon, Ivory Coast, Kenya, Madagascar, Nigeria, Senegal, Sudan, Zaire and Zambia.

Inter-regional 0638 Seminar/workshop on teacher training for schools of medicine and allied health sciences, Chicago, USA (18 - 28 Oct. 1971) R

The purpose of the seminar/workshop was to assist top-level administrators of schools for health personnel in the planning, establishment and/or improvement of training centres for teachers of health personnel. The seminar was held, in English, at the Center for Educational Development of the College of Medicine, University of Illinois, Chicago, which provided the faculty. There were 11 participants from Australia, Ceylon, Chile, Egypt, Honduras, Iran, Netherlands, Thailand, Uganda and Union of Soviet Socialist Republics.

WHO met the cost of attendance of the participants and other expenses.

Inter-regional 0639 Travelling Seminar on the Training and Utilization of Medical Assistants (Feldshers), Union of Soviet Socialist Republics (3 - 24 June 1971) UNDP/TA

The purpose of the seminar was to enable health administrators holding important positions and teachers responsible for the training of health service personnel to study the role of the various categories of feldshers in the USSR, their training and the careers they can enter, with the ultimate objective of stimulating the interest of health authorities in the utilization of the "medical assistant" type of personnel for improving the efficiency of health services and population coverage, especially in rural areas. The seminar, which was conducted in French, took place in Moscow, Gomel, Stavropol and Ordjonikidze.

WHO provided the services of two temporary advisers and met the cost of attendance of 18 participants from Algeria, Argentina, Chad, Dahomey, Iran, Laos, Madagascar, Mali, Morocco, Niger, Syrian Arab Republic, Upper Volta and Zaire and, under other projects, of two participants from Canada and Italy.

Inter-regional 0640 Course on diagnostic techniques for chromosome aberrations, Stockholm (23 Aug. - 4 Sept. 1971) R

The course was held at the Department of Clinical Genetics, Karolinska Hospital, Stockholm. There were 12 participants from Egypt, India, Iran, Israel, Mexico, Pakistan, Peru, Thailand and Turkey. The programme of the course included training in such new techniques as fluorescence analysis and autoradiographic identification of specific chromosomes.

WHO provided lecturers and met the cost of attendance of the participants.
Inter-regional 0641  Workshop on Research Training in Reproductive Physiology, Geneva (13 - 17 Sept. 1971) R

The purposes of the workshop were to review the state of existing research training programmes in reproductive physiology; to lay down guidelines for the establishment of research training for individuals of different levels of academic preparation; to propose centres in which such training programmes might be established or strengthened; and to suggest ways of co-ordinating the research training provided in different centres. There were 14 participants (temporary advisers) from Argentina, Belgium, Egypt, India, Nigeria, Philippines, Sweden, Thailand, United Kingdom, and United States of America.


To develop a programme covering the field of forensic psychiatry on the international level, with specific reference to the mental health aspects of prevention of crime and treatment of offenders.

Inter-regional 0653  Social and physical adaptation of Tokelau Island migrants to settlement in New Zealand (1969 - 1971) R

The study is being conducted by the Epidemiology Unit of the Wellington Hospital for the purpose of comparing the blood pressure and other parameters in Tokelau Islanders before, during and after migration from an atoll to a New Zealand setting. WHO has assisted by providing epidemiological and sociological advice and has given a grant to cover some of the initial local expenses.

The study is continuing in 1972 without direct support from WHO.

Inter-regional 0654  Health effects of urbanization, Iran (1970 - 1971) R

A WHO team, consisting of an epidemiologist, a sociologist, a geographer and a statistician, participated through the Iran/WHO International Epidemiological Research Centre (see project Inter-regional 0559) in a feasibility study to determine the practicability of identifying and obtaining sample data on recent migrants from rural areas to the Tehran urban area by means of a house-to-house survey. An assessment was made of the proportion of migrants who could be located after an interval of three to six months, a series of adaptation problems were identified and tests were made of a questionnaire for assessing adaptation and stress.

Local staff and facilities for the study were provided by the Institute of Public Health Research, University of Tehran.

Inter-regional 0655  Ecology of infectious diseases, Nyon, Switzerland (1970 - 1971) R

The purpose of this study was to develop quantitative methodologies for the analysis of seasonal population dynamics and movement of several forest rodent populations as a basis for determining potential contact rates in individual animals that may be reservoirs of human diseases. Over a thousand individual animals have been examined, many of them having been observed six or more times. Computer programmes have been developed for the analysis of the data obtained and for the mapping of the movements and territoriality of individual animals.

Inter-regional 0656  Social and mental adaptation of Sérér migrants to urban life in Dakar (1970 - 1971) R

The purpose was to study the health effects of migration from rural tribal areas into the city of Dakar. Data were collected in 1970 on the sociological and demographic background of the migrants, the problems of social and psychological adjustment entailed by their migration and their health behaviour, as well as physiological indicators of health status. During 1971 these data were extensively analysed in collaboration with the Centre of Psychopathological Research of the University of Dakar and the Dakar Centre of the Office de la Recherche Scientifique et Technique Outre-Mer, Paris.

WHO provided the assistance of an epidemiologist, a demographer/sociologist, a statistician and a biomedical engineer as well as a grant to meet some of the local costs.

Inter-regional 0657  Multifactorial prophylactic trial in myocardial infarction and cerebral stroke in Yugoslavia (1969 - 1971) R

The field work for a feasibility study of intervention in a chronic disease was completed in Zagreb, Yugoslavia, in 1970, and most of the data analysis was carried out in 1971. The main directions of the analysis have been: behavioural characteristics of the study population (as indicators of participation in the programme) as related to the level of risk factors for cardiovascular diseases, such as blood pressure, cholesterol level and glucose tolerance; iatrogenic effects of the prophylactic programme; prevalence of the risk factors; methodological problems of conducting an intervention trial in an open population; and the effectiveness of various measures in relation to the efforts expended.

The study was undertaken in collaboration with the team from the Andrija Stampar School of Public Health, Zagreb, and WHO's contribution consisted of epidemiological, sociological and statistical advice, as well as participation in the development of the required data analysis methods.

Inter-regional 0658  Research on the epidemiology and methodology of schistosomiasis control in man-made lakes (1971 - ) R UNDP/SF

To undertake basic research in order to indicate to the governments concerned effective and economical methods of schistosomiasis control under man-made conditions with the environmental changes resulting from them; in particular (i) to study the ecology and epidemiology of schistosomiasis in man-made lakes; (ii) to carry out preliminary field trials, including the testing, evaluation and adaptation of known control methods, and, where necessary, the devising of new ones suitable for the conditions found; (iii) to make recommendations on feasible methods of schistosomiasis control in man-made lake conditions; and (iv) to provide training in the techniques of schistosomiasis research and control under those conditions.

From 20 September to 8 October 1971 a consultation was held at the project headquarters in Accra, Ghana, to discuss study designs and protocols for the research activities.

Inter-regional 0660  Comprehensive health planning research, Colombia (1970 - ) R Special Account for Medical Research PAHO (Government of Colombia)

The ultimate objective of this programme is to make the benefits of good health planning more accessible to Member States of WHO. To accomplish this a project has been started in Colombia which will attempt to create, through gradual modification of an existing health planning system, an improved planning system that will utilize resources more effectively.

Inter-regional 0668  Mathematical aspects of mass health screening (1970 - 1971) R

Several mathematical models, aimed at improving the prediction of disease from known risk factors, identifying new
factors and defining normal values, have been developed and programmed. These models have been tested with data from several studies of chronic disease and mass health screening.

Inter-regional 0669 Seminar on the Standardization of Psychiatric Diagnosis, Classification and Statistics, Basle, Switzerland (2 - 8 Dec. 1970) R

The seminar was the sixth of a series of 10 annual meetings, the purpose of which is to secure international agreement among psychiatrists and other health personnel of different countries on psychiatric diagnosis, classification and statistics used in mental health services, research and training, and to improve communication between experts and the reporting of psychiatric diseases. The seminar was concerned with the problems of diagnosis, classification and statistics of neurotic and psychosomatic disorders. Written case histories and videotape recordings of interviews with patients were assessed and the diagnoses made served as a basis for discussions to work out a standard system for diagnosis and classification.

The seminar was attended by a group of 12 experts from seven countries who have been collaborating in the project since its inception and by psychiatrists from six countries in the European Region.

Inter-regional 0670 Ecological studies of urban health disorders, Hanover (Federal Republic of Germany) and Cali (Colombia) (1970 - 1971) R

The purpose of the project was to assess the magnitude and localization of health needs in urban areas in relation to factors bearing on health and on disease processes. Analysis of the data obtained was centred on relating selected health variables to community characteristics such as housing standards, patterns of urban growth and expansion, social composition of the population, and type and accessibility of medical services. The findings suggest that some form of surveillance of environmental and social conditions is possible by the use of these methods.

The Cali part of the project was linked with the Inter-American investigation of mortality in childhood, which provided part of the data.

Inter-regional 0671 Training course for national programmes on problems of alcohol and drug dependence, United Kingdom, Netherlands and Poland (12 Sept. - 3 Oct. 1971) R

The purposes of the course were (i) to enable public health officers, psychiatrists and others concerned with the organization of the relevant services to study and exchange experience on practical aspects of the development of local and national services for the prevention and treatment of dependence on alcohol and other drugs; (ii) to stimulate local and national compilation of information to provide an adequate basis for the development of services; and (iii) to stimulate research on the evaluation of preventive and treatment measures. There were 22 participants from Costa Rica, El Salvador, Federal Republic of Germany, Finland, Iran, Israel, Japan, Mexico, Netherlands, Panama, Philippines, Poland, Spain, Sweden, United Kingdom and Venezuela. Between 1969 and 1971 detailed reviews were prepared, in the host countries and in Czechoslovakia, of the problems of alcohol and drug dependence and the ways in which these problems were being met. In preparation for the course the participants also drafted reviews of the situation in their own countries. These documents served as a basis for discussion on improved planning of national and local programmes. During the course, facilities available in the three host countries were visited and discussed. Consideration was given to the medical, psychological, sociological, economic and legal aspects of the problems involved and to the need for multidisciplinary and inter-agency collaboration in planning programmes.

WHO provided the services of four consultants and of staff members and met the cost of attendance of 12 participants.

Inter-regional 0673 Human environment (1970 - ) R

To co-operate with the United Nations and with other specialized agencies in preparations for the United Nations Conference on the Human Environment to be held in Stockholm in June 1972; and to co-operate with UNESCO in future preparations with respect to the "Man and the Biosphere" programme.

Inter-regional 0674 Methodological study on behavioural and operational components of health intervention programmes, Rotterdam (Netherlands) and Kaunas (Lithuanian SSR) (1970 - ) R

To investigate methodological problems involved in a health intervention programme, using cardiovascular diseases as the intervention vehicle, with the specific objective of ascertaining the factors that determine (i) which individuals among those identified in a population as being at risk will participate in an intervention programme; (ii) successful adherence to the programme; (iii) the relationship of the cost of undertaking such a programme to the benefits in terms of the proportion of individuals who will be at less risk through intervention, by developing a cost-effectiveness model.

This study is being carried out in co-operation with two research teams, one from the Municipal Health Department of Rotterdam, the other from the Kaunas Medical Institute. WHO's contribution consists of making available epidemiological, sociological and statistical advice and co-ordinating the data-processing methods used in both study areas.

Inter-regional 0677 Course in psychopharmacology for teachers in medical schools, Copenhagen and Aarhus (28 Feb. - 20 March 1971) Special Account for Miscellaneous Designated Contributions

The purpose of the course was to give psychiatrists from developing countries training in psychopharmacological methods of treatment of mental disorders. The course lasted three weeks, two in Copenhagen and one in Aarhus. It was attended by 15 psychiatrists from Argentina, China (Taiwan), Ghana, Hong Kong, India, Iran, Peru, Philippines, Sudan, Syrian Arab Republic, Thailand, Turkey, Uganda and Yugoslavia. The programme included lectures, visits to various psychiatric institutions and round-table discussions. The topics discussed were the classification of psychotropic drugs, their effectiveness and adverse effects; the training of personnel distributing psychotropic drugs; psychopharmacological training in medical schools; and research in clinical psychopharmacology.

The faculty for the course consisted mainly of Danish specialists. WHO provided the services of three lecturers and fellowships for the participants.

Inter-regional 0683 Karolinska Symposia on research methods in reproductive endocrinology (1970 - ) R

The objectives of the Karolinska Symposia are to help the development and standardization of new methods used in the investigation of reproduction, to increase international collaboration in this field and to identify young scientists doing significant work in reproductive biomedicine.

WHO acted as host to the third symposium, which was concerned with in vitro methods in reproductive cell biology and which was held in Geneva in January 1971.
A WHO staff member attended the fourth symposium—on perfusion techniques—which was held in New York in October 1971.

Inter-regional 0689 Project systems analysis (1969 - ) R

To apply the techniques of systems analysis and action research to providing a detailed, consistent methodology for the formulation of development projects; identifying management techniques for development projects so as to make them susceptible of monitoring, control and evaluation; specifying information system requirements for the support of project management; and proposing methods and mechanisms for propagating the development project concept, methodology and supporting systems. (See para. 6.83)

Inter-regional 0691 Advanced course in clinical chemistry, Copenhagen
(30 March - 15 June 1971) Special Account for Miscellaneous Designated Contributions

The course, which was the fourth of a series, was organized jointly by the Danish authorities and WHO. Its purpose was to give senior laboratory personnel an opportunity of becoming better acquainted with new techniques in different branches of clinical chemistry, as well as with the methodology of quality control and the organization of clinical chemistry laboratories. There were 15 participants from Brazil, Bulgaria, Egypt, Hong Kong, India, Iraq, Japan, Peru, Philippines, Romania, Singapore, Sudan, Thailand, Turkey and Yugoslavia.

WHO provided the services of two consultants and a staff member, and met the cost of attendance of the participants.

