Pan American Health Organization
Advisory Committee on Health Research

A Historical Review of Its Contributions to Health, Health Care, and Health Policies

1962-2008

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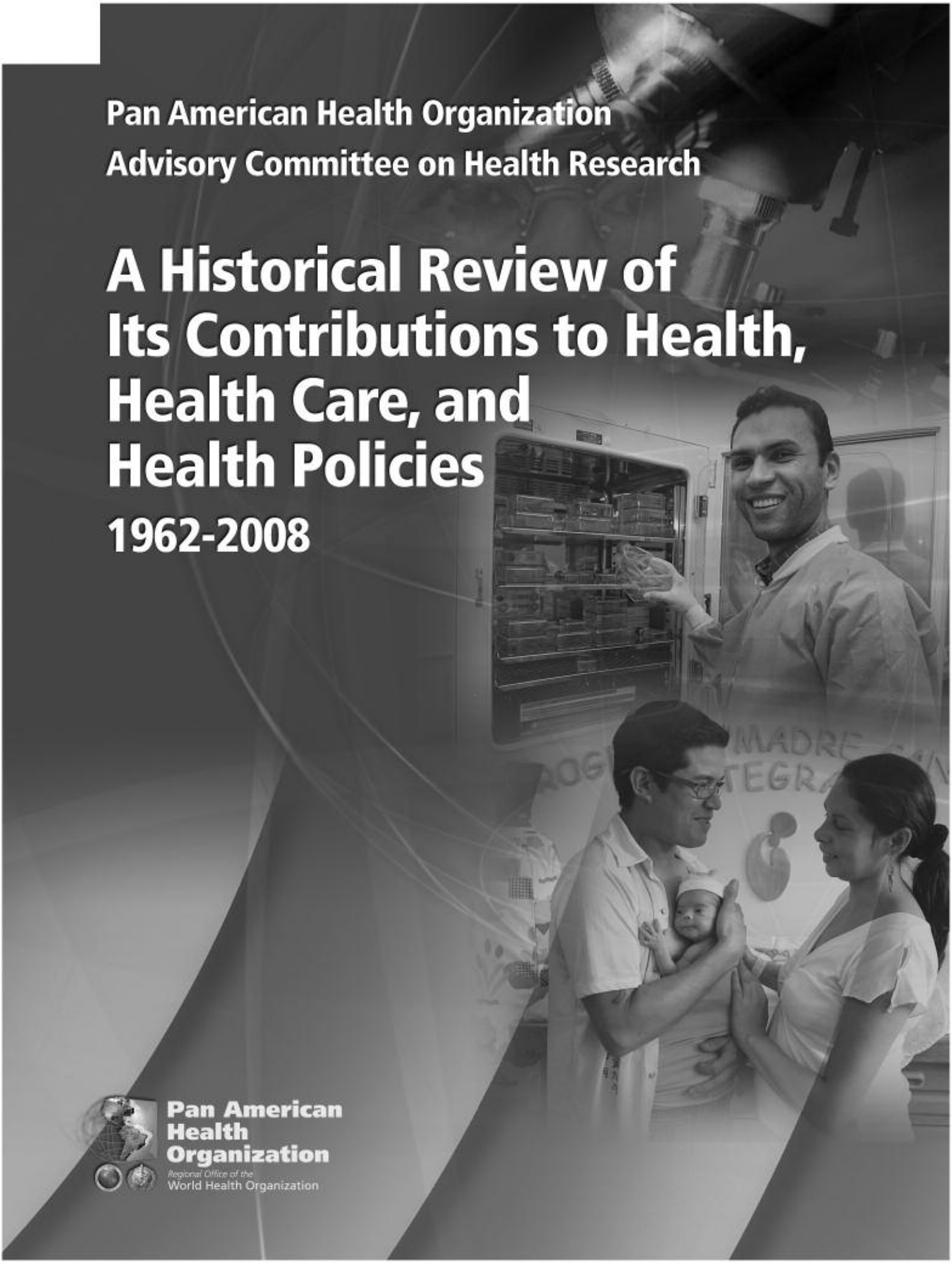

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Advisory Committee on Health Research

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EXECUTIVE SUMMARY

Introduction

In 1959, the World Health Organization (WHO) established the Advisory Committee for Medical Research (ACMR) to provide advice on medical research to the Director. A few years later, in 1962, the Pan American Health Organization (PAHO), WHO's Regional Office for the Americas, established the Advisory Committee on Medical Research (ACMR) "to review existing and proposed research programs and make appropriate suggestions" and "to recommend the basis for a long-term research policy for present and future projects, to be approved by the Governing Bodies of the Pan American Health Organization". In 1986, the Committee changed its name to the Advisory Committee for Health Research (ACHR).

