



**FORTY-FIFTH WORLD HEALTH ASSEMBLY**

Provisional agenda item 18

**THE ROLE OF HEALTH RESEARCH**

**Progress report by the Director-General**

The past three decades have witnessed a considerable expansion in the Organization's research activities, including the creation of "special programmes" to carry out mission-oriented research. These are periodically documented and reviewed by the governing bodies. However, broader issues involving policy and strategy have to be reviewed from time to time and the Technical Discussions in 1990 provided such an opportunity. Despite its general title, resolution WHA43.19 on the role of health research indeed raised new substantive issues.

This progress report was presented to the eighty-ninth session of the Executive Board. It outlines the steps taken to implement resolution WHA43.19, and its structure follows the outline of the resolution's operative paragraph 5. As recommended by the resolution, the Advisory Committee on Health Research has been closely involved in implementation. Since the role of the Committee is to translate the policy guidance provided by the governing bodies into research strategies, plans and programmes, it is expected that discussions at the Health Assembly will orient health research at all levels of the Organization.

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## I. BACKGROUND

1. Historically, the conduct and coordination of research have been considered as essential functions of WHO.<sup>1</sup> Over the years several resolutions have reaffirmed the principles and modalities of the Organization's involvement in research.
2. The considerable growth of resources from "voluntary" funds has led to large operational structures such as the "special programmes".
3. The governing bodies and the Advisory Committee on Health Research (ACHR)<sup>2</sup> have continued to review periodically the overall orientation and balance of research efforts from the viewpoint of policy and strategy.
4. Resolution WHA43.19 was a turning point, as it followed the first Technical Discussions ever devoted to health research, in May 1990. It provided the necessary policy guidance for WHO's research activities and for the role of different partners in collaborative research efforts. Recommendations to Member States embodied the notion of essential health research, covering a broad spectrum of activities, ranging from elementary fact-finding and situation analysis to the fostering of innovation and experimentation. The disciplines involved are policy research, systems research and the public health sciences. Development agencies were encouraged to increase their support not only to that type of research and to capability building, but also to policy-making bodies in research, science and technology. The research community was invited to participate both in essential health research and in research on global health problems. It was also emphasized that problems of health development should be approached by scientific methods.
5. Progress in the implementation of resolution WHA43.19 is reported in the following paragraphs. The principal mechanism for implementation has been the system of the global and the regional ACHRs - including the working subgroups<sup>3</sup> - whose role it is to translate the policy guidance provided by the governing bodies into research strategies, plans and programmes. It follows that past and current discussions at the Executive Board and the Health Assembly will orient research at all levels of the Organization. The guidance arising from such discussions will be acted upon by the global ACHR at its next session which is set to review all research activities.

## II. REPORT OF THE TECHNICAL DISCUSSIONS

6. The Technical Discussions offered a special opportunity for Member States to look at their priority problems in health; to consider the best way to formulate a health policy in order to provide overall guidance in planning the solution of these problems; to consider the basis for setting priorities; to question the available knowledge and know-how that could be brought to bear on the priority problems; to identify those fields in which strategic and operational research would be needed; and to establish ways in which health priorities influence research planning and research priorities.
7. Four working sessions took place in parallel to discuss four critical themes: health systems research, research capability strengthening, nutrition research, and recent advances in biological and physical sciences, and their implications for health care.
8. The report of the Technical Discussions has been widely distributed, mainly through the regional offices and the regional ACHRs. It has also been widely quoted in various newsletters, publications and conferences. A book containing the full material presented at and arising from the Technical Discussions went on sale in January 1992 and a number of copies have been distributed free of charge.

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<sup>1</sup> Resolution WHA2.19.

<sup>2</sup> Established by resolution WHA12.17

<sup>3</sup> Task Force on health development research; Task Force on investigation of evolving problems of critical significance to health; Task Force on monitoring of emerging areas in science and technology; Subcommittee on research capability strengthening; Subcommittee on health and the economy.