Inter-regional 0703 Group of Experts on the Scientific Aspects of Marine Pollution, third session, Rome
(22 - 27 Feb. 1971) R

The functions of the Group are to advise the sponsoring organizations (the United Nations, FAO, IAEA, IMCO, UNESCO, WHO and WMO) on the scientific aspects of marine pollution, especially those of an interdisciplinary nature; to advise on the establishment of effective international documents and intergovernmental instruments for the control of marine pollution; to consider specific questions that may be put to it by the executive head of any sponsoring organization or by any Member State.

The third session of the Group was concerned mainly with the list of harmful chemical substances drawn up at its second session, in 1970, which is likely to be used in the United Nations Secretary-General's contribution to the Conference on the Human Environment, to be held in Stockholm in 1972. The Group also discussed the quality of water desirable for bathing and for the culture of shellfish, and the formulation of guides and criteria for these and other uses of coastal water. Further subjects debated at this session of the Group were the scientific basis for a monitoring system for marine pollution, the dispersion of pollutants by natural physical processes, and other problems related to the Long-term and Expanded Programme of Oceanic Exploration and Research.

WHO provided the services of four temporary advisers and of a staff member.

Inter-regional 0704 Meeting of the Working Group on Hydrological Aspects of Natural and Artificial Changes in Water Quality, Geneva
(13 - 17 Sept. 1971) R (UNESCO - International Hydrological Decade)

At this, its first meeting, the Working Group, which was established by the Co-ordinating Council of the International Hydrological Decade at its sixth session, held in 1970, and for which WHO provides the technical secretariat, drew up a tentative outline for a guidebook on hydrological measurements and data needed in water quality surveys of rivers, lakes, impoundments, estuaries and groundwater resources. There were participants from Canada, Chile, Czechoslovakia, Federal Republic of Germany, India, Japan, and Union of Soviet Socialist Republics. WMO and IAEA were also represented.

WHO provided three temporary advisers nominated by UNESCO.

Inter-regional 0707 Seminar on Public Health Aspects of Water Pollution, Dübendorf (Zurich), Switzerland
(22 - 26 Nov. 1971) R

In addition to the discussions held in strict accordance with the purpose defined in its title, this seminar, which took place at the Federal Institute for Water Resources and Water Pollution Control, near Zurich, provided an opportunity to deal with the question of the management of water pollution and water quality control, using the modern methods of systems analysis. There were 19 participants from Australia, Brazil, Chile, Czechoslovakia, Egypt, Greece, Hungary, India, Iran, Iraq, Liberia, Poland, Singapore, Spain, Thailand, Turkey, Uganda and Venezuela.

WHO provided seven lecturers and the services of two staff members and met the cost of attendance of the participants.

Inter-regional 0708 Seminar on Training and Services in Occupational Health for Developing Countries, Djakarta
(29 Nov. - 10 Dec. 1971) UNDP / TA

The purpose of the seminar was to evaluate occupational health training requirements and propose curricula, and to devise means of improving occupational health services in developing countries, as well as to promote field studies in the participating countries for the guidance of local services and training programmes. The seminar, which was held in co-operation with the Indonesian National Institute of Occupational Health and Industrial Hygiene, had 22 participants from Burma, Ceylon, China (Taiwan), India, Indonesia, Iran, Japan, Malaysia, Philippines, Republic of Korea, Singapore and Thailand.

WHO provided a consultant for one month and the technical services of a staff member and met the cost of attendance of 21 participants.

Inter-regional 0713 Travelling Seminar on Hospital and Sanitary-Epidemiological Station Laboratory Services, Union of Soviet Socialist Republics
(27 Sept. - 16 Oct. 1971) UNDP / TA

The purpose of the seminar, which was organized jointly with the Ministry of Health of the USSR and conducted in French, was to give directors of public health laboratories in different countries a good knowledge of the organization of health laboratory services in the USSR, to discuss the use of that type of organization as a model, and to visit applied research laboratory institutions. There were 13 participants from Algeria, Chile, Iran, Mali, Senegal, Spain, Syrian Arab Republic, Togo, Tunisia and Turkey. They visited laboratories in Moscow, Tashkent, Ferghana, Smolensk and Safonovo.

WHO provided a consultant and the services of two staff members and met the cost of attendance of the participants.

Inter-regional 1001 Development of family planning activities—country appraisals (1970 - 1974) UNFPA

To assist in the development of family planning activities within health services and in the establishment of family planning programmes.
Inter-regional 1003 Development of family planning aspects of maternal and child health activities (1970 - ) UNFPA

To promote maternal and child health through the improvement of maternity, infant and child health care, with emphasis on the provision of family planning in connexion with the maternity cycle.

Inter-regional 1008 Strengthening of health education services to support family planning activities (1970 - ) UNFPA

To help health authorities to strengthen their health education services in support of family planning activities. The project will include (i) assistance in planning, utilizing and evaluating such services; (ii) examination of ways of strengthening family life education and related school health education; (iii) provision of short courses, workshops, seminars, and inservice training; and (iv) strengthening of the health education element in other WHO-assisted programmes concerned with the health aspects of family planning. Assistance will also be provided in developing collaborative activities in health education with other organizations of the United Nations system and with non-governmental organizations.

Inter-regional 1019 Operational and epidemiological research on the health aspects of family planning and population dynamics (1970 - 1974) UNFPA

To stimulate and co-ordinate operational research and administrative and epidemiological studies of family planning in health services, as well as studies of the health aspects of population dynamics.

Inter-regional 1020 Research in health education and behavioural sciences relevant to family planning (1970 - ) UNFPA

To assist in planning and developing the research in health education and related social sciences that is essential for the planning of measures to enlist more effective co-operation of the public in the health aspects of family planning and related health services.

Inter-regional 1021 Study on levels, trends and differentials of fetal, infant and childhood mortality (1970 - 1975) UNFPA (UN)

To carry out, jointly with the United Nations, an investigation into levels, trends and differentials in fetal, infant and early childhood mortality.

Two consultations were held in Geneva in 1971 - one from 16 to 22 March, to discuss fetal, infant and child mortality, and one from 17 to 21 May, to discuss an international reporting system on legally induced abortions.

Inter-regional 1022 Combined ad hoc surveys on fetal, infant and early childhood mortality and fertility patterns (1970 - 1974) UNFPA

To provide estimates of levels and trends and differentials of fetal, infant and early childhood mortality in relation to fertility patterns and to test statistical methods and techniques suitable for carrying out the surveys in selected countries.

Inter-regional 1023 Registration of pregnancies (1970 - 1974) UNFPA

To establish a registry of pregnancies and assess the various outcomes of these, namely, early fetal death corresponding to abortion, in addition to the usually recorded late fetal death and live birth.

The project is to be carried out in a few countries where most of the pregnant women receive antenatal care.

A consultation was held in Geneva from 14 to 18 December 1970 to discuss the project. In April 1971 two informal meetings were held, one (1-2 April) to consider future activities and another (5-7 April) to consider an outline for a protocol and a questionnaire for the study. A second consultation was held in Geneva from 25 to 27 August 1971 to design the questionnaire and to define the tabulation scheme and data processing.

Inter-regional 1028 Evaluation of family planning activities within health services (1970 - 1974) UNFPA

To assist governments in evaluating family planning activities in the context of health services, including collection of the necessary information, development of assessment methods, and field studies to test those methods.

Inter-regional 1031 Teaching of human reproduction, family planning and population dynamics in medical schools (1971 - ) UNFPA

To develop suitable methods and materials for the teaching of human reproduction, family planning and population dynamics as subjects in medical schools, and to assist such schools in integrating the subjects into the curriculum.

A consultation was held in Geneva from 1 to 4 June 1971 to discuss education methods, including audiovisual aids, and evaluation procedures for use in family planning training programmes for health personnel. There were six participants (temporary advisers) from Colombia, Ghana, India, Pakistan, Tunisia and the United Kingdom, and observers from UNESCO and the International Planned Parenthood Federation also attended. WHO provided a consultant.

A second consultation was held in Geneva from 5 to 9 July to discuss guidelines for developing a core curriculum for a medical course based on the family. There were 11 participants (temporary advisers) from Brazil, Cameroon, India, Israel, Norway, Poland, the United Kingdom, the United Republic of Tanzania, the United States of America, and Zambia.

Inter-regional 1034 Consultation on Teaching of Human Reproduction, Family Planning and Population Dynamics in Nursing and Midwifery Education Programmes, Geneva (4 - 8 Oct. 1971) UNFPA

The purpose of the consultation was to bring together a small group of specialists from the six WHO regions to review the knowledge, skills and attitudes required by nursing and midwifery personnel in relation to human reproduction, family planning and population dynamics, and to discuss methods of incorporating these subjects into curricula for nurses and midwives and their auxiliaries. There were eight participants (temporary advisers) from Egypt, Ghana, India, Philippines, United Kingdom and United States of America.

WHO provided supporting services for the meeting and the services of six staff members.

Inter-regional 1041 Teaching of human reproduction, family planning and population dynamics to auxiliary health personnel (1971 - ) UNFPA

To incorporate the teaching of human reproduction into the basic training of auxiliary health personnel.

A consultation was held in Geneva from 18 to 22 January 1971 to review teaching programmes with a view to the incorporation of the subjects of human reproduction and family planning, to discuss aims and functions, and to formulate guidelines for training programmes and recommendations for structure and content of courses for auxiliary personnel. There were five
participants (temporary advisers) from Brazil, Egypt, Hungary, India and Nigeria, and an observer from the International Planned Parenthood Federation attended.

Inter-regional 1047 Manual on fertility analysis (1971 - 1972) UNFPA

To prepare a manual on methods and techniques in health statistics relating to studies in human reproduction and in family planning programmes, with special reference to conditions in developing countries. The manual will deal with problems of collecting, estimating and adjusting basic data, the techniques useful for combined fetal, infant and early childhood mortality surveys and fertility surveys, evaluation methods for family planning programmes and other methods for evaluation of their impact on the health status of the population.

Inter-regional 1048 Manual on morbidity and mortality analysis (1970 - 1972) UNFPA

To prepare a manual on methods and techniques for the collection and analysis of numerical information on morbidity and mortality. The manual will deal with aspects of automatic data processing, population models in health statistics, the theory of competing risks, and other methods for evaluation of specific public health measures.

Inter-regional 1054 WHO reference centres on human reproduction, family planning and population dynamics (1971 - 1974) UNFPA

To establish international, regional and national reference centres in order to develop standards and methods, stimulate research and training and maintain surveillance in various fields of health relating to family planning.

Inter-regional 1055 Research training grants in human reproduction, family planning and population dynamics (1970 - 1974) UNFPA

To provide research training for scientists, clinicians and health administrators, particularly those from developing countries, in laboratory work and clinical, epidemiological and public health aspects of human reproduction, family planning and population dynamics, in advanced research and training institutions in different parts of the world.

Inter-regional 1139 Research administration in human reproduction, family planning and population dynamics (1971 - 1974) UNFPA

To assist developing countries in improving research administration in human reproduction, family planning and population dynamics, evaluating research needs and opportunities, making an inventory of research manpower and facilities, estimating potential for development and training, and establishing priorities. Attention is also to be paid to the appraisal of requests for research support and the administration of grants, the evaluation of results, and the dissemination of relevant information.

Inter-regional 1147 Development of health statistics activities in the field of health aspects of human reproduction, family planning and population dynamics (1971) UNFPA

WHO provided two consultants to advise on the development of a broad long-range programme of statistical activities in the field of health aspects of human reproduction, family planning and population dynamics.

Inter-regional 1148 Support to data processing centres (1971 - 1974) UNFPA

To explore the feasibility and the problems involved in setting up regional data processing centres, in accordance with the recommendation of the Consultation on the Role of Health Statistics in Studies of Human Reproduction and in Family Planning Programmes, held in Geneva from 28 September to 3 October 1970.

Inter-regional 1151 Methodology of reporting and analysis of perinatal and maternal morbidity and mortality (1971 - 1974) UNFPA

(i) To carry out studies with a view to establishing internationally acceptable criteria, definitions, classifications and nomenclature both for morbidity and causes of death and for the medical procedures—preventive, therapeutic and diagnostic—related to the perinatal period; (ii) to propose a methodology for the registration of pregnancies; (iii) to propose a methodology for the collection and analysis of information on child and mother (with special reference to multiple causes of illness and death) in countries with a high doctor/population ratio and those with a low one; (iv) to propose a statistical methodology for measuring the survival probability of the immature fetus; (v) to carry out studies on the multifactorial causation of mortality as related to population dynamics; and (vi) to set up a reference centre to advise on and assist the above activities.

A consultation was held in Geneva from 25 to 29 October 1971 to discuss the best format for a death certificate used for clinical reporting of perinatal and maternal death and to suggest ad hoc field studies in this area.

A further consultation, on viability criteria and interpretation of signs of life, was held in Geneva from 15 to 19 November 1971 to propose new definitions for prenatal mortality and events affecting the prenatal period and to advise on the revision of Chapters 10, 11, 14 and 15 of the International Classification of Diseases and review the proposals already prepared. (The informal meeting held on 1 and 2 April in connexion with project Inter-regional 1023—see above—also considered future activities related to this project.)

Inter-regional 1153 Consultation on Health Statistics Projections, Geneva (21 - 27 Sept. 1971) UNFPA

The purpose of the consultation was to review national experience in projecting health statistics trends. It stressed the need for better communication between producers and users of projections and made recommendations as to the methodology to be developed for statistical projections. It further recommended that the manuals that are being prepared by WHO should provide guidance on health status, measurements and projections.

WHO provided two consultants to assist in the preparation of the consultation and supporting services for the consultation.

Inter-regional 1154 Pilot study on application of randomized response techniques to collection of data on health aspects of population dynamics (1971 - 1974) UNFPA

To initiate studies in three or four countries on the collection of information on abortion, extramarital conception, etc.
Inter-regional 1167 Study on curricula for the training of health statisticians in family planning statistics (1971 - ) UNFPA

To strengthen the professional training of health statisticians in family planning statistics, by identifying the changes that should be made in training programmes and formulating the appropriate guidelines, and by recommending other measures to improve family planning aspects of health statistics training.