Methodology

First, a systematic search and review was conducted of documents related to ACHR that had been produced between 1962 to 2008. In addition to covering PAHO's web library page (*http://library.paho.org*) the search included the Virtual Health Library (including databases available through BIREME), PubMed (1966 to July 2008), and The Cochrane Library (2008, Issue 3). The search also was intended to identify literature published by PAHO, and relevant references were found in all of them.

A historical, systematic review was chosen as the methodological approach for identifying and summarizing ACHR's contributions and achievements and the impact of these contributions to health, health care, and health policies. Based on a conceptual framework that included health research systems functions and PAHO's 2008 health research policy draft, a structured form was developed to extract information from documents. This information was then summarized by a contractor experienced in systematic reviews, and submitted to PAHO for review. The process was conducted in August 2008, followed by consultations and editionos with some advisors in September 2008.

Results

The search retrieved 40 Reports to the Director and more than 300 technical reports presented in 42 ACHR meetings. Additional technical and historical documents and web pages also were retrieved and reviewed.

Group Composition and Processes

PAHO's Advisory Committee on Health Research had 124 members from more than 25 countries (some may have more than one citizenship) between 1962 and 2008, with participating members at Committee meetings ranging between 4 and 19. Members have included renowned scientists and experts—among them Nobel laureates, from various branches of knowledge and with a wide array of experience. They mainly come from Member States that are at various levels of development in health research. Mirroring global and Regional inequities in access to higher education and senior leading positions in the 20th century, men have dominated the Committee's membership; in ACHR's early years, only 10% of members were women and in the last decade at least 25% of the members of the Committee have been women.

Contributions and Achievements, and Their Impact on Health, Health Care, and Health Policies

Since its beginning, ACHR has focused on advising PAHO on matters of health research; monitoring and evaluating research developments; establishing standards and requirements to guide policies; identifying health research priorities; monitoring adherence; following up on implementation; defining mechanisms and processes to address needs; advocating for research partnerships; evaluating its own processes; and improving research and safeguarding the public.

Most of the strategies that have been developed fall into the following categories: strengthening governance for research and national health research systems (NHRS) in Latin America and the Caribbean; promoting health research; improving competence in health research; developing and maintaining sustainable health research systems; fostering health research partnerships and collaboration; enhancing health research productivity; translating knowledge.

Conclusion

Throughout ACHR's life, the research and health landscapes have dramatically changed. For example, significant progress has been attained in eradicating infectious diseases (e.g., polio has been eradicated from most countries in the Americas) and non-communicable diseases; research capabilities and production have increased exponentially; and access to evidence from research has greatly improved with the arrival of new information and communication technologies, such as the Internet, and the development of new methodologies to summarize information and deliver it in formats that address the information needs of different audiences. Yet, new challenges continue to emerge and health improvement goals are always changing—as conditions improve, new goals are set to address emerging challenges, maintain achievements, and improve equity. Research as a Public Health Function still needs to be strengthened in many countries, and international agendas dealing with the production and implementation of knowledge are being proposed at milestone events such as the 2004 Ministerial Summit on Health Research; WHO's endorsement of the recommendations issued at such events has been followed by proposals and actions that are being implemented. On all these fronts, ACHR has been extraordinarily helpful to PAHO, and it remains relevant for addressing the challenges PAHO must face in the 21st century. ACHR's guidance will continue to be essential for building the future of health and health research in Latin American and Caribbean countries.

INTRODUCTION

A World Bank study published in 2005 evaluated the worldwide impact of innovation on long-term development between 1960 and 2000 using such measurements as patents, investment in research and development (R&D) and number of technical personnel (such as engineers and scientists) working in R&D. The findings suggest that innovation has a strong and positive effect on development in countries, and that there is a strong correlation between patenting activity and R&D efforts, therefore concluding that innovation should be placed at the top of the research agenda (1).

Five decades ago, the governments of the Americas concluded that if they were to solve economic development problems and improve the living conditions and health of broad segments of their populations, they needed to engage in Region-wide cooperation, economic integration, and incorporation of technological innovation (2–5).

In a letter addressed to President Eisenhower in 1958, President Kubitschek of Brazil advanced the idea of the Operation Pan–America; one month later, the United States declared that it was ready to establish the Inter-American Bank, which has worked effectively for many years (3); in 1960 the Council of the Organization of American States signed the Act of Bogotá, recommending measures for social improvement and economic development within the framework of operation Pan America; and in 1961, the Charter of Punta del Este established the Alliance for Progress, promoted cooperation to accelerate economic and social development in the Region. These events established the framework for preparing, executing, and periodically reviewing health policies and national programs; they also led to the setting up of a special fund for providing external assistance for social development. Health became closely linked to economic and social development, and PAHO was assigned a vital role in the Alliance for Progress (2–5).

