WORLD HEALTH ORGANIZATION
ORGANISATION MONDIALE DE LA SANTE

A44/6
10 April 1991

FORTY-FOURTH WORLD HEALTH ASSEMBLY

Provisional agenda item 17.2

TUBERCULOSIS CONTROL PROGRAMME

Progress and evaluation report

An earlier version of this report was submitted to the Executive Board at its eighty-seventh session as document EB87/4. The present document provides updated information and reflects the Board's discussion. Following its review of the report, the Board recommended for adoption by the Forty-fourth World Health Assembly the draft resolution contained in resolution EB87.R7.[1]

CONTENTS

I. BACKGROUND

Epidemiological situation

1. Tuberculosis is one of the major causes of morbidity and mortality in the developing world. To understand its nature and magnitude more fully, a special study was undertaken in 1989/1990 to review official statistics and available data from both published and unpublished field studies.

---

[1] Document EB87/1991/REC/1, p. 9.

2. The summary findings of the study indicate that 1.7 thousand million people, or one-third of the world's population, have been or are infected with Mycobacterium tuberculosis, although not all of them develop the disease. The overall proportion of the total population infected in the industrialized and developing worlds is similar. However, 80% of infected individuals in industrialized countries are 50 years old or more, and 75% in developing countries are less than 50 years old. This stems from the differences in the past and current levels of transmission of infection, and the population structures in these two areas.

3. It is estimated that in 1990 eight million new tuberculosis cases will occur, 7.6 million cases (95%) in developing and 400 000 cases (5%) in industrialized countries. The largest numbers will occur in WHO's Western Pacific Region (2.6 million), South-East Asia Region (2.5 million), and African Region (1.4 million). The highest incidence will be in the African Region (272 cases per 100 000).

4. It is estimated that 2.9 million tuberculosis deaths will occur in 1990. This number makes tuberculosis the foremost cause of death from a single pathogen in the world. Although the highest number of deaths will occur in the South-East Asia Region (940 000), the Western Pacific Region (890 000), and the African Region (660 000), it is estimated that more than 40 000 tuberculosis deaths will still occur in the industrialized world (Table 1).

TABLE 1. THE GLOBAL TOLL OF TUBERCULOSIS

Region	People infected (in millions)	New cases	Deaths
Africa	171	1 400 000	660 000
Americas[1]	117	560 000	220 000
South-East Asia	426	2 480 000	940 000
Europe and other industrialized countries[2]	382	410 000	40 000
Eastern Mediterranean	52	594 000	160 000
Western Pacific[3]	574	2 560 000	890 000
Total	1 722	8 002 000	2 910 000

[1] Excluding USA and Canada.
[2] USA, Canada, Japan, Australia, and New Zealand.
[3] Excluding Japan, Australia, and New Zealand.

5. There is a striking difference between kinds of tuberculosis sufferers in developing and in industrialized countries because of dissimilarity in the pathogenesis of tuberculosis in the two groups of countries. In the industrialized countries tuberculosis is mainly seen in the elderly and is caused by endogenous reactivation of infection contracted in the past. Only a small percentage of all cases are the result of recent infection. These occur mainly in ethnic minorities and migrants. In developing countries the risk of infection remains high and tuberculosis afflicts nearly all age groups. Although 1.3 million cases and 450 000 deaths from tuberculosis occur in children under 15 years of age in developing countries, the greatest incidence and mortality is concentrated in the economically most productive age group of the population (15-59 years). More than 80% of the tuberculosis toll in the developing world falls into this age group. Furthermore, it is estimated that tuberculosis accounts for 26% of avoidable adult deaths.

6. Countries can be divided into four groups in terms of the current level and past trend of the annual risk of infection and health resource availability.