A consultation was held in Geneva from 23 - 29 November 1971 to review training programmes in health statistics and to emphasize the need for education in the statistical methods essential in studies on human reproduction as applied to family planning programmes. It brought together eight experts including teachers of public health subjects, population dynamics, epidemiology and statistics, family planning experts and statisticians.

Inter-regional 1168 Training centre for exfoliative cytology and obstetrical and gynaecological pathology in relation to family planning programmes (1971 - ) UNFPA (Columbia University, USA)

To develop a training centre for exfoliative cytology and obstetrical and gynaecological pathology in relation to family planning programmes, which will function in collaboration with inter-regional training centres. Cytology laboratory facilities are to be established in the countries from which trainees are drawn. It is intended to develop, in a number of countries with family planning programmes, expertise that may serve to provide advice to governments and carry out cytological monitoring of, for example, possible adverse side-effects of certain contraceptive methods.
ANNEXES
MEMBERS AND ASSOCIATE MEMBERS OF THE WORLD HEALTH ORGANIZATION

At 31 December 1971

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<tr>
<th>Country</th>
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Peru                        | 13 November 1949               |
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| Portugal                     | 13 February 1948               |
| Republic of Korea            | 17 August 1949                 |
| Romania                      | 8 June 1948                    |
| Rwanda                       | 7 November 1962                |
| Saudi Arabia                 | 26 May 1947                    |
| Senegal                      | 31 October 1960                |
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| Singapore                    | 25 February 1966               |
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| South Africa                 | 7 August 1947                  |
| Spain                        | 28 May 1951                    |
| Sudan                        | 14 May 1956                    |
| Sweden                       | 28 August 1947                 |
| Tanzania                     | 26 March 1947                  |
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| Togo                         | 13 May 1960                    |
| Trinidad and Tobago          | 3 January 1963                 |
| Tunisia                      | 14 May 1956                    |
| Turkey                       | 2 January 1948                 |
| Uganda                       | 7 March 1963                   |
| Ukrainian SSR                | 3 April 1948                   |
| United Kingdom of Great Britain | 22 July 1946               |
| United Republic of Tanzania  | 15 March 1962                  |
| United States of America     | 21 June 1948                   |
| Upper Volta                   | 4 October 1960                 |
| Uruguay                      | 22 April 1949                  |
| Venezuela                     | 7 July 1948                    |
| Viet-Nam                      | 17 May 1950                    |
| Western Samoa                 | 16 May 1962                    |
| Yemen                        | 20 November 1953               |
| Yugoslavia                    | 19 November 1947               |
| Zaire                        | 24 February 1961               |
| Zambia                        | 2 February 1963                |

Associate Member

Southern Rhodesia            | 16 May 1950  

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* Member States that have acceded to the Convention on the Privileges and Immunities of the Specialized Agencies and its Annex VII.

1 Qatar, which was admitted to associate membership on 5 March 1964, became an independent State during 1971.

2 Southern Rhodesia’s associate membership is regarded as in suspense.
## Annex 2

### MEMBERSHIP OF THE EXECUTIVE BOARD

#### 1. Forty-seventh Session (Geneva, 19-29 January 1971)

<table>
<thead>
<tr>
<th>Designated by</th>
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<tbody>
<tr>
<td>Dr H. ABDUL-GHAFFAR</td>
<td>Saudi Arabia</td>
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<tr>
<td>Dr J. ANOUTI, Vice-Chairman</td>
<td>Lebanon</td>
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<td>Dr D. ARNAUDOV</td>
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<td>Central African Republic</td>
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<td>Dr A. BENADOUDA</td>
<td>Algeria</td>
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<tr>
<td>Dr S. P. EHRlich JR</td>
<td>United States of America</td>
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<tr>
<td>Mr Y. WOLDE-GERIMA</td>
<td>Ethiopia</td>
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<tr>
<td>Dr J. H. GESA</td>
<td>Uganda</td>
</tr>
</tbody>
</table>

- Sir George GODBER, United Kingdom of Great Britain and Northern Ireland
- Professor S. HALTER, Belgium
- Dr Y. R. JOSHI, Nepal
- Dr B. JURICIC, Chairman, Chile
- Dr B. D. B. LAYTON, Vice-Chairman, Canada
- Dr Z. ONYANGO, Kenya
- Dr O. SOUVANNAVONG, Laos
- Dr D. Terrefe, alternate, attended the session.
- Dr O. Egas Cevallos, alternate, attended the session.
- Dr O. P. Szepin, alternate, attended the session.

#### 2. Forty-eighth Session (Geneva, 24-25 May 1971)

The Twenty-fourth World Health Assembly in resolution WHA24.7 elected Denmark, Ecuador, Italy, Lesotho, Syrian Arab Republic, Thailand, Trinidad and Tobago, and Uruguay to designate persons to serve on the Board in place of the retiring members — designated by Belgium, Canada, Chile, Jamaica, Lebanon, Mongolia, Uganda and the United Kingdom of Great Britain and Northern Ireland. This resulted in the following composition of the Board at the forty-eighth session:

<table>
<thead>
<tr>
<th>Designated by</th>
<th>Designated by</th>
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<tbody>
<tr>
<td>Dr H. ABDUL-GHAFFAR, Rapporteur</td>
<td>Saudi Arabia</td>
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<tr>
<td>Dr Esther AMMUNSEN</td>
<td>Denmark</td>
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<tr>
<td>Dr D. ARNAUDOV</td>
<td>Bulgaria</td>
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<tr>
<td>Professor E. J. AUJALEU</td>
<td>France</td>
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<tr>
<td>Dr D. AVILÉS</td>
<td>Nicaragua</td>
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<tr>
<td>Dr A. BARRAUD, Vice-Chairman</td>
<td>Upper Volta</td>
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<td>Dr F. A. BAUHOFER</td>
<td>Austria</td>
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<td>Dr S. BÉDAYA-NGARO</td>
<td>Central African Republic</td>
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<td>Dr A. BENADOUDA</td>
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<td>Dr S. P. EHRlich JR, Chairman</td>
<td>United States of America</td>
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<tr>
<td>Dr Y. WOLDE-GERIMA</td>
<td>Ethiopia</td>
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<td>Dr C. HEMACHUDHA</td>
<td>Thailand</td>
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<td>Dr M. U. HENRY</td>
<td>Trinidad and Tobago</td>
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<td>Dr Y. R. JOSHI</td>
<td>Nepal</td>
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<td>Dr J. L. MOLAP</td>
<td>Lesotho</td>
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<td>Dr Z. ONYANGO</td>
<td>Kenya</td>
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<td>Dr F. PARRA GIL</td>
<td>Ecuador</td>
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<td>Dr N. RAMZI</td>
<td>Syrian Arab Republic</td>
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<tr>
<td>Dr A. SÁENZ SANGUINETTI, Rapporteur</td>
<td>Uruguay</td>
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<tr>
<td>Dr O. SOUVANNAVONG</td>
<td>Laos</td>
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<tr>
<td>Professor R. VANNUGLI</td>
<td>Italy</td>
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<tr>
<td>Dr V. P. VASSILOPOULOS, Vice-Chairman</td>
<td>Cyprus</td>
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<tr>
<td>Dr D. D. VENEDIKTOV</td>
<td>Union of Soviet Socialist Republics</td>
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<tr>
<td>Professor K. YANAGISAWA</td>
<td>Japan</td>
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</tbody>
</table>

- Dr C. Hemachudha, alternate, attended the session.
- Dr M. U. Henry, alternate, attended the session.
- Dr Y. R. Joshi, alternate, attended the session.
- Dr J. L. Molapo, alternate, attended the session.
- Dr N. Ramzi, alternate, attended the session.
- Dr A. Sáenz Sanguinetti, alternate, attended the session.
- Dr O. Souvannavong, alternate, attended the session.
- Dr V. P. Vasilopoulos, alternate, attended the session.

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1 Dr J. M. Aashy, alternate, attended the session.
2 Dr G. Diawara, alternate, attended the session.
3 Unable to attend.
4 Dr D. Terrefe, alternate, attended the session.
5 Dr O. Egas Cevallos, alternate, attended the session.
6 Dr O. P. Szepin, alternate, attended the session.
Annex 3

ORGANIZATIONAL AND RELATED MEETINGS IN 1971

Executive Board, forty-seventh session: Standing Committee on Administration and Finance
Executive Board, forty-seventh session
Executive Board, forty-seventh session: Standing Committee on Non-governmental Organizations
Executive Board, forty-seventh session: Committee on Arrears of Contributions in respect of the Office International d'Hygiène Publique
Executive Board: Ad Hoc Committee
Twenty-fourth World Health Assembly
Executive Board, forty-eighth session
Executive Board, forty-eighth session: Committee on Arrears of Contributions in respect of the Office International d’Hygiène Publique
Regional Committee for Africa, twenty-first session
Regional Committee for Europe, twenty-first session
Regional Committee for the Eastern Mediterranean: Sub-Committee A

Regional Committee for the Western Pacific, twenty-second session
Regional Committee for the Americas, twenty-third session/XX Meeting of the Directing Council of PAHO

Regional Committee for South-East Asia, twenty-fourth session

Annex 4

EXPERT ADVISORY PANELS AND COMMITTEES

1. EXPERT ADVISORY PANELS

The expert advisory panels in existence at 31 December 1971 were on the following subjects:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Panel Name</th>
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<tbody>
<tr>
<td>Air pollution</td>
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<tr>
<td>Antibiotics</td>
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<td>Bacterial diseases</td>
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<td>Biological standardization</td>
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<td>Brucellosis</td>
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<td>Cancer</td>
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<td>Cardiovascular diseases</td>
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<td>Chronic degenerative diseases</td>
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<td>Dental health</td>
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<td>Drug dependence</td>
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<td>Drug evaluation</td>
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<td>Environmental health</td>
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<td>Food additives</td>
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<td>Food hygiene</td>
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<td>Health education</td>
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<td>Health laboratory services</td>
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<td>Health of seafarers</td>
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<td>Health statistics</td>
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<td>Human genetics</td>
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<td>Human reproduction</td>
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<td>Immunology</td>
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<td>Insecticides</td>
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<tr>
<td>International pharmacopoeia and pharmaceutical preparations</td>
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<tr>
<td>International surveillance of communicable diseases</td>
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<tr>
<td>Leprosy</td>
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<td>Malaria</td>
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<tr>
<td>Maternal and child health</td>
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<tr>
<td>Medical research</td>
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<td>Mental health</td>
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<td>Nursing</td>
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<td>Nutrition</td>
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<td>Occupational health</td>
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<td>Organization of medical care</td>
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<tr>
<td>Parasitic diseases</td>
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<tr>
<td>Professional and technical education of medical and auxiliary personnel</td>
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<tr>
<td>Public health administration</td>
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<tr>
<td>Rabies</td>
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<td>Radiation</td>
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<td>Rehabilitation</td>
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<td>Trachoma</td>
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<td>Tuberculosis</td>
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<td>Veneral infections and treponematoses</td>
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<td>Virus diseases</td>
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<tr>
<td>Zoonoses</td>
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</tbody>
</table>

1 The Committee was disestablished by resolution EB48.R17.
2 See resolution WHA12.17.
2. EXPERT COMMITTEES

The membership of the expert committees that met in 1971 was as follows:

WHO Expert Committee on Yellow Fever

Entebbe, 9-15 March
Dr Solon de Camargo, Ministry of Health, Rio de Janeiro, Brazil
Professor W. G. Downs, Department of Epidemiology and Public Health, Yale University School of Medicine, New Haven, Conn., USA
Dr F. C. Grant, Epidemiological Division, Ministry of Health, Accra, Ghana
Dr J. Hamon, Chief, Entomological Mission, Office de la Recherche scientifique et technique outre-mer (ORSTOM) auprès de l'Organisation de Coordination et Coopération pour la Lutte contre les Grandes Endémies (OCCGE), Centre Muraz, Bobo Dioulasso, Upper Volta
Dr G. W. Kafuko, East African Virus Research Institute, Entebbe, Uganda
Dr Y. Robin, Institut Pasteur, Dakar, Senegal
Dr A. C. Sáenz, Director, National Institute of Microbiology, Buenos Aires, Argentina

WHO Expert Committee on Health Criteria for Water Supplies

Geneva, 30 March - 5 April
Dr K. I. Akulov, Deputy Minister of Health, Ministry of Health of the Russian Soviet Federal Socialist Republic, Moscow, USSR
Dr J. M. de Azevedo Netto, Professor of Sanitary Engineering, University of São Paulo, Brazil
Professor P. Bonnevie, Director, Institute of Social Medicine, University of Copenhagen, Denmark
Dr F. W. J. van Haaren, Head, Laboratories of the Municipal Waterworks of Amsterdam, Netherlands
Dr K. E. Hakim, Chairperson, Environmental Health Department, High Institute of Public Health, Alexandria, Egypt
Mr T. F. Hope, General Manager and Engineer-in-Chief, Guma Valley Water Company, Freetown, Sierra Leone
Mr C. D. Parker, Director, Water Science Laboratories (Pty) Ltd, Carlton, Victoria, Australia
Mr A. K. Roy, Chief Engineer, Local Self-Government Engineering Department, Lucknow, Uttar Pradesh, India

WHO Expert Committee on Insecticides

Geneva, 19-23 April
Dr J. Hamon, Chief, Entomological Mission, Office de la Recherche scientifique et technique outre-mer (ORSTOM) auprès de l'Organisation de Coordination et Coopération pour la Lutte contre les Grandes Endémies (OCCGE), Centre Muraz, Bobo Dioulasso, Upper Volta
Dr Martha Archipovna Klisenko, Chief, Laboratory of Analytical Chemistry of Pesticides; Head, Department of Chemistry, All-Union Scientific Research Institute of Hygiene and Toxicology of Pesticides, Polymers and Plastics, Kiev, USSR
Dr J. W. Miles, Chief, Chemistry Section, Technical Development Laboratories, Laboratory Division, Center for Disease Control, Savannah, Ga., USA
Dr E. Paulini, Chief, Chemical Laboratory, Instituto Nacional de Endemias Rurais, Centro de Pesquisas, Belo Horizonte, Brazil
Dr G. H. Sanai, Associate Professor of Chemistry and Toxicology, School of Public Health and Institute of Public Health Research, University of Teheran, Iran
Dr J. B. Shrivastav, Director-General of Health Services, Government of India, New Delhi, India
Dr E. M. Thain, Deputy Director, Tropical Products Institute, London, England

