

*directing council*



PAN AMERICAN  
HEALTH  
ORGANIZATION

XXXII Meeting

*regional committee*

WORLD  
HEALTH  
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REPORT TO THE DIRECTOR ON THE XXVI MEETING OF THE ADVISORY COMMITTEE ON  
HEALTH RESEARCH

The XXVI Meeting of the Advisory Committee on Health Research (ACHR) was held from 3 to 6 August 1987 in the auditorium of the National School of Public Health at the Oswaldo Cruz Foundation, Rio de Janeiro, Brazil.

The meeting was attended by authorities from the Government of Brazil, 10 of the 15 members of the ACHR, specially invited guests, observers, and staff from PAHO/WHO and other international agencies.

The program of work included the discussion of technical topics grouped under four broad headings and sessions: Organization and Management of Research in the Pan American Health Organization, Scientific and Technological Development in Health in Brazil, and Technical Cooperation in Biotechnology in Health. The Executive Session dealt with matters relating to the mechanisms of work of the ACHR, which are detailed in the full version of this report.

The Committee made recommendations to the Director on each of the subjects addressed, which are summarized in the text that follows. Special attention is called to those relating to the development of biotechnology in Latin America and the Caribbean and to the formulation of a research program for the countries of the Central American Isthmus.

Annex

CD32/23 (Eng.)  
ANNEX

XXVI MEETING OF THE ADVISORY COMMITTEE  
ON HEALTH RESEARCH

Report to the Director of the Pan American  
Sanitary Bureau

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REPORT TO THE ADVISORY COMMITTEE  
ON HEALTH RESEARCH

INAUGURAL SESSION

1. Address by Dr. Frederick Robbins, Chairman of the ACHR

Dr. Robbins opened the meeting by welcoming the participants and expressing appreciation, on behalf of the members of the Committee and in his own name, for the invitation extended by the authorities of the Government of Brazil through Dr. Sergio Arouca, President of the Oswaldo Cruz Foundation.

He evinced great interest in learning about the Brazilian experience included on the agenda, which would undoubtedly be as rich and interesting as the Cuban experience that the Committee had had the opportunity to hear about in 1985.

The Chairman expressed the hope that the meeting could devote time to discussions and recommendations on the subject of AIDS even though it was not included as an item in the program of work. He pointed out that in North America there was possibly more awareness of the threatening presence of this disease but that its rapid spread and the devastating toll it has taken in other regions of the world, such as countries in Africa, justified its being a matter of deep concern for all the countries in the Region.

2. Address by Dr. Sergio Arouca, President of the Oswaldo Cruz Foundation (FIOCRUZ) and Member of the ACHR

After welcoming all the participants, Dr. Arouca referred to the need to seek new approaches and solutions in the pursuit of scientific and technological development in Latin America and the Caribbean. This development, he said, has faced, and continues to face, major obstacles owing to the severe and prolonged economic crisis that has afflicted the Hemisphere.

Dr. Arouca reaffirmed his belief that without strong, solid technological and scientific development, articulated within the national development plans, it would be difficult for the underdeveloped countries of the Hemisphere to overcome the crisis.

He then cited the privileged role of the Oswaldo Cruz Foundation in his country. This institution, he said, has made it possible for work to be done simultaneously in basic and applied research, education, quality control, and health programs. The wealth and multiplicity of functions has made it possible to establish links with almost all the programs undertaken by the Ministry of Health.

He pointed out that at the moment the Foundation, together with the Ministry of Health and Brazilian society in general, was participating in the implementation of a broad and basic public health reform in the country.

Concluding his remarks, Dr. Arouca thanked the Director of PAHO/WHO for having accepted the invitation to hold the XXVI Meeting of the Committee at the FIOCRUZ and expressed the hope that its sessions would be productive and that the stay of the participants in Rio de Janeiro would be a pleasant one.

3. Remarks by Dr. Carlyle Guerra de Macedo, Director of PAHO/WHO

Dr. Guerra de Macedo, addressing the authorities of the Government of Brazil and the other companions and colleagues present, pointed out that the meeting would deal essentially with work under way in fulfillment of previous recommendations of the ACHR. Within this context he emphasized the importance of systematic evaluation of the research component in the technical programs of PAHO/WHO and their specialized centers. He said that this should be part of the research information subsystem that the Organization was designing.

The Director then referred to activities aimed at strengthening the research infrastructure in the countries and reiterated the importance of mobilizing national resources and TCDC for scientific and technological development in Latin America and the Caribbean. To illustrate this last point, he cited the proposal for the development of biotechnology applied to health that the Committee was to discuss in later sessions. He pointed out that biotechnology, as he had said five years ago at the ACHR meeting in Mexico, was an area of knowledge that offered extraordinary possibilities for scientific development in the countries. The proposal, he went on to say, makes an initial attempt to group the efforts of some of the countries in the development of diagnostic methods for AIDS, hepatitis, malaria, and Chagas' disease.

The Director of PAHO/WHO emphasized the need for all the countries to have ethical guidelines for regulating experimentation on human subjects and safeguards for the management of recombinant DNA.

He concluded his intervention by thanking Dr. Roberto Figueira Santos, Minister of Health of Brazil, and Dr. Sergio Arouca, President of FIOCRUZ, for the invitation extended to the Committee, in particular, and in general for the solid and generous support that the Government of Brazil has given to the Organization.

4. Remarks by Dr. Roberto Figueira Santos, Minister of Health of Brazil

Dr. Roberto Figueira Santos, Minister of Health of Brazil, began his intervention by welcoming the members of the Committee. He indicated that he was going to analyze certain aspects of the evolution of health research in Brazil, attempting to point out those of greatest interest for broader consideration in terms of the situation in the Americas as a whole.

The university system in Brazil is barely 50 years old. Prior to establishment of the first universities, i.e. those devoted in a more systematic way to the cultivation of science and the formation of researchers, both the preparation of professionals and scientific research were done in isolated institutions, the first of these being the school of medicine based in Bahia, which opened its doors in 1808. Biomedical research had its beginnings at the end of the last century, and it was closely linked to the needs of the services. Given the close cultural ties with France at that time, the Pasteur Institute was taken as the model for the creation of institutions such as the FIOCRUZ (host of this event), the Butantán Institute in Sao Paulo, and others. These centers were devoted to research on communicable diseases, to their laboratory diagnosis, and to the production of sera and vaccines. After a period of intense activity, in subsequent decades these institutions declined noticeably, and only recently are they beginning to assume a significant role once again.