The Pan American Sanitary Bureau (PASB) emerged from a resolution of the Second International Conference of American States (Mexico, January 1902), and is the Secretariat of the Pan American Health Organization. In 1958 at the XV Pan American Sanitary Conference, the Pan American Sanitary Organization's name was changed to the Pan American Health Organization (PAHO). PAHO's fundamental purpose has been to promote and coordinate the efforts of the countries of the Region of the Americas to combat disease, lengthen life, and promote the physical and mental health of their people. In response to the attention given to health research and the promotion of economic development, the XVI Pan American Sanitary Conference approved in 1962 a list of proposed areas of work that stimulated all research aspects of PAHO's technical programs and allowed the Organization to expand vigorously in the following years (2).

In 1959 WHO established the Advisory Committee for Medical Research (ACMR), which was charged with providing advice on medical research to the Director. Abraham Horwitz, PASB's first Director from Latin America, was urged by governing bodies to "take all possible steps to expand the research activities of the Organization, including specific projects and their financing, for the mutual benefit of the countries of the Region [of the Americas]" (6). To this end, in 1962 PAHO established its Advisory Committee on Medical Research (ACMR) "to review the existing and proposed research programs and make appropriate suggestions" and to "recommend the basis of a long term research policy for present and future projects, to be approved by the Governing bodies of the Pan American Health Organization" (6–10).

In 1986, the Committee's name was changed to the Advisory Committee on Health Research (ACHR). ACHR is part of WHO's system of advisory committees; it is charged with supporting WHO in carrying out its constitutional role of promoting and coordinating research related to international health work, acting in close cooperation with external institutions that pursue common goals and with the scientific community at large.

Because of the great variety in organizational structures, interconnection of elements and bodies, and adaptations that emerge over time, the evolution of institutions is difficult to understand and describe; moreover, interactions are frequently non-linear or non-deterministic, and system-level behavior frequently emerges from these interactions (11,12). Given these factors, analyzing a consultative body's impact, contribution, output, and achievements of a consultative

body should not be done solely on the basis of quantitative indicators. The first measurable product would appear to be its recommendations and the verification of the implementation of the actions recommended. Consequently, a description of the contributions by PAHOs ACHR is complemented by a broad impact assessment of the recommendations to PAHO and its Member States.

This historical review aims to provide a synthesis of the lines of work, contributions, and achievements of PAHO's ACHR based on the available reports, and to describe some the impact assessments these contributions have had on health, health care, and health policies between 1962 and 2008, especially in the Americas.

METHODOLOGY

PAHO's website and institutional web library page (*http://library.paho.org*), as well as the Virtual Health Library (including BIREME's databases), were systematically reviewed to locate available documentation about of the PAHO's ACHR from 1962 to 2008. In addition, PubMED (1966 to July 2008), and The Cochrane Library (2008, Issue 3) were searched to identify published literature concerning or supported by the Advisory Committee on Health Research. The following key terms were used in the search: "CAIS"; "ACHR"; ("Advisory Committee on Health Research" OR "Advisory Committee on Medical Research") and (PAHO or OPS or "Pan-American Health Organization"). To identify additional information, support was sought from PAHOs Technology Health Care and Research (THR) and Information and Knowledge Management (IKM) technical areas. The search also identified reference lists and checked annexes of ACHR Reports to Director. To find additional references, current and former PAHO employees and ACHR members were contacted. No language restrictions were applied, and reviewed material included documents in French, English, Spanish and Portuguese. Additional relevant technical documents concerning health research were sought, such as reports produced by the Ibero-American Network of Science and Technology Indicators (RICyT) webpage [*http://www.ricyt.org*].

To identify and summarize the contributions and achievements of PAHO's ACHR a historical systematic review was carried out as well as an assessment of the impact of these contributions to health, health care and health policies.

Based on the conceptual framework of functions of health research systems described by Pang et al (13) and a draft of PAHOs Health Research Policy that is still under development but was discussed at the 42nd ACHR meeting, a structured form was developed to extract information from documents, including the following set of implementation strategies and instruments: group composition and processes for recommendations of the ACHR; strengthening governance for research and the national health research systems (NHRS) in the Latin American and Caribbean countries; health research promotion; improvement of competence in health research; development and maintenance of sustainable health research systems; health research alliances and collaboration; health research productivity; and translation of knowledge.

Historical systematic reviews do not aim to produce quantitative summaries; rather, they resemble conventional systematic reviews by following explicit methods, including a comprehensive literature search and detailed quality appraisal procedures (whenever possible), and a standardized qualitative research synthesis.

The kinds of evaluated documents varied, and included documents such as technical reports, ACHR Reports to the Director, reports from the Director of PASB, conference reports, organizational web pages, project proposals, surveys, and descriptive studies.

