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REPORT OF THE ADVISORY COMMITTEE ON HEALTH RESEARCH

The XXXV Meeting of the PAHO/WHO Advisory Committee on Health Research (ACHR) was held in Havana, Cuba, from 17 to 19 July 2000. The meeting covered research topics related to PAHO technical cooperation.

At previous meetings, the ACHR had recommended focusing technical cooperation activities on four strategic areas: (1) preparation and implementation of a regional research agenda; (2) promotion of training and exchange of researchers among the countries of the Region; (3) support for greater use of scientific information in the decision-making process in health; and (4) the search for greater equity in the countries of the Region in terms of their capacity to generate and access knowledge and information on health.

The XXXV Meeting of the ACHR evaluated the progress that has been made in each of these strategic areas. Of particular importance were the following: the discussion on DECIDES, which is a proposal to apply new communication and information technologies to the production, dissemination, and utilization of scientific information; the sessions devoted to evaluating graduate-level health programs; the progress report on implementation of the Virtual Health Library (VHL); and the report on activities of the Research Grants Program. The Committee noted the important progress that has been made, particularly with regard to support for relatively less-developed countries, and it recommended that these strategic areas be maintained and consolidated.

The status of health research in Cuba was also discussed. The importance of the Cuban experience was noted in terms of reconciling cutting-edge developments in the biomedical sciences with the needs of the health system. This has had a great impact on resolving public health problems. While the Cuban experience is unique, the country nevertheless has important similarities with others in the Region. Therefore, the

evaluation and eventual adaptation of its experiences in health science and technology are of inestimable value for other developing countries.

The meeting also included discussions on the designs and results of multicenter projects promoted and financed by PAHO to analyze inequity in the determinants of health, and dietary and exercise habits and chronic diseases in the Caribbean. The research activities of the Institute of Nutrition of Central America and Panama (INCAP) were also reviewed, and Dr. Jorge Allende gave a presentation on recent advances in molecular biology and their importance for public health.

To commemorate PAHO's 100 years of service in 2002, it was recommended that a large-scale scientific event be held that coincides with that year's ACHR meeting. High-level international scientists would be invited to discuss state-of-the-art trends and challenges facing the scientific disciplines related to PAHO's strategic and programming orientations, as well as their implications for public health and technical cooperation. Representatives of various sectors related to research in the Region, including representatives of the CONICYTs, would be invited to the event.

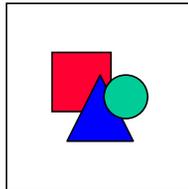
This final report of the XXXV Meeting of the ACHR is presented to the 42nd Directing Council for study and discussion.

Annex

PAN AMERICAN HEALTH ORGANIZATION
Pan American Sanitary Bureau, Regional Office of the
WORLD HEALTH ORGANIZATION

ACHR 35/2000.15

Original: Spanish



**XXXV MEETING OF THE ADVISORY COMMITTEE ON HEALTH
RESEARCH**

Havana, Cuba
17 - 19 July 2000

REPORT TO THE DIRECTOR

Health Research Coordination
Division of Health and Human Development
Washington, DC, July 2000

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REPORT OF THE XXXV MEETING OF THE ACHR

17-19 July 2000

Havana, Cuba

SUMMARY of the Presentations

1. Opening Session

1.1 Address by the Minister of Health of Cuba, Dr. Carlos Dotres

Dr. Dotres welcomed the members of the ACHR and expressed his satisfaction that PAHO had accepted the invitation to hold this meeting in Havana. He said that research is an essential part of the Cuban Health System, and that the important role of research can be clearly identified in the progress and achievements in health in Cuba. The agenda of the meeting includes topics of great importance for S&T development in the Region. It also provides an opportunity to review S&T developments in Cuba, particularly at the Tuesday session. Dr. Dotres concluded by emphasizing the importance of the Latin American School of Medical Sciences, which offers training opportunities for 1,500 physicians annually from all the countries of the Region. He invited the members of the ACHR to visit that exemplary initiative of solidarity among the peoples of Latin America and the Caribbean.

1.2 Address by the President of the Science Academy of Cuba, Dr. Ismael Clark

The President of the Academy welcomed the participants, reminding them that in its more than 100 years of existence, the academy has played a key role in the achievements of Cuban science. Since 1962, the academy has occupied the magnificent building in which it now has the pleasure of offering its warmest hospitality to the members of the ACHR.

1.3 Address by the President of the ACHR, Dr. Jorge Allende

Dr. Allende thanked the Government of Cuba for its invitation and pointed to the importance of the Cuban experience for Latin America. He mentioned the challenges that Committee faces in trying to help countries of the Region to become up-to-date with such advances in the biomedical sciences as the sequencing of the human genome. He reiterated the importance of training human resources and of making available the financial resources needed for the development of science in the Region. He concluded by noting the importance of the topics that were to be addressed at this meeting.

1.4 Address by the Director of PAHO/WHO, Dr. George A. O. Alleyne

Dr. Alleyne thanked Cuba for the invitation to hold the meeting here and said that he understood it as an expression of the strong ties between Cuba and PAHO, as well as of the importance attached to science and research in Cuba in deeds as well as words. Dr. Alleyne requested to a moment of silence in memory of Dr. Abraham Horwitz, during whose administration the ACHR was created. He recalled that in his discussions with Dr. Horwitz on PAHO's role in research, Dr. Horwitz mentioned the dilemma between the researcher concerned with knowledge and the State concerned with application, and that PAHO had to serve both concerns. Thirty years ago, the principal focus of the Committee was to provide small grants to young researchers, as well as to support research in the Pan American Centers. Today, research is an integral part of all the areas of PAHO, and the principal concern is how to best select research topics and promote the creation of collaborative networks to carry that research out.

The ACHR must be clear in terms of whom it advises and the principles upon which the work of PAHO is based, these being to combat inequities and to support Pan-Americanism. The availability of reliable, disaggregated data is fundamental for the analysis of inequities. Cuba is an example in this regard. The importance of studying inequities in terms both of health and its determinants, as well as the role of PAHO in helping to reduce those inequities, will be emphasized throughout the discussions at this meeting. PAHO's principal strategies in research are training human resources; recognizing in policies the complexity of transferring data/information and searching for mechanisms that both promote that transfer and take the complexity involved into account; creating networks, particularly more efficient centers for coordination; and defining agendas that make it possible to target efforts in specific relevant subjects. Dr. Alleyne specifically mentioned the experience of the CGIAR (Cooperative Group for International Agricultural Research) as an example of a research network applicable to the Americas. Dr. Alleyne finished by requesting the Committee's input in order to enhance these strategies. As part of the celebration marking the 100th anniversary of PAHO, Dr. Alleyne said that the Organization intends to hold a large-scale scientific event to complement the meeting of the ACHR in the year 2002. He requested the support of the Committee for the organization of this meeting and the participation of its members in the preparatory activities that should be carried out in 2001.

2. *Presentation and Discussion of the Agenda*

The agenda was presented by the Secretary of the ACHR, Dr. Alberto Pellegrini. He pointed out that the program of the meeting seeks to report on the activities carried out in response to ACHR recommendations, particularly those related to: 1) preparing and implementing a regional research agenda with broad participation; 2) promoting the training and exchange of researchers among the countries of the Region; 3) reducing inequalities among these countries with respect to the capacity to generate and access information and knowledge in health; and 4) promoting greater use of scientific information in the decision-making process in health. In this regard, the sessions that stand out include those devoted to the presentation of DECIDES, the evaluation of graduate-level health programs, the report on progress in the implementation of the Virtual Health Library (VHL), and the report on activities of the Research Grants Program geared toward strengthening research capacity in the relatively less developed countries.

As at previous meetings, research activities carried out by the World Health Organization (WHO) at the global level will be discussed. Also as is customary, an early session will be devoted to reviewing the health situation of the host country, Cuba. The meeting will also involve discussions of the protocols and results of multicenter projects promoted by PAHO and a review of research activities by a Pan American Center, this time INCAP. Finally, in response to a recommendation of the ACHR to include a presentation on progress in an area/discipline of biomedical research, a presentation by Dr. Jorge Allende was scheduled on recent progress in molecular biology and its importance for public health.