### III. NEW SUBSTANTIVE ISSUES

#### Assessment of new and emerging areas of science and technology

9. The global ACHR set up the Task Force on monitoring of emerging areas in science and technology with the following brief: to match existing problems with existing technology, i.e., to identify existing technology that could be used directly, or be developed, to solve significant problems in health care; to assess new and emerging areas in science and technology with the potential for future application to solving health problems, if appropriately developed; to disseminate information; and to catalyse research to meet identified needs, especially in relation to methodological requirements.

10. The starting point of the Task Force was promotion of cooperation between health professionals of developing countries and experts at the cutting edge of science and technology, with a dual aim. On selected needs, for which well-defined technologies were already known or in the course of development, the targets would be to acquire, evaluate and disseminate information, and to establish networks of centres in the North and interested centres in the South to initiate and support pilot projects. On specific health care problems, the intention was to conduct brain-storming sessions for the identification of possible technological solutions using the current state of the art. Examples would be inexpensive field diagnostics, simple ophthalmological instruments, accessible support devices for the elderly, and a fresh look at the control of communicable diseases.

11. Although not an operational entity, the Task Force intends to establish a mechanism for identifying potentially significant new developments in science and technology to be reviewed, annotated and followed up by experts, and reported briefly in a newsletter. The newsletter would cover emerging areas of science and technology and other aspects relevant for health care delivery in developing countries. A network of 30 to 40 "corresponding editors" would be established, covering a wide range of countries and science/technology disciplines. Proposed contents would include: short reports on new developments of potential interest, drawing attention to horizon technology in the life sciences, physical sciences and technology, including biomedical and clinical engineering, biotechnology, molecular biology and genetics; brief mention of outstanding research results; highlights of recent reports of general importance; brief accounts of new technological innovations; announcements of relevant events; and summaries of expert papers prepared for, and to be published by, ACHR.

12. The Task Force also considered the need to produce a series of occasional expert papers as an important element in the process of disseminating information about usable science and technology. Topics would range widely, from basic information on establishment of a given technical facility - say, an information technology system - to the scope of major important branches of technology - say, food technology and biotechnology - to review of significant issues in advanced science - say, biomaterials, imaging technology or monoclonal antibodies. Degree of novelty in use or innovation in design, and potential relevance to developing countries would be taken into account in the choice of material. The papers would be specially commissioned, referred as appropriate and published in a clearly identified series: an Expert Report Series of ACHR (possibly printed as supplements to the *Bulletin of the World Health Organization*).

13. The Task Force recommended that several research projects suggested by the ACHR Subcommittee on health and the economy required methodological support, for example in estimating health status, and in developing new indicators for studying multisectoral interactions. This matter will be pursued in more detail within the Organization.

#### Investigation of evolving problems of critical significance to health

14. In discussing this issue, ACHR recognized the need to launch a long-term effort in cooperation with appropriate institutions of learning and development agencies. It set up the Task Force on investigation of evolving problems of critical significance to health to examine certain major topics linked to health, including demographic transitions and their consequences, migration, urbanization, employment, nutritional problems, new and evolving diseases and more generally, interaction between development and health. Several meetings were held to define strategic lines of thinking, culminating with an international scientific workshop on "Global perspectives of human development" held near Ulm in Germany in July 1991. While the Commission on

Health and Environment continued its broad debate of some of these issues, the Task Force identified a number of specific areas that it wished to investigate.

15. Discussion focused on such areas as the major determinants of global development, methodological considerations including systems and modelling approaches, and possible research avenues.

### **Major determinants of global development problems**

16. Global development problems result from complex interactions between natural and man-made systems, with biological, environmental and sociobehavioural factors playing a major role. Several components and trends are of special relevance: population dynamics, mobility and migration, industrialization, energy, environment, food supply and nutrition, and social behaviour.

17. **Population dynamics, mobility and migration:** Demographic growth remains a priority issue, since under the United Nations medium-variant projections, world population is expected to reach 6 thousand million by the end of the century and to exceed 7 thousand million in 2010. The age structure of the world population is changing rapidly and the older population is growing faster in the developing than in the developed countries (annual growth rate of 3% compared to 1.8% during the period 1985-1990). The workshop considered that attempts to lower the population increase had not led so far to satisfactory results.