WHO Expert Committee on Specifications for Pharmaceutical Preparations

Geneva, 26 April - 1 May
Dr T. Canbäck, Director of Chemical Research, Central Pharmaceuticals Laboratory, Solna, Sweden
Professor Y. I. C. Cohen, Director, Pharmaceutical Control Laboratory, Radio-elements Department, Atomic Energy Commission, Saclay, Essonne, France
Dr L. F. Dodson, Director, National Biological Standards Laboratory, Department of Health, Canberra, Australia
Mr C. A. Johnson, Scientific Director, British Pharmacopoeia Commission, London, England
Dr E. Lang, Ciba-Geigy S.A., Basle, Switzerland
Dr T. J. Macek, Director of Revision, United States Pharmacopoeia, Bethesda, Md., USA
Professor M. D. Maškovskij, Chairman, Pharmacopoeia Commission of the USSR, Ministry of Health of the USSR, Moscow, USSR
Dr R. B. Salama, Dean, Faculty of Pharmacy, University of Khartoum, Sudan

WHO Expert Committee on Solid Wastes Disposal and Control

Zurich-Dübendorf, 15-21 June
Professor S. J. Arcévala, Director, Central Public Health Engineering Research Institute, Nagpur, India
Mr M. Assar, Under-Secretary of State for Planning and Programmes, Ministry of Health, Teheran, Iran

Dr. L.-J. Coin, Chef de Service, Laboratoire d’Hygiène de la Ville de Paris, France

Dr. A. J. Dudarev, Chief Medical Officer, Leningrad Sanitation and Epidemiological Centre, Leningrad, USSR

Mr. R. Kojetinsky, Senior Councillor, Roads and Traffic Group, Municipal Directorate of Public Works, Vienna, Austria

Mr. T. F. Lye, Senior Public Health Engineer, Public Health Division, Ministry of Health, Singapore

Mr. D. F. Metzler, Deputy Commissioner, New York State Department of Environmental Conservation, Albany, N.Y., USA

Professor A. M. Wright, Senior Lecturer, Faculty of Engineering, University of Science and Technology, Kumasi, Ghana

WHO Expert Committee on Organization of Local and Intermediate Health Administrations

Geneva, 26 October - 2 November

Dr. S. L. Adesuyi, Chief Medical Adviser to the Federal Government, Federal Ministry of Health, Lagos, Nigeria

Dr. E. M. Backett, Head, Department of Community Health, University of Nottingham Medical School, Nottingham, England

Dr. C. J. Cummins, Director-General of Public Health of New South Wales, Department of Health, Sydney, New South Wales, Australia

Dr. F. Rizk Hassan, Under-Secretary of State, Ministry of Public Health, Cairo, Egypt

Dr. G. James, President, Mount Sinai Medical Center, New York, N.Y., USA

Dr. P. M. Kaul, formerly Assistant Director-General, World Health Organization; New Delhi, India

Dr. J. Kostrezewski, Professor of Epidemiology; Head, Department of Epidemiology, State Institute of Hygiene, Warsaw, Poland

WHO Expert Committee on Biological Standardization

Geneva, 3-9 November

Dr. I. Archetti, Chief, Virus Department, Istituto Superiore di Sanità, Rome, Italy

Dr. H. H. Cohen, Director, National Institute of Public Health, Utrecht, Netherlands

Dr. J. Desbordes, Directeur de la Section de Microbiologie, Laboratoire des Actions de Santé, Paris, France

Dr. N. K. Dutta, Director, Haffkine Institute, Bombay, India

Dr. L. Higy-Mandic, Chief, Department of Biological Standardization, Institute of Immunology, Zagreb, Yugoslavia

Dr. D. W. Howes, Chief Virologist, Viral Products Section, National Biological Standards Laboratory, Parkville, Melbourne, Victoria, Australia

Mr. J. L. Lightbown, Division of Biological Standards, National Institute for Medical Research, London, England

Dr. H. Mirchamsy, Associate Director, Razi State Institute, Teheran, Iran

Dr. R. Murray, Director, Division of Biologics Standards, National Institutes of Health, Bethesda, Md., USA

Dr. F. P. Nagler, Chief, Virus Laboratories, Department of National Health and Welfare, Ottawa, Ont., Canada

Dr. J. Spaun, Deputy Director, Department of Biological Standardization, Statens Seruminstitut, Copenhagen, Denmark

Unable to attend:

Dr. S. G. Dzagurov, Director, State Institute for the Control of Medical Biological Preparations (L. A. Tarasević Institute), Moscow, USSR

Professor D. G. Evans, Director, Lister Institute of Preventive Medicine, London, England

Professor H. O. Schild, Pharmacology Department, University College, London, England

WHO Expert Committee on Planning and Organization of a Health Laboratory Service

Geneva, 8-15 November

Dr. F. S. Boi-Doku, formerly Deputy Director of Medical Services, Ministry of Health, Accra, Ghana

Dr. L. Chambon, Deputy Director, Institut Pasteur, Paris, France

Sir James Howie, Director, Public Health Laboratory Service, London, England

Dr. P. M. Kaul, formerly Assistant Director-General, World Health Organization; New Delhi, India

Dr. P. Kokko, Director, Laboratory Division, Center for Disease Control, Atlanta, Ga., USA

Dr. W. Laurie, Director, Laboratory Service, Department of Public Health of Western Australia, Perth, Australia

Dr. I. Mesrobeanu, Professor of Microbiology, Institute of Medicine, Bucharest, Romania

Dr. A. Vilches, Professor of Microbiology and Parasitology, Faculty of Medical Sciences, University of Buenos Aires, Argentina

Unable to attend:

Dr. J. B. Shrivastav, Director-General of Health Services, Government of India, New Delhi, India

WHO Expert Committee on Smallpox Eradication

Geneva, 22-30 November

Dr. A. N. Bica, Secretary of Public Health, Ministry of Health, Rio de Janeiro, Brazil

Dr. R. Gispen, Director, National Institute of Public Health, Utrecht, Netherlands

Dr. F. C. Grant, Epidemiological Division, Ministry of Health, Accra, Ghana

Dr. S. S. Marennikova, Chief, Laboratory of Smallpox Prophylaxis, Institute of Viral Preparations, Moscow, USSR

Dr. I. F. Setiady, Chief, Directorate for the Control of Epidemics, Ministry of Health, Djakarta, Indonesia

Dr. M. Singh, Deputy Assistant Director-General (Smallpox), Directorate General of Health Services, New Delhi, India

Dr. P. F. Wehrle, Hastings Professor of Paediatrics; Director, Children’s Division, Los Angeles County, University of Southern California Medical Center, Los Angeles, Calif., USA

Joint FAO/WHO Expert Committee on Energy and Protein Requirements

Rome, 22 March - 2 April

Dr G. H. Beaton, Professor and Head, Department of Nutrition, School of Hygiene, University of Toronto, Ont., Canada
Dr C. Gopalan, Director, National Institute of Nutrition, Indian Council of Medical Research, Hyderabad, India
Dr A. E. Harper, Chairman, Department of Nutritional Sciences and Professor of Biochemistry, University of Wisconsin, Madison, Wis., USA
Dr D. M. Hegsted, Professor of Nutrition, School of Public Health, Harvard University, Boston, Mass., USA
Dr M. J. Karvonen, Director, Institute of Occupational Health, Helsinki, Finland
Dr K. Lindner, Deputy Director, Institute of Nutrition, Budapest, Hungary
Dr H. N. Munro, Professor of Physiological Chemistry, Department of Nutrition and Food Science, Massachusetts Institute of Technology, Cambridge, Mass., USA
Mr P. R. Payne, Senior Lecturer, London School of Hygiene and Tropical Medicine, London, England
Dr N. S. Scrimshaw, Head, Department of Nutrition and Food Science, Massachusetts Institute of Technology, Cambridge, Mass., USA
Professor J. Trémolières, Institut national de la Santé et de la Recherche médicale, Hôpital Bichat, Paris, France
Dr A. Valyasevi, Chairman, Department of Pediatrics, Faculty of Medicine, Ramathibodi Hospital, Bangkok, Thailand
Dr J. Waterlow, Professor of Human Nutrition, London School of Hygiene and Tropical Medicine, London, England

Joint FAO/WHO Expert Committee on Food Additives

Rome, 16-24 June

Professor B. Blanc, Director, Swiss Federal Dairy Science Institute, Liebefeld-Berne, Switzerland
Dr H. Blumenthal, Deputy Director, Division of Toxicology, Bureau of Foods, Food and Drug Administration, Washington, D.C., USA
Dr T. Cayle, Director of Research, Wallerstein Company, New York, N.Y., USA
Mr H. Chefiel, Chairman, Scientific Subcommittee, Permanent International Committee on Canned Foods, Paris, France
Dr H. Egan, Government Chemist, Department of Trade and Industry, London, England
Dr A. P. de Groot, Head, Department of Biology and Toxicology, Central Institute for Nutrition and Food Research, Zeist, Netherlands
Dr K. Kojima, Chief, Food Chemistry Division, Ministry of Health and Welfare, Tokyo, Japan
Mr H. P. Mollenhauer, Chief, International Food Section, Federal Ministry of Youth, Family and Health, Bad Godesberg, Federal Republic of Germany
Professor M. J. Rand, Department of Pharmacology, University of Melbourne, Victoria, Australia
Dr L. Schinetti, Director, Research Department, Società del Plasmon S.P.A., Milan, Italy
Professor R. C. Truhaut, Director, Toxicological Research Centre, Faculty of Pharmacy, University of Paris, France

Unable to attend:

Dr A. N. Zajc, Head, Laboratory for Research on the Health Aspects of Food Additives, Institute of Nutrition, Academy of Medical Sciences of the USSR, Moscow, USSR

Joint IAEA/WHO Expert Committee on the Medical Uses of Ionizing Radiation and Radioisotopes

Geneva, 26 October - 1 November

Dr T. S. Bunnag, Deputy Director, Chulalongkorn Memorial Hospital Medical School, Bangkok, Thailand
Professor R. H. Chamberlain, Department of Radiology, Hospital of the University of Pennsylvania, Philadelphia, Pa., USA
Dr J. T. Kofi Duncan, Department of Radiation Biology and Radiotherapy, College of Medicine, University of Lagos, Nigeria
Professor S. Halter, Secretary-General, Ministry of Public Health and Family Welfare, Brussels, Belgium
Professor C. Kellershohn, Service Hospitalier Frédéric Joliot, Hôpital d'Orsay, Essonne, France
Dr O. J. Machado, Chief, Radiotherapy Section, National Cancer Institute, Rio de Janeiro, Brazil
Professor I. A. Perelesgin, Head, Department of Roentgenology and Radiology, Second Moscow Medical Institute, Moscow, USSR
Dr El Sheikh Abdel Rahman, Director, Radiation and Isotopes Centre, Khartoum, Sudan
Sir Brian Windeyer, Vice-Chancellor, University of London, England

Joint Meeting of the FAO Working Party of Experts and the WHO Expert Committee on Pesticide Residues

Geneva, 22-29 November

Dr D. C. Abbott, Senior Superintendent, Environmental Chemistry, Laboratory of the Government Chemist, London, England
Dr A. F. H. Besemer, Pesticides Division, Plant Protection Service, Ministry of Agriculture, Wageningen, Netherlands
Mr W. Burns Brown, Pest Infestation Control Laboratory, Ministry of Agriculture, Fisheries and Food, Slough, Bucks., England
Professor F. Coulston, Director, Institute of Experimental Pathology and Toxicology, Albany Medical College, Union University, Albany, N.Y., USA
Dr K. R. Hill, Supervisory Chemist, Agricultural Research Service, Entomology Research Division, United States Department of Agriculture, Beltsville, Md., USA
Dr P. E. Koivistoinen, Director, Institute of Food Chemistry and Technology, University of Helsinki, Finland

Unable to attend:

Dr P. E. Koivistoinen, Director, Institute of Food Chemistry and Technology, University of Helsinki, Finland
ANNEX 4

Professor I. Nir, Head, Department of Clinical Pharmacology, Ministry of Health, Jerusalem, Israel
Dr Y. Omori, Head, Department of Pharmacology, National Institute of Hygienic Sciences, Tokyo, Japan
Dr E. Poulsen, Director, Institute of Toxicology, National Food Institute, Søborg, Denmark

Dr F. J. C. Roe, Research Co-ordinator, Tobacco Research Council, London, England
Mr J. T. Snelson, Pesticides Co-ordinator, Department of Primary Industry, Canberra, Australia
Professor R. C. Truhaut, Director, Toxicological Research Centre, Faculty of Pharmacy, University of Paris, France

3. MEETING OF A GROUP OF MEMBERS OF THE COMMITTEE ON INTERNATIONAL SURVEILLANCE OF COMMUNICABLE DISEASES FOR THE CONSIDERATION OF A DISPUTE

Geneva, 6-7 January

Dr S. J. Farsey, Senior Lecturer in Preventive Medicine, Makerere University Faculty of Medicine, Kampala, Uganda

Dr D. J. Sencer, Assistant Surgeon-General; Director, Center for Disease Control, Atlanta, Ga., USA
Dr I. Shigematsu, Chief, Department of Epidemiology, Institute of Public Health, Tokyo, Japan

4. ADVISORY COMMITTEE ON MEDICAL RESEARCH

The Advisory Committee on Medical Research was established pursuant to resolution WHA12.17.