In the last 50 years, Dr. Figueira Santos went on to say, the universities have grown and proliferated, tending, insofar as biomedical and clinical research was concerned, to be isolated from the services. There has been a dichotomy between the services and the university programs.

Research in Brazil gained strong impetus with the creation of the National Research Council in the 1950's. Since then the Council has grown impressively, promoting research and the formation of scientists in almost all areas of knowledge. Today there is a trend toward greater rapprochement between the services, under the leadership of the Ministry of Health, and the agencies responsible for coordinating and carrying out research. As a result, there has been a shift away from the traditional approaches of the agencies that finance research. Up until recently these agencies operated largely or entirely without priorities; the investigator would come to the agency with his proposal and receive his financing or not almost exclusively on the basis of the quality of the proposal. This method ensured absolute respect for the investigator's freedom, but it slowed down, perhaps excessively, the definition of research priorities that might contribute to raising the country's quality of health. Priorities should be set without prejudice to the investigator's autonomy, and a balance should be struck between these two orientations, which necessarily have to coexist in a country like Brazil where there are serious gaps in knowledge.

The Ministry of Health is trying to press its demands on scientists by establishing priority lines of research. Agencies under the Ministry such as the National Health Council and the Secretariat for Science and Technology are engaged in this task, working in articulation with the recently created Ministry of Science and Technology.

The priorities cannot be limited to the prevention and control of communicable diseases. Areas such as chronic degenerative diseases, health economics, technological development of raw materials for the

pharmaceutical industry, technological training for self-reliance in immunobiological products, and greater nationalization of biomedical instruments diversify the traditional orientation of health research, give it greater importance, and make it more consistent with the broad view of health that has been officially adopted by the World Health Organization.

In closing, Dr. Roberto Figueira Santos expressed the appreciation of the Government of Brazil for the valuable services that the Pan American Health Organization, especially under the leadership of Dr. Carlyle Guerra de Macedo, is making available for health in Brazil. Wishing the participants a successful meeting, he once again expressed pleasure that Brazil had been chosen as its site and hoped that the members of the ACHR would have a chance to get to know the country, its beauties, and the hospitality of its people.

I. ORGANIZATION AND MANAGEMENT OF RESEARCH IN THE PAN AMERICAN HEALTH ORGANIZATION

1. Report on the Evaluation of the Research Component in Six Technical Programs of PAHO/WHO

The report was presented by Dr. Maria Leite-Ribeiro, Chief of the Research Coordination Unit in PAHO/WHO. Dr. Leite-Ribeiro recalled that at the XXV Meeting of the Advisory Committee on Health Research, held in April 1986, the Committee had approved a proposal presented by the Research Coordination Unit which set forth the details for an objective evaluation of the research component in the technical programs of PAHO/WHO. The methodology approved by the Committee called for an annual evaluation of approximately half the technical programs of the Organization--and their corresponding regional centers--in terms of the research activities carried out under the Organization's previous biennial program budget.

The questionnaires, she said, cover the general characteristics of the technical program and the research activities of the regional center, focusing on the following objectives:

- a) Identification of the human, material, and financial resources included in the research activities;
- b) Identification of research policies, strategies, and activities and determination of their interrelationships;
- c) Determination of the mechanisms being used to strengthen research capacity in national institutions and institutions belonging to national networks;
- d) Identification of the WHO Collaborating Centers being used, the type of relationship, and their use as mechanisms of technical cooperation;

- e) Identification of problems encountered in management of the research component.

Dr. Leite-Ribeiro indicated that that the initial evaluation of the research component covered the following PAHO/WHO programs and centers for the period 1984-1985: Health of Adults (HPA); Environmental Health (HPE) and its corresponding Regional Centers, including the Pan American Center for Human Ecology and Health (ECO) and the Pan American Center for Sanitary Engineering and Environmental Sciences (CEPIS); Maternal and Child Health (HPM) and its corresponding Regional Center, the Latin American Center for Perinatology and Human Development (CLAP); Communicable Diseases (HPT); Health Services Development (HSD); and Health Manpower Development (HSM). She pointed out that during the period of the survey HSD was called Health Services Delivery (HSC).

Referring to the results of the survey, she indicated that a total of 125 research activities had been identified among the six technical programs and that three of these programs accounted for 90% of the total: HPT (49%), HPM (30%), and HPA (11%).

The speaker indicated that the funds (regular and extrabudgetary) used for research during 1984-1985 by the six technical programs came to a total of US\$6,441,336, or 16.4% of the total funding for the six technical programs (\$3,095,093 regular budget, or 13.9%, and \$3,346,243 extrabudgetary funds, or 19.6%).

It was reported that all three Regional Centers (CEPIS, CLAP, ECO) systematically evaluated the results of their activities through internal self-appraisals, external evaluations, assessment of targets met versus those programmed, and research. CLAP provided a summary of 23 ongoing research projects during 1984-1985, which are reported in the PAHO/WHO publication "Research in Progress 1984-1985." All the Centers indicated that they needed a more explicit policy relative to the development of personnel in the scientific areas.

The funds (regular and extrabudgetary) used for research by the three Regional Centers during 1984-1985 came to a total of \$1,540,914, or 24.4% of the total funding of the three centers (\$1,225,778 regular budget, or 26.8%, and \$315,136 extrabudgetary funds, or 18.4%).

#### Discussion

The Committee recognized the work done by the Secretariat, as reflected in the copious information provided in the document. It was pointed out, however, that the largely descriptive nature of the document made it difficult to make recommendations to the Director. For this reason it would be necessary to have an analysis of the data that would permit conclusions.

It was proposed, first, to appoint a subcommittee to undertake the analysis needed. The proposal was accepted in principle, but not to be implemented immediately, given the short duration of the XXVI Meeting of the ACHR.



The Committee then addressed the evaluation process itself and the instrument for the collection of data. With regard to the former, it felt that the document revealed that the Organization did not have a research program with concrete, pre-set goals and objectives. There were problems with the statement that research was included in all the cooperation activities, which the Committee found difficult or impossible to evaluate. It felt that the instrument for the collection of data, even though it was provisional, should be more refined and should include questions on future plans, and it emphasized the urgency of designing and implementing an information system. The system should not only quantify resources and activities but also spell out the results obtained and the use that had been made thereof.

The Committee also commented on the specialized centers and expressed the desire that the reports of the external evaluations be sent to it on a systematic basis.