18. **Industrialization:** The finite nature of natural resources, indiscriminate storage of industrial wastes leading to pollution (e.g. nuclear), the widespread use of aerosols causing ozone depletion, and carbon dioxide emissions producing the greenhouse effect, are well-publicised examples of global problems which transcend national boundaries. The workshop recommended more research on behavioural and social impacts of industrialization and introduction of new technologies in both developing and industrialized countries.

19. **Energy:** The issue is linked with the process of industrialization and technology development. Politicians and the scientific community face various technical and ethical issues which require further investigation.

20. **Environment:** In addition to health hazards resulting from individual behaviour (smoking, alcohol, etc.), thousands of environmental contaminants are encountered, particularly in occupational settings. Methodology needs to be developed further in order to assess the impact of low doses of contaminants typically found in the ecosystem.

21. **Food supply and nutrition:** Two dimensions need to be investigated here: first, at the individual level, education and the behavioural sciences play an important role; second, at the socioeconomic level, issues of accessibility (financial and other) to food, production and distribution, legislation (pricing policies), marketing and food control, need to be addressed.

22. **Social behaviour:** Behavioural research is needed in order to understand the origins of health damaging behaviour and, more important, to identify the approach and design the means by which health promoting behaviour may be encouraged. The scope of interest includes the behaviour of individuals, families, communities and organizations, including the behaviour of individuals within such groups.

### **Systems and modelling approaches**

23. The weaknesses of previous global models suggest that new approaches are needed, particularly in terms of defining the right questions, acquiring the right data and developing the right methods.

24. The investigation of three scenarios has been envisaged: (i) a pessimistic one, with small population growth in the North, little resource transfer to the South, with minimal consumption growth, despite high reproduction rates. This would lead to an increased population burden with widespread poverty and further deterioration of the environment; (ii) an "optimistic" scenario, with no population growth in the North, a steady increase in resource transfer to the South, together with a slowly, yet steadily shrinking reproduction rate in the South. Given the effect of the time lag, this would still lead to overpopulation, and a hardly manageable situation; (iii) a "massive action" scenario, implying a shrinking population in the North, accompanied by constant rate of consumption, allowing a fast transfer of knowledge and technology to the South. This scenario would lead to an appreciable deceleration of population growth in the South and a

modest rise in worldwide consumption. Underlying all these assumptions for the development of new models is a strong belief that work on existing methods, as well as the development of new methods, should be intensified, including the search for new indicators.

### **Research avenues**

25. Suggestions for opening up research avenues were discussed under four headings, and are summarized as follows:

- **Quality of life and health indicators: Emphasis on need for better indicators:**
  - extended coverage of emerging problems
  - use of new technologies, e.g. remote sensing, computational logic, etc.
- **Developmental perspectives of the human habitat:**
  - policy coordination
  - establishment of communication pathways for timely global exchange of research progress
- **Access to health services: Main groupings concern:**
  - health services research
  - health personnel research
  - disability research
  - political sciences
  - behavioural research
- **Ethics and equity in health:**
  - promotion of concepts of equity as the overall objective of every health care system
  - compliance with strict ethical standards (policy aspects, sociobehavioural components).

26. The detailed structuring of the research agenda still requires extensive work, drawing on the considerable material presented and produced at the workshop. It was suggested that a small institutional network should be set up to elaborate in a systematic and practical way concrete study proposals and seek funding from donor agencies.

### **Methodologies for trend assessment and forecasting**

27. The need to strengthen capacity for epidemiological analysis from field level up to policy level cannot be overemphasized. Indeed, the periodic observation and measurement of health-related variables, in relation with, or independent from public intervention, is indispensable to monitor changes in health status and in appropriate determinants of health. However, it is seldom feasible to take objective measurements, so that investigators have to fall back on estimates and interpolations, thus rendering meaningless the simple extrapolation of trends, into the future. In addition, it is now accepted that health-related variables are generated by non-linear processes which are incompletely and poorly understood. On the other hand, detailed statistical and modelling studies based on the resulting data depend upon certain essential properties of the data: notably the validity of mean values, whether or not subject to trends, seasonal variations or redundancy. All these factors must be taken into account in order to assess the properties of a health-related variable on which depend the methods used for testing and correcting the measurements.