TABLE 2. EPIDEMIOLOGICAL PATTERN OF TUBERCULOSIS

Countries/areas	Annual risk of infection		Health resource availability
	Current level (%)	Annual declining trend (%)	
A. Industrialized countries	0.1-0.01	> 10	Excellent
B. Middle-income countries in Latin America, West Asia and North Africa	0.5-1.5	5-10	Good
C. Middle-income countries in East and South-East Asia	1.0-2.5	< 5	Good
D. Sub-Saharan Africa and India Subcontinent	1.0-2.5	0.3	Poor

In industrialized countries (A), tuberculosis has been very rapidly declining as transmission, measured as the annual risk of infection, has diminished. But tuberculosis is still one of the most common notifiable infectious diseases. Furthermore, in many industrialized countries the declining trend has slowed down, and in some countries (Japan and the United States of America) it has been reversed. In some middle-income developing countries (B), tuberculosis has declined relatively rapidly and has begun to lose status as a major public health problem. In other middle-income developing countries (C), the decline is slow and tuberculosis still remains a major public health problem. In these countries, there is a higher frequency of drug-resistant patients than in other countries, due to the combination of poor quality of treatment in the national tuberculosis control programmes in the past and uncontrolled use of anti-tuberculosis drugs in the private sector. In the majority of low-income developing countries (D), almost no decline has been observed and the absolute number of cases is probably increasing due to population growth.

Current status of control activities

7. To assess the current status of tuberculosis control activities in developing countries, another special study was undertaken in 1989 which involved a review and analysis of available published and unpublished reports on tuberculosis control activities, as well as visits to programmes in more than 10 countries.

8. The results of the study indicate that the majority of countries do not have a built-in mechanism to monitor treatment outcomes. So far fewer than 15 countries have been identified with such a built-in monitoring system to produce, on a regular basis, crucial information on the percentage of patients cured, deceased or lost to follow-up. However, many countries have partial information on the outcome of treatment based on *ad hoc* surveys in a limited number of treatment centres.

9. In many developing countries fewer than half the tuberculosis patients who started treatment were cured or completed their treatment. However, four countries (Malawi, Mozambique, Nicaragua and the United Republic of Tanzania), which have a built-in system to monitor treatment outcomes, achieved a cure rate of over 80%. These excellent results were obtained with technical and financial assistance from the International Union Against Tuberculosis and Lung Disease.

10. It is roughly estimated that fewer than half the existing tuberculosis cases in developing countries, excluding China, have access to treatment services. This proportion varies considerably among different WHO regions as shown in Table 3.

TABLE 3. ESTIMATE OF TUBERCULOSIS SERVICES COVERAGE IN DEVELOPING COUNTRIES FROM 1980 TO 1989

Regions	Service coverage
	(%)
Africa	24
Americas[1]	42
South-East Asia	44
Eastern Mediterranean	70
Western Pacific[2]	88
Total	46

[1] Excluding Canada and USA.

[2] Excluding Australia, China, Japan and New Zealand.

There has been no significant change in the services coverage rate in any region over the past 15 years.

HIV and tuberculosis

11. It is estimated that more than 3 million people in the world are dually infected with tubercle bacilli and HIV, 2.4 million in sub-Saharan Africa alone. HIV infection is the highest risk factor so far identified that increases the likelihood of latent tuberculosis infection progressing to active disease by reducing the protection provided by cell-mediated immunity. Currently, less than 5% of the total global tuberculosis incidence is associated with HIV infection, the majority of cases being concentrated in only some 10 sub-Saharan African countries. However, the AIDS epidemic in these countries is having a devastating effect on tuberculosis control programmes, with up to 100% increases in reported tuberculosis cases in the past four to five years. There are more demands for diagnostic services, anti-tuberculosis drugs, hospital beds and other supplies and services in areas where they are already in short supply. HIV-infected persons show a higher frequency of extrapulmonary tuberculosis, which is more difficult to diagnose than pulmonary tuberculosis. Also, because HIV-infected persons have, in certain instances, adverse reactions to drugs, particularly thioacetazone, patient management will become increasingly difficult. In countries where HIV infection is endemic, BCG vaccination of the newborn is particularly indicated, even for those born to mothers known or suspected to be HIV-infected, provided the infant is asymptomatic for AIDS. The risk of tuberculosis in such infants is substantially increased. Although some 25% of them may be HIV-infected, available data suggest that the risk of their contracting tuberculosis is about 500 times greater than the risk of serious adverse reactions to the vaccination.

II. PROGRAMME OBJECTIVES AND TECHNICAL POLICY

12. The objectives of the control programme are: to reduce the mortality caused by tuberculosis; to reduce the prevalence of the disease, which is currently estimated at more than 20 million in the world; and to reduce the incidence of the disease.