3. *Research in the World Health Organization*

This presentation was made by Dr. Tikki Pang, head of the Department of Research Policy and Cooperation of the World Health Organization. Dr. Pang began the presentation by mentioning that while important advances have been made in health research, they have not benefited the developing countries as much as they could have. It has been calculated, for example, that only 10% of the world's resources for research are allocated to health problems that affect 90% of the world's population. Given the disparities in economic power and scientific resources, there is a widening health gap between the rich and poor countries.

Considering that research and knowledge are international public goods, WHO, as an international organization, plays a unique and important role in correcting the inequality in the distribution of such goods and in ensuring that research benefits the poor in a sustainable and equitable way. Building and strengthening research capacity is one of the most effective, efficient, and sustainable ways to help developing countries benefit from advances in scientific knowledge. And one of the most effective ways to achieve that is to promote regional research networks. WHO also needs to stay current on scientific advances by maintaining close ties with the scientific community. It needs mechanisms to permit technical assistance from scientific leaders to be incorporated into research policy and the allocation of that organization's resources.

The principal goal of WHO's cooperation activities in research is to improve the health of the poor by reducing the gap between the developed and developing countries in terms of the production and use of existing scientific knowledge and access to it. To reach this goal, the organization must develop the ability to identify emerging trends in scientific knowledge and their potential to improve health; mobilize the scientific community to address priority health problems; and develop initiatives to strengthen the quality of research in the developing world in order to promote the use of research as the basis for policy development.

Coordinating these cooperative activities is the responsibility of the Department of Research Policy and Cooperation (RPC), which has regional counterparts with which it closely collaborates to promote research in the various regions of WHO. Among current principal initiatives is the competition for research grants of close to US\$200,000 each (totaling \$2 million), financed by the Rockefeller Foundation. Nearly 450 proposals were received, and the winners will be announced at a meeting in Bangkok next October. This meeting will be held with participants from every continent and will involve discussions of research policies and priorities at the global level. Along with this meeting, the global ACHR will hold its first meeting since its reorganization. Dr. Pang also mentioned the meeting in Annecy at the beginning of this year, which identified the principal barriers to research in developing countries, along with proposals to overcome them, including the provision of research funds at the national level in order to focus research efforts. These funds will be administered by committees with representation from the various sectors involved in national research.

Dr. Pang closed the presentation by remarking that the WHO's commitment to promoting health research has been clear and has been explicitly stated by the Director-General in her address to the 105th Executive Board in January 2000. Achievement of the objectives in this area will depend on close cooperation with other international organizations, the international scientific community, the regional offices, and the countries themselves.

4. *Regional Health Research Agenda*

This presentation was made by Dr. Alberto Pellegrini, Chief of PAHO's Health Research Coordination Program (HDP/HDR). DECIDES--Democratizing Knowledge and Information for the Right to Health--is a technical cooperation strategy designed to take advantage of opportunities opened up by new communication and information technologies. Its fundamental purpose is to expand the participation of the various social actors in the production, dissemination, and use of the information they need, so that they take a proactive attitude toward improving their individual and collective health.

DECIDES is grounded in two basic assumptions:

- Broad access to scientific and technical information is necessary for ensuring the right to health;
- New information and communication technologies make it possible to promote interaction between different actors (researchers, health professionals, managers, and the general public) for the development and exchange of knowledge and information. This facilitates broader participation in decision-making on policies and programs in health and research.

Based on these assumptions, DECIDES is aimed at overcoming the following principal problems:

- Limited participation in defining research agendas;
- Low utilization of research findings for health policies and programs;
- Shortcomings in terms of cooperation and exchange of researchers between the Latin American and Caribbean countries;
- Inequitable access to health information.

To help eliminate these problems, DECIDES looks to take advantage of some of the current trends and opportunities in the Region, including:

- The decentralization and democratization of decision-making on public policy;
- The strengthening of regional integration mechanisms;
- The availability of new information and communication technologies, particularly implementation of the Virtual Health Library (VHL) under the aegis of BIREME/PAHO.

The basic strategy for implementing DECIDES is to develop virtual networks in order to deepen and multiply interaction and cooperation between researchers, health professionals, citizens, journalists, politicians, and other actors by facilitating the creation of debate and discussion groups, virtual research groups, support for exchange and training programs, etc.

The virtual networks promoted by DECIDES consist of four basic components, which are relatively autonomous but share a common site in the VHL that provides support and promotes cross-fertilization:

- The Interactive Agenda of Health Research (AGENDA): promotes interaction between researchers, decisionmakers, the staff of research planning and financing organizations, and other actors in the development and implementation of a research agenda that responds to the population's priority health problems;
- Health Researchers' Exchange Network (REDIISAL): supports the training and exchange of health researchers by promoting and strengthening mechanisms for cooperation among the countries of the Region;
- Solidary Cities (CISOL): facilitates access to information on health policies and programs for citizens and decisionmakers;
- Virtual Health Library (VHL): constitutes the technological platform and the common virtual space where the various components of DECIDES are developed.

After describing each component of DECIDES in greater detail, Dr. Pellegrini mentioned that this strategy is made viable in practice through projects aimed at specific results and that have a limited time frame and a particular geographical site for their operations. Although the countries in this site will profit more directly, the use of modern communications technology opens possibilities for other countries of the Region to benefit from these initiatives. Once the information is placed on the Internet, its benefits automatically spread to all the countries and users. Two DECIDES projects are currently being prepared: DECIDES/MERCOSUR and DECIDES/U.S.-Mexico border.

These two projects and others that will eventually be prepared to make DECIDES viable share the elements already cited, such as the AGENDA, REDIISAL and CISOL components, the use of the VHL common site, intensive utilization of modern communications and information technologies, the creation of exchange networks, and others. The projects are programmed for four-years; at the end of this period, the networks of cooperating institutions will be able to take over the management of the different intervention areas, with the support and coordination of BIREME.

5. PAHO Technical Cooperation for Training and Exchange of Researchers in Latin America and the Caribbean

Dr. Rebecca de los Ríos of PAHO's Health Research Coordination Program gave this presentation. To begin, she recalled that the exchange and training of researchers has traditionally been an area of PAHO technical cooperation and is now the object of discussions and recommendations by the ACHR. Its incorporation as a component of DECIDES opens new prospects for increasing the impact of technical cooperation in this area.

The training of human resources for scientific research in health in the Latin America and Caribbean countries (LAC) has accomplished through fellowships for doctoral programs abroad (mainly in the United States, England, and France) financed by the public sector through national councils of science and technology and, more recently, loans from entities such as the Inter-American Development Bank and the World Bank. Following this stage of training for researchers abroad, favorable conditions were created in such countries as Brazil, Argentina, and Mexico, and more recently Chile, Colombia, and Venezuela, to develop national research training programs at the doctoral level. These programs grew considerably in the 1980s and 1990s. The focus was on the self-sufficiency of the institutions themselves, and they did not take optimal advantage of the scientific resources available within the country or in other LAC countries. As a result, a sizable number of doctoral programs with the same objective of training researchers in the same scientific areas have limited exchange between them.

Despite new information and communication technologies, the information on available training programs for researchers in LAC institutions is still very limited and diffuse, in comparison with the quantity and quality of on-line information on research centers in the developed countries. In terms of achieving scientific excellence, this puts the countries of LAC at a disadvantage. As a result, the Region's capacity for cooperation and exchange is even more limited.

Because of the lack of sustainability of public resources, the self-sufficiency model has fallen into crisis, obliging the institutions to seek complementarity in their relations in order to make better use of available resources. Integrated doctorates have been established that use teaching, bibliographic, and laboratory resources from several of a country's own academic and research institutions. Despite this trend, much remains to be done in terms of efficiently using the scientific infrastructure that the countries of LAC have developed.