RESULTS

The search identified 40/42 ACHR Reports to the Director and more than 300 technical reports discussed at the 42 ACHR meetings, as well as other technical and historical documents, reports from the Director of PASB, and web pages. The search and appraisal were carried out in August 2008. Considering the large numbers of references, technical reports presented during the meetings (and included as annexes to the Reports to the Director) are not cited separately (14-61).

Group Composition and Processes

An "advisory committee" is any committee, board, council, commission, panel, task force, or similar group of volunteers that meets regularly on a long-term basis to advice and/or support an organization or a division of an organization, but has no authority over it.

The grounds to determine the ideal composition and size of an advisory committee is seldom provided by scientific evidence, but empirical evidence suggests that rich interactions take place if panel members bring a mix of perspectives, technical ability, and experience, and that this may result in more appropriate guidance (62-68). Social and organizational psychology disciplines suggest that group size should be between six

and twelve members (66), and that the group's dynamics may be greatly affected by the "group leader who has a crucial role in ensuring a positive group process and that all voices within the group can be heard" (14).

Between 1962 and 2008, ACHR has had 124 members from 25 countries, although some may have had more than one country of citizenship (Table1); the number of members participating in ACHR Meetings ranges from 4 to 19. The Unit Chief of the Research Promotion & Development team (or its equivalent) has traditionally acted as the Secretary for ACHR (see Table 1A). Women's participation in ACHR has been increasing, but has been low overall. This may well be a reflection of global and Regional inequities affecting women's access to higher education and high level positions seen in the 20th century. Committee membership included renowned scientists and experts chosen from diverse branches of knowledge. Each meeting included a range of core and support documents in a broad range of topics, prepared by the Secretariat, Committee members, PAHO staff, and special guests. Two formal reports concerning the structure and processes of ACHR were found. The first one was the report of the Subcommittee for Restructuring ACHR and was presented at the XXIV Meeting in 1985. It recommended a standing core membership of 15 administrators and researchers experienced in policy formulation and the organization of research in health and related sectors (69). It also recommended that ongoing communications be strengthened between the Chairman of ACHR and the Director of PASB with regards to the formulation of the annual program of work of Committee members. The second report about the structure and operation of the ACHR was presented at the XXXI ACHR (70); at that meeting, the roles of ACHR as an advisory body were defined (see box below).

From 1985 to 1995 ACHR held seven meetings and produced 84 documents on the establishment of institutional policy orientations for research, most of them dealing with the evaluation of institutional activity, the identification of problems, the setting of priorities, the definition of strategic orientations for scientific activity, the presentation of theoretical developments, and the description of specific situations or case studies. The report of the XXXI ACHR emphasized the need to produce documents that support viable recommendations for management areas most directly linked to research; in addition, it stressed the value of monitoring the most important recommendations of the previous meetings and proposed an output index to assess the development of recommendations from documents and reports presented in ACHR. At various times, meetings were held every two years, and in a few occasions two meetings took place the same year. Traditionally, the President and Secretary of PAHO's ACHR have been invited to participate in WHOs ACHR meetings.

In 2005, the Secretariat proposed complementing traditional, face-to-face meetings with the use of modern information and communications technology; to that end it established a dynamic committee held regular deliberations and maintained ongoing communication with ACHR members through the use of such technology.

The review of the reports shows that ACHR processes and governance procedures have held 42 face-to-face meetings between 1962 and 2008, with a deep sense of engagement by ACHR members with PAHO and with the Director of PASB.

Roles of ACHR as An Advisory Body (as defined at the XXXI Meeting of ACHR)

a) Evaluate the evolution of health problems and update priorities, thereby ensuring acquisition of the new knowledge required to deal with problems as they arise.
b) Formulate strategies to address the problems through research. In this instance an entirely new horizon emerges, based on the differential development between the countries of the Region. For example, associations should be fostered between centers in a developed country and centers in the developing countries, in regard to collaborative and multicenter projects.
c) Establish strategies to strengthen infrastructure that will foster research, emphasizing human resources education and the establishment of networks for information exchange.
d) Evaluate the results of research conducted and recommend eventual fields for its application, as support for the technical cooperation provided by the Organization.

Table1. ACHR member's primary listed nationality, 1962- 2008.

Country	Number	Percentage
Argentina	10	8.1
Brazil	12	9.7
Canada	12	9.7
Chile	6	4.8
Colombia	7	5.6
Costa Rica	2	1.6
Cuba	3	2.4
Ecuador	1	0.8
France	1	0.8
Great Britain	2	1.6
Guatemala	1	0.8
Guyana	1	0.8
Honduras	1	0.8
Jamaica	4	3.2
Japan	1	0.8
Mexico	10	8.1
Netherlands Antilles	1	0.8
Nicaragua	1	0.8
Panama	2	1.6
Peru	3	2.4
Puerto Rico	1	0.8
Trinidad and Tobago	1	0.8
United States of America	33	26.6
Uruguay	2	1.6
Venezuela	6	4.8
Total	124	100

Table1a. ACHR Secretaries, 1976-2008.