Thirteenth Session, Geneva, 21-25 June

Professor M. Ayub Khan, Director, Army Medical Services, Islamabad, Pakistan
Professor L. L. Cavalli-Sforza, Department of Genetics, Stanford University Medical Center, Stanford, Calif., USA
Professor G. F. Gause, Director, Institute of New Antibiotics, Academy of Medical Sciences of the USSR, Moscow, USSR
Professor J. Hamburger, Clinique néphrologique de la Faculté de Médecine, Hôpital Necker, Paris, France
Professor T. A. Lambo, Vice-Chancellor, University of Ibadan, Nigeria
Professor A. M. Lwoff, Director, Institut de Recherches scientifiques sur le Cancer, Villejuif, Val-de-Marne, France
Professor A. Moga, President, Romanian Academy of Medical Sciences, Bucharest, Romania
Professor A. M. Lwoff, Director, Institut de Recherches scientifiques sur le Cancer, Villejuif, Val-de-Marne, France
Professor A. M. Lwoff, Director, Institut de Recherches scientifiques sur le Cancer, Villejuif, Val-de-Marne, France
Professor A. M. Lwoff, Director, Institut de Recherches scientifiques sur le Cancer, Villejuif, Val-de-Marne, France
Professor A. Moga, President, Romanian Academy of Medical Sciences, Bucharest, Romania
Professor M. Prywes, Vice-President, Hebrew University of Jerusalem, Israel
Lord Rosenheim, President, Royal College of Physicians, London, England

Professor N. S. Scrimshaw, Head, Department of Nutrition and Food Science, Massachusetts Institute of Technology, Cambridge, Mass., USA
Professor K. L. Standard, Head, Department of Social and Preventive Medicine, University of the West Indies, Kingston, Jamaica
Professor V. D. Timakov, President, Academy of Medical Sciences of the USSR, Moscow, USSR
Professor T. B. Turner, Dean Emeritus, Johns Hopkins University, Baltimore, Md., USA
Professor B. Uvnäs, Head, Department of Pharmacology, Karolinska Institute, Stockholm, Sweden
Professor P. N. Wahi, Director-General, Indian Council of Medical Research, New Delhi, India

Unable to attend:

Professor C. Chagas, Director, Institute of Biophysics, Federal University of Rio de Janeiro, Brazil
Dr H. Utena, Professor of Psychiatry, Department of Neuro-Psychiatry, Faculty of Medicine, University of Tokyo, Japan
Professor O. Westphal, Director, Max-Planck Institute for Immunobiology, Freiburg-im-Breisgau, Federal Republic of Germany

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1 Convened in accordance with Article 112 of the International Sanitary Regulations (1951).
Annex 5

SCIENTIFIC GROUP MEETINGS IN 1971

Scientific Group on Human Development and Public Health
Scientific Group on Treatment of Haemoglobinopathies and Allied Disorders
Scientific Group on the Genetic Aspects of Family Planning
Scientific Group on Research in Epidemiology and Communications Science
Scientific Group on Inherited Blood-Clotting Disorders
Scientific Group on the Standardization of Techniques for the Collection and Reporting of Data on Community Water Supply
Scientific Group on the Mental Health Aspects of Human Reproduction
Scientific Group on Clinical Immunology
Scientific Group on Oral Enteric Bacterial Vaccines
Scientific Group on Opiates and their Alternates for Pain and Cough Relief
Scientific Group on Prevention, Treatment and Rehabilitation in Genetic Disorders
Scientific Group on the Etiology and Prevention of Dental Caries
Scientific Group on Vector Ecology

Annex 6

WHO REFERENCE CENTRES

The institutions that served or were designated as international or regional reference centres during 1971 are listed below under the following headings:

Air pollution
Antibiotics
Arbovirus diseases
Biological standardization
Blood groups
Brucellosis
Cancer
Cardiovascular diseases
Cell cultures
Chemical reference substances
Enteric infections, bacterial
Enterovirus diseases
Epidemiology and communications science, research
Filarial
Food contaminants
Genetics, human
Immunology
Influenza
Leishmaniasis
Leprosy
Leptospirosis
Malaria
Meningococcal infections
Mental health
Mycoplasmas
Nutritional anaemias
Plague
Rabies
Radiation
Reproduction, human
Respiratory virus diseases other than influenza
Rheumatic diseases
Rickettssioses
Schistosomiasis
Serum reference banks
Smallpox
Staphylococcal infections
Statistics (Classification of diseases)
Streptococcal infections
Trachoma
Trypanosomiasis
Tuberculosis
Vector biology and control
Venereal infections and treponematoses
Wastes disposal
Water supply

Air Pollution
International Reference Centre for Clinical and Epidemiological Aspects of Air Pollution
Medical Research Council’s Air Pollution Research Unit, St Bartholomew’s Hospital Medical College, London, England

International Reference Centre on Air Pollution Control
Air Pollution Control Office, Environmental Protection Agency, Rockville, Md., USA

Regional Reference Centres on Air Pollution
Central Public Health Engineering Research Institute, Nagpur, India
Department of Community Environmental Sciences, Institute of Public Health, Tokyo, Japan

1 Scientific group reports published in 1971 are listed in Annex 10.
Department of Community Hygiene, Central Institute for Advanced Medical Studies, Ministry of Health of the USSR, Moscow, USSR

Antibiotics

International Centre for Information on Antibiotics
Laboratoire de Bactériologie et de Parasitologie, University of Liège, Belgium

Arbovirus Diseases

International Reference Centre for Arboviruses
Department of Virology, Queensland Institute of Medical Research, Brisbane, Australia
Institute of Virology, Bratislava, Czechoslovakia
Laboratoire des Arbovirus, Institut Pasteur, Paris, France
Virus Research Centre, Indian Council of Medical Research, Poona, India
Department of Virology and Rickettsiology, National Institute of Health, Tokyo, Japan
Institut Pasteur, Dakar, Senegal
East African Virus Research Institute, East African Common Services Organization, Entebbe, Uganda
Department for Arboviruses, Institute of Poliomyelitis and Viral Encephalitides, Moscow, USSR
Virology Section, Center for Disease Control, Atlanta, Ga., USA

Biological Standardization

International Laboratories for Biological Standards
Statens Seruminstitut, Copenhagen, Denmark
National Institute for Medical Research, London, England
Central Veterinary Laboratory, Ministry of Agriculture, Fisheries and Food, Weybridge, England

Blood Groups

International Blood Group Reference Laboratory
Medical Research Council's Blood Group Reference Laboratory, London, England

Brucellosis

FAO/WHO Brucellosis Centres
Commonwealth Serum Laboratories, Parkville, Victoria, Australia
State Veterinary Serum Laboratory, Copenhagen, Denmark
Central Veterinary Laboratory, Ministry of Agriculture, Fisheries and Food, Weybridge, England
Centre de Recherches sur la Fièvre ondulante, Montpellier, Hérault, France
Veterinary Microbiological Institute, Athens, Greece
Indian Veterinary Research Institute, Mukteswar-Kumaon, Uttar Pradesh, India
Institute of Hygiene, University of Florence Faculty of Medicine, Italy
National Institute of Animal Health, Tokyo, Japan
Medical Research Institute, General Hospital, Mexico City, Mexico
Institut Pasteur, Tunis, Tunisia
Institute of Veterinary Bacteriology and Serology, Istanbul, Turkey
Department of Medicine, University of Minnesota Medical School, Minneapolis, Minn., USA
State Laboratory of Hygiene, Rijeka, Yugoslavia

WHO Brucellosis Centre
Gamaleja Institute of Epidemiology and Microbiology, Moscow, USSR

Cancer

International Reference Centre for Comparative Oncology
Armed Forces Institute of Pathology, Washington, D.C., USA
International Reference Centre for Evaluation of Methods of Diagnosis and Treatment of Breast Cancer
Institut Gustave Roussy, Villejuif, Val-de-Marne, France
International Reference Centre for Evaluation of Methods of Diagnosis and Treatment of Female Genital Tract (Ovarian) Cancer
N. N. Petrov Research Institute of Oncology, Leningrad, USSR
International Reference Centre for Evaluation of Methods of Diagnosis and Treatment of Melanoma
National Institute for the Study and Treatment of Tumours, Milan, Italy
International Reference Centre for Evaluation of Methods of Diagnosis and Treatment of Stomach Cancer
National Cancer Centre Hospital, Tokyo, Japan
International Reference Centre for the Histopathological Nomenclature and Classification of Bone Tumours
Latin American Registry of Bone Pathology, Ostéo-articular Pathology Centre, Italian Hospital, Buenos Aires, Argentina
International Reference Centre for the Histopathological Nomenclature and Classification of Tumours of the Central Nervous System and Allied Structures
Department of General Neurology, Max-Planck Institute for Brain Research, Cologne, Federal Republic of Germany
International Reference Centre for the Histopathological Nomenclature and Classification of Gastro-oesophageal Tumours
Department of Pathology, University of Tokyo Faculty of Medicine, Tokyo, Japan
International Reference Centre for the Histopathological Nomenclature and Classification of Intestinal Tumours
Research Department, St Mark's Hospital, London, England
International Reference Centre for the Histopathological Nomenclature and Classification of Leukaemias and other Neoplastic Conditions of the Haematopoietic Cells
Institut de Cancérologie et d’Immunogénétique, Hôpital Paul-Brousse, Villejuif, Val-de-Marne, France

International Reference Centre for the Histopathological Nomenclature and Classification of Lung Tumours
Institute of General and Experimental Pathology, University of Oslo, Norway

International Reference Centre for the Histopathological Nomenclature and Classification of Male Urogenital Tract Tumours
Armed Forces Institute of Pathology, Washington, D.C., USA

International Reference Centre for the Histopathological Nomenclature and Classification of Mammary Tumours
Bland Sutton Institute of Pathology, Middlesex Hospital, London, England

International Reference Centre for the Histopathological Nomenclature and Classification of Odontogenic Tumours
Department of Oral Pathology, Royal Dental College, Copenhagen, Denmark

International Reference Centre for the Histopathological Nomenclature and Classification of Oral Precancerous Conditions
Department of Oral Pathology, Royal Dental College, Copenhagen, Denmark

International Reference Centre for the Histopathological Nomenclature and Classification of Oropharyngeal Tumours
Sarojini Najdu Medical College, Agra, Uttar Pradesh, India

International Reference Centre for the Histopathological Nomenclature and Classification of Ovarian Tumours
N. N. Petrov Research Institute of Oncology, Leningrad, USSR

International Reference Centre for the Histopathological Nomenclature and Classification of Salivary Gland Tumours
Bland Sutton Institute of Pathology, Middlesex Hospital, London, England

International Reference Centre for the Histopathological Nomenclature and Classification of Skin Tumours
Pathology Department, University of Western Australia, Perth, Australia

International Reference Centre for the Histopathological Nomenclature and Classification of Soft Tissue Tumours
Armed Forces Institute of Pathology, Washington, D.C., USA

International Reference Centre for the Histopathological Nomenclature and Classification of Thyroid Tumours
University Institute of Pathology, Cantonal Hospital, Zurich, Switzerland

International Reference Centre for the Histopathological Nomenclature and Classification of Uterine and Placental Tumours
Institute of Pathology, Municipal Hospital, Copenhagen, Denmark

International Reference Centre for Nomenclature in Cytology (Female Genital Tract)
Centre de Cytologie et de Dépistage du Cancer, Geneva, Switzerland

WHO/IARC International Reference Centre for the Provision of Frozen Transplantable Tumour Strains
Research Unit of Tumour Immunology, Karolinska Institute, Stockholm, Sweden

WHO/IARC International Reference Centre for the Provision and Study of Tumour-bearing Animals
Netherlands Cancer Institute, Amsterdam, Netherlands

Cardiovascular Diseases
International Reference Centre for Lipid Determination in Cardiovascular Research
Lipid Standardization Laboratory, Medical Laboratory Section, Center for Disease Control, Atlanta, Ga., USA

Research and Training Centre for Cardiovascular Diseases
Makerere University Faculty of Medicine, Kampala, Uganda

Cell Cultures
International Reference Centre for Cell Cultures
American Type Culture Collection, Rockville, Md., USA

Chemical Reference Substances
Centre for Chemical Reference Substances
Centre for Authentic Chemical Substances, Apotekens Central-laboratorium, Solna, Stockholm, Sweden

Enteric Infections, Bacterial
International Reference Centre for Enteric Phage-Typing
Central Public Health Laboratory, London, England

International Reference Centre for Escherichia
Statens Seruminstitut, Copenhagen, Denmark

International Reference Centre for Salmonella
Institut Pasteur, Paris, France

International Reference Centres for Shigella
Central Public Health Laboratory, London, England
Center for Disease Control, Atlanta, Ga., USA

International Reference Centre for Vibrios
Cholera Research Centre, Calcutta, India

Enterovirus Diseases
International Reference Centre for Enteroviruses
Department of Virology and Epidemiology, Baylor University College of Medicine, Houston, Tex., USA

Regional Reference Centres for Enteroviruses
Enterovirus Department, Statens Seruminstitut, Copenhagen, Denmark

Section de Virologie, Laboratoire national de la Santé publique, Lyons, France
Department of Enteroviruses, National Institute of Health, Tokyo, Japan
Department of Bacteriology, University of Singapore
Enterovirology Unit, Virology Section, Center for Disease Control, Atlanta, Ga., USA
Institute of Poliomyelitis and Viral Encephalitides, Moscow, USSR

Epidemiology and Communications Science, Research
Epidemiological Research Centre
Institute of Public Health Research, School of Public Health, University of Teheran, Iran

Filaria
International Reference Centre for Filarial Nematodes
Department of Parasitology, London School of Hygiene and Tropical Medicine, London, England

Food Contaminants
FAO/WHO International Reference Centre for Documentation on Marine Biotoxins
World Life Research Institute, Colton, Calif., USA

Genetics, Human
International Reference Centre for Abnormal Haemoglobins
Medical Research Council's Abnormal Haemoglobin Research Unit, University of Cambridge, England
International Reference Centre for Glucose-6-Phosphate Dehydrogenase
Department of Medicine, University of Washington, Seattle, Wash., USA
Regional Reference Centres for Glucose-6-Phosphate Dehydrogenase
Department of Haematology, Tel-Hashomer Government Hospital, Israel
Sub-Department of Haematology, University College Hospital, Ibadan, Nigeria
International Reference Centre for the Processing of Human Genetics Data
Population Genetics Laboratory, School of Medicine, University of Hawaii, Honolulu, Hawaii, USA
International Reference Centre for Serum Protein Groups
Zoology Department, University of Texas, Austin, Tex., USA