#### Recommendations

- That a research program be established in PAHO/WHO.
  - That an information system for the PAHO/WHO research program be designed and implemented immediately.
  - That half the components of the program be evaluated every two years by ad hoc subcommittees of the ACHR, with expert collaboration when and as necessary.
  - That the evaluation be based on the quadrennial progress report of each component of the research program and on the activities programmed for the next four years.
  - That the Secretariat prepare a document detailing the above information and present it to the ad hoc subcommittees.
  - That the ad hoc subcommittees present to the full ACHR the result of the evaluation and their recommendations, together with the report prepared by the Secretariat.
2. Dietary Policies: Nutrition and Health - Reflections on Research Priorities

Dr. Carlos Hernán Daza, Coordinator of the PAHO/WHO Regional Food and Nutrition Program, made the presentation under this item, highlighting the major points contained in Document PAHO/ACHR/28/87.13.

He explained that the regional program, including the specialized centers, namely the Institute of Nutrition of Central America and Panama (INCAP) and Caribbean Food and Nutrition Institute (CFNI), promotes and supports actions aimed at identifying and solving the Member Countries' priority problems in the area of food and nutrition.

He indicated that the strategies for technical cooperation include the coordination and promotion of research on nutrition in three fundamental areas: biomedical, socio-epidemiological, and operational. In connection with the last, great importance is given to evaluative studies of broad-based national programs aimed at improving the diet of low-income populations and/or the populations at biological and social risk.

To this end, he indicated, PAHO/WHO is promoting the establishment of a regional operational network of food and nutrition institutions (RORIAN) to support the formation and training of specialized personnel, the development of collaborative research projects, and the dissemination of information.

The economic and social situation of Latin America and the Caribbean, Dr. Daza said, makes it necessary to carry out research using new operational approaches and priorities. He emphasized that it was fundamental to have a greater understanding of the sociocultural realities that determine or bear on malnutrition by insufficiency (protein-energy) or by excess (overweight and diet-related chronic diseases), both in terms of food consumed within the family and its use during illness (diarrhea, acute respiratory infections, etc.).

Accordingly, PAHO/WHO has proposed to emphasize the following lines of research in the future:

- Food and nutrition surveillance.
- Feeding of mothers and children.
- Food and nutrition policies and programs.
- Nutrition of adolescents and the elderly.
- Specific nutritional deficiencies.

#### Discussion

The Committee commented on various aspects of the topic, both those cited by the speaker and points covered in the document prepared by the WHO Secretariat in Geneva entitled "Dietary Policies: Nutrition and Health - Reflections on Research Priorities."

It stressed the difficulties involved in analyzing the nutritional status of populations without having simple measurement instruments that have been validated at the level of small communities or any evaluations of intervention programs. This last is considered to be one of the most serious technical problems related to this subject.

In addition, it pointed out that, although modern technology was important in the search for and production of new food sources, the contribution of the social sciences was essential for finding solutions to the food and nutrition problems that prevail in the Region.

In concluding the discussion, the Committee pointed out that the technical and scientific problems associated with food and nutrition are only secondary compared with the more dramatic ones of a political and economic nature that the Region is facing, where repercussions of external indebtedness are compromising the nutrition of the peoples and in particular that of the child population.

### Recommendations

Having heard the presentation by Dr. Daza, the Committee recommended that the Organization assign maximum priority to research in nutrition, strengthening the mechanisms for institutional support and coordination (RORIAN), according to the priorities proposed by the Regional Food and Nutrition Program.

Attention was called to the need to strengthen the capacity of national and subregional institutions, including INCAP and CFNI, to carry out operations research in the area of food and nutrition.

### 3. Report on the Workshop on Research Priorities and Strategies in Central America and Panama

The topic was presented by Dr. Alberto Pellegrini Filho, consultant to the PAHO Research Coordination Unit, and was based on the report on the workshop held in Antigua, Guatemala, from 17 to 21 November 1987. Representatives of all the countries of the Central American Isthmus and of the Dominican Republic participated in this meeting.

The three principal objectives of the workshop were:

- Analysis of the processes of planning and administration of science and technology in health in the countries of the subregion. More specifically, it involved analysis of the role in the institutions of planning, coordination, execution and utilization of research results in relation to four basic areas in the development of scientific activity: the definition of research policies and priorities, research financing, scientific-technical information systems, and human resource development for research.
- Preparation of the general bases of a research program to give scientific support to the activities of the Health Priorities Plan for Central America and Panama (PPS/CAP).
- Identification of areas of cooperation among countries in the field of research on health and definition of the role of PAHO in their promotion and strengthening.

Dr. Pellegrini presented a summary of the discussions in the plenary session of the workshop on each of the four topics indicated, pointing out that these discussions were developed within a frame of reference prepared by the participants. In accordance with this, scientific activity is a social practice articulated with other social practices; thus its characteristics are conditioned by the economic, political and social structures within which it is developed. Scientific activity includes the processes of production, circulation, and utilization of knowledge, in which are identified operational entities (research units, agents, instruments, etc.) and determinants (coordination, financing, training of human resources, legal establishment, etc.).

The discussion on topics and specific aspects, such as the definition of priorities, financing, and human resources, was made in the workshop using as a reference this broad vision of scientific activity, which means that an integrated approach to thinking about them was sought, with a concern for relating these components to given social objectives. In the discussion of these topics situational aspects were also pointed out--in particular, the consequences of the economic, political, and social crises that the Subregion is experiencing in the development of research on health. The conditions of uncertainty and instability, the loss of prestige experienced by the investigators, and the reduction in the financial resources devoted to research were noted as examples.

In the second part of the workshop two groups were devoted to the preparation of the bases for a program of research related to the seven areas of the PPS/CAP. A methodology was outlined for identification of priority topics that took into account the needs and demands of health and of the services, the responsive capacity of the investigators for the production of knowledge required, and other variables. The organizational characteristics and the profile of functions of the unit responsible for preparation and coordination of that program were suggested by the participants in the workshop, recognizing as their principal activities the definition of priorities and the thematic plan of research, supporting the execution of projects, the administration of technological scientific information systems, and the promotion of the training of human resources in research.

The importance of the follow-up of the activities suggested by the participants, particularly the realization of national meetings for implementation of their recommendations, was emphasized at the end of the presentation made by Dr. Pellegrini, who reported to the ACHR of the existence of activities programmed for that purpose.