Years	Name	Title
1976 – 1977	Mauricio MARTÍNEZ DA SILVA	Medical Officer
1977 – 1981	Adolfo PÉREZ MIRAVETE	Medical Officer
1981 – 1983	George ALLEYNE	Medical Officer
1985 – 1988	María LEITE RIVERO	Medical Officer
1989 – 2005	Alberto PELLEGRINNI FILHO	Program Coordinator / Unit Chief
2005 – 2008*	Luis Gabriel CUERVO AMORE	Unit Chief / Team Leader

Contributions and Achievements, and Their Impact on Health, Health Care, and Health Policies

1. Strengthening "good" governance and stewardship for research and the national health research systems in Latin American and Caribbean countries

a. Definition

Governance in research deals with consistent management; setting principles, requirements, and standards that lead to cohesive policies; defining mechanisms and processes; monitoring and assessing arrangements; and improving research and safeguards to the public (71). Merriam-Webster's dictionary [http://www.merriam-webster.com/dictionary/] defines stewardship as "the careful and responsible management of something entrusted to one's care." Pang and colleagues have proposed that stewardship within the health research systems (HRS) should include the following four components: "definition and articulation of a vision for a national HRS; identification of appropriate health research priorities and coordination of adherence to them; setting and monitoring of ethical standards for health research and research partnerships; and monitoring and evaluation of the HRS itself." Although the subject of good governance is probably more political than technical, broadly conceived, stewardship can be seen not merely as a set of practices but rather as akin to the notion of 'good governance' (72).

b. Stimulating biomedical research

PAHO's formal research program was established in 1961 with the creation of an Office of Research Coordination and in 1962 with the creation of the Organization's Advisory Committee on Medical Research (ACMR), mandated to "review the existing and proposed research program and make appropriate suggestions," and "recommend the basis of a long-term research policy for present and future projects, to be approved by the Governing Bodies of PAHO."

The Committee's responsibilities included the examination and stimulation of the biomedical research fields that dealt with the Organization's objectives, as proposed by the Director, and the formulation of opinions on policy related to research, training, and education. Following ACMR's recommendation, in 1962 the XVI Pan American Sanitary Conference established research as a major item in PAHO's policy; the policy statements stressed the Organization's role in assisting countries to develop the necessary research resources.

The Committee's early meetings were devoted to a systematic assessment of the needs and opportunities for research in a wide range of fields, emphasizing health problems of international importance and ecological and biological concerns with social implications. ACMR initially focused on analyzing and discussing the latest research advances in areas of interest to its members and assess scientific progress. Based on guidelines provided by ACMR, PAHO implemented research programs that played an important role in stimulating and strengthening the resources and capabilities for biomedical research in the Americas and obtained support for research projects that met standards of excellence for granting agencies.

In 1964, PAHOs Governing Bodies approved a list of 45 projects to be developed with scientists and institutions from all over the Americas, and the Committee suggested that various standardized protocols be developed on such topics as tuberculosis programs and protection against radiation.

By 1965, ACMR expressed concern about several issues: the uneven distribution of research efforts in the in the Americas; limited tradition in science in the LAC; weaknesses in research on clinical investigation epidemiology, virology, and public health administration; a lack of resources in many countries; the structural rigidity of universities; and poor scientific communication. The Committee focused on educational research as a way to maintain quality standards of scientists and doctors in training and to address the trend in Latin America and the Caribbean to leave their countries of origin in pursuit of better work opportunities, especially to work in the United States.

In the 1967 Declaration by the Presidents of the Americas at Punta del Este, Uruguay, the Heads of State urged that a Regional program be put in place to foster scientific and technological development. For the first time in Latin America's history, Presidents had concurred on funding science and technology. Recommendations were made for including selected fields, including basic sciences, biochemistry, physiology, genetics, and microbiology; priority was given to multinational programs and postgraduate training that would begin to stimulate research. ACMR's proposal for revising and expanding PAHO's research program was fully endorsed at the Special Meeting of Ministers of Health of the Americas held in Buenos Aires, Argentina, in 1968. In the then Department of Research Development & Coordination, two units were organized, one for operational research and another for promoting and coordinating multinational research and research training programs. In addition ACMR stressed the importance of setting up services for vital and health statistics.

c. Formulation of research policy

During the 1970s, the focus gradually changed. The Committee began to emphasize PAHO's research activities and played a more active role in formulating research policy. The chairman communicated directly with PAHOs Governing Bodies, and PAHOs research priorities focused on strengthening health services and extending health coverage to rural and underserved areas; controlling diseases, especially communicable diseases (i.e., through immunization, by strengthening the oral rehydration component of national primary health care programs); developing human resources for research; family health and family planning; and environmental health.