Recognizing the need for complementarity has given rise to bilateral scientific cooperation agreements both for conducting research projects of common interest and for the training and exchange of researchers. For a number of reasons, among them the lack of information, there has been limited execution and utilization of these agreements. The same can be said of such multilateral cooperation agreements as the Regional Research Exchange Network for the Development of Latin America and the Caribbean (RIDALC), Coordination for Latin American and Caribbean Graduate Programs (COPLAR), The Common Market in Science and Technology Knowledge (MERCOCYT), the Hemispheric Inter-University Network for the Development of Science and Technology (RedHUCyT), the Hemispheric System of Student and Professor Exchange (SHIP), and others.

To help overcome these problems, PAHO has proposed the creation of REDIISAL (Information and Exchange Network for Researchers in Health) as one of the components of the DECIDES technical cooperation strategy. REDIISAL is based on the same basic principals as DECIDES. It is defined as a virtual space for information, communication, interaction, and exchange of health researchers. Through information and communications products and services available through new digital technologies,

REDIISAL will be a promotion and cooperation mechanism for scientific activities in health in the countries of the Region.

The REDIISAL site will include the following types of services and information:

- Opportunities and financing for the training, scientific exchange, and updating of the skills of researchers in health: high-level officials of institutions, graduate programs, fellowships, scientific cooperation agreements, news on events, etc.;
- Virtual communication services for interaction between and the exchange of researchers; specialized sites for discussions by researchers (virtual research groups); meetings for peer review of projects and articles, etc.;
- Scientific information, products, and services for the teaching of health research: teleconferencing, courses and cooperative seminars, opportunities for discussions between specialists to develop basic bibliographies, collaborative production of texts, etc.

To conclude her presentation, Dr. de los Ríos presented the plan of work for the implementation of REDIISAL, which includes conducting situation analysis, preparing technical projects, mobilizing financial resources, etc. Several of these activities are already in progress, such as the “Study on the Supply, Needs, and Capacity for the Exchange of Graduate Programs in Health,” which is being conducted in nine countries. This study is conducted through an on-line questionnaire that will generate a database with information on the programs and their areas of research, which in turn will allow for greater exchange between programs.

6. *Progress in Implementation of the Virtual Health Library (VHL)*

This presentation was made by Dr. Abel Packer, Director of the Latin American and Caribbean Center on Health Sciences Information (BIREME). To begin, Dr. Packer recalled the conceptual underpinnings that sustain the Virtual Health Library (VHL) and the principal components of this project.

Created in 1967, BIREME’s mission is to contribute to the improvement of health in Latin America and the Caribbean through the development of national capabilities for providing and improving access to scientific information. This mission is based on recognition that universal and equitable access to scientific information is a necessary condition for the development of health. Cooperative activities of BIREME reach practically all the countries of the Region, involving nearly 800 information centers in a system called the Latin American Information System in Health Sciences.

During its 33 years of existence, the BIREME cooperation program has continually been renovated through the adoption of new models of administration, organization, and information technology. The emergence of the Internet as the prevailing information paradigm has rendered the existing regional system obsolete, prompting the need to renovate BIREME to keep up with the radical changes in information flows that are occurring internationally in all areas of knowledge. The new model of cooperation is the

VHL, officially launched during the VII Meeting of the Regional System in San José, Costa Rica, in March 1998.

After listing the main components of the VHL, Dr. Packer noted the principles upon which their implementation is based, including the following:

- Equity as a guiding principle, meaning that all institutions and communities requiring health sciences information should have the right to access the VHL without limitations in terms of subject matter or geography;
- Priority should be given to policies and actions that build partnerships between all participants, with a view to a joint operation of the information sources;
- Decentralization of the development of the VHL to facilitate proficiency in the use of the technologies and for capacity building at all levels;
- Overcoming of local limitations to guarantee active participation and sustainability;
- Operation of information sources under quality control and evaluation mechanisms.

Implementation of the VHL over the next five years will be in three stages:

- The current period between 1999 and 2001 is called “Setting Up the VHL.” The priority is the realignment of current products and services to operate in the context of the VHL. During this period, promotion and training have characterized the cooperation activities;
- The period between 2001 and 2003 is called “Building Momentum for the VHL.” This period should see an increase in the number of institutions and information sources in terms of both subject areas and geography. Technical cooperation will concentrate on promoting independent initiatives;
- Finally, from 2004 onward it is expected that the VHL will be consolidated as a basic reference for scientific and technical health information in the Region.

The VHL is being implemented in two complementary areas. The first is geographical, involving the creation of national advisory committees charged with coordinating national participation in the VHL and preparing and following up on national implementation plans. The second is subject areas, involving the creation of specialized information networks charged with building their respective VHL components.

Since its launch in March 1998, the information on the VHL has been widely disseminated at the national, regional, and global levels through meetings, materials, and actions. This process is aimed at procuring the support of authorities, managers, and professionals. However, adoption of the VHL in practice is a challenge, since it implies radical changes that can generate resistance. Technical cooperation since 1998 has sought to overcome such resistance by training human resources in the technical and managerial area and by promoting changes in the structures and functions related to the flow of information. The development of models and expertise in particular subject and geographical areas is the central strategy for the implementation of the VHL. These

models and expertise are being disseminated and discussed at national and regional meetings.

At the end of 1999, BIREME organized the first VHL coordination meeting with more than 120 representatives of institutions in the Region. This meeting demonstrated that the VHL is an irreversible reality as a basic reference for cooperation on health information. To conclude, Dr. Packer discussed the current implementation status of the VHL, emphasizing both achievements and challenges:

- Most of the countries of the Region have been apprised of the VHL, and it is already well known in health information centers. However, other sectors and authorities need to be aware of it so that it can be adopted as a reference for national information policies;
- The VHL has been formally adopted in 15 countries, most of which are taking steps to implement it through the creation of national advisory committees. In these countries, the main activities focus on realigning existing products and services within the new context of the VHL;
- The VHL has already been implemented in selected thematic areas. Two of them-- adolescence and toxicology--were set up as pilot models. Based on the experience gained from their implementation, work began in several other areas;
- Electronic publication is a key component of the VHL. It is expected that in three years the VHL, in an integrated and decentralized way, will manage the most relevant scientific literature in full-text electronic format. The SciELO (Scientific Electronic Library Online) model for scientific journals has been applied successfully at the national and regional levels. It is already operating nationally in four countries--Brazil, Chile, Costa Rica, and Cuba. At the regional level, SciELO has been used to manage a collection of the four leading public health publications, as well as another publication in Spain. The SciELO model is being adapted so that it can soon be applied to other types of literature, such as government documents, theses, legislation, etc.

One of the greatest challenges for the VHL is sustainability. Most of the achievements with the system to date have been attained with the existing financial, human, and technological resources. Further and more rapid development in the near future will require greater political support and financial resources.

7. Panel: Health Research in Cuba

This panel was made up of Dr. Jamila de Armas D'Avila, Vice Minister of Education and Research of the MINSAP; Dr. Eric Martínez, Director of Research of the MINSAP; Dr. Agustín Lage D'Avila, Director of the *Centro de Inmunoensayo* [Immunoassay Center]; and Dr. Jorge Gavilondo, a member of the ACHR.

Dr. Armas D'Avila coordinated the panel. In her introductory comments, she noted that scientific development in Cuba is closely linked with the health system and that, despite the country's recent economic difficulties, this sector has remained a government priority. Dr. Martínez began his presentation by recognizing PAHO's support for national research efforts. He presented demographic data on health and the production of health services, and on achievements in the control and eradication of several diseases. The underlying principles of the health system are its statist and socialized nature, universal access, the application of advances in science and technology, social participation, and international cooperation.

The Research Institute, established in 1966, is devoted to conducting research on the most urgent health problems, medical education, and health care. It has integrated these three components from the beginning. In the 1980s, it supported the development of family physicians as well as large research and technological development institutes for the production of vaccines, drugs, diagnostic reagents, equipment, etc. The crisis of the ensuing decade stimulated even further development of S&T and the application of its achievements as a way of overcoming the difficulties facing the population. Current priorities are maternal and child health, disease control, and care for the elderly, who already represent a significant segment of the population.