13. WHO's tuberculosis control policy (case-finding and treatment, with priority on sputum-positive infectious cases, and BCG vaccination at birth) was formulated more than a quarter of a century ago, with the aim of achieving the above three objectives. It was based on a relatively comprehensive understanding of the natural history and epidemiology of the disease, and on the availability of relatively effective and simple intervention technologies. Since then, there have been no major policy changes, except that it was realized that the epidemiological impact of mass BCG vaccination had been grossly overestimated. Although BCG prevents childhood tuberculosis, particularly the most severe forms (more than 50 000 deaths in children up to 4 years of age can be prevented by increasing BCG coverage from the current 81% to 90%), its preventive effect on the infectious types of adult tuberculosis is limited. BCG vaccination therefore does not contribute significantly to reducing the transmission of infection. Otherwise, from a scientific perspective, this policy is basically sound enough to achieve the programme objectives for countries where the risk of infection remains substantial.

14. In fact, the control policy was successfully implemented in the industrialized countries and in some middle-income developing countries, leading to the rapid decrease of tuberculosis problems. For example, in western European countries, the annual rate of decline of tuberculosis incidence, after the implementation of modern tuberculosis control, reached 10%-15%, compared with 4%-5% as a result of the improvement in general socioeconomic conditions (housing, nutrition, etc.) and the isolation of tuberculosis patients in sanatoria in the pre-control era. While the incidence in these industrialized countries has reached a very low level, its declining rate has recently slowed down since the cases now originate from the still large pool of persons infected in the past. Thus it should be realized that these countries are at a new stage of tuberculosis control in which the once very effective control strategy can no longer have the same impact. In order to eliminate tuberculosis (the working definition of elimination of tuberculosis is to achieve an incidence of less than 1 per million population) in the future, a new strategy is needed.

15. On the other hand, the implementation of the control policy in the majority of developing countries has not been successful. The main problem in most developing countries is, as described in paragraphs 8 to 10, that not "enough" tuberculosis patients are cured to achieve the objectives of the programme. This probably stems from a combination of the following factors:

- technical policies largely concentrate on "what should and could be done" in relatively well-developed health service systems or under special research settings, and often lack the component of "how to do it" under different types of settings;

- some of the intervention technologies, which are effective, simple, and affordable under well-developed health service systems, are not necessarily effective, simple and affordable under poorly developed health service systems;

- some of the technical policies appear to have been taken as a dogma (i.e. tuberculosis patients should not be hospitalized), so that result-oriented and local-specific innovative approaches tended to be discouraged.

III. PROGRAMME ACTIVITIES AND IMPLEMENTATION STATUS

16. In order to achieve its objectives, the programme is built around operational support and research and development. These components are closely linked to ensure that the research is geared to solving the problems that occur during the programme's implementation, and that the findings will be integrated into the programme.

Operational support

17. Operational support applies current information and intervention technologies to the prevention and control of tuberculosis under different epidemiological situations and health-service systems. WHO's main activities over the past two years have been the development of more effective tuberculosis control and elimination strategies, and training.

Strategy development

18. Given the current tuberculosis situation in the world, as described above, strategy development receives the highest priority. The aim is to elaborate a tuberculosis control and elimination strategy, which includes the setting of specific targets and the identification of key activities and their monitoring indicators, for the following groups of countries: low-income developing countries with still poorly developed health infrastructures; middle-income developing countries with relatively well-developed health infrastructures; industrialized countries and low tuberculosis incidence countries; and AIDS epidemic countries.

19. This outline for WHO's tuberculosis control/elimination strategy was elaborated on the basis of a series of workshops and case studies over the past two years. The prime objective of the control/elimination strategy is to improve the cure rate of tuberculosis patients under treatment, particularly sputum-positive infectious patients. This strategy will enable a cure rate of 85% to be targeted in developing countries and of 95% to be targeted in industrialized countries. Experience of tuberculosis control programmes in more than a dozen countries has clearly demonstrated that both the introduction of short-course chemotherapy in place of "standard" chemotherapy and improved management of the treatment system are necessary to achieve this 85% cure rate in developing countries without exceptionally well-developed or human-resource intensive health services systems. In addition, operational research has shown that short-course chemotherapy, which currently costs US$ 30-40 per patient, is more cost-effective than "standard" chemotherapy, which costs US$ 15. The reason is mainly that short-course chemotherapy makes it easier to overcome the main operational constraints to achieving a high cure rate by securing patient-compliance, reducing patient-load under treatment, preventing emergence of drug-resistant bacilli, particularly when combined tablets (isoniazid/rifampicin) are used.