WHO established regional ACMRs and made funds available to PAHO for research; coordination among PAHO, WHO, and ACMR began (32). PAHO also established guidelines. Research Ethics Committee as a way to protect those who participated in research, to monitor review committees in PAHO Centers, review projects conducted in sites that did not have an ethics review committee, advise Member States on the implementation of ethics review committees, and bring ethical reviews up to international standards and requirements.

The Division of Human Resources and Research took responsibility for the promotion and coordination of research activities with technical cooperation programs; the cataloguing of research projects; the organization of research grants and training related activities; the promotion of national research policies; the establishment of priority areas in biomedical, socioepidemiological and operational research; the development of an information system on research in health; institutional development and coordination of collaborating centers; technical cooperation for training and advisory services on statistical methodology; and for the coordination of the activities of the Special Program for Research and Training in Tropical Diseases (TDR) in the Americas.

In the firsts 15 years of ACMR's operation, recommendations focused on stimulating and supporting biomedical research and research training with emphasis on collaborative multinational projects, the strengthening of biomedical communications and resources through scientific meetings and the provision of access to scientific production and other resources, and the promotion and application of operations research to improve the efficiency of healthfacilities and programs. Many experts were tapped as consultants, 216 technical reports and 31 scientific monographs were published. PAHO had to align its priorities with those of granting agencies, and the Organization contributed with 30% of the budget The Office of Research Coordination implemented the Organization's policy by identifying research problems and opportunities, particularly regarding projects suited for multicountry collaboration efforts, and by exploring acquiring financial support from granting agencies.

Although in 1962 most Latin American and Caribbean countries lacked functional scientific or technological infrastructures, by the mid 1980s most of them had established institutions and systems to promote and support science and technology activities. In stressing the importance of biotechnology, ACHR gave priority to biotechnological research geared to producing vaccines and developing diagnostic methods, and developing insecticides and drugs. Member Countries were encouraged to include the development and strengthening of biotechnology in their national policies on science and

technology for economic and social development, and for these purposes, contact were established with the government agencies and research councils in charge of planning and supporting developmental and technological research in member countries.

In 1985, PAHO's Research Grants Program became a technical cooperation mechanism designed to generate knowledge that could address priority health issues; ACMR subcommittees (renamed ACHR in 1986) were created to focus on biotechnology and health systems research.

By the mid-1990s, ACHR focused on orienting PAHO's research policies, along with other technical cooperation activities of the Organization, to concentrate its activities along five areas selected by the Governing Bodies according to PAHO's 1995–1998 Strategic and Programmatic Orientations.

PAHO research areas by the mid 1990s

- Health and Development,
- Health Promotion and Protection,
- Health Systems Development,
- Environmental Protection and Development,
- Disease Prevention and Control.

A more comprehensive concept of health promotion was developed and is reflected in WHO discussion documents (1986), as well as in the Ottawa Charter for Health Promotion (1986), the Declaration of Santa Fé de Bogotá (1992), and the Declaration of the Caribbean (1993), as well as in other documents along the lines of the Ottawa Charter in developed countries.

Beginning in 1995, PASB's Director (in that year, Dr. George A. O. Alleyne) has guided the execution of the Organization's regional programming, reflecting persistent intentions to seek equity and "Pan Americanism." ACHR recommended that clear and formal criteria and mechanisms for reviewing projects be established, involving many divisions, Pan American centers, and Country Offices. PAHOs Regional Program of Bioethics analyzed the ethical implications of research and formulated standards relating to new trends, such as the commercialization of knowledge and the gene pool; bioethics and the ethical regulation of research became a cornerstone in the development of health research systems.

In 1997, particular attention was paid to topics such as "the privatization of knowledge and the strengthening of mechanisms for controlling intellectual property and its impact on health research in the Region."

d. The Regional Health Research Agenda

At the onset of the 21st century, ACHR recommended that work with the national councils for science and technology be intensified to achieve a full commitment and the commensurate allocation of resources that would contribute towards cooperation and exchange among countries. During these years, ACHR also was concerned with establishing a Regional health research agenda; to that end, it presented a technical cooperation strategy known as DECIDES (Democratizing Knowledge and Information for the Right to Health), which aimed at taking advantage of opportunities presented by new communication and information technology.

Five strategic objectives were identified for PAHO's institutional development, which also represent possibilities for cooperation in health research. (See box below.)

PAHO's Strategic Objectives:

- to better respond to country needs,
- to adopt new modalities of technical cooperation,
- to be a regional forum for health in the Americas,
- to create a knowledge-based/learning organization, and
- to enhance management practices.