28. New methods are indeed needed for correcting values or estimating missing data. The problem of indicators may require fresh thinking; the limits to what is feasible with existing indicators may have been reached. It is important to keep in mind that health, being a subjective concept, cannot be measured directly. It can only be evaluated by using measures that "indicate" the variable, attribute or concept that cannot itself be accessed. A critical review of indicators raises many issues: acceptability, validation, availability, utility (explanatory and predictive capabilities), and the need to discard those that are redundant, unverifiable, unstable or ineffective.

29. The United Nations system is conscious of such needs and an international conference of experts was held under its auspices in Rabat, Morocco, in April 1991. Several issues were discussed and taken up subsequently at ACHR level by the Task Force on monitoring of emerging areas in science and technology. They were:

- the construction of "qualitative indicators of development";
- the need for new, perhaps "knowledge-based" indicators for studying multisectoral interactions, since certain significant pointers to health status or other health-related features may only be expressed semantically, not quantitatively;
- multi-dimensional indicators, which include a static measurement (assessing the current value of some variable), a dynamic component (describing the evolving pattern with the passage of time) and a latent component (indicating, for example, the consequences of the occurrence of some event);
- multi-valent indicators, e.g. representing the degree of ill-health and its consequences, such as disability;
- the unsuitability of measures of fitness (isolated measures) as indicators of health (as can be conjectured from the delayed effects of certain viral infections, from pre-symptomatic neoplastic disease and other chronic "degenerative" conditions).

30. Future methodological developments in this area and in related issues of comparative epidemiology will also be investigated by ACHR subgroups with a view to supporting existing WHO activities in this domain.

#### IV. FURTHER DEVELOPMENTS IN THE WHO RESEARCH STRATEGY

31. A report entitled "Health research strategy for HFA/2000"<sup>1</sup> was submitted to the seventy-seventh session of the Executive Board in January 1986. The basic tenets of the document are summarized below.

32. **Control of diseases associated with poverty.** The research needed is essentially of the health systems type, as the effective measures are well known: provision of sufficient and safe food, clean water, adequate sanitary facilities, fertility regulation, and immunization and treatment of common infections. Individuals and communities have important roles to play in relation to their own health behaviour and to implementing required measures. The aim of research should be to assist administrations and communities to achieve these advances as directly and as quickly as possible.

33. **Control of diseases, both infectious and noncommunicable, specific to the tropics.** These diseases do not respond adequately to the relief of poverty and the measures referred to above, and they should be attacked with all the resources - laboratory, clinical, epidemiological and socioeconomic - that can be brought to bear on them.

34. **Control of diseases associated with affluence.** This requires investigation of the environmental and behavioural influences which have led to the noncommunicable diseases now predominant in developed countries and beginning to appear in the developing world. In some, the major influences (tobacco, alcohol, occupational hazards, etc.) are already known, and the research required is predominantly concerned with behaviour; in others, the influences are unknown and research, particularly epidemiological, is needed into disease origins.

35. **Treatment and care of the sick.** Even on the most optimistic assumptions about disease prevention, it will be necessary to make extensive provision for the treatment and care of the sick. For this the mainstay will be biomedical research (which also, of course, contributes powerfully to the preventive measures). WHO's contribution, although modest financially, will continue to be important. It contributes to the success of biomedical research in many ways, particularly by ensuring that new knowledge is widely known and quickly applied as it becomes available.

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<sup>1</sup> Document EB77/INF.DOC./8.