#### Discussion

Dr. Pellegrini's presentation gave rise to some reflections by the Committee with respect to scientific planning in general and to the establishment of priorities in particular.

It was brought to light that the topic was of world-wide interest, as demonstrated by the convocation of meetings held recently in Geneva, Switzerland, and Bellagio, Italy. Also mentioned were the creation, at Harvard University, of a Committee on Priorities in Research for Development and the experience of the University of Madison in defining priorities for research on vaccines.

Referring specifically to the model on which experiments were carried out during the workshop held in Guatemala, it was suggested that the methodology be further refined to include the selection of parameters for measurement of the proposed variables. Subsequently that model should be tested at the national level with the participation of persons from various professions and with various interests.

The Committee explained that no method of scientific planning could ignore the pressure exercised in the decision-making process by people organized in voluntary groups, committed to the solution of health problems or with other interests. He pointed out, in addition, that the development of science and technology depended basically on a political will that was translated into the allocation of the financial resources necessary for that purpose in the national budget.

In addition to the aforementioned aspects, the Committee deemed correct the decision of the Organization to begin activities related to scientific planning in Central America where, despite the difficult political situation that existed in the Subregion, greater efforts toward union and cooperation among the countries are becoming apparent. He indicated that the report on the workshop should be widely disseminated and that PAHO/WHO should promote the continuity of the process initiated in Guatemala.

#### Recommendations

- That the Ministers of Health of Central America and Panama be informed of the workshop held by PAHO/WHO in Guatemala.
- That the Ministers of Health be encouraged to allocate resources for the realization of national workshops integrating health professionals working in services, education, and research.
- That those national workshops prepare a plan of research priorities that identifies the projects to be carried out at the national level and those that require the collaboration and the experience of all the countries of the isthmus for their execution.
- That resources be assigned and technical cooperation offered for the realization of those workshops and that the management of the search for extrabudgetary resources for the execution of projects be supported.
- That a report be made to the XXVII Meeting of the ACHR on the development of research in Central America and Panama.

4. Management of the Environment and Vector Control

There were two speakers on this topic, Dr. Rodrigo Zeledón, Minister of Science and Technology of Costa Rica and Chairman of the Group of Experts on Environmental Management for Vector Control of WHO, FAO and UNEP, and Dr. Gabriel Schmunis, PAHO/WHO Adviser on Communicable Diseases Research.

Dr. Zeledón referred in his presentation to the proliferation in Latin America of projects involving water, for irrigation or the production of energy. He indicated that although these projects influenced the economic development of the countries in a positive way, if the necessary measures were not taken, they could become a serious threat to the health of the populations. In order to illustrate this statement the speaker showed some statistics that revealed the introduction in some cases and the increase in others of diseases transmitted by vectors, such as malaria, schistosomiasis, filariasis, onchocerciasis, and encephalitis.

Dr. Zeledón stated that in the search for solutions to these problems the use of insecticides and molluscocides for economic, social, and ecological reasons should not be favored in the Region. He stated that it was necessary to put the emphasis on finding other mechanisms that should be investigated in the Region, such as the introduction of permanent or temporal modifications in the habitat or in human behavior that would contribute to vector control in the areas affected by projects involving water.

Dr. Schmunis, for his part, dealt with the biology of the vectors and their control. The presentation began with a summary of the situation in the Region with respect to diseases such as malaria, schistosomiasis, dengue, American tripanosomiasis, onchocerciasis and leishmaniasis. He also indicated that Aedes aegypti, which had been eradicated in 17 countries, had been reintroduced in many urban areas. This favors the dissemination of dengue and poses the possibility of outbreaks of urban yellow fever. In addition, the recent discovery of Aedes albopictus in 12 states of the United States of America and in four states in Brazil complicates the situation even more. In Asia this is an excellent vector of dengue and could be a vector of California encephalitis in the Americas.

Measures for the prevention of these diseases are well known. Although the methodology utilized most is still based on the use of chemical insecticides, the increase in costs, the resistance of the vector, the low specificity of the target, and concern for the ecological changes lead to a preference for the combined use of several control strategies, including biological control. This means the utilization of all the technology capable of achieving effective control of the vector, based on the ecological comprehension of the problem. Integrated control includes measures directed toward the modification or manipulation of the environment.

The projects carried out in Saint Lucia, Dominica, El Salvador, Guatemala, Argentina, and Venezuela are examples of the utilization of diverse control strategies in which, in one way or another, the management of the environment is involved.

Although in the cases mentioned several measures destined to modify the environment to make it unfavorable for the survival of the vector are applied, the possibility is not excluded that under certain circumstances there is knowledge of how to apply a single strategy--for example, the use of chemical pesticides or methods of biological control.

Research in this area is financed by national institutions in Argentina, Brazil, Colombia, Cuba, Mexico, and Venezuela; the Program of Research and Training in Tropical Diseases, World Bank/UNDP/WHO (TDR), through the Scientific Working Group in Biology and Vector Control, and the Board on Science and Technology for International Development (BOSTID), National Academy of Sciences/National Research Council of the United States of America.

In the Region, from the beginning of the TDR program until October 1986 financing was provided for 64 projects with a value of \$1,838,000. This represents almost 40% of all the funds of this component of the program. However, probably because of the lack of specialists in this field, the number of projects financed in biology and vector control is very low when compared with the total number of projects financed in the Region by the other components of TDR. Through BOSTID, investigators in Brazil, Colombia, Guatemala, Mexico, Panama, and Peru have obtained from 1984 to July 1986 34% (\$771,800) of the overall funds available in that program.

The activities of cooperation carried out by PAHO/WHO are destined to promote: the identification of gaps in knowledge of causes, risk factors, groups, and trends in vector-borne diseases; the development of methodologies for the study of the dynamics of transmission; the evaluation of the results of different control strategies, including cost; the development of research proposals; and the review and monitoring of projects in progress and training in research.

Finally, Dr. Schmunis pointed out the priority areas of research identified by the Organization: epidemiology, ecological knowledge, vector biology, social factors, measures of intervention, and cost-effectiveness. Taken as a whole and not as isolated topics, they constitute multidisciplinary research that makes it possible to focus on the problems of control in a logical sequence. In this context, everything is included from laboratory research through the application of the knowledge in the field. Unfortunately, the lack of qualified personnel impedes the realization of this research. In this respect he pointed out the dramatic scarcity of entomologist-physicians. A case study carried out in four countries of the Region in 1985 demonstrated that only five entomologist-physicians work in the programs for vector control.