Based on policies adopted by PAHO's Governing Bodies, including by the Pan American Sanitary Conference, and considering that the Ministerial Summit on Health Research in Mexico City, Mexico, held in November 2004, focused on the need to improve knowledge use to attain better policies on health, ACHR noted that the global environment was favorable to defining a clear strategy and policy on health research for the Region.

Furthermore, PAHO, in collaboration with the United States Centers for Disease Control and Prevention (CDC) and the Latin American Center for Research in Health Systems (CLAISS), developed a measurement instrument, based on the North American experience with the National Public Health Performance Standards Program. Eleven Essential Public Health Functions (EPHFs) and the role of the National Health Authorities were assessed in 2002, with the participation of some 2,000 key informants from 41 Latin American and Caribbean countries. The findings showed that there was a Region wide need to strengthen essential research for the development and application of innovative solutions in health (73).

In 2004, the Ministerial Summit on Health Research in Mexico City issued the "Mexico Statement on Health

Essential Public Health Functions

1. Monitoring, evaluation, and analysis of health status.
2. Surveillance, research, and control of the risks and threats to public health.
3. Health promotion.
4. Social participation in health.
5. Development of policies and institutional capacity for public health planning and management.
6. Strengthening of public health regulation and enforcement capabilities.
7. Evaluation and promotion of equitable access to necessary health services.
8. Human resources development and training in public health.
9. Quality assurance in individual and population-based health services.
10. Research in public health.
11. Mitigation of the impact of emergencies and disasters on health.

Research – Knowledge for Better Health: Strengthening Health Systems". It listed necessary strategies and actions that had to be undertaken to bolster national health research systems that respond to country needs by producing and using scientific research that informs decisions for health. Among them, the statement called upon WHO to "support networking of national research agencies in conducting collaborative research to address global health priorities," and to facilitate all major stakeholders' efforts to "establish a platform linking a network of international clinical trial registers to ensure a single point of access and the unambiguous identification of trials"; to "report progress on the Mexico Statement at the United Nations Millennium Development Goals Summit in 2005, at a conference on health systems in 2006, and at the next Ministerial Summit on health research in 2008;" and to convene a ministerial-level international conference on research into human resources for health (74). WHO's 58th World Health Assembly acknowledged the Mexico Statement and issued Resolution WHA58.34, urging interested parties to act accordingly (75). With support from its global and regional Advisory Committees on Health Research and its regional offices, WHO has coordinated a response, including technical cooperation for the subjects mentioned in the Resolution. In the Americas, PAHO has coordinated the response to Resolution WHA58.34 with its ACHR's advice, and has aligned its technical cooperation and its expected results with WHO, as reflected in PAHO's 2008–2012 Strategic Plan (76). Ministers of Health and other interested parties have committed themselves to strengthen national health research systems and to develop strategies to improve the systematic use of scientific evidence that informs decisions on equity and health, as reflected in the Health Agenda for the Americas 2008-2017 (77). Moreover, there has debates and consultations have been actively engaged and a technical and Ministerial-level network has been created for this purpose (78).

Prompted by the current Director, Dr. Mirta Roses, a draft policy began to be developed in 2007 and was first discussed with PAHO's ACHR in 2008 with the aim of presenting it for consideration of the Directing Bodies in 2009. The draft policy document intends for PAHO's research policy "to promote the identification of gaps in the knowledge which impede solution of national health problems and to cooperate with the countries of Americas in carrying out in a coordinated manner the research necessary to fill those gaps." The three major activities were promotion, cooperation, and coordination.

ACHR also debated and promoted the development of the Evidence-Informed Policy Network (EVIPNet) initiative, which WHO is coordinating to enhance the systematic use of research evidence for health at the country level, thus building bridges between policymakers, researchers, and civil society, and facilitating the systematic use of research evidence by decision makers, including policy makers, in low- and middle-income countries. EVIPNet Americas was officially launched in July 2007 in Washington DC (79).

The Health Agenda for the Americas and PASB's 2008–2012 Strategic Plan identified the need to strengthen research production and the use of research results in technical cooperation in the Organization. It also requested that biomedical and health trial registration be promoted and that national clinical trial register that adhere to WHO standards be developed. According to the Director of the Pan American Sanitary Bureau, these initiatives also should consider recommendations of the Commission on Intellectual Property Rights, Innovation, and Public Health (80), and, more recently, the content of the Global Strategy on Innovation, Intellectual Property, and Public Health (81).

In 2008, 21 countries had been identified as having a government institution devoted to science and technology, policies in this regard, and enough resources allocated to allow for conducting research in the country (see Table 2). The Caribbean Health Research

Council represents a shared structure for all English-speaking Caribbean countries to establish health research priorities. In addition, WHO issued its Guidelines for Good Clinical Practice (GCP) for Trials on Pharmaceutical Products in 1995 to provide a body of applicable international standards for managing biomedical research on human subjects. In the Americas, a Regional Good Clinical Practice Working Group was put together in 1999, to promote the development of GCPs (82).