20. However, as experienced on many occasions, the introduction of short-course chemotherapy does not automatically lead to an 85% cure rate without simultaneous improvement in the management of the treatment system. Two key factors for an improved management system are provision of regular anti-tuberculosis drug supplies to the treatment centres and rigorous cohort analysis of treatment outcome of all sputum-positive patients at all treatment centres. The analysis will show the health workers how well or poorly they are implementing the treatment activities.

21. The second objective, which should not be actively pursued until the first objective is achieved, is to expand tuberculosis services by fully utilizing the available health-services networks, at least down to district hospital level, in order to detect more cases, particularly sputum-positive cases. It should be realized that establishing a microscope centre beyond district hospital level is not necessarily effective. The reason is mainly that the prevalence of tuberculosis is usually much lower than that of common acute infectious diseases, such as diarrhoea and pneumonia, so that fewer than five sputum-positive cases can be expected in a year by a typical health centre in a developing country covering 10 000 inhabitants. In this situation, it is not easy to maintain a high quality of sputum microscopy examination.

22. The most effective factor for increasing the services coverage rate is a high cure rate of diagnosed cases, which can attract tuberculosis patients even from very remote areas. By achieving a high cure rate in all district hospitals, where tuberculosis can be diagnosed by direct microscopy examination, often with the use of chest X-ray as screening, the United Republic of Tanzania has achieved a 65% case-finding coverage rate. In a country with a more developed health services infrastructure, it would be quite possible to achieve a much higher services coverage rate. Target tuberculosis services coverage rates are tentatively proposed as 60%-65% in low-income developing countries with poorly developed transport and communication systems, and 85% in middle-income developing countries with relatively well-developed infrastructures.

23. The proposed global target of WHO's new tuberculosis control strategy is to achieve, by the year 2000, 85% cure of all sputum-positive cases under treatment and 70% case detection. As indicated above, different targets are set according to the health-related resource availability of a country. The expected impact of achieving the targets is shown in Table 4.

TABLE 4. NEW TUBERCULOSIS CONTROL STRATEGY TARGETS AND EXPECTED IMPACT

Countries	Target cure rates (%)	Case-finding coverage rates (%)	Expected duration to achieve 50% reduction of tuberculosis incidence	Expected No. of annual tuberculosis deaths prevented worldwide
Low-income developing countries with poorly developed health service	85	60-65	10-12 years	
Middle-income developing countries with relatively well-developed health service system	85	85	7-9 years	1 200 000
Industrialized countries and low tuberculosis incidence countries	95	N.A.	??	

N.A. It is impossible to monitor the case-finding coverage rate because of the lack of a methodology to estimate the incidence of tuberculosis when the annual infection rate is low.

24. By achieving these targets, it is expected first to reduce annual tuberculosis deaths by 40%, to 1.7 million from the current 2.9 million. Second, the worldwide prevalence of tuberculosis will be reduced by 50% from the current level of more than 20 million as a result of eliminating vast numbers of chronic/retreatment cases by short-course chemotherapy. This reduction will occur mostly in countries in the Western Pacific and South-East Asia Regions. In some countries in these regions, the prevalence of tuberculosis is three to five times higher than the incidence. Third, in high- and middle-incidence countries, the tuberculosis incidence will halve in 12 years with an 85% cure-rate and a 60%-65% case-finding coverage rate, and in eight years with an 85% cure-rate and an 85% case-finding coverage rate.