The System of Science and Technological Innovation in health is made up of S&T units from the various institutes and other agencies. The system is in charge of planning, financing, human resources development, information, and international cooperation. Dr. Martínez noted the institutional resources, educators, and researchers that are part of the system, which has 506 physicians in the health sciences. He also mentioned the most important advances in the areas of Health Systems Research. These areas account for 616 current research projects geared to health system development, health technology assessment, and pharmaceuticals programs. The latter program began with an import-substitution orientation and is now being directed toward the development of new drugs for AIDS, cytostatics and others, incorporating and developing new technologies such as microspheres, liposomes, and computer modeling.

Efforts are currently under way to create a culture that respects intellectual property and to promote greater self-financing of research funding through national and international agreements. With the support of PAHO, the OFIS is being established to mobilize additional resources.

In his presentation on the development of Cuban biotechnology, Dr. Lage D'Avila pointed out that this has always been closely related to development of the health system itself. Biotechnology in Cuba is state-owned. It was developed exclusively by Cubans and employs full cycle approach that involves everything from research on up to marketing. Work in biotechnology is carried out chiefly in the 38 institutions that make up the scientific area and its support network in terms of regulation, computers, etc. During the economic crisis of the 1990s, major investments were made in these institutions as a way of overcoming the crisis. Dr. Lage D'Avila gave a detailed description of each center, its respective resources, and principal achievements.

Dr. Gavilondo presented the principal diagnostic and therapeutic products and vaccines developed with biotechnology techniques. He said that in the future, in addition to

consolidating recombinant DNA techniques, new technologies should be developed such as bioinformatics, the rational modeling of new drugs, and the production of transgenic plants and animals.

8. *Health and Economic Growth*

In his presentation, Dr. Juan Antonio Casas, Director of PAHO's Division of Health and Human Development, reviewed existing evidence in the literature on the relationship between investments in health and economic growth from the perspective of Latin America and the Caribbean. He began by indicating that it is very well established that higher income results in better availability of many of the goods and services that improve health, such as better nutrition, access to safe drinking water and sanitation, quality health services, and better information and education. Further, the lower the income level, the greater the potential gain in health through marginal increases in income. However, although health status is highly correlated with income levels, there are other determinants that can affect the health of the population. This means that certain policies can be applied to improve health, even when resources are relatively limited.

A common element of the various theories that attempt to analyze the factors involved in the development of societies seems to be the recognition that better health is as much a cause as an effect of economic growth. Educational levels greatly influence national growth rates, and the ability to learn, in turn, is heavily influenced by nutrition and health. The low growth rates and high levels of inequality in Latin America in recent decades relative to those of East Asia can be attributed to differences in educational performance, part of which are caused by poor health and nutrition. There is abundant and growing evidence that investing in health not only improves productivity and creates human capital--and consequently has a strong impact on economic growth--but that effective health care delivery, especially for the poor, can also provide a safety net and prevent an even more precipitous fall into poverty. Although other determinants are probably more pertinent in terms of health production, adequate access to health care, in particular to the financing of that care, is not only a basic human right, but also an effective social and economic policy insofar as it protects low- and even middle-income groups from catastrophic health costs and the potential impoverishment that can result.

Women play a key role in human development. Investing in the health of mothers not only improves the nutrition of children from birth, but also their educational achievements, thus influencing their future choice of occupation and their productivity. There is also mounting evidence that chronic diseases that occur when people are older are largely the result of exposure to infectious diseases and other types of biomedical and socioeconomic stress in childhood. Because it is mothers who pay the most attention on the schoolwork of their children, the effect of maternal health on productivity is usually greater for women who are better educated.

In a longitudinal study by INCAP in four Guatemalan villages, pregnant women and young children were given different food supplements. The information collected in 1969 and then in 1988 on physical growth and development, maturation, the capacity for work,

intellectual performance, and schooling clearly show that better nutrition and health in infancy leads to better formation of human capital in adolescence and adulthood. Now that the subjects of the study are approaching the most productive stages of life in economic terms, a follow-up study of wage differentials, educational achievements and other indicators will provide a unique opportunity to directly observe the effects of infant health and early nutrition on the formation of human capital and on income and well-being.

Good health and nutrition improve worker productivity. Health has direct a impact on household income and productivity. The healthiest populations tend to have greater productivity because workers have more energy, are healthier mentally, and miss fewer days of work due to illness or to the illness of family members. A healthy and educated work force attracts foreign investment, as well as the positive externalities of a healthy environment in terms of increased trade, tourism, investment, and other economic activities.

There are many examples that link the control of specific diseases with productivity and/or increases in income. For example, there is a clear negative correlation between morbidity from malaria and the rate of GDP growth, which could be partly related to obstacles to integration of malaria-prone areas into world trade networks.

Dr. Casas described the results of a series of studies that demonstrate that investing in health is economically productive, but that the investment does not necessarily involve hiring medical staff, establishing hospitals, and providing health services. Investing in child nutrition, sanitation, and housing seems to be more effective in improving health. The cost-effectiveness of such investment must be further evaluated to determine which areas should be priorities.

Health also affects economic growth through its impact on demographic factors. Lower life expectancy inhibits investment in education and other forms of human capital, since there is a greater risk that people will not survive long enough to benefit from the investment. Analysis of cross-country data over the past 25 years has provided empirical evidence that health and demographic variables play an important role in economic growth rates. In 1965, an 1% increase in life expectancy represented a more than 3% increase in per capita GDP growth for every year during the quarter century that followed. Higher rates of infant mortality and fertility have a highly negative impact on overall growth. A study showed that a reduction of infant mortality by half represented an 1% acceleration in growth rates in the ensuing quarter century in the 75 countries for which data was available.

Econometric studies reveal a major correlation association between health and economic growth. Robert Barro found a highly positive impact by health on the growth of human capital, greater even than the effect attributable to male schooling. A similar study financed by PAHO in Latin America (Brazil, Colombia, and Mexico) found that health has a stronger impact than education on economic growth, with a latent period of 15 to 20 years. One of the principal results of this study was that improvements in health depend more on public policy, technological change, and fertility than on increases in income. One of the weaknesses in the Latin American countries was the scarcity of information required for this type of analysis. Econometric analysis of this sort can produce different

results using different sets of data, different variables, and different countries. These exercises are useful to stimulate discussion about possible mechanisms, but they are probably not the best approach for a precise empirical quantification of the impact of health on economic growth.

Dr. Casas concluded his presentation by posing some questions for future research on the relationship between health and economic growth, and he examined the antecedents and approaches most adequate to respond to these questions:

- Can investing in health and reducing inequities in health reduce inequality and promote long-term growth in the Region?
- Is investing in health services the most effective way to invest in health?
- Will improving the health of a greater number of elderly people increase their earning power and allow for extending the formation of human capital beyond the retirement age?

9. *Multicenter Project: Macrodeterminants of Inequities in Health*

Dr. Norberto Dachs of PAHO's Program on Public Policy and Health presented the protocol and preliminary results of this multicenter project financed by the PAHO Research Grants Program. The project began in February of this year and is being carried out in five countries of the Region.

With respect to the justification for the project, Dr. Dachs noted out that inequity is the most important health problem in the Americas--a result of the major social inequalities in the Region--but that the amount of research on the topic does not reflect its importance. A recent review of close to 400 works published by authors in the Region found a scarcity of research that can provide evidence to support taking action, as well as deficiencies in the design of the projects and the quality of the data. These deficiencies should be corrected. Decisionmakers wishing to implement interventions to reduce inequities in health do not have the relevant and useful information they need and must therefore depend on studies that are carried out in (and concern) developed countries.

On the other hand, a considerable number of national household surveys have been conducted in the Region in the past decade. These represent reliable sources, but they have been little used to study the relationship between socioeconomic characteristics, health conditions, and access to, spending on, and use of health services. The multicenter project aims to analyze household survey data, particularly the DHS (Demographic Health Survey) and the LSMS (Living Standards Measurements Survey), along with data from national censuses.

The general objective of the project is to use existing information from five Latin American countries to describe trends and levels of inequality in health and to deepen knowledge of its determinants. The goal is to provide the information needed for policy recommendations to improve equity in health.