36. **Delivery of health services.** The critical determinants of health should be addressed through health services that are relevant to local needs and cultures and aim to cover entire populations, particularly the most vulnerable groups. Quality-assurance considerations should be duly taken into account. To join with policy-makers and communities in assessing needs, planning, financing and implementing programmes and evaluating them in terms of coverage, efficiency and effectiveness is the challenge for WHO in health systems research.
37. The application of these principles will inevitably differ between regions and between countries within the same region, according to many variables: the nature of the predominant health problems; the present level of health; economic resources; or cultural, political and religious traditions. However, the aim should be common to all: to focus research where it will result in rapid advance towards the goal of improved health for all.
38. Considering action at country level, two sources of enlightenment are available: the experience of industrial countries during the past two centuries, and the experience of some developing countries which have made rapid progress during the past few decades. Conclusions from these sources are reasonably consistent, particularly on the basic observation that the advances in health stemmed almost entirely from the decline of mortality from infectious diseases.
39. In developed countries, infectious diseases declined because of increased resistance brought about by improvement in nutrition and, later to a lesser extent, immunization, and of reduced exposure, which resulted from hygienic measures (in respect of water, sanitation, food and housing) introduced progressively from the late nineteenth century. In developing countries the decline of mortality can be attributed predominantly to better nutrition. However, in some countries which in a few decades attained western standards of health other developments contributed powerfully, if indirectly, to health: education, particularly of women; equity of access to health resources; political and social will to improve health; and, above all, control of fertility, which safeguarded the advances from the effects of rising numbers.
40. In line with this assessment of the contribution of different influences, developing countries that do not have the resources needed to provide all the services specified under primary health care - the position of most of them - would be well advised to give high priority in research and services to nutrition, immunization and sanitation. If limited resources prevent the full provision of sanitary services, as they are likely to, a large advance can be made by increasing resistance to infection. It is hardly possible to overestimate the significance of the observation that in China and Kerala (India) the advances were due almost entirely to better nutrition; there were no substantial improvements in water, sanitation and personal care, and immunization coverage was low.
41. Drawing on the available information it can therefore be argued that research on nutrition and population control is of great priority, but that research on immunization, safe water, sanitation, improved economic growth, therapeutic health care, and education, especially of females, is likely to bring marked improvement in the health of populations.
42. Nutritional deficiencies could in principle be rectified: calorie and protein deficiencies by increased food production, and micronutrient deficiencies by dietary supplementation. In contrast, nutritional excess is linked to obesity, cardiovascular disease and dental caries and with possible influences on cancer and diabetes. Infection control could be approached by interventions with immunization and therapy. Other issues are also important - control of fertility, safe water, sanitation, hygiene and housing. WHO has already initiated various programmes on these issues.
43. In the light of these considerations, updating WHO's research strategy implies a series of general and specific measures.
44. General measures are needed:
- to enhance the ability to assess needs and set priorities at national level;
  - to build up the institutional research capacity of developing countries (see also section VI);

- to improve the networking process for research on global health problems (see paragraph 26); and
- to strengthen the overall scientific and technological infrastructure (information exchange, human resources development, technology transfer and adaptation, etc.).

45. Specific measures are called for:

- to develop robust approaches for the analysis of multisectoral determinants of health and of the effect of health on other sectors;
- to intensify research activities in the relevant WHO programmes (in addition to the "special programmes"): nutrition, immunization, environmental health and health systems research;
- to focus within such programmes on priority research areas;
- to delineate levels of responsibility (global, regional, national) and attempt to rationalize the allocation of resources;
- to identify the role of different partners in research, e.g., governments, nongovernmental organizations and funding agencies;
- to clarify the taxonomy for various types of research, ranging from the generation of new knowledge (fundamental), to "auditing" (surveys), seeking the best possible distribution of efforts;
- to assess critically the time and resources required for carrying out a package of investigations up to their conclusions; and
- to differentiate the scale of research activities according to geographical conditions (size of region, subregion, population, economic and communication problems, etc.).

46. Further discussions will be needed within ACHR, at both global and regional level, to elaborate these guidelines and to determine the best way to implement them. It is estimated that the work of ACHR task forces will contribute strongly to updating the strategy. An interim report will be due in May 1992, with the main document scheduled for the last quarter of 1992.

## V. HARMONIZATION OF SCIENCE AND RESEARCH POLICIES

47. A strong and coherent scientific framework for WHO's programme should facilitate interactions with other organizations and bodies of the United Nations system and with appropriate nongovernmental organizations. Such interactions are in need of better harmonization. With a view to improving the inner consistency of and balance between scientific and research activities, the Director-General has established a Council for Science and Technology, following a recommendation by ACHR, to keep track of relevant organizational developments and advise him accordingly.