25. Once these objectives have been achieved, the programme should start exploring ways to introduce preventive chemotherapy with six to 12 months isoniazid (INH) administration to the groups with a high risk of developing tuberculosis, such as contacts. For countries with low tuberculosis incidence, where new infection or reinfection is very rare and the vast majority of tuberculosis cases occur among those infected long before, the prevention of breakdown from a latent remote infection status to disease, together with the surveillance of new infections, are the main strategies towards eliminating tuberculosis. The present technologies, i.e., INH chemoprophylaxis and tuberculin testing, have too serious limitations to be effectively applied, on a mass scale, for the purpose of tuberculosis elimination.

26. The basic strategy for countries where HIV infection is prevalent and the tuberculosis programme is not performing satisfactorily is to develop an effective tuberculosis programme as soon as possible to cope with the increased number of cases. The first objective is to improve the cure rate through the introduction of short-course chemotherapy and an improved treatment management system. Countries where HIV infection is prevalent and the programme is performing effectively should continue to give the highest priority to finding smear-positive cases and maintaining the high cure rate. In addition, disease surveillance and programme monitoring should be strengthened. Furthermore, the programme should continue or initiate treatment of symptomatic smear-negative cases and radiological suspects. The main priority for countries where HIV infection is not yet prevalent is to intensify the present programme, particularly in the area of programme monitoring and disease surveillance, including the establishment of HIV testing in sentinel tuberculosis centres.

Training

27. Activities in this area concentrate on providing support to existing training courses, and developing management-oriented modules for the training of senior and middle-level managers of national tuberculosis programmes in the effective implementation of new control strategies in developing countries.

28. Technical, financial and administrative support is provided to two international, two regional and seven national training courses for tuberculosis control. Between 1985 and 1988, 213 participants from 61 countries were trained at two international training courses. Similar support was provided to two international bacteriological training courses.

29. The objective of training with management-oriented modules is to provide selected practical knowledge and skills to a large number of health workers in a short period of time. The modules will contain such key components of new tuberculosis control strategies as methods to diagnose cases, to register cases, to estimate services coverage rate, to supply the drugs regularly to treatment centres, to organize the administration of short-course chemotherapy, and to monitor and evaluate the treatment outcomes. In order to reach a technical consensus on treatment activities in the preparatory process for developing the training modules, a workshop was organized in 1990 to prepare guidelines on tuberculosis treatment, with emphasis on the standardization of regimens, introduction of short-course chemotherapy and cohort analysis for regular monitoring of the cure rate.

Research and development

Elaboration of research strategy

30. Technologies that have succeeded in controlling tuberculosis in the industrialized countries and in some middle-income developing countries have failed in many developing countries. A workshop was organized in 1990 to single out the reasons for this failure and to identify research needs, including new technologies that may be applied to both industrialized and developing countries.

31. The workshop defined a number of research priorities. For treatment, the highest priority is country/area-specific operational research to determine ways to improve the

cure rate and the efficiency of treatment systems once an 85% cure rate is achieved. Another research priority is to develop new drugs that can be used to treat multiple isoniazid- and rifampicin-resistant cases which are now practically incurable in developing countries.

32. For diagnosis, the highest research priority is country/area-specific operational research to determine ways to expand case-finding coverage and to detect more cases in earlier or less infectious stages through the innovative use of existing knowledge or technologies, such as symptoms, chest X-ray and sputum examination. A new epidemiological methodology needs to be developed to monitor the progress of case-finding coverage rates more easily and accurately. Since the currently available diagnostic procedures are very time-consuming, rather insensitive and non-specific, and the cost of labour and materials is very high, another high priority area is the development of new diagnostic technologies by fully utilizing the progress that has been made in molecular biology and immunology. These technologies should be reliable, feasible, safe and attractive to both health care workers and patients. Another high priority is to develop technologies that are more sensitive and specific than the tuberculin skin test for detecting infection, the surveillance of which is crucial for tuberculosis elimination.

33. For prevention, the highest priority is to develop less toxic preventive treatment regimens which should also be much easier to administer than isoniazid, and to test the feasibility of introducing them into the programme activities. Another priority is to identify risk factors for the breakdown from latent remote infection to disease, for use in intervention programmes.