The selection of the countries in which to carry out the project was limited by the availability in recent years of the two types of surveys, the LSMS and the DHS. Using

that criterion, Bolivia, Brazil, Colombia, Nicaragua, and Peru were selected. With regard to methodological aspects, “traditional” linear regression and logistic regression models were developed for the analysis of mortality in children under 5 and for the height of children aged 6 months to 5 years. Multilevel models were also used that combine individual variables with variables at the census segment level and from municipalities (or their equivalent administrative unit). Trend analyses will also be conducted for the periods of the inequities, since data are available from three DHS surveys over a period of 8 to 14 years for Bolivia, Brazil, and Peru.

The results will be disseminated through scientific publications and other media in order to reach a wide range of actors, including decisionmakers and the general public.

Dr. Dachs next presented some preliminary results of the project indicating the adjustments to the methodological approaches that were used. As an example, he reported that in a given country, 37% of the interviewees from the lower income decile indicated that they suffered from health problems, and of those, only 24% sought medical care. In the high-income decile, 27% indicated they had health problems and 53% of these sought care.

Dr. Dachs concluded his presentation by mentioning that the project represents a good opportunity for an interdisciplinary approach, which has great potential when economists and epidemiologists work together on a specific task.

10. Multicenter Project: Analysis by Gender of Dietary Behavior and of Exercise in the Caribbean

Dr. Fitzroy J. Henry, Director of the Caribbean Food and Nutrition Institute (CFNI) presented this multicenter project. Financed by the Research Grants Program, the project will be carried out in four countries: Belize, Jamaica, Trinidad and Tobago, and St. Kitts/Nevis. Initially, Dr. Henry explained the importance of this project in terms of CFNI technical cooperation activities, which he explained in brief.

There is a need in the Caribbean to undertake comprehensive health promotion programs geared to the prevention and control of chronic diseases. At present, heart disease, hypertension, diabetes, and cancer are the principal conditions that affect the health of adults in the Caribbean and impose a significant burden of disease, disability, and death.

The level of compliance with standards for disease prevention is still not well known because of the lack of research in this regard. On the other hand, there is great interest in the application of behavioral theories that can be used to support the selection of psychosocial strategies that effectively promote behavioral change. The trans-theoretical model (TTM) has been shown to be applicable in health promotion for diverse populations and cultures and will be used in this multicenter study. The TTM is based on the premise that behavioral change is a process made up of a series of stages, and that individuals have various levels of motivation or disposition for undertaking those changes. Many unsuccessful interventions in terms of promoting healthier lifestyles or changing lifestyles are due to a failure to consider at which stage the person is currently found.

The study is based on the following hypotheses:

- There is a great difference in the disposition for behavioral change between men and women in the Caribbean;

- Obese adults are significantly more predisposed to change their behavior with regard to healthier nutrition and physical exercise than are non-obese adults.

The objectives are to:

- Evaluate and compare the various stages of change between men and women in order to increase their fruit and vegetable intake and get them to undertake regular physical activity;
- Examine the relationship between the stage of change that involves consuming more fruits and vegetables and the psychosocial factors between obese and non-obese adults;
- Examine the relationship between the stage of change that involves undertaking regular physical activity and the psychosocial factors between obese and non-obese adults;
- Examine the influence of the media on perceptions and attitudes regarding purchasing and consumption habits (food, dietary supplements, exercise equipment) and activity levels.

In order to meet these objectives, the study will use qualitative and quantitative research methods, particularly focus groups and cross-sectional household surveys. Results from the focus groups will be used to identify the themes and concepts to be taken into account in the preparation of the questionnaires for the household surveys. This will be carried out in each of the four countries with adults 18 years old or older. The size of sample will be approximately 1,000 households in Belize and St. Kitts/Nevis, 1,500 in Trinidad and Tobago, and 1,900 in Jamaica.

Among the variables to be considered in the survey are demographic characteristics (age, ethnic group, sex, education, marital status, occupation, and employment), obesity (BMI), the presence of chronic disease (diagnosis of diabetes, hypertension, heart disease, or cancer), consumption of fruits and vegetables, physical exercise, and the influence of the media. The stages of change of the TTM (in terms of intake of vegetables and fruits and exercise) in which the interviewees will be categorized include the following: pre-consideration (does not intend to change); consideration (intends to change); preparation (plans to change); action (changes behavior within six months or less); and maintenance (changes behavior for more than six months). Questions referring to positive and negative factors (barriers) to behavioral change will be also included.

Dr. Henry concluded his presentation by mentioning some of the bi/multivariate statistical tests that will be conducted to analyze the relationships between the variables considered.

11. Research Activities at INCAP

Dr. Hernán Delgado, Director of the Institute of Nutrition of Central America and Panama (INCAP), presented the principal nutritional problems of the countries of the subregion and the research activities undertaken by INCAP.

Since its founding in 1949, INCAP has focused on identifying and finding solutions for the food and nutrition problems of the Central American region. At present and over the past 10 years, the institute has provided technical cooperation to the countries in implementing the regional initiative to promote nutrition and food security by collaborating on diagnostic studies and in the design, implementation, monitoring, and evaluation of programs and public nutrition projects at the municipal, national, and regional levels.

In reviewing the evolution of INCAP, Dr. Delgado mentioned that INCAP research initially focused on the clinical aspects of malnutrition, especially of infant and preschool children. This was in response to requests from pediatricians who did not have standardized methods or techniques for the diagnosis, treatment, and monitoring of cases that required medical attention. Subsequently, research focused on nutritional epidemiology, particularly knowledge of the magnitude, distribution, and determinants of the principal nutritional problems. Between 1965 and 1969, the Central American countries, with the technical support of INCAP, conducted the first national nutrition surveys, which today constitute the baseline from which to estimate changes in nutritional status at the national and regional levels.

By the end of the 1960s, and particularly in the 1970s and 1980s, practical application of the knowledge, technologies, and available methodologies was strengthened. Numerous studies of applied nutrition were carried out that formulated and tested specific interventions with regard to the availability, consumption, and biological utilization of food, as well as access to it. In 1993 INCAP began to focus its technical cooperation--which integrates aspects of research, technical assistance, training and human resource development, dissemination of scientific and technical information, and mobilization of resources--on promoting Nutrition and Food Safety (SAN).

The foundation of the institute's research policy, approved by the INCAP Council in 1991, is the search for solutions to the most serious food and nutrition problems of the member countries. The main strategies to promote research development include strengthening research capacity in the countries through multicenter studies and applied research, and the provision of training in research for staff working in the field of food and nutrition, with preference given to support for research centers and universities.

INCAP tries to promote dynamic interaction between the generation of knowledge, the design of public nutrition programs, and the training of human resources. Research findings are used as input for programs and for defining educational curricula.

A significant proportion of the Central American population still lives in conditions of nutritional and food insecurity caused by the limited availability of food, lack of economic access to food, lack of food and nutrition education, and/or the inadequate biological utilization of food. Taking this into account, the XLII Meeting of the INCAP Council in Panama in August 1996 defined the programming lines for INCAP technical cooperation, including research. They included the following: harmonization of food regulations; production of nourishing foods; nutrition and food safety in local development processes; education and training of human resources in food and nutrition; community food and nutrition education; prevention and control of nutritional deficiencies through micronutrient supplementation; health and nutrition of women and

children; prevention of chronic noncommunicable diseases; and nutritional surveillance, monitoring, and evaluation.

Dr. Delgado then described the principal research projects and the progress and achievements in each programming line from 1994-1999. During this period, applied research was carried out on SAN, including the implementation of multicenter studies with the participation of universities and research centers both within and outside of Central America. In addition, numerous qualitative ethnographic research was conducted to better understand the problems of nutrition and food insecurity. The results facilitated the development of educational and communications interventions to promote healthy lifestyles and adequate diets. Laboratory research linked the problems of nutrition-infection and food protection. During this period, INCAP also promoted the development and validation of methodologies and technologies, most of which are related to food technology and nutrition.

Over the past decade, INCAP has placed special emphasis on the need to promote the use and transfer of the knowledge, technologies, and methodologies that have been generated as a result of research. To this end it has decentralized technical cooperation and is developing the Virtual Health Library to facilitate access to the information that is now available.