### Discussion

Both presentations gave rise to an interesting debate on different approaches of programming for vector control.

The vertical approach was criticized; mention was made of the lack of community participation and integration with the actions of the health services which limited the possibilities of success of the control measures. It was suggested that this activity be incorporated in primary care.

This suggestion was not considered viable because it represented an additional load for the already overloaded programs for primary care. The Committee pointed out that situations such as those explained in general by the speakers should be dealt with utilizing one approach or a combination of approaches. The selection of these should conform to the epidemiological and environmental characteristics as well as to the economic and social particulars of the areas affected.

### Recommendations

- That PAHO/WHO stimulate and promote in Latin America research on biomedical, ecological, and socioeconomic factors in order to prevent vector-borne diseases.
- That PAHO/WHO request the Member Countries to designate resources for the formation of entomologist-physicians.
- That PAHO/WHO assign resources for technical cooperation to strengthen the programs for training entomologist-physicians in Latin America.

## II. SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENT IN HEALTH IN BRAZIL

This session, which included a round table made up of distinguished scientists from different institutions in Brazil, was presided over by Dr. Sergio Arouca, President of the Oswaldo Cruz Foundation and member of the Advisory Committee on Health Research of PAHO/WHO.

Dr. Arouca indicated that the presentations would emphasize different aspects of the development of biotechnology in Brazil and that as a whole would acquaint the audience with the organization of the biotechnology system in the country.

Dr. Akira Homa, Director of Biomanguinhos, initiated the presentations by describing the national program of self-reliance in immunobiology, pointing out the role of FIOCRUZ in the implementation of that program.



Next, Dr. Carlos Morel, Vice President of Research of the Oswaldo Cruz Foundation, discussed the new scientific and technological developments in progress in the country and their application and importance for the health of the Brazilian people.

The Dr. Isaias Raw, Director of the Center for Biotechnology of the Butantán Institute, supplemented the previous presentations, referring to the role of the Institute under his direction.

The fourth presentation was made by Dr. Jorge Guimaraes of the BIO-RIO Foundation who described the scientific-industrial complex "Polo Bio-Rio." This project articulates the efforts of the State and Municipality of Rio de Janeiro, the Federal University of Rio de Janeiro, the Oswaldo Cruz Foundation and the Brazilian Association of Biotechnology Companies. Dr. Guimaraes stated that the principal objectives of the initiative are: the collaborative generation and transfer of technologies among the research institutions and the biotechnology companies; the development of integrated programs for human resources; and the industrialization of biotechnological products with priority for the sectors of health, agriculture, energy, and others.

Drs. Vladimir Belinatti of the National Council of Scientific and Technological Development and Reynaldo Guimaraes of the Financing Agency for Studies and Projects, both dependencies of the Ministry of Science and Technology of Brazil, described aspects of the organization and financing of scientific and technological activity in the country.

Finally, Dr. Celina Roitman, of the Secretariat of Biotechnology of the Ministry of Science and Technology, referred to the efforts and achievements in the coordination of the activities in biotechnology in the country.

The transcription of all the presentations will appear in the full text of this report.

### III. TECHNICAL COOPERATION IN BIOTECHNOLOGY IN HEALTH

#### 1. Strengthening the Transfer of Technology to Developing Countries, with Special Reference to Health

This topic was presented by Dr. Gordon L. Ada of the University of Canberra, Australia, and was based on the report of the Fifth Meeting (7 to 10 April 1986) of the Subcommittee on Technology Transfer of the ACHR of WHO, of which he is Chairman.

Initially Dr. Ada referred to specific conceptual positions of the Subcommittee concerning the transfer of technology to developing countries. He considers that this should occur through a process in which the beneficiary country participates actively, evaluating its own needs and aspirations and sponsoring research activities and the updating of existing technology, insofar as possible.

The Subcommittee considers that the nature of the technology to be transferred should vary in relation to the state of social, economic, and technological development in the beneficiary country and that the modalities of transfer are multiple, from the distribution of information to the reception of a complete industrial "package."

Continuing his general comments, Dr. Ada referred to the factors that influence the success of technology transfer and the means that facilitate it. He identified the requirements necessary for both the providing countries and the users. With respect to the latter, he emphasized the need for the political will of the government to create an appropriate infrastructure for both health care and the transfer of technology. This should allow the user country to have a body of experts and technologists familiar with the latest progress in a specific field and able to evaluate the desirability of a particular technology and the capacity of the country to apply it in health.

Dr. Ada then described and analyzed the potential of the new techniques in the biological sciences for the developing countries, in particular recombinant DNA technologies. He noted the interest in developing pilot projects for technology transfer with the participation of WHO, and indicated that the production of measles vaccine brings together excellent conditions and constitutes a prime model.

#### Discussion

The Committee thanked Dr. Ada for his presentation, indicating that it correctly presented not only aspects of biotechnology, but also other subject matter that could be utilized in the Region.

With respect to technological transfer, the Committee indicated that it was important to study not only how the processes were transferred between developed and developing countries but also among the latter. To omit this would be to ignore the proven capacity of some countries of the Region to develop new technologies.

It also emphasized that although the transfer of technology for the improvement of the health services was of great importance, the transfer of the technology without the transfer of the science did not contribute to development but to dependency.

The Committee insisted, in addition, that although its function was to recommend a search for autochthonous methods for evaluating imported technologies, even more important was its role as promoter of scientific and technological development in Latin America, recognizing that this was not exclusively an attribute of the developed world.

The discussion concluded with the assertion by the Chairman that no human group had a monopoly on brains and that neither in Latin America nor in any other part of the world were those riches scarce.

### Recommendations

- That a subcommittee of the ACHR on health and scientific development be established.
- That the functions of that subcommittee be discussed by the working group formed by the Chairman in order to treat topics related to the internal operation of the ACHR.

### 2. The Role of the International Agencies in the Development of Biotechnology. Initiatives in Progress

This topic was presented by Dr. Fernando Hurtado, consultant for UNFPA in Brazil. Among the initiatives in progress in the Region he pointed out the UNDP/UNESCO/UNIDO Regional Program of Biotechnology for Latin America and the Caribbean. The Program has as its overall objective the promotion of integration and complementary activities by the countries of the Region and contribution to the development and implementation of biotechnologies, for the purpose of solving priority regional problems. Among the premises on which the Program is based are the search for scientific and technological integration among the participating countries; strengthening of horizontal cooperation among them; integration of research and development activities with those of production; and concentration of the available resources on a limited number of projects with high impact.