Immunology
International Reference Centre for Genetic Factors of Human Immunoglobulins
Centre départemental de Transfusion sanguine et de Génétique humaine, Bois-Guillaume, Seine-Maritime, France
Regional Reference Centres for Genetic Factors of Human Immunoglobulins
Department of Medical Microbiology, University of Lund, Sweden
Department of Biology, Western Reserve University, Cleveland, Ohio, USA
International Reference Centre for Immunoglobulins
Institut de Biochimie, University of Lausanne, Switzerland
Regional Reference Centre for Immunoglobulins
National Cancer Institute, National Institutes of Health, Bethesda, Md., USA
International Reference Centre for the Use of Immunoglobulin Anti-D in the Prevention of Rh Sensitization
Medical Research Council's Experimental Haematology Research Unit, St Mary's Hospital Medical School, London, England
International Reference Centre for the Serology of Autoimmune Disorders
Department of Immunology, Middlesex Hospital Medical School, London, England
Regional Reference Centres for the Serology of Autoimmune Disorders
The Walter and Eliza Hall Institute of Medical Research, Melbourne University, Victoria, Australia
Center for Immunology, School of Medicine, State University of New York at Buffalo, N.Y., USA
International Reference Centre for Testing of Natural Resistance Factors
Department of Immunology, Institute of Microbiology, Prague, Czechoslovakia
International Reference Centre for Tumour-Specific Antigens
Division of Immunology and Oncology, Gamaleja Institute of Epidemiology and Microbiology, Moscow, USSR
Research and Training Centres for Immunology
Instituto Butantan, São Paulo, Brazil
School of Medicine, American University of Beirut, Lebanon
Children's Hospital of Mexico, Mexico City, Mexico
Department of Chemical Pathology, University College Hospital, Ibadan, Nigeria
Faculty of Medicine, University of Singapore, Singapore
Institut de Biochimie, University of Lausanne, Switzerland
Research and Training Centre for Advanced Studies in Immunology
* Department of Chemical Immunology and Cell Biology, Weizmann Institute of Science, Rehovot, Israel

Influenza
World Influenza Centre
National Institute for Medical Research, London, England
International Influenza Centre for the Americas
Virology Section, Center for Disease Control, Atlanta, Ga., USA
Leishmaniasis

*International Reference Centre for Leishmaniasis*

Department of Parasitology, Hadassah Medical School, Jerusalem, Israel

Leprosy

*International Reference Centre for the Serology of Leprosy*

Department of Microbiology and Immunology, Ribeirão Preto Faculty of Medicine, University of São Paulo, Brazil

*International Reference Centre for the Histological Identification and Classification of Leprosy*

* Division of Dermatology, Ministry of Health and Social Welfare, Caracas, Venezuela

*Regional Reference Centres for Mycobacterium leprae*

Division of Bacteriology and Virus Research, National Institute for Medical Research, London, England

Virology Section, Center for Disease Control, Atlanta, Ga., USA

*Regional Reference Centres for the Standardization of Leprinolin*

Laboratory of Serology, National Institute for Leprosy Research, Tokyo, Japan

Leonard Wood Memorial Laboratory for Leprosy Research, Johns Hopkins University, Baltimore, Md., USA

Leptospirosis

*WHO/FAO Leptospirosis Reference Laboratories*

Laboratory of Microbiology and Pathology, State Health Department, Brisbane, Australia

London School of Hygiene and Tropical Medicine, London, England

Israel Institute for Biological Research, Ness-Ziona, Israel

Istituto Superiore di Sanità, Rome, Italy

National Institute of Health, Tokyo, Japan

Institute for Tropical Hygiene (Royal Tropical Institute), Amsterdam, Netherlands

Division of Veterinary Medicine, Walter Reed Army Medical Center, Washington, D.C., USA

*WHO Leptospirosis Reference Laboratory*

Gamaleya Institute of Epidemiology and Microbiology, Moscow, USSR

Malaria

*International Reference Centre for Malaria*

Laboratory of Parasite Chemotherapy, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Md., USA

*Regional Reference Centres for Malaria*

Horton Malaria Reference Laboratory, Epsom, England

National Institute of Communicable Diseases, New Delhi, India

*International Reference Centre for Avian Malaria Parasites*

Department of Biology, Memorial University of Newfoundland, St John's, Newfoundland, Canada

Regional Reference Centre for Screening of Potential Antimalarial Compounds

Department of Parasitology, Liverpool School of Tropical Medicine, Liverpool, England

Meningococcal Infections

*International Reference Centre for Meningococci*

Laboratoire de Microbiologie, Centre de Recherches du Service de Santé des Troupes de Marine, Marseilles, France

Mental Health

*International Reference Centre for Information on Psychotropic Drugs*

National Institute of Mental Health, Chevy Chase, Md., USA

*International Reference Centre for the Study of Adverse and Side Effects of Psychotropic Drugs*

Centre psychiatrique Sainte-Anne, Paris, France

*Regional Reference Centres for the Study of Psychotropic Drugs*

Faculty of Medicine, Hokkaido University, Sapporo, Japan

Clinique neuro-psychiatrique, Faculté mixte de Médecine et de Pharmacie, University of Dakar, Senegal

Psychiatric Clinic, Faculty of Medicine, University of Basle, Switzerland

Mycoplasmas

*International Reference Centre for Human Mycoplasmas*

Laboratory of Infectious Diseases, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Md., USA

*FAO/WHO International Reference Centre for Animal Mycoplasmas*

Institute of General Pathology, University of Aarhus Medical Faculty, Denmark

Nutritional Anaemias

*International Reference Centre for Anaemias*

School of Medicine, University of Washington, Seattle, Wash., USA

*Regional Reference Centres for Anaemias*

Department of Pathology, St Bartholomew’s Hospital Medical College, London, England

Venezuelan Institute for Scientific Research, Caracas, Venezuela

Plague

*International Reference Centre for Plague*

Central Asian Institute for Research on Plague Control, Alma-Ata, USSR

Rabies

*International Reference Centres for Rabies*

Institut Pasteur, Paris, France

Pasteur Institute of Southern India, Coonoor, India
Institute of Poliomyelitis and Viral Encephalitides, Moscow, USSR
Wistar Institute of Anatomy and Biology, Philadelphia, Pa., USA
Regional Reference Centre for Rabies in the Americas
Rabies Laboratory, Center for Disease Control, Atlanta, Ga., USA

Radiation
International Reference Centre on Environmental Radiation
Service central de Protection contre les Rayonnements ionisants, Le Vésinet, Yvelines, France
Regional Reference Centres for Secondary Standards in Radiation Dosimetry
Laboratory for Dosimetry, National Atomic Energy Commission, Buenos Aires, Argentina
* Department of Radiotherapy, Institute of Oncology, National Medical Centre of the Mexican Social Security Institute, General Hospital, Mexico City, Mexico
Radiation Hygiene Laboratory, Institute of Hygiene, Bucharest, Romania
Radiotherapy Department, Outram Road General Hospital, Singapore

Reproduction, Human
International Reference Centre for the Biology of Spermatozoa
Laboratory of Reproductive Pharmacology, New York Medical College, New York, N.Y., USA
International Reference Centre for Fertility Promoting Agents
Institute of Endocrinology, Tel-Hashomer Government Hospital, Israel
Research and Training Centre on Human Reproduction
Reproductive Endocrinology Research Unit, Karolinska Institute, Stockholm, Sweden

Respiratory Virus Diseases other than Influenza
International Reference Centres for Respiratory Viruses other than Influenza
Common Cold Research Unit, National Institute for Medical Research, Harvard Hospital, Salisbury, England
Laboratory of Infectious Diseases, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Md., USA
Regional Reference Centres for Respiratory Viruses other than Influenza
Fairfield Hospital Communicable Disease Centre, Melbourne, Victoria, Australia
Institute of Epidemiology and Microbiology, Prague, Czechoslovakia

Respiratory Virus Laboratory, National Institute of Health, Tokyo, Japan
Ivanovskij Institute of Virology, Moscow, USSR
Virology Section, Center for Disease Control, Atlanta, Ga., USA

Rheumatic Diseases
International Reference Centre for the Study of Connective Tissue Diseases
Hôpital Cochin, Paris, France
Regional Reference Centres for the Study of Connective Tissue Diseases
* Rheumatology Service, Medical Clinic, Faculty of Medicine, University of Barcelona, Spain
* Institute of Rheumatology, Academy of Medical Sciences of the USSR, Moscow, USSR
* Connective Tissue Division, Johns Hopkins University School of Medicine, Baltimore, Md., USA
* Medical Clinic, Faculty of Medicine, University of the Republic, Montevideo, Uruguay

Rickettsioses
Regional Reference Centres for Human Rickettsioses
Institute of Virology, Bratislava, Czechoslovakia
Rocky Mountain Laboratory, National Institute of Allergy and Infectious Diseases, Hamilton, Mont., USA

Schistosomiasis
Snail Identification Centre
Danish Bilharziasis Laboratory, Copenhagen, Denmark

Serum Reference Banks
Institute of Epidemiology and Microbiology, Prague, Czechoslovakia
National Institute of Health, Tokyo, Japan
Department of Epidemiology and Public Health, Yale University School of Medicine, New Haven, Conn., USA

Smallpox
International Reference Centre for Smallpox
Laboratory of Smallpox Prophylaxis, Research Institute of Virus Preparations, Moscow, USSR
Regional Reference Centre for Smallpox
Center for Disease Control, Atlanta, Ga., USA
International Reference Centre for Smallpox Vaccine
Virus and Ricketsial Diseases Laboratory, National Institute of Public Health, Utrecht, Netherlands
Regional Reference Centre for Smallpox Vaccine
Connaught Medical Research Laboratories, University of Toronto, Ont., Canada

Staphylococcal Infections

*International Reference Centre for Staphylococcal Phage-Typing*
Central Public Health Laboratory, London, England

Statistics (Classification of Diseases)

*International Reference Centres for the Classification of Diseases*
Section Information sur la Santé publique, Institut national de la Santé et de la Recherche médicale, Boulogne-sur-Seine, France
Department of Public Health Statistics, Semàňko Institute of Social Hygiene and Public Health Administration, Moscow, USSR
Latin American Centre for Classification of Diseases, Centro Simón Bolivar, Caracas, Venezuela

Streptococcal Infections

*International Reference Centre for Streptococcus Typing*
Streptococcus Reference Laboratory, Institute of Epidemiology and Microbiology, Prague, Czechoslovakia

Trachoma

*International Reference Centre for Trachoma*
Francis I. Proctor Foundation for Research in Ophthalmology, University of California Medical Center, San Francisco, Calif., USA

Trypanosomiasis

*International Reference Centre for Trypanosomiasis*
East African Trypanosomiasis Research Organization, Tororo, Uganda

Tuberculosis

*International Reference Centre for the Diagnosis of Tuberculosis*
Tuberculosis Research Institute, Prague, Czechoslovakia

Regional Reference Centre for the Diagnosis of Tuberculosis
Department of Tuberculosis, National Institute of Health, Tokyo, Japan

*International Reference Centre for BCG Seed-lots and Control of BCG Products*
BCG Department, Statens Seruminstitut, Copenhagen, Denmark

Regional Reference Centre for Bacteriology of Tuberculosis
National Tuberculosis Institute, El Algodonal, Caracas, Venezuela

Vector Biology and Control

*International Reference Centre for the Diagnosis of Diseases of Vectors*
Department of Zoology and Entomology, Ohio State University, Columbus, Ohio, USA

International Reference Centres for the Evaluation and Testing of New Insecticides
Toxicology Research Unit, Medical Research Council Laboratories, Carshalton, Surrey, England
Tropical Pesticides Research Unit, Salisbury, Wilts., England
Department of Entomology, College of Liberal Arts and Sciences, University of Illinois, Urbana, Ill., USA
Entomological Research Division, United States Department of Agriculture, Agricultural Research Service, Gainesville, Fla., USA
Technical Development Laboratories, Center for Disease Control, Savannah, Ga., USA
Mission entomologique, Centre Muraz, Bobo Dioulasso, Upper Volta

*International Reference Centre for Maintenance and Distribution of Standardized Strains of the Aedes Complex*
Department of Biology, University of Notre Dame, Ind., USA

*International Reference Centre for Maintenance and Distribution of Standardized Strains of Anopheles*
Ross Institute, London School of Hygiene and Tropical Medicine, London, England

*International Reference Centre for Maintenance and Distribution of Standardized Strains of the Culex pipiens Complex*
Institute of Genetics, Johannes Gutenberg University, Mainz, Federal Republic of Germany

*International Reference Centre for Maintenance and Distribution of Standardized Strains of Musca domestica*
Institute of Zoology, University of Pavia, Italy

Regional Reference Centres for the Biology and Distribution of Ticks
Institute of Parasitology, Prague, Czechoslovakia
United States Naval Medical Research Unit No. 3, Cairo, Egypt
Gamaleja Institute of Epidemiology and Microbiology, Moscow, USSR

Department of Zoology, University of Maryland, College Park, Md., USA

Venereal Infections and Treponematoses

*International Reference Centre for Endemic Treponematoses*
Institut Alfred-Fournier, Paris, France

*International Reference Centre for Gonococci*
Neisseria Department, Statens Seruminstitut, Copenhagen, Denmark

*International Treponematoses Laboratory Centre*
Johns Hopkins University, Baltimore, Md., USA

*International Reference Centres for the Serology of Treponematoses*
Treponematoses Research Laboratory, Statens Seruminstitut, Copenhagen, Denmark

Venereal Disease Research Laboratory, Center for Disease Control, Atlanta, Ga., USA
### Annex 7