To diversify its external financing sources, the Institute has been promoting the mobilization of resources by approaching cooperation agencies (bilateral, multilateral, NGOs, foundations and universities), promoting its institutional tasks in scientific and technical forums, reactivating the Foundation for Food and Nutrition of Central America and Panama (FANCAP) in order to attract funds in support of SAN, creating a trust fund, and selling its services, mainly to the food industry.

Dr. Delgado concluded his presentation by reporting on the recent preparation of the Marketing and Institutional Promotion Plan, which supports the participation of different actors in the development of the SAN in the Central American region as part of the process for strengthening subregional integration.

12. PAHO Research Grants Program Report

Dr. Rebecca de los Ríos of PAHO's Program on Health Research Coordination, presented the principal activities and results achieved by the Research Grants Program (RGP) during 1999. She began by noting changes in the modalities of the RGP introduced in 1995-1996, pursuant to ACHR recommendations, as well as the measures adopted to implement those recommendations. The presentation was divided into two parts: the first was devoted to reporting on the results of the modalities and regular RGP programs; the second focused on the results of the special agreements established in response to the ACHR's recommendations.

With regard to the four regular modalities of the RGP, Dr. Ríos noted that two of them--the Program for Graduate Thesis Grants in Public Health (for master's and doctoral candidates), and the Program for Research and Training Grants in Public Health--place greater emphasis on educating and updating the skills of researchers. The other two--

collaborative multicenter studies and regional research competitions--emphasize the production of knowledge to respond to priority health problems.

The Program for Graduate Thesis Grants in Public Health is one of the most successful modalities in terms of the quality and quantity of the programs, as well as the delivery of final reports. From the creation of the program in 1997 until the end of 1999, 77 projects were evaluated and 38 financed (17 master's theses and 21 doctoral dissertations). Fifteen completed research projects were published in the Technical Documents Series entitled "Research in Public Health." They are available in full text on the Internet.

The Program for Research and Training in Public Health received 24 applications in 1999, but only two were approved. One of the difficulties facing researchers who submit applications to this program is to satisfactorily meet the admissions requirements for training abroad. To overcome this problem, a series of agreements have been reached to place researchers from the Region with leading institutions. The agreement with Spain's Carlos III Institute of Health is part of this initiative.

Two multicenter projects began in 1999 that were selected through an internal competition between the various technical areas of PAHO. These projects were:

- "Inequities in Health Status, Access, and Expenditures: Utilizing Secondary Data to Support Policy Decisions," coordinated by the Division of Health and Human Development (HDP) with the participation of Bolivia, Brazil, Colombia, Peru, and Nicaragua.
- "Analysis by Gender of Diet Behavior and of Exercise in the Caribbean: A Frame of Reference for Action," coordinated by the Caribbean Food and Nutrition Institute (CFNI), with the participation of Jamaica, Trinidad and Tobago, Belize, and St. Kitts/Nevis.

Another multicenter project approved in 1999, "The Nutritional Status of Adolescents during Pregnancy and Nursing" is in final stage of technical and ethical review. Coordination will be the responsibility of the Latin American Center for Perinatology and Human Development (CLAP), with the participation of Guatemala, the Dominican Republic, and Uruguay.

Two projects selected through internal competition and carried out in 1999 under Regional Research Competitions were:

- "Gender Equity in the Health Sector Reform Process," coordinated by the Program on Women, Health, and Development (HDW) of the Division of Health and Human Development (HDP). Sixty-one proposals were submitted for this competition. An external committee of experts selected six of them--from Barbados, Brazil, Colombia, Chile, Ecuador, and Peru--for financing;
- "Quality Assessment of Radiological Diagnostic Services," coordinated by the Program on Essential Drugs and Technology (HSE) of the Division of Health Systems and Services Development (HSP). As a result of this competition, five projects from Cuba, Colombia, Mexico, Bolivia, and Argentina were financed.

Dr. de los Ríos also referred to the special agreements established by the RGP in 1999 to respond to ACHR recommendations with respect to:

- Focusing actions targeted to the relatively less developed countries;

- Promoting the exchange of researchers between LAC countries and supporting the development of collaborative projects among them;
- Promoting and supporting biomedical research that impacts public health;
- Strengthening ties with national S&T organizations.

The agreements referred to included:

- The agreement signed with the Central American Population and Health Program of the University of Costa Rica (UCR). Its purpose is to provide technical and financial support for the implementation of six thesis projects on the topic of inequities in health by Central American students in the Master's Degree Program on Population and Health. The agreement also has programmed six fellowships for the participation of Central American researchers in two training workshops at the UCR, one on "Communicating Research Results to Decisionmakers" (May 2000) and the other on "New Methods for Analyzing Quantitative Data for Measuring and Evaluating Health Interventions (July 2000);
- The two-year agreement signed with National Science and Technology Councils of Guatemala and Costa Rica, for US\$100,000 each, cofinanced in equal parts by PAHO and the CONICYTs, to support research projects on priority health issues;
- The agreement signed with the Carlos III Institute of Health (ISCIII) of Spain for US\$120,000, cofinanced in equal parts by PAHO and the ISCIII. The agreement aims to provide Latin American researchers with the opportunity to participate in a year-long training program at the ISCIII to prepare a research framework. At the end of the period this framework should be submitted to the RGP to obtain a return grant. This initiative has had an excellent response, with 106 applications, from which an ad hoc committee of PAHO and ISCIII specialists and researchers selected six: two from Cuba, two from Colombia, one from Ecuador, and one from Peru;
- An agreement signed between PAHO and the Latin American Biological Network (RELAB) to finance biomedical research projects of interest to public health. Proposals must involve collaborative work by at least two laboratories from different countries, each of which will receive a grant of US\$7,000. This program has received 55 proposals from high-level scientific researchers and laboratories, from which a committee of RELAB and PAHO researchers selected eight;
- An agreement with the International Clearinghouse for the Health Sector Reform Initiative (ICHSRI/NADIR). This initiative, financed by the Nordic countries and coordinated by the Mexican Foundation for Health (FUNSALUD), supports research on sectoral reforms and their effects, access

to health services, and their financing and utilization in developing countries. Of the total number of projects presented at the international level, 10 were from LAC and five were financed (Chile, Peru, Jamaica, Mexico, Colombia). The agreement provides for PAHO participation in promoting the initiative, reviewing the research proposals, and providing technical assistance for projects and for the review of manuscripts for publication. ICHSRI is committed to following up on the projects approved in LAC and keeping PAHO apprised of their progress and results, organizing a Regional Seminar with the principal researchers from approved projects to discuss their findings, and coordinating the preparation of the publication.

To conclude her presentation, Dr. De los Rios pointed out that, more than being just a fund to finance projects, the RGP has been designed as an important tool for technical cooperation in research, facilitating the production of knowledge, exchange and cooperation among researchers, and the dissemination and use of results. In this regard, the impact of the RGP should be measured not only in terms of the activities and projects that it finances, but also by the extent to which it becomes involved with broader initiatives oriented to democratizing knowledge and information as part of the overall DECIDES strategy.

14. Presentation: Progress in Molecular Biology and its Impact on Health

This presentation by Dr. Jorge Allende, President of the ACHR and Director of the Institute of Biomedical Sciences of the School of Medicine of the University of Chile. The presentation marks the first of a series that will be the responsibility of the members of the ACHR. At each presentation, an ACHR member will be invited to discuss the progress in his or specialty and its implications for public health. Dr. Allende began by pointing out that molecular biology is a relatively new field of science, dating back only some 50 years. He reviewed the principal milestones of its history, beginning with the discovery by Avery in 1944 that DNA is the genetic material, and culminating with the general mapping of the human genome in June 2000, which has opened the new post-genome era. This sequence of milestones demonstrates clearly that the major advances of the past 10 years came from consortia of dozens of laboratories and companies working on joint projects, rather than from the work of isolated researchers, as was previously the case.