Dr. Hurtado reported that the Program has the support of 10 countries and financial resources on the order of \$5 million for the period 1987-1991. There are strong possibilities of acquiring additional resources; with that objective, contacts are being made with the Ibero-American Institute of Cooperation, with the European Economic Community and with the Italian-American Institute. In its first meeting in Mexico in April 1987, the Regional Directing Council, central coordinating agency for the Program, approved six intercountry projects in the areas of health, agriculture, and foods that total approximately \$3 million.

Dr. Hurtado reported to the Committee on other initiatives, in addition to the Regional Program. UNESCO, in collaboration with INCRO, UNEP, and FAO, organized a network of reference centers in microbiology known as MIRCEN, devoted to areas of special interest for biotechnology; UNIDO sponsored the creation of the International Center for Genetic Engineering and Biotechnology; the University of the United Nations is participating in research activities in the field of biotechnology applied to agriculture. For 10 years the UNDP supported a regional program of graduate training for the purpose of promoting the development and integration of the investigators of the Region working in the biological sciences. PAHO has been working in biotechnology for some years and at present seeks to define new programs and lines of action in this field, an effort in which the ACHR is actively engaged as is

evidenced by this meeting. The Directing Council of the Regional Program of Biotechnology of the UNDP expressed a need for dissemination of information and definition of policies related to safety in the management of products and biological techniques, requesting that PAHO assume responsibility for promoting activities in that sense. In order to fulfill to that mandate, PAHO, IICA, the OAS and the UNDP are programming joint initiatives.

#### Discussion

Dr. Hurtado's presentation reinitiated the debate within the Committee on the transfer of technology vis-à-vis its generation in developing countries. Reference was also made to the initiatives of the international organizations and the amount of the resources they assigned to the development of biotechnology.

With respect to technology transfer, the status of Latin America and the Caribbean solely as users, and not suppliers, of technologies was brought up. Reaffirming the words of the Chairman related to the wealth of brains in the world, he indicated that the limitations were solely in infrastructure and in a political-economic environment that gave free rein to the creativity of the Latin American and Caribbean scientific community.

To illustrate the will of a country and the importance of international cooperation in the development of science and technology, Dr. Caldeyro-Barcia referred to the situation in his country (Uruguay). He said that the country, after suffering the onslaughts of a military dictatorship for 11 years, was today developing the basic sciences and their industrial applications. The support of the European Economic Community, the UNDP, UNESCO and PAHO/WHO, the Governments of Argentina, Brazil, Spain, and others, added to that of the new government of Uruguay, had permitted the repatriation of 50 of the 400 scientists scattered in Japan, the United States of America, and the countries of Europe that had found themselves needing to abandon the country during the dictatorship. He indicated that it is hoped that, by 1987, 85 more will have returned, despite having to face a substantial reduction in their income.

Initially, there was disagreement among the members of the Committee concerning the amounts of money contributed by the international organizations for the development of biotechnology, in particular the US\$5 million designated for that purpose by the UNDP. After a healthy debate, there was a consensus that the role of the international agencies was basically catalytic and that the contributions that they made in foreign exchange, while appearing small, tended to increase substantially the allocation of resources in national currency by the Member Governments.

Next the Committee discussed the International Centers of Biotechnology of the UNDP in Trieste and New Delhi. It manifested concern for the lack of interrelationship between the two centers, but

considered judging them premature. It concluded, however, that the political climate that induced the creation of the centers and the decision concerning their sites had stimulated the creation in the countries of their own structures.

The Committee also manifested its satisfaction with the role in the area of biosafety assigned to PAHO/WHO by the Regional Directing Council of the UNDP/UNESCO/UNIDO Program.

#### Recommendations

- That PAHO/WHO continue the efforts of coordination with other international agencies aimed at developing biotechnology in Latin America and the Caribbean.
- That PAHO/WHO assign the necessary resources to fulfill the leadership role in biosafety assigned to it by the Regional Directing Council on Biotechnology of the UNDP/UNESCO/UNIDO.

### 3. Research in Technology Related to Recombinant DNA. PAHO/WHO Standards

Dr. Maria Leite-Ribeiro, Chief of the Research Coordination Unit in PAHO/WHO, made the presentation.

She stated that the possibility of altering various forms of life by means of genetic engineering has raised ethical and functional questions. In the 1970s there was great concern about the possibility of creating risks that could not be controlled. Some of the first guidelines of the National Institutes of Health of the United States of America reflected that feeling: the directives represent a compromise among the fears of (i) dangerous creation of new biological organisms and (ii) excessive regulation of research. Recently several countries have attempted to end these concerns by establishing standards and procedures that regulate the various uses of the new biotechnology.

The new biotechnology, said Dr. Leite-Ribeiro, shows great progress in the pharmaceutical industry, although its development receives the stimulation of commercial interests, especially in agriculture and the food industry. The health organizations are more interested in the part of that biotechnology that deals with recombinant DNA (DNAr). There are different definitions of this research, but that recommended in the guidelines of the European Community is as appropriate as any other among the better ones. This defined it as "The formation of new combinations of genetic material by the insertion of molecules of nucleic acid, produced through any environment outside the cell, in a virus, bacterial plasmid, or other vector system, in order to permit their incorporation in a receptor organism in which they do not exist in natural form and in which they can continue propagating."

Dr. Leite-Ribeiro indicated that the Pan American Health Organization considered that it had two functions concerning the regulation of the use of biotechnology:

1. To establish procedures that should be observed when it participates directly or indirectly in research or other activities that include DNAr.
2. To advise the countries on information sources or guidelines for experiments that include DNAr and to help them to establish their own standards or to modify the existing ones.

She stated that there would be direct participation by PAHO when its personnel carry out research with DNAr material, although in the foreseeable future this work will always be done with the collaboration of scientific personnel not belonging to the Organization, when it makes grants to individuals or institutions for research that includes DNAr and when it has to act as executing agency for a project in which national personal carry out research with DNAr.

The speaker emphasized that none of this research could be initiated without the express consent of the Director of PAHO. The Director will be advised by the respective internal committee on the desirability of that research, and the request to conduct it should be presented to the Research Coordination Unit of PAHO, with a detailed protocol of the experiment. This protocol will be submitted for analysis by a committee designated for that purpose that will examine the proposed research methodology and evaluate the potential risk for the environment and the proposed material. In accordance with its evaluation, the Committee will advise the Director on the desirability of approving such research. This function corresponds at present to the Ethics Committee of PAHO that, if necessary, can consult internal or external experts.