Tuberculosis/AIDS research

34. In order to define the nature and magnitude of HIV-related tuberculosis problems and priority research areas, two workshops were organized in 1988 in cooperation with the Global Programme on AIDS and IUATLD. Specific study questions were formulated in the areas of epidemiological surveillance, diagnosis, clinical presentation, prevention and treatment. With the financial support of the Global Programme on AIDS, one professional and one half-time secretary were appointed in 1989 to administer tuberculosis/HIV research. A workshop was organized in 1990 to elaborate the research methodologies for preventive chemotherapy in HIV/tuberculosis infection. From April 1989 to September 1990 the following research was funded: five epidemiological studies, one study on diagnosis, three on clinical presentation and four on prevention.

Other research

35. Five contact studies, five case-control studies, and one comparative trial to measure the protection efficacy of BCG have been carried out over the past 10 years under the technical guidance of the programme. These activities further confirmed that the efficacy of BCG vaccination varied but that it provided substantial protection to more severe types of childhood tuberculosis. The comparative trial showed that there was a difference between vaccines from different seed lots regarding efficacy and incidence of side-effects.

36. A cost-effectiveness study carried out by the programme in three successful tuberculosis control programmes in Africa showed that short-course chemotherapy is more cost-effective than standard chemotherapy, and that it is an excellent investment compared with virtually any health intervention. Only the most cost-effective interventions, including immunizations and oral rehydration therapy, yield estimates per death averted in the same range.

IV. FUTURE PLANS (1992-1995)

Coalition building

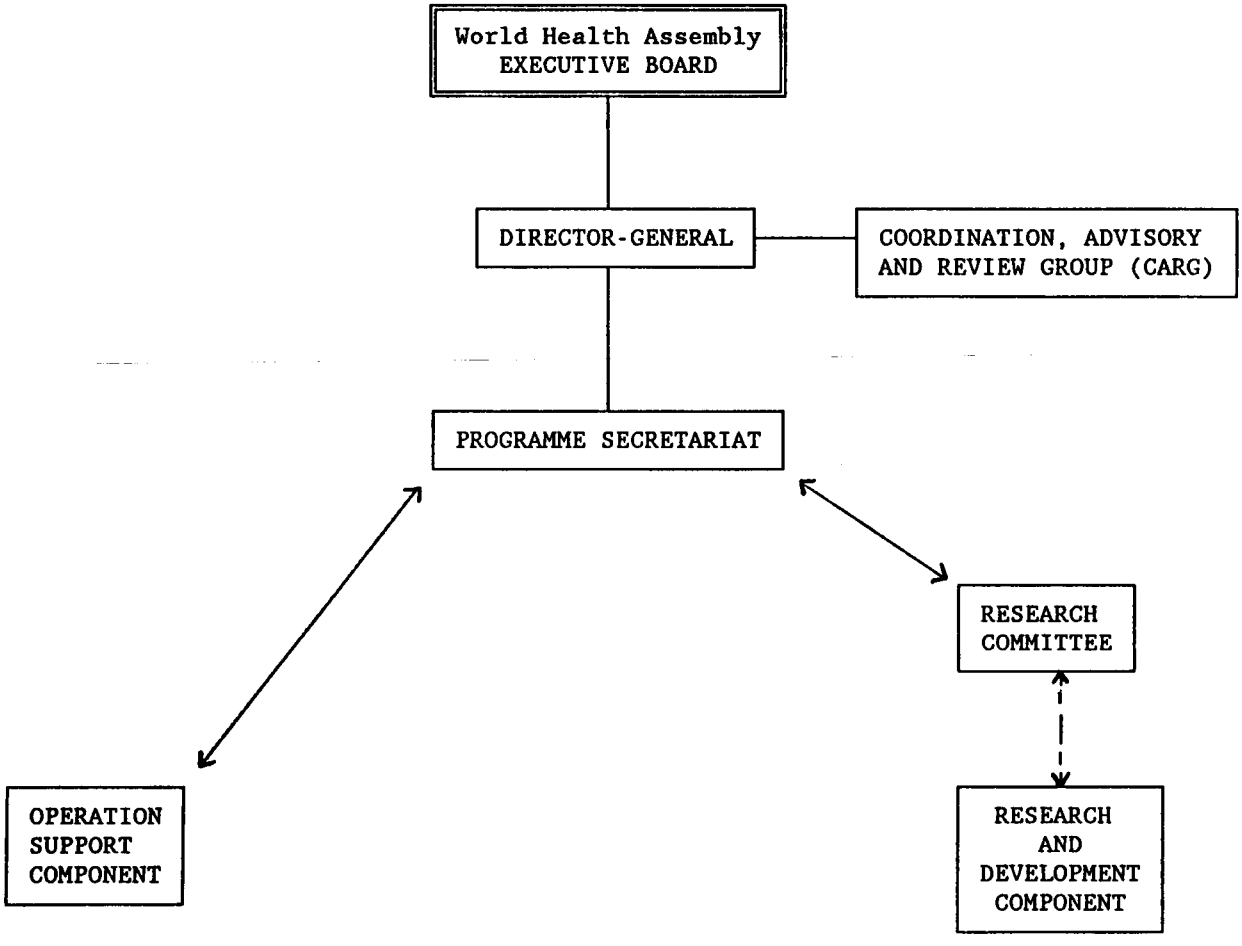
37. There is a striking resurgence of interest in tuberculosis among the world development community stemming from increased awareness that tuberculosis is a problem of