Among the principal impacts of molecular biology and biotechnology on medicine, Dr. Allende noted the production of proteins of high therapeutic value through genetic engineering (insulin, interferon); new types of vaccines; the diagnosis of infectious agents with tiny samples; progress in knowledge of the molecular basis of cancer; mechanisms of hormonal functions; the diagnosis of genetic diseases and therapies for them; and the development of drugs through molecular modeling. Dr. Allende then examined the principal advances in the molecular basis of cancer and the capacities acquired by cancerous cells, pointing out in particular the progress in knowledge of the molecular mechanisms to control cell reproduction, angiogenesis, and metastasis.

According to Dr. Allende, the post-genome period is the era of functional genomics, when efforts will focus on defining the function of every gene and its corresponding proteins. More than the study and isolation of essential elements, the new era also implies

a change of paradigm, with an emphasis on the capacity to correlate, find patterns, define, and confront the challenge of developing new mathematical models that can recognize complex systems. And beyond the study of isolated molecules, the new approach should include the analysis of their functions with regard to other genomes and proteomes. This new approach is also based on new technologies such as proteomic technology, devoted to studying the interactions between proteins and the role of their three-dimensional structure in diseases (e.g., Prions), and the bioinformation that allows for comparative genome analysis and the study of the functions of protein families.

To conclude the conference, Dr. Allende discussed the challenges facing the Region in the post-genome era. He noted that the Region's participation in the major advances in molecular biology and genomics was relatively small, given the limited number of researchers trained in that field. The enormous progress that the post-genome era holds will benefit only the countries capable of mastering the new technologies and of promoting or involving themselves in consortia of international laboratories. He recommended that the countries of the Region train more researchers to use functional genome technologies, organize large-scale projects in areas of gene functions of interest to the Region with the participation of laboratories from several countries, and form a common front in order to defend the biodiversity and genetics of indigenous populations regarding the use and marketing of the Region's genetic resources. Dr. Allende closed by indicating that there are significant examples of progress in these directions, such as the sequencing of the *xylella fastidiosa* gene (orange parasite) and of a significant part of the sugarcane gene by a consortium of 35 laboratories in the State of São Paulo, Brazil.

15. *International Cooperation of the U.S. National Institutes of Health (NIH)*

Dr. Luis Salicrup, responsible for the cooperation to Latin America promoted by Fogarty International, the external cooperation entity of the NIH, gave a brief presentation on existing initiatives and programs. These basically involve the training of human resources, support for research, dissemination of information, and cooperation for policy development. With regard to human resources, Dr. Salicrup mentioned the Pan American fellowship program; workshops and short courses such as those recently held on nutrition and tuberculosis; the visiting scientists program; and the research training programs at the university and pre-doctorate level. With regard to support for research, he mentioned the support for the Latin American network of molecular biology, bilateral agreements with various countries such as Mexico and Chile, and research training grants through projects developed through consortia between U.S. and Latin American institutions. Finally, in policy development, he spoke of regional forums organized to discuss S&T policies as well as bioethics initiatives.

Summary of Discussions and Recommendations

1. *Research in the World Health Organization*

The Committee called attention to the importance of defining with greater clarity the role of the ACHR system and the nature of the relationship between the global ACHR and the

regional ACHRs. The Committee indicated that the Bangkok meeting represents an excellent opportunity to discuss this subject.

Governments and researchers are rapidly losing control of the direction of research activities. Having the greatest diversity of actors and sources for research is positive in the sense that it expands the support for research activities; but at the same time, it can result in distortions in terms of setting priorities, since there is a risk that these diverse players might respond to special interests. On the other hand, the centralization of resources and decisions in national committees, even though there may be representatives of various sectors on those committees, can be a mechanism that concentrates power and thus also generates serious distortions. It is very important, then, to strike a balance between these two approaches, protecting the positive elements of having a diverse set of actors and sources, while at the same time establishing control mechanisms that guarantee the public interest without concentrating too much power in centralized entities.

WHO should exercise a steering role with regard to research efforts in the global area. This does not mean imposing and controlling resources and training, but rather promoting and orienting research efforts, particularly in terms of calling attention to key problems and mobilizing resources for all types of studies.

2. Regional Health Research Agenda

The Committee emphasized the importance of DECIDES as a cooperation strategy that looks to respond to the main recommendations of the ACHR, particularly those of its two most recent meetings. DECIDES constitutes a step forward in terms of BIREME's traditional clientele and type of users to the extent that it facilitates the incorporation of new types of information and new users/producers. DECIDES has great potential to integrate, incorporate, and maximize a series of isolated initiatives currently in progress in several countries of the Region in the production, dissemination, and use of scientific and technical information.

Despite this potential, DECIDES will face certain barriers, such as the absence of a culture of information sharing and collaboration. It will not only have to create the site to facilitate interaction, but also engage in other promotional activities and incentives to help overcome these cultural barriers.

Isolated connections are not enough to make networks dynamic and autonomous. Particularly in the initial stages, considerable energy should be expended on supporting the creation and operation of networks and on defining specific areas that stimulate joint efforts and make it possible to obtain short-term results.

The implementation of DECIDES implies a strategic vision in the selection of the areas to be addressed and in the specific work to be undertaken. Along with the U.S.-Mexico area and MERCOSUR, the countries of Central America have a tradition of collaborative effort and share common problems that could be appropriately addressed through a strategy such as DECIDES. DECIDES should be implemented through projects in which responsibilities, resources, timetables, and products are clearly defined.

3. PAHO Technical Cooperation for Exchange and Training of Researchers in Latin America

Recognizing the progress that has been made in so short a time, the ACHR envisions that the initiatives now in progress should significantly strengthen exchange and cooperation among researchers.

The PhDs in the Region who received training supported self-sufficiency in human resources, materials, financing, research capacity, etc. However, it is now clear that this model is unsustainable, which means that the Region must search for agreements and partnerships to establish cooperative programs. Notwithstanding this change and the success of initiatives such as the "sandwich" modality of graduate programs, there are still serious barriers, particularly in terms of multidisciplinary approaches, given the predominance of a compartmentalized perspective and of financing mechanisms that do not encourage cooperation.

Despite the need for additional resources for exchange fellowships, the current resources, as well as resources that are under-utilized or ineffective, no longer respond to the priorities set but rather to the individual interests of the student. This means that it is left to the donor country to define the selection criteria;

PAHO can play an important role in surmounting these problems by:

- Disseminating information on needs and opportunities for exchange;
- Promoting opportunities in specific priority areas;
- Assessing the impact of training and exchange programs;
- Promoting an increase in and better use of resources for cooperation among countries such as loans for health and S&Ts from development banks.

4. Progress in Implementation of the Virtual Health Library (VHL)

The Committee expressed its appreciation of the progress that has been made with the VHL since its presentation at the 1998 meeting. The VHL is now a reality.

Despite the progress represented by the electronic publication of scientific journals through SciELO, significantly reducing the time between publication and indexing in regional and international bibliographic bases, there is still a long time between the preparation of a manuscript, its approval, and its publication. SciELO should evolve from the publication of articles to their on-line review.

Another problem is the financing of the publications, since this still operates under a traditional arrangement that has not been adapted to the new reality of electronic publication.

The VHL, and particularly SciELO, can be an important tool for studies analyzing trends in the Region's scientific output, transcending the limitations of international associations such as the International Statistical Institute (ISI). Being able to assess the impact of Latin American publications through SciELO will make it possible to establish new criteria to evaluate the curriculum and performance of researchers in the Region.

Quality control of the products and services to be included in the VHL is one of its most significant characteristics and what distinguishes it from the Internet in general. It is essential to preserve the transparency and rigorous criteria of that quality control.

5. *Panel: Health Research in Cuba*

The Committee expressed its great satisfaction at the opportunity to learn about and discuss the Cuban experience, an experience that clearly shows the possibility for convergence between cutting-edge developments in the biomedical sciences and the needs of the health system., promoting a major impact in terms of the resolution of public health problems, notwithstanding the still prevalent opinion that these sectors that are not necessarily linked.