In evaluating the proposed research, the Committee will take into account the various regional or international standards of research involving DNAr. Some examples of these are the guidelines of the National Institutes of Health of the United States of America for research involving DNAr molecules and the considerations relative to the innocuity of DNAr presented by the Organization for Economic Cooperation and Development (OECD).

#### Discussion

At the outset the Chairman felt it necessary to orient the discussion toward aspects of biosafety and not toward the ethics of experimentation in human subjects. He indicated that it was necessary to make that distinction because although the safety measures for work with DNAr in laboratories had been relaxed since no accidents had been reported, experimenting with them outside the confines of the laboratory required the preparation and strict fulfillment of safety measures that protect the environment.

The question was raised whether the guidelines had or had not been adopted by the PAHO/WHO Governing Bodies. It was reported that these had been prepared in order to control the behavior and participation of PAHO/WHO, not its Member States, in experiments with DNAr. The latter, exercising their national sovereignty, could adopt those guidelines, utilize them as a basis for the preparation of their own, or create others.

The Committee insisted that PAHO/WHO had to promote the adoption of international guidelines, the formulation of standards and/or legislation, that regulate experimentation on human subjects and research with DNAr in the laboratory and in the environment.

#### Recommendations

- That PAHO/WHO urge the research institutions to include in their statutes or constitution the creation of committees on ethics and biosafety.
- That it continue to urge in the universities and institutions of research of the Hemisphere teaching, not only the theoretical, but also the practical, application of ethical and safety principles in biomedical research.
- That it urge the agencies funding biomedical research in the Hemisphere and the media for dissemination of scientific knowledge to accept only projects and articles that follow ethical and safety procedures.

#### 4. Technical Cooperation in the Field of Biotechnology Applied to Health in Latin America

Dr. Carlos Morel, Vice President of Research of the Oswaldo Cruz Foundation, made the presentation, based on the report of a meeting of experts held from 26 to 30 January 1987, in the Headquarters of PAHO/WHO (Document PAHO/ACHR/26/87.8). Scientists from Argentina, Brazil, Costa Rica, Cuba, Mexico, and Venezuela participated in this meeting, and its central objective was the identification of concrete lines of action by PAHO/WHO so that it can give effective support to the efforts that the countries of the Region are making in the development of this field.

The first part of Dr. Morel's presentation was devoted to an analysis of the importance of biotechnology in the economic and social context of Latin America and of the factors that affect its development. Among those mentioned were state funds for basic and applied research; the availability of human resources and training; state policies and programs in biotechnology; university-industry relations; foreign policies of the state with respect to technology transfer, foreign investments, and foreign trade; financing and fiscal incentives for companies working in the field; legislation with respect to the protection of health, safety, the environment, and intellectual property; and social participation in the decision-making process.

After analyzing the importance of each of these different factors in the development of biotechnology, he presented possible lines of joint action by PAHO and countries of the Region, whose common objective is the strengthening of the existing scientific-technical infrastructure. These lines of action include the development of systems of scientific-technical information, human resources, and technical-material infrastructure and support for formulation of policies, legislation, and standards. For each of these lines of action, the group of experts recommended a series of activities of technical cooperation, which were submitted for consideration by the Committee.

Finally, Dr. Morel presented the general bases for a program of regional cooperation that has as its objective the development of diagnostic methods for AIDS, hepatitis, malaria and Chagas' disease, using biotechnological techniques. This program, in addition to serving a clearly recognized social need, should have a driving character, articulating the lines of technical cooperation previously mentioned and promoting the mobilization of efforts and resources for the development of biotechnology in the Region.

The Committee was informed that, taking these recommendations into account, the Director of PAHO had included among the priority areas of the Research Grants Program of the Organization the development and evaluation of diagnostic methods for the four diseases mentioned. In addition, it was reported that initiatives are being made for acquisition of the technical and financial support of some international agencies for the proposed activities.

#### Discussion

The discussion emphasized two aspects of Dr. Morel's presentation. One referred to the criteria that were utilized to orient the program toward the development of diagnostic methods and the second to the problems in university-industry relations.

Concerning the first, the Committee expressed concern that the development of therapeutic and preventive methods would not be included along with that of diagnostic methods.

Without ruling out the possibility of the development of therapeutic methods in a later stage, Dr. Morel indicated that the program attempted to articulate research with industrial production which in the case of therapeutic methods would require large investments of resources and more time to obtain results. With respect to research and development of preventive methods, he pointed out that some countries, such as Brazil, were producing vaccines and had the scientific capacity to develop new generations of vaccines but that only with difficulty could their production compete with that of the more developed countries. In addition, he emphasized that this was an area that already had contributions of resources, both national and international, for its development, which was not the case for diagnostic methods.



On the concern expressed by the Committee about university-industry relations, Dr. Morel explained that that topic had been transformed, from merely ideological debate within the research centers, into a concrete reality that presented itself as a day-to-day scientific preoccupation. He indicated that that accumulated daily experience made it possible to design creative forms of work to overcome the well-known conflicts of interests between the universities and industry.

After the clarifications and explanations contributed by Dr. Morel, the Committee considered that the proposal was viable from both the scientific and economic points of view. It considered it indispensable, in order to ensure success, to define clearly the technical-managerial aspects of the implementation of the Program, such as patent rights, production licenses, and the search for and administration of material and human resources. In this regard, it emphasized the catalytic action of PAHO/WHO and stated its optimism about the future of the Program.

#### Recommendations

- That support be given to the recommendations formulated by the Group of Experts that prepared the proposal.
- That financial resources that ensure the development of the Program be assigned and mobilized.
- That the concepts and strategies of TCDC be applied in the implementation of the Program.
- That a permanent subcommittee of the ACHR for the implementation, enhancement, and evaluation of the Program be named.
- That, in the meetings of the ACHR, there be systematic reporting on the development of the biotechnology program applied to health in the Region.

#### CLOSING SESSION

The XXVI Meeting of the Advisory Committee of Health Research was closed on the afternoon of Thursday, 6 August 1987.

Drs. Robbins, Arouca and Guerra de Macedo spoke briefly, expressing appreciation for the presence of the attendees and the valuable collaboration of the personnel of the Oswald Cruz Foundation and the interpreters.