tremendous magnitude, but that it can be effectively controlled by existing technologies, and that control is a very cost-effective intervention. It is crucial for WHO to provide international direction and coordination, in addition to serving as the technical authority, to help combat the disease. In this respect, WHO strongly encourages the participation of all parties that are involved, or are interested in playing a constructive role. To this end, WHO is willing to share, with any interested party, the tools that have been, and will be, developed to implement effective tuberculosis control/elimination strategies. The lessons of both success and failure learned not only from tuberculosis control-related activities, but also from activities in other relevant areas, including other WHO programmes, will be used to improve continuously the efficacy of these tools. Further, WHO will continue its advocacy activities for tuberculosis with any long-standing or new partners, to secure the needed resources for global tuberculosis control/elimination.

Proposed organizational structure

38. Since there has up to now been no formal organizational structure to advise the Director-General periodically on the direction of the programme, including its funding, the Director-General has established a Coordination, Advisory and Review Group. The Group, consisting of representatives of governments of both developing and industrialized countries, will review the progress of the programme and provide oversight and overall advisory support to the Director-General and the programme secretariat. The Group will also provide a forum for the representatives of all interested parties involved in tuberculosis control activities so that a coordinated global effort against the disease can be undertaken under WHO's leadership.

Given the complexity of research on tuberculosis, a research steering committee will be created with the participation of individuals having the relevant expertise to provide the programme secretariat with direction and support to the research and development component.



Planned activities (1992-1995)

39. The focus of programme activities in the period 1992 to 1995 will shift from strategy development to the accelerated implementation of new tuberculosis control and elimination strategies. This will be done not only by significantly strengthening activities in the operational support component, but also by undertaking sharply focused research activities that are likely to produce new knowledge and technologies to overcome the recognized major constraints of current control technologies and strategies. The planned activities include the development of key tools for implementing new strategies, training, direct support for implementing programmes at country level, monitoring and evaluation, and research and development.

Tools

40. The basic components of new strategies have been identified and developed over the past two years as described above. The main tools for implementing new strategies, such as training modules, guidelines for tuberculosis control in AIDS epidemic countries and guidelines for elaborating a tuberculosis elimination plan, are progressing and will be completed by the end of 1991. Guidelines for tuberculosis control among migrants and refugees and a manual for conducting a comprehensive programme review will be prepared by 1992. To complete the development of new strategies, a tenth meeting of the Expert Committee on Tuberculosis is to be organized in 1992 to advise the Director-General.

Training

41. Using the training modules, six WHO-sponsored training courses will be held in 1992. By 1995 there will be 24 courses held annually, so that 360 key staff for national tuberculosis programmes will be trained per year. Once trained, the staff are expected to conduct training courses for middle-level programme managers in their own countries.

Direct support to national tuberculosis control programmes, including demonstration projects and technical coordination

42. Six different types of demonstration project will be undertaken for the following groups of countries/areas: French-speaking low-income developing countries; middle-income developing countries; industrialized or island countries with low tuberculosis incidence; AIDS epidemic countries where the national tuberculosis programme is not performing effectively; "megacities" in developing countries; and refugee camps or areas under conflict. All projects, except the one for industrialized countries, will be undertaken under the umbrella of the integrated disease control approach initiated by the WHO Office of International Cooperation. Intensified technical and financial support will be provided for the demonstration projects. These projects are meant to serve as models for other countries with similar environments.