This linkage is not only recommended but also very necessary, since the capacity to apply the knowledge and benefits of progress in S&T is ever more closely tied to the capacity to generate that progress. No to accept that reality puts the LAC countries in danger of being disconnected from scientific progress and of losing the capacity to determine the best way to benefit from that progress.

The focus on full-cycle research that is the basis of S&T policy in Cuba is facilitated by the fact that the State is a fundamental actor. In countries with a greater multiplicity of actors, where the market is the basic focus of the productive sector, and where academic prestige is what motivates researchers, it is more difficult to implement this approach because of the traditional separation between research and the productive sector. This generates serious problems in terms of the applicability of local discoveries; the dispersion of development resources, resulting in a low-impact on public health; mistrust of science by the general public (which perceives it as having its own agenda); and difficulty in achieving sustainable financing for the research effort. The greatest challenges to S&T policies in LAC are to grow and to connect.

Despite these problems, there are signs that science and the productive sector are moving closer to one another. Science is increasingly devoting itself to complex interdisciplinary problems that demand greater cooperation between researchers and society, and the productive sector increasingly needs the constant development and adoption of innovations in order to stay competitive. S&T policies should facilitate and promote these trends, offering an opportunity and mechanisms for greater interaction between the two sectors while at the same time protecting the public good in terms of developments in science and technology.

Despite the uniqueness of the Cuban experience, it should not be considered an anomaly that is inapplicable in other contexts. On the contrary, Cuba has enough important similarities with other countries of the Region that the critique, evaluation, and eventual adaptation of its experience in the field of S&T in health are of inestimable value for other developing countries. PAHO can and is playing an important role in this regard.

6. *Health and Economic Growth*

The Committee recognized the importance of this line of research and cooperation, which makes it possible to emphasize health not only as an important good unto itself, but also as a powerful mechanism for development. At the same time, the Committee underscored the need for greater interdisciplinary efforts in conducting this type of research. This is particularly important between economists and epidemiologists, because it can result in a

consensus on the quality of the data, the selection of adequate statistical analyses, and criteria for determining causality. There are problems in this regard in some of the studies presented, such as those involving the detection of early menarche as a positive indicator of health, or of techno-physiological evolution as an explanatory variable of development, which apart from having little scientific foundation, generates ethical concerns.

A cross-disciplinary model needs to be constructed that takes into account the complexity of relations between health and economic growth, including the individual and collective dimensions of health. Policy interventions cannot be limited to only one aspect of this complex relationship. They must have a broader approach that affects several points. In order to orient policies, it is not as important to know whether the relationship between economic growth and health is stronger on one side or the other as it is to identify the most effective interventions to create a virtuous circle between the two dimensions.

The Committee recommends that PAHO analyze successful experiences in other sectors such as education and agriculture (particularly the latter) with respect to the relationship between research, advocacy, and policy definition to national strategies for economic growth.

7. *Multicenter Project: Macrodeterminants of Inequities in Health*

The Committee noted the importance of the project. Preliminary results clearly indicate that aggregate data is of little use in terms of accurately describing health status and orienting interventions. The committee expressed an interest in the final results of the project.

8. *Multicenter Project: Analysis by Gender of Dietary Behavior and of Exercise in the Caribbean*

The committee showed great interest in this study, pointing to the lack of research on differentials in eating habits and exercise not only by gender but other socioeconomic variables as well.

The Committee also noted that it is important to include analysis related to collective lifestyles in the area of socioeconomic clusters, which determine individual behavior to a large extent and greatly hinder behavioral change through exclusively individual interventions.

9. *Research Activities at INCAP*

The Committee recognized the importance of INCAP's activities to the subregion, underscoring the Institute's significant contributions even in times of financial difficulty, as in the 1980s. The Committee also praised the clarity of INCAP's agenda, which makes it possible for the Institute to concentrate its activities on given topics/areas based on need rather than the orientation of donors.

In particular, the Committee noted the importance of the Institute's adoption of a gender approach in the situational diagnoses and the implementation of its interventions.

10. *PAHO Research Grants Program Report*

The Committee noted the important achievements of the Research Grants Program in 1999, in both its training and capacity strengthening activities and in the production of

scientific knowledge. It also recognized the effective way in which the Committee's recommendations were adopted, particularly those related to support for the relatively less developed countries. Through these achievements, the RGP is affirming its presence and visibility to the Region's scientific community.

Dissemination and use of results warrant greater attention. The Committee recommends that an ongoing assessment of the RGP be conducted regarding these aspects, as well as the training of researchers.

In terms of the relationship between the scientific community and biomedical research, there is still a notion that with the reorientation of the RGP there was a reduction in support for this type of research. Successful experiences such as training in biotechnology, particularly in PCR, should be reactivated, this time related to gene technology, including the promotion of consortia, exchanges, and horizontal cooperation between laboratories.

Even though PAHO is not a financing agency for research, the RGP is so important as a technical cooperation mechanism that alternative approaches should be pursued to increase its resources. Among the alternatives mentioned were agreements with broad-based research financing organizations. PAHO could provide seed money for pilot projects that would be subsequently adopted, expanded, and replicated with resources from these other organizations. Agreements should also be explored with the larger affiliates of CONICYTs in the Region so that they more decidedly support regional cooperation on research. Resources could be used from loans that most of these agencies have received from the development banks. In order to sensitize these CONICYT agencies to provide greater support for PAHO research activities, their representatives should be periodically invited to meetings of the ACHR.

11. Conference: Progress in Molecular Biology and its Impact on Public Health

The Committee commended Dr. Allende for his excellent conference, focusing the discussion on three aspects:

- Opportunities for participation in research and development related to the post-genome era that are opening up for the countries of the Region, given the international nature of the activities that should be undertaken;
- The social, ethical, and political implications of the development facilitated by molecular biology, particularly as it relates to the sequencing of the human genome; and
- The need to promote interdisciplinary and cross-disciplinary approaches in order to understand in greater depth the complex relationships between heredity and the influences of the natural and social environment. A closer relationship with the social sciences is imperative not only to intensify the study of relationships between nature and society, but also to promote mutual understanding between science and society. In this way, the opportunities for and constraints on progress in biology in its ethical, economic, environmental, and other dimensions will be better understood by society as a whole.

GENERAL Recommendations

At its final session to prepare general recommendations, the Committee expressed its great appreciation to the Cuban authorities and staff for their competent organization of the meeting and for their warmth and hospitality. The Committee's general recommendations included the following:

1. The Committee recognized the progress made and the great care that has been taken by the Secretariat to comply with the recommendations issued at the previous meeting. Because of its strategic nature, the Committee decided to maintain its recommendation that PAHO continue to engage in cooperation activities to develop and implement a regional agenda for broad-based participatory research; promote the training of researchers and their exchange among the countries of the Region; support greater use of scientific information in the decision-making process in health; and achieve greater equity among the countries of the Region with respect to the capacity to generate and access information and knowledge on health.
2. The Committee recognizes that because of the complexity of health problems, it is difficult to address them through a single scientific discipline. It therefore recommends that PAHO cooperation activities in research have as a general orientation the strengthening of capacity in the countries to adopt an interdisciplinary and transdisciplinary approach to analyzing the design and problems of interventions.
3. The Committee also recommends intensifying work with the CONICYTs so that they make a more decisive commitment to allocating resources for cooperation and exchange between countries. This means inserting a component toward that end in the S&T loans that these agencies receive from development banks. The Shared Agenda signed by PAHO, the IDB, and the World Bank is an excellent frame of reference that will permit PAHO to work with these banks, encouraging them to include such a component in their loans to the countries of the Region.
4. PAHO should strengthen its information systems on researchers, projects, institutions, financial resources, and scientific output, for both the research activities with which it is involved and those of national institutions.
5. With regard to the major scientific event to commemorate the 100th anniversary of PAHO in 2002, the Committee suggests that this coincide with that year's ACHR meeting and that the discussions be organized around PAHO's five strategic orientations. Renowned international scientists working in the scientific disciplines related to each of these orientations should be invited to discuss overall trends and challenges and their implications for public health and technical cooperation. Representatives of the various sectors related to research in the Region, including representatives of the CONICYTs, should be invited to this event.