#### Annexes

XXVI MEETING OF THE ADVISORY COMMITTEE ON HEALTH RESEARCH (ACHR)  
3-6 AUGUST 1987  
RIO DE JANEIRO, BRAZIL

PROGRAM OF WORK

Monday, 3 August 1987

INAUGURAL SESSION

8:30 a.m. - 10:00 a.m.

Remarks by the Chairman of the  
Advisory Committee on Health Research  
Dr. Frederick C. Robbins

Remarks by the President of the  
Oswaldo Cruz Foundation  
Dr. Antonio Sergio da Silva Arouca

Remarks by the Director of the Pan  
American Health Organization  
Dr. Carlyle Guerra de Macedo

Remarks by the Minister of Health of  
Brazil  
Dr. Roberto Figueira Santos

10:00 a.m. - 10:30 a.m.

Recess

SESSION I

ORGANIZATION AND MANAGEMENT OF  
RESEARCH IN THE PAN AMERICAN HEALTH  
ORGANIZATION

10:30 a.m. - 11:15 a.m.

Report on the Evaluation of the  
Research Component in Six Technical  
Programs of PAHO/WHO  
Dr. Maria Leite-Ribeiro

11:15 a.m. - 12:30 p.m.

Discussion

12:30 p.m. - 2:00 p.m.

Recess

2:00 p.m. - 2:30 p.m.

Dietary Policies: Nutrition and  
Health - Reflections on Research  
Priorities  
Dr. Carlos Hernán Daza

2:30 p.m. - 3:00 p.m.	Discussion
3:00 p.m. - 3:15 p.m.	Recess
3:15 p.m. - 3:45 p.m.	Report of the Workshop on Research Priorities and Strategies in Central America and Panama <u>Dr. Alberto Pellegrini Filho</u>
3:45 p.m. - 4:15 p.m.	Discussion
4:15 p.m. - 4:45 p.m.	Management of the Environment and Vector Control
	- Research Options in Environmental Management for Vector Control <u>Dr. Rodrigo Zeledón</u>
4:45 p.m. - 5:30 p.m.	- Biology and Vector Control in the PAHO Program of Communicable Diseases <u>Dr. Gabriel Schmunis</u>
5:30 p.m. - 6:15 p.m.	Discussion

Tuesday, 4 August 1987

SESSION II

SCIENTIFIC AND TECHNOLOGICAL DEVELOP-  
MENT IN HEALTH IN BRAZIL

8:30 a.m. - 10:30 a.m.	Round Table on Science and Technology in Brazil <u>Dr. Antonio Sergio da Silva Arouca</u> <u>(Chairman), Dr. Carlos Morel,</u> <u>Dr. Vladimir Belinatti, Dr. Jorge</u> <u>Guimaraes; Dr. Reynaldo Guimaraes;</u> <u>Dr. Akira Homa, Dr. Severino Marcio</u> <u>Meirelles, Dr. Isafas Raw, Dr. Celina</u> <u>Roitman</u>
10:30 a.m. - 10:45 a.m.	Recess
10:45 a.m. - 12:30 p.m.	Discussion
12:30 p.m. - 2:00 p.m.	Recess
2:00 p.m. - 5:30 p.m.	Visit to the Installations of the Oswaldo Cruz Foundation

Wednesday, 5 August 1987

SESSION III

TECHNICAL COOPERATION IN BIOTECH-  
NOLOGY IN HEALTH

8:30 a.m. - 9:15 a.m.	Strengthening the Transfer of Technology to Developing Countries, with Special Reference to Health <u>Dr. Gordon L. Ada</u>
9:15 a.m. - 10:00 a.m.	Discussion
10:00 a.m. - 10:15 a.m.	Recess
10:15 a.m. - 10:45 a.m.	The Role of the International Agencies in the Development of Biotechnology. Initiatives in Progress <u>Dr. Fernando Hurtado</u>
10:45 a.m. - 11:15 a.m.	Discussion
11:15 a.m. - 11:45 a.m.	Research in Technology Related to Recombinant DNA. PAHO/WHO Standards <u>Dr. María Leite-Ribeiro</u>
11:45 a.m. - 12:30 p.m.	Discussion
12:30 p.m. - 2:00 p.m.	Recess
2:00 p.m. - 2:45 p.m.	Technical Cooperation in the Field of Biotechnology Applied to Health in Latin America <u>Dr. Carlos Morel</u>
2:45 p.m. - 3:15 p.m.	Discussion
3:15 p.m. - 3:30 p.m.	Recess
3:30 p.m. - 5:00 p.m.	Discussion

Thursday, 6 August 1987

SESSION IV

8:30 a.m. - 10:15 a.m.	Continuation of the Discussion on Technical Cooperation in the Field of Biotechnology Applied to Health in Latin America
10:15 a.m. - 10:30 a.m.	Recess

Thursday, 6 August 1987 (cont.)

CLOSED EXECUTIVE SESSION

10:30 a.m. - 11:00 a.m.	Report on the XXVIII Meeting of the World Committee on Research in Health <u>Dr. Mohamed Abdelmoumene</u>
11:00 a.m. - 11:15 a.m.	Discussion
11:15 a.m. - 11:45 a.m.	Report on the Actions Carried Out by PAHO/WHO in Relation to the Recommendations of the Advisory Committee on Health Research <u>Dr. Maria Leite-Ribeiro</u>
11:45 a.m. - 12:00 p.m.	Discussion
12:00 p.m. - 2:00 p.m.	Recess
2:00 p.m. - 2:45 p.m.	Technical and Administrative Aspects of the Operation of the Advisory Committee on Health Research <u>Dr. Maria Leite-Ribeiro</u>
2:45 p.m. - 3:15 p.m.	Discussion
3:15 p.m. - 3:45 p.m.	Recess
3:45 p.m. - 4:45 p.m.	Approval of the Draft Report of the XXVI Meeting of the Advisory Committee on Health Research

CLOSING SESSION

4:45 p.m. - 5:30 p.m.	Remarks by the Chairman of the Advisory Committee on Health Research <u>Dr. Frederick Robbins</u>
	Remarks by the President of the Oswaldo Cruz Foundation <u>Dr. Antonio Sergio da Silva Arouca</u>
	Remarks by the Director of PAHO <u>Dr. Carlyle Guerra de Macedo</u>

## XXVI MEETING OF THE ADVISORY COMMITTEE ON HEALTH RESEARCH

## LIST OF PARTICIPANTS

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EXPERT FROM THE HOST COUNTRY

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