43. In addition to the six demonstration projects, or as a part of them (if some are to be undertaken in cooperation with other sources of external assistance), the programme will provide technical coordination between donors and the countries receiving external assistance. Technical coordination will include provision of WHO short-term consultants, joint project appraisal and review.

Monitoring and evaluation, including programme evaluation at country level, global monitoring of programme outputs and overall review of the WHO tuberculosis control programme

44. Programme evaluation at country level will start in 1993 using the manual for programme review, and the number of evaluations will be increased to ten per year in 1995.

45. Programme output will be monitored globally through the collection and analysis of data relating to two indicators on an annual basis: the number of tuberculosis cases notified, with breakdown of sputum-positive, sputum-negative pulmonary and extrapulmonary

tuberculosis, and the cure rate/treatment completion rate of sputum-positive cases. It is expected that the number of national tuberculosis programmes that can produce the data for these two indicators and report to WHO will rise with the increase in training activities.

46. Overall review of the programme will be undertaken on an annual basis by the Coordinating, Advisory and Review Group. This review will encompass not only the operational support component but also research activities.

Research and development

47. The volume of operational research is expected to grow, making a major contribution to the implementation of the new strategy, particularly in the WHO-supported demonstration projects. The research will aim at increasing the cure rate and/or expanding the service coverage rate. Important advances are expected in the development of new diagnostic technologies, particularly polymerase chain reaction methods, and of new prevention treatment regimens.

48. A summary of projected targets for the major planned activities is shown in Table 5.

TABLE 5. MAJOR PROJECTED TARGETS FOR THE OPERATIONAL SUPPORT COMPONENT

	1992	1995
Training		
Total WHO-sponsored courses/staff trained annually	6/90	24/360
Direct support		
Demonstration projects	2	8
Technical coordination activities	12	36
Monitoring/evaluation		
National tuberculosis programmes evaluated	0	10
National tuberculosis programmes with known cure rate and notified numbers of cases	20	75
Research and development		
Operational research activities	4	24

Budget requirements

49. The programme is supported through the Organization's regular budget and extrabudgetary contributions. The regular budget provisions and extrabudgetary funds for three bienniums between 1986 and 1991 or pledged up to 30 September 1990 are shown in Table 6.

TABLE 6. REGULAR BUDGET PROVISIONS AND EXTRABUDGETARY FUNDS, 1986-1987, 1988-1989, 1990-1991

	1986-1987	1988-1989	1990-1991
	US$	US$	US$
Regular budget			
Global and interregional	602 100	798 700	1 094 800
Regions	3 056 200	3 436 900	2 743 600
Extrabudgetary funds[a]			
Finnish Anti-Tuberculosis Association	22 148	-	-
Sweden	-	146 906	-
Italy	-	349 866	796
Japan	-	700 000	-
Netherlands	-	262 091	282 487[b]
Japan Pharmaceutical Manufacturers' Association	-	-	137 931
Total	3 680 448	5 694 463	4 259 614

[a] Extrabudgetary funds received by the regions are not included.

[b] Pledged.

50. Available resources for 1988-1989 have increased by 55% compared with 1986-1987, due to the increase in the regular budget, particularly for the regions, and in extrabudgetary contributions for global and interregional activities. Despite a reduction of US$ 693 300 in the 1990-1991 regular budget for the regions, the overall available resources for 1990-1991 will probably increase further, mainly because of the expected substantial increase in extrabudgetary contributions to global and interregional activities.

51. For the biennium 1992-1993 a total of US$ 6 496 304 is required for global and interregional activities alone, with the following breakdown:

Planning/management	US$ 1 144 900
Operational support	US$ 3 412 404
Research and development	US$ 1 939 000

The total does not include approximately US$ 2 000 000, which is expected to be provided by the Global Programme on AIDS for tuberculosis/HIV-related research activities, including the cost of one professional staff member and one half-time secretary.

- - -