**WHO COLLABORATIVE RESEARCH: CONTRACTS CONCLUDED WITH INSTITUTIONS FOR PROJECTS INITIATED IN 1971**

<table>
<thead>
<tr>
<th>Subject of Research</th>
<th>Region</th>
<th></th>
<th></th>
<th></th>
<th>Total</th>
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<tr>
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<td>Africa</td>
<td>The Americas</td>
<td>South-East Asia</td>
<td>Europe</td>
<td>Eastern Mediterranean</td>
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<td>Bacterial diseases (other than leprosy and tuberculosis)</td>
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<td>Biology, pharmacology and toxicology:</td>
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<td>Biological standardization</td>
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<td>Drug monitoring</td>
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<td>Drug safety</td>
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<td>Chronic and degenerative diseases:</td>
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<td>Environmental health:</td>
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<td>Occupational health</td>
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<td>Maternal and child health</td>
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<td>Parasitic diseases (other than malaria)</td>
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<td>Research in epidemiology and communications science</td>
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<td>Smallpox</td>
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<tr>
<td>Tuberculosis</td>
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<td>—</td>
<td>—</td>
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<td>Vector biology and control</td>
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</tr>
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<td>Venereal diseases and treponematoses</td>
<td>1</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Veterinary public health</td>
<td>—</td>
<td>5</td>
<td>—</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>Virus diseases (other than smallpox)</td>
<td>—</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td>21</td>
<td>54</td>
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### Annex 8

#### RESEARCH GRANTS AWARDED FOR TRAINING AND EXCHANGE IN 1971, BY SUBJECT AND TYPE OF GRANT

<table>
<thead>
<tr>
<th>Subject</th>
<th>Training grants</th>
<th>Grants for exchange of research workers</th>
<th>Total</th>
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<tbody>
<tr>
<td>Bacterial diseases (other than leprosy and tuberculosis)</td>
<td>2</td>
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<td>3</td>
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<tr>
<td>Biology, pharmacology and toxicology:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pharmacology</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Chronic and degenerative diseases:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cancer</td>
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<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Cardiovascular diseases</td>
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<td>3</td>
</tr>
<tr>
<td>Other chronic diseases</td>
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<td></td>
<td>1</td>
</tr>
<tr>
<td>Community health services</td>
<td></td>
<td>1</td>
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</tr>
<tr>
<td>Education and training:</td>
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<td></td>
</tr>
<tr>
<td>Postgraduate education</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Undergraduate education</td>
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<td>Environmental health:</td>
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<tr>
<td>Radiation health</td>
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<td>1</td>
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</tr>
<tr>
<td>Family health:</td>
<td></td>
<td></td>
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<tr>
<td>Human genetics</td>
<td>4</td>
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</tr>
<tr>
<td>Human reproduction</td>
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</tr>
<tr>
<td>Maternal and child health</td>
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</tr>
<tr>
<td>Immunology</td>
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<td>9</td>
</tr>
<tr>
<td>Leprosy</td>
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<td></td>
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</tr>
<tr>
<td>Malaria</td>
<td>1</td>
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</tr>
<tr>
<td>Mental health</td>
<td>4</td>
<td>5</td>
<td>9</td>
</tr>
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<td>Parasitic diseases (other than malaria)</td>
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<td>6</td>
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<tr>
<td>Research in epidemiology and communications science:</td>
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</tr>
<tr>
<td>Behavioural science</td>
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<td>Numerical analysis</td>
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</tr>
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<td>Research in epidemiology</td>
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<td>1</td>
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<tr>
<td>Vector biology and control</td>
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<td>Veterinary public health</td>
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<td>Virus diseases (other than smallpox)</td>
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<td><strong>Total</strong></td>
<td><strong>59</strong></td>
<td><strong>38</strong></td>
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1 In addition, three research grants were awarded, supported by the Swedish National Association against Heart and Chest Diseases.
## Annex 9

**Fellowships Awarded, by Subject of Study and by Region,**
1 December 1970 - 30 November 1971

<table>
<thead>
<tr>
<th>Subject of Study</th>
<th>Region</th>
<th>Africa</th>
<th>The Americas</th>
<th>South-East Asia</th>
<th>Europe</th>
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<td>80</td>
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<td>114</td>
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<td><strong>Percentage</strong></td>
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### Annex 9 (continued)

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<th>Subject of Study</th>
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<td>Other communicable diseases</td>
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<td>Laboratory services</td>
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<td><strong>Percentage</strong></td>
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</tr>
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<td><strong>Sub-total — Clinical Medicine</strong></td>
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<td><strong>Sub-total — Basic Medical Sciences and Medical and Allied Education</strong></td>
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<td>93</td>
</tr>
<tr>
<td><strong>Total — Clinical Medicine, Basic Medical Sciences and Medical and Allied Education</strong></td>
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<td>99</td>
</tr>
<tr>
<td><strong>Percentage</strong></td>
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<td>17</td>
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<td><strong>GRAND TOTAL</strong></td>
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PUBLICATIONS ISSUED IN 1971

MONOGRAPH SERIES
38  Insecticide Resistance in Arthropods, by A. W. A. Brown & R. Pal, second edition (E)
57  Interactions of Nutrition and Infection, by N. S. Scrimshaw, C. E. Taylor & J. E. Gordon (F, R)
58  The Teaching of Public Health in Europe, by J. D. Cottrell in collaboration with B. Kesić & R. Senault (F, R)
60  Waste Stabilization Ponds, by E. F. Gloyna (E)

PUBLIC HEALTH PAPERS
34  Principles and Practice of Screening for Disease, by J. M. G. Wilson & G. Jungner (R)
36  A Medical Review of the Nature and Uses of Examinations in Medical Education, by J. Charvat, C. McGuire & V. Parsons (R)
37  The Assessment of Biological Age in Man, by F. Bourlière (R)
40  Principles and Practice of Cholera Control, by various authors (R, S)
41  Mental Health of Adolescents and Young Persons, report on a Technical Conference, by A. R. May, J. H. Kahn & B. Cronholm (E, F, S)
42  The Prevention of Perinatal Morbidity and Mortality, report on a Seminar (F)
43  Principles of Health Planning in the USSR, by G. A. Popov (E)
44  Planning and Programming for Nursing Services (E)
45  Mass Health Examinations (E)

TECHNICAL REPORT SERIES
395  Hospital Administration, report of a WHO Expert Committee (R)
399  Microbiological Aspects of Food Hygiene, report of a WHO Expert Committee with the participation of FAO (R)
400  Paediatric Research, report of a WHO Scientific Group (R)
408  Respiratory Viruses, report of a WHO Scientific Group (R)
409  Planning and Evaluation of Health Education Services, report of a WHO Expert Committee (R)
410  Urban Air Pollution with particular reference to Motor Vehicles, report of a WHO Expert Committee (R)
411  Comparative Studies of American and African Trypanosomiasis, report of a WHO Scientific Group (R)
413  WHO Expert Committee on Biological Standardization, twenty-first report (R)
424  Developments in Fertility Control, report of a WHO Scientific Group (R)
433  Parastiology of Malaria, report of a WHO Scientific Group (S)
437  WHO Expert Committee on Drug Dependence, seventeenth report (R)
438  Genetic Factors in Congenital Malformations, report of a WHO Scientific Group (R, S)
441  The Pathological Diagnosis of Acute Ischaemic Heart Disease, report of a WHO Scientific Group (R)
443  Insecticide Resistance and Vector Control, seventeenth report of the WHO Expert Committee on Insecticides (S)
444  WHO Expert Committee on Biological Standardization, twenty-second report (R, S)
446  Clinical Pharmacology: Scope, Organization, Training, report of a WHO Study Group (R)
447  WHO Expert Committee on Plague, fourth report (R)
448  Factors Regulating the Immune Response, report of a WHO Scientific Group (R, S)
450  Biological Research in Schizophrenia, report of a WHO Scientific Group (S)
452  Requirements of Ascorbic Acid, Vitamin D, Vitamin B12, Folate, and Iron, report of a Joint FAO/WHO Expert Committee (R, S)
454  Multipurpose Serological Surveys and WHO Serum Reference Banks, report of a WHO Scientific Group (S)
455  Treponematoses Research, report of a WHO Scientific Group (S)
456  Training in National Health Planning, report of a WHO Expert Committee (S)
457  Prevention of Perinatal Mortality and Morbidity, report of a WHO Expert Committee (S)
458  Pesticide Residues in Food, report of the 1969 Joint FAO/WHO Meeting (F, S)
459  WHO Expert Committee on Leprosy, fourth report (S)
460  WHO Expert Committee on Drug Dependence, eighteenth report (S)
461  Spontaneous and Induced Abortion, report of a WHO Scientific Group (S)
462  Evaluation of Food Additives, fourteenth report of the Joint FAO/WHO Expert Committee on Food Additives (E, F, S)
463  WHO Expert Committee on Biological Standardization, twenty-third report (E, F, S)
464  Joint FAO/WHO Expert Committee on Brucellosis, fifth report (E, F)
465  Application and Dispersal of Pesticides, eighteenth report of the WHO Expert Committee on Insecticides (E, S, F)
466  Methodology for Family Studies of Genetic Factors, report of a WHO Scientific Group (E, F, S)

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1 The language of issue is denoted as follows: C = Chinese; E = English; F = French; P = Portuguese; R = Russian; S = Spanish; E-F = English and French; E/S = bilingual edition.
Public Health Implications of Radioactive Waste Releases, by C. P. Staub (F)

The Education and Training of Engineers for Environmental Health, by various authors (F)

International Nonproprietary Names for Pharmaceutical Preparations: Cumulative List No. 3 (1971) (E, F)

World Health Organization Publications: Catalogue 1947-1971 (E)

PERIODICALS

World Health

Monthly (E, F, P, R, S)

WHO Chronicle

Volume 24, No. 5-12 (C)
Volume 24, No. 8-12 (R)
Volume 25, No. 1-12 (E, F, S)
Volume 25, No. 1-5 (C)
Volume 25, No. 1-8 (R)

Bulletin of the World Health Organization

Volume 41, No. 3-6 (R)
Volume 42, No. 1-6 (R)
Volume 43, No. 5-6 (E-F)
Volume 43, No. 1-6 (R)
Volume 44, No. 1-6 (E-F)
Volume 45, No. 1-2 (E-F)

Supplement to Vol. 44 of the Bulletin

Epidemiologie de la tuberculose et défayances de la lutte antituberculeuse chez l’enfant, by A. Lotte, S. Perdrizet & F. Hatton (F)

International Digest of Health Legislation

Volume 21, No. 3-4 (E, F)
Volume 22, No. 1-3 (E, F)

World Health Statistics Report

Volume 23, No. 12 (E/F)
Volume 24, No. 1-10 (E/F)

World Health Statistics Annual

1964 — Volume III (R)
1967 — Volume I (R)
1967 — Volume III (E/F)
1968 — Volume I (E/F)
1968 — Volume II (E/F)

TRANSLATED WHO PUBLICATIONS ISSUED BY OTHER PUBLISHERS IN 1971

Public Health Papers

10 Control of Soil-transmitted Helminths, by P. C. Beaver
31 A Guide for Staffing a Hospital Nursing Service, by Marguerite Paetznick
33 The Physiological Basis of Health Standards for Dwellings, by M. S. Goromosov
40 Principles and Practice of Cholera Control [Supplement only]

Technical Report Series

225 Public Health Aspects of Housing, first report of the Expert Committee
254 Public Health Responsibilities in Radiation Protection, fourth report of the Expert Committee on Radiation
319 WHO Expert Committee on Leprosy, third report

Organization of Services for the Mentally Retarded, fifteenth report of the WHO Expert Committee on Mental Health
Streptococcal and Staphylococcal Infections, report of a WHO Expert Committee
Statistics of Health Services and of their Activities, thirteenth report of the WHO Expert Committee on Health Statistics
National Environmental Health Programmes: Their Planning, Organization and Administration, report of a WHO Expert Committee
Programmes of Analysis of Mortality Trends and Levels, report of a Joint United Nations/WHO Meeting

European Standards for Drinking-Water, second edition

PUBLICATIONS ISSUED BY THE PAN AMERICAN HEALTH ORGANIZATION IN 1971

120 El control de las enfermedades transmisibles en el hombre, fourth printing (S)

Procedimientos para la investigación de brotes de enfermedades transmitidas por alimentos, second printing (S)

Elements of a Food and Nutrition Policy in Latin America, second printing (E)

Grupo de Estudio sobre la Coordinación de la Atención Médica, second printing (S)

Nutrición materna y planificación de la familia en las Américas, second printing (S)
218 III Inter-American Meeting on Foot-and-Mouth Disease and Zoonoses Control (E, S)
219 Manual of Descriptive Study Methods in Nursing by Phyllis J. Verhonick (E, S)
220 Venereal Diseases as a National and International Health Problem—Technical Discussions of the XVIII Pan American Sanitary Conference (E, S)
221 Grupo de Trabajo sobre Protección Radiológica (S)
222 Metabolic Adaptation and Nutrition (E)
223 Reported Cases of Notifiable Diseases in the Americas, 1968 (E, S)
224 Conferencia Latinoamericana sobre Rehabilitación de Inválidos (S)
225 Seminar on Drug Control in the Americas (E, S)
226 International Conference on the Application of Vaccines against Viral, Rickettsial, and Bacterial Diseases of Man—Proceedings (E)
227 Facts on Health Progress, 1971 (E, S)
228 Guide for the Reports on the Aedes aegypti Eradication Campaign in the Americas (E, S)
229 Exámenes radiológicos. Guía para el uso profesional (S)
230 Clasificación de operaciones quirúrgicas y de otros procedimientos terapéuticos y diagnósticos (S)
231 Environment, Ecology, and Epidemiology, by Reuel A. Stallones (E, S)
232 Conferencia de Escuelas de Salud Pública sobre Salud y Población (S)

OFFICIAL DOCUMENTS SERIES

108 XVIII Pan American Sanitary Conference; WHO Regional Committee, XXII Meeting—Minutes of Plenary sessions and of the Committees, and Annexes (E, S)
110 Executive Committee of the Pan American Health Organization, 65th and 66th Meetings—Final Reports and Précis Minutes (E, S)

OTHER PUBLICATIONS

Handbook of Resolutions of the Governing Bodies of the Pan American Health Organization (January 1942-October 1970) (E, S)
Sugerencias para la Organización de los Servicios de Biblioteca de una Escuela de Medicina (Biblioteca Regional de Medicina) (S)

PUBLICATIONS OF THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER IN 1971