48. ACHR has carried out a preliminary study on "Mechanisms for the acquisition of scientific advice in WHO"<sup>1</sup> which produced a number of recommendations. These include the need to review periodically all WHO research; to improve coordination and cross-representation between various advisory bodies; and to enhance cooperation between the ACHR system and medical research councils. Further points are that the strengthening of research capability should be optimized and linked more closely with training programmes, and an attempt should be made to develop "prototype" institutions; WHO collaborating centres and nongovernmental organizations should be evaluated periodically in respect of their scientific contribution to the Organization's programmes; and the system of expert advisory panels should be kept under review, including the possibility of changing the current one-year period for renewal of experts to "up to four years", to ensure continuity and allow each expert time to contribute to the substantive analyses undertaken by the panel. The ACHR will continue to study these issues in more detail.

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<sup>1</sup> Document available on request.

## VI. INSTITUTIONAL ARRANGEMENTS FOR STRENGTHENING RESEARCH CAPABILITIES

49. Institutional arrangements and stability depend naturally on political will. Sometimes regional agreements enhance national motivation to join in a common enterprise as demonstrated by the network of PAHO centres. At the global level, expenditures of the order of several hundred million dollars have been made by WHO over the past 15 years on research capability strengthening. These sums mainly supported research and development efforts in the special programmes.

50. The scale of support (in terms of duration and money) required for "broad spectrum strengthening" (e.g. public health sciences) in a whole region or subregion (say, in Africa) is not known, since the experience acquired so far is not sufficient to draw a conclusion.

51. There is no experience either on the feasibility of "prototype institutions" which could offer, on a regional or subregional basis, a comprehensive package of facilities in training, research, services and expert advice, for example in epidemiology and informatics.

52. Before pursuing any schemes involving alternative institutional arrangements, the ACHR subcommittee on research capability strengthening thought it desirable to make a rapid survey of selected research institutes with an established reputation in order to define the critical determinants of success. The following were studied: the University of Ibadan, Nigeria, a group of institutions in Pakistan, the High Institute of Public Health, Alexandria, Egypt, Mahidol University, Bangkok, the All India Institute of Medical Sciences, New Delhi, the National Institute of Health and Family Welfare, New Delhi, the National Institute of Health, Research and Development, Jakarta, the Institute of Medical Research, Kuala Lumpur, and the network of PAHO centres.

53. It appeared from the study that the main features that determine the success and sustainability of a research institution are:

- a history of consistently strong leadership, dedicated to quality work and constant improvement;
- a tradition of scientific inquiry coupled with a sense of discipline and rigour in research management;
- a systematic documentation of professional and research activities, including publications;
- a critical mass, in professional, technical and financial terms, to guarantee momentum;
- an environment conducive to research, which is one of the main conditions for motivating young scientists. This includes naturally an appropriate infrastructure, such as technical and bibliographic facilities;
- a close relationship with policy planners and decision-makers in order to ensure the stability of support at government level, particularly the ministry of health, and chart the course of health systems research; and
- external cooperation and networking to attract further technical support and funding from international sources.

## VII. RESOURCES

54. The total resources available for global and interregional research-related activities out of the regular budget are less than US\$ 5 million per year, whereas the research funding from extrabudgetary sources amounts to some US\$ 100 million annually.

55. In view of the enormous operational responsibilities of the Organization, especially at regional level, there is very little leeway to augment research resources from the regular budget. It could be argued, however, that if only 1% of extrabudgetary funds were dedicated to "horizontal" research capability strengthening (say, in epidemiology), this would amount to a substantial contribution (equivalent to 20% of regular budget funds for global research activities).

## VIII. CONCLUSIONS

56. This interim report outlines the course taken in following up resolution WHA43.19. It is a continuing process and future efforts will take into account at the operational level the guidance provided by the governing bodies and ACHR.

57. The three task forces (on science and technology, global problems, and health development research) will continue to delineate problem areas where knowledge deficiencies need to be addressed by scientific investigation. The challenges are respectively to enhance productively scientific exchange and cooperation between North and South; to develop early warning methods for the diagnosis of incipient global problems; and to improve trend analysis techniques and related models and indicators.

58. The ACHR subcommittee on research capability strengthening will need to determine ways and means to improve coordination and maximize impact for the activities concerned, at an acceptable cost.

59. Lastly, the overall health research strategy is being updated and its thrust should be felt in due course throughout the Organization's research activities.

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