Annual Report, 1970 (E, F)
Liver Cancer—Proceedings of a Working Conference (IARC Scientific Publications No. 1) (E)

Annex 11

WHO LIBRARY STATISTICS, 1971

Acquisitions

Periodicals received:
by subscription ........................................ 878
by exchange with WHO publications ................. 1 417
by gift .................................................. 862
Annual reports received .................................. 2 113
Books and pamphlets ordered ......................... 1 610
Books and pamphlets received ......................... 3 207
Volumes bound ........................................... 2 041

Catalogue

Titles catalogued ......................................... 2 789
Articles in journals indexed ............................ 12 584
Documents indexed ........................................ 6 243
Index cards filed .......................................... 70 316
Index cards distributed to Headquarters secretariat and Regional Offices .......................... 253 535

Loans

Lent to WHO secretariat .................................. 11 195
Lent to other libraries .................................... 6 029
Borrowed from other libraries ......................... 2 012
Periodicals circulated to WHO secretariat .......... 79 119
Photocopying (number of exposures) ................ 172 760
Items consulted in reading rooms .................... 45 232

Medical literature supply

Orders placed for:

Headquarters secretariat (number) .................... 556
Regional Offices (number) ............................. 2 275

Duplicates distributed to Regional Offices and to other libraries .............................. 1 506
NON-GOVERNMENTAL ORGANIZATIONS IN OFFICIAL RELATIONS WITH WHO
at 31 December 1971

Biometric Society
Christian Medical Commission
Council for International Organizations of Medical Sciences
Inter-American Association of Sanitary Engineering
International Academy of Legal Medicine and of Social Medicine
International Air Transport Association
International Association for Accident and Traffic Medicine
International Association of Agricultural Medicine
International Association for Child Psychiatry and Allied Professions
International Association of Logopedics and Phoniatrics
International Association of Medical Laboratory Technologists
International Association of Microbiological Societies
International Association for Prevention of Blindness
International Astronautical Federation
International Brain Research Organization
International Commission on Radiological Protection
International Commission on Radiation Units and Measurements
International Committee of Catholic Nurses
International Committee of the Red Cross
International Confederation of Midwives
International Council on Alcohol and Addictions
International Council on Jewish Social and Welfare Services
International Council of Nurses
International Council of Scientific Unions
International Council on Social Welfare
International Council of Societies of Pathology
International Denial Federation
International Diabetes Federation
International Epidemiological Association
International Federation of Gynecology and Obstetrics
International Federation for Housing and Planning
International Federation for Medical and Biological Engineering
International Federation of Medical Student Associations
International Federation of Multiple Sclerosis Societies
International Federation of Pharmaceutical Manufacturers Associations
International Federation of Physical Medicine
International Federation of Sports Medicine
International Federation of Surgical Colleges
International Fertility Association
International Hospital Federation
International Hydatidological Association
International League of Dermatological Societies
International League against Epilepsy
International League against Rheumatism
International Leprosy Association
International Organization against Trachoma
International Organization for Standardization
International Paediatric Association
International Pharmaceutical Federation
International Planned Parenthood Federation
International Society of Biometeorology
International Society of Blood Transfusion
International Society for Burn Injuries
International Society of Cardiology
International Society of Criminology
International Society of Hematology
International Society of Orthopaedic Surgery and Traumatology
International Society of Radiographers and Radiological Technicians
International Society of Radiology
International Society for Rehabilitation of the Disabled
International Solid Wastes and Public Cleansing Association
International Union of Architects
International Union against Cancer
International Union for Child Welfare
International Union for Health Education
International Union of Local Authorities
International Union of Nutritional Sciences
International Union of Pharmacology
International Union of Pure and Applied Chemistry
International Union of School and University Health and Medicine
International Union against Tuberculosis
International Union against the Venereal Diseases and the Treponematoses
International Water Supply Association
Joint Commission on International Aspects of Mental Retardation
League of Red Cross Societies
Medical Women's International Association
Permanent Commission and International Association on Occupational Health
Transplantation Society
World Confederation for Physical Therapy
World Federation of the Deaf
World Federation of Hemophilia
World Federation for Mental Health
World Federation of Neurology
World Federation of Occupational Therapists
World Federation of Public Health Associations
World Federation of Societies of Anaesthesiologists
World Federation of United Nations Associations
World Medical Association
World Psychiatric Association
World Union OSE
World Veterans Federation
World Veterinary Association

INTERGOVERNMENTAL ORGANIZATIONS WHICH HAVE ENTERED INTO FORMAL AGREEMENTS WITH WHO APPROVED BY THE WORLD HEALTH ASSEMBLY

International Committee of Military Medicine and Pharmacy
International Office of Epizootics
League of Arab States
Organization of African Unity
United International Bureaux for the Protection of Intellectual Property
Annex 13

REGULAR BUDGET FOR 1971

<table>
<thead>
<tr>
<th>Appropriation section</th>
<th>Purpose of appropriation</th>
<th>Amounts approved</th>
<th>Supplementary estimates</th>
<th>Transfers: increase (decrease)</th>
<th>Revised appropriations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>US $</td>
<td>US $</td>
<td>US $</td>
<td>US $</td>
</tr>
<tr>
<td>PART I. ORGANIZATIONAL MEETINGS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. World Health Assembly</td>
<td></td>
<td>537,684</td>
<td>—</td>
<td>16,000</td>
<td>553,684</td>
</tr>
<tr>
<td>2. Executive Board and its Committees</td>
<td></td>
<td>235,950</td>
<td>—</td>
<td>3,000</td>
<td>238,950</td>
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<tr>
<td>3. Regional Committees</td>
<td></td>
<td>126,900</td>
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<td>—</td>
<td>126,900</td>
</tr>
<tr>
<td><strong>Total — Part I</strong></td>
<td></td>
<td><strong>900,534</strong></td>
<td>—</td>
<td><strong>19,000</strong></td>
<td><strong>919,534</strong></td>
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<td>PART II. OPERATING PROGRAMME</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4. Programme Activities</td>
<td></td>
<td>60,571,050</td>
<td>1,521,446</td>
<td>(292,700)</td>
<td>61,799,796</td>
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<tr>
<td>5. Regional Offices</td>
<td></td>
<td>6,396,685</td>
<td>130,790</td>
<td>25,000</td>
<td>6,552,475</td>
</tr>
<tr>
<td>6. Expert Committees</td>
<td></td>
<td>216,800</td>
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<td>—</td>
<td>216,800</td>
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<tr>
<td><strong>Total — Part II</strong></td>
<td></td>
<td><strong>67,184,535</strong></td>
<td><strong>1,652,236</strong></td>
<td><strong>(267,700)</strong></td>
<td><strong>68,569,071</strong></td>
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<td>PART III. ADMINISTRATIVE SERVICES</td>
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<tr>
<td>7. Administrative Services</td>
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<td>4,881,231</td>
<td>87,764</td>
<td>220,000</td>
<td>5,188,995</td>
</tr>
<tr>
<td><strong>Total — Part III</strong></td>
<td></td>
<td><strong>4,881,231</strong></td>
<td><strong>87,764</strong></td>
<td><strong>220,000</strong></td>
<td><strong>5,188,995</strong></td>
</tr>
<tr>
<td>PART IV. OTHER PURPOSES</td>
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<td></td>
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<tr>
<td>8. Headquarters Building: Repayment of Loans</td>
<td></td>
<td>508,700</td>
<td>—</td>
<td>28,700</td>
<td>537,400</td>
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<tr>
<td><strong>Total — Part IV</strong></td>
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<td><strong>508,700</strong></td>
<td>—</td>
<td><strong>28,700</strong></td>
<td><strong>537,400</strong></td>
</tr>
</tbody>
</table>

**Effective Working Budget (Parts I, II, III and IV)**

| | | | | |
|---|---|---|---|
| 73,475,000 | 1,740,000 | — | 75,215,000 |

1 See resolutions WHA23.51, WHA23.13 and EB47.R3.
2 Approved by the Twenty-fourth World Health Assembly in resolution WHA24.10.
3 Transfers between appropriation sections made with the concurrence of the majority of the members of the Executive Board, in accordance with Financial Regulation 4.5.
# Annex 14

## NUMBERS AND DISTRIBUTION OF THE STAFF

### at 30 November 1970 and 30 November 1971

<table>
<thead>
<tr>
<th>Distribution</th>
<th>Staff as at 30 November 1970</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Regular</td>
<td>Other</td>
<td>Voluntary</td>
<td>IARC</td>
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<tr>
<td>International recruited</td>
<td>469</td>
<td>489</td>
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<tr>
<td>Locally recruited</td>
<td>696</td>
<td>701</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Headquarters</td>
<td>1165</td>
<td>1080</td>
<td>78</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>International recruited</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Locally recruited</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Regional offices</td>
<td>292</td>
<td>287</td>
<td>5</td>
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<tr>
<td>Internationally recruited</td>
<td>57</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Locally recruited</td>
<td>235</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Africa</td>
<td>300</td>
<td>295</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internationally recruited</td>
<td>37</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Locally recruited</td>
<td>52</td>
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<td></td>
</tr>
<tr>
<td>The Americas</td>
<td>89</td>
<td>85</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internationally recruited</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Locally recruited</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South-East Asia</td>
<td>184</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internationally recruited</td>
<td>35</td>
<td></td>
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<tr>
<td>Locally recruited</td>
<td>149</td>
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<tr>
<td>Europe</td>
<td>184</td>
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<td></td>
</tr>
<tr>
<td>Internationally recruited</td>
<td>50</td>
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</tr>
<tr>
<td>Locally recruited</td>
<td>111</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern Mediterranean</td>
<td>161</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internationally recruited</td>
<td>39</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Locally recruited</td>
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<tr>
<td>Western Pacific</td>
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<tr>
<td>Internationally recruited</td>
<td>33</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Locally recruited</td>
<td>88</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WHO representatives' and zone offices</td>
<td>121</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Internationally recruited</td>
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<tr>
<td>Locally recruited</td>
<td>109</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>149</td>
<td>149</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Excluding short-term consultants.

2 Including liaison offices.
Annex 14 (continued)

<table>
<thead>
<tr>
<th>Distribution</th>
<th>Staff as at 30 November 1970</th>
<th>Staff as at 30 November 1971</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Regular Budget</td>
</tr>
<tr>
<td><strong>Field staff in countries</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internationally recruited</td>
<td>912</td>
<td>680</td>
</tr>
<tr>
<td>Locally recruited</td>
<td>61</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>973</td>
<td>680</td>
</tr>
<tr>
<td><strong>International Agency for Research on Cancer</strong></td>
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<td></td>
</tr>
<tr>
<td>Internationally recruited</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>Locally recruited</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>75</td>
<td></td>
</tr>
<tr>
<td><strong>Inter-regional and other activities</strong></td>
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<td></td>
</tr>
<tr>
<td>Internationally recruited</td>
<td>70</td>
<td>62</td>
</tr>
<tr>
<td>Locally recruited</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>90</td>
<td>62</td>
</tr>
<tr>
<td><strong>3 447</strong></td>
<td>2 949</td>
<td>392</td>
</tr>
<tr>
<td><strong>Staff on loan to WHO, or on leave without pay</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>50</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Staff seconded to other organizations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>WHO GRAND TOTAL</strong></td>
<td>3 497</td>
<td>2 949</td>
</tr>
<tr>
<td><strong>PAHO GRAND TOTAL</strong></td>
<td>1 011</td>
<td></td>
</tr>
</tbody>
</table>

\(^a\) Including 9 agents in Zaire.

\(^b\) Including 8 agents in Zaire.
### Annex 15

#### COMPOSITION OF THE STAFF BY NATIONALITY

##### at 30 November 1971

<table>
<thead>
<tr>
<th>Country</th>
<th>WHO</th>
<th>PAHO</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>3</td>
<td>—</td>
<td>3</td>
</tr>
<tr>
<td>Argentina</td>
<td>20</td>
<td>27</td>
<td>47</td>
</tr>
<tr>
<td>Australia</td>
<td>33</td>
<td>—</td>
<td>33</td>
</tr>
<tr>
<td>Austria</td>
<td>15</td>
<td>—</td>
<td>15</td>
</tr>
<tr>
<td>Barbados</td>
<td>1</td>
<td>—</td>
<td>1</td>
</tr>
<tr>
<td>Belgium</td>
<td>36</td>
<td>3</td>
<td>39</td>
</tr>
<tr>
<td>Bolivia</td>
<td>8</td>
<td>9</td>
<td>17</td>
</tr>
<tr>
<td>Brazil</td>
<td>25</td>
<td>23</td>
<td>48</td>
</tr>
<tr>
<td>Bulgaria</td>
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<tr>
<td>Burma</td>
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<td>—</td>
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</tr>
<tr>
<td>Burundi</td>
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<td>—</td>
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</tr>
<tr>
<td>Cameroon</td>
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<tr>
<td>Canada</td>
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<tr>
<td>Ceylon</td>
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<td>Chile</td>
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<td>China</td>
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<tr>
<td>Colombia</td>
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<td>43</td>
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<tr>
<td>Congo</td>
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<tr>
<td>Costa Rica</td>
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<td>15</td>
<td>22</td>
</tr>
<tr>
<td>Cuba</td>
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<td>4</td>
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<tr>
<td>Cyprus</td>
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</tr>
<tr>
<td>Czechoslovakia</td>
<td>21</td>
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<tr>
<td>Dahomey</td>
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<td>Denmark</td>
<td>23</td>
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<td>24</td>
</tr>
<tr>
<td>Dominican Republic</td>
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<td>Ecuador</td>
<td>8</td>
<td>11</td>
<td>19</td>
</tr>
<tr>
<td>Egypt</td>
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<td>—</td>
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</tr>
<tr>
<td>El Salvador</td>
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<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Ethiopia</td>
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<td>—</td>
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</tr>
<tr>
<td>Federal Republic of Germany</td>
<td>53</td>
<td>2</td>
<td>55</td>
</tr>
<tr>
<td>Finland</td>
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<td>France</td>
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<td>Gabon</td>
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</tr>
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**GRAND TOTAL** 3643 1050 4693
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at 31 December 1971
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