Table2. Government institutions for Science and Tecnology Policy Formulation and resource allocation in Latin America and the Caribbean (83)

Country	A&T Policy Institution	Research council and funds
Argentina	Secretariat for Science, Technology and Innovation	CONICET
Bolivia	National Secretariat for Science and Technology (SICYT-SEUB)	CONACYT
Brazil	Ministry of Science andTechnology	National Research Council (CNPq). FINEP, CAPIS, FAPs
Chile	National Research Council	CONYCIT
Colombia	Departamento de Planeación Nacional. National Research Council CNCyt	Colciencias
Costa Rica	Ministry of Science and Technology (MICIT)	CONICIT
Cuba	Ministry of Science and Technology and Environment	Cuban Academy of Sciences
Ecuador	SENACYT	CONICIT
El Salvador	Ministry of Economy. CONACYT.	Department of funding for development of S & T
Guatemala	CONACYT	FONACYT
Guyana	Council for Science, Technology and the Environment	CONICYT
Honduras	Council for Science, Technology and the Environment	COHCIT
Jamaica	Nacional Research Council NCST	
Mexico	Secretariat for Public Education	CONACYT
Nicaragua	Nicaraguan Council on Science, Technology	COHCIT
Panama	National Secretariat for Science and Technology (SENACYT)	CONACYT FONACYT

Country	A&T Policy Institution	Research council and funds
Paraguay	CONACYT	CONACYT FONACYT
Peru	CONCYTEC	FONDECYT
Trinidad & Tobago	National Institute for Higher Education, Research, S & T. (NIHERST)	
Uruguay	CONICYT	DINACYT-OPP
Venezuela	Ministry of Science and Technology	CONICIT FONACIT

2. Health Research Promotion and the Common Good

a. Formulation of Recommendations

Within the area of public health, the Charter of Punta del Este (1961) had two overriding objectives: (1) to increase life expectancy at birth by a minimum of five years, and (2) to enhance the capacity to learn and produce by improving individual and collective health. Specific objectives intimately related with the work of the ACMR included increasing water supply and sanitation coverage; improving nutrition; the reduction of infant and child mortality; prevention and control of communicable diseases, particularly vaccine-preventable diseases; and the training of medical and health personnel, among others.

The ACMR encouraged the presentation of research proposals on topics of specific interest in the Americas in order to bolster research in medical schools and develop graduate training centers in universities and in special non-university institutes throughout the Region. It also supported submissions to be made to research funding agencies, provided guidance on research to be funded through the PAHO regular budget, and advocated for the establishment of specific centers to support research in the Americas. Areas for research that have become of particular interest since 1962 include environmental health and water supply in urban and rural areas, waste disposal and air and water pollution, agricultural and food sciences (primarily promoted through the Institute of Nutrition of Central America and Panama, known as INCAP), dental health, maternal and child health, nutrition, brain development and vitamin deficiency disorders as they relate to fetal nutrition, childhood mortality, Chagas' disease, HIV/AIDS (beginning in the 1980s), malaria, schistosomiasis, leprosy, rabies, tuberculosis, plague, rotavirus and other types of gastroenteritis, cardiovascular diseases, congenital malformations and the epidemiology of cancer, vaccines, viral respiratory diseases, arthropod-borne virus diseases, zoonoses, radiation, endemic goiter, mycotic diseases, health economics and medical care, indigenous populations and population dynamics, mental health, violence, migration, health promotion and education, and health systems and services organization, among others (84-89). The number of research proposals considered by the Governing Bodies of PAHO increased six-fold between the 1940s and the 1980s. In most cases (87%), it was stated that the proposed research was to be conducted and/or supported by PAHO, its Member States, or both (2).

By the mid-1980s, the ACHR recognized that significant resources had been allocated by PAHO to support health research, and it emphasized the need for continuous assessment of research quality and the importance of supporting biomedical research, particularly in the areas of biotechnology and molecular biology.

In 1983, the PAHO Directing Council created the Grants Fund and made available US$ 1.3 million, and in 1985, Directive 01-85 established the PAHO Research Grants Program (RGP) as a technical cooperation mechanism designed to generate knowledge and to help solve priority health problems. The RGP initially focused on 11 priority areas. These were increased to 15 in 1988 and reduced to 5 in 1994. In 2000, the ACHR recognized two modalities: (1) capacity-building for research (skills and education) that would fund postgraduate theses work in public health at the masters and doctorate levels, and (2) knowledge delivery which funded multicenter studies and regional research. Thirty countries participated in 441 projects that were supported through the RGP, and more than US$ 8.6 million were allotted to the RGP during these 21 years.

b. Impact of Contributions on Health Care and Research

During the 1960s, PAHO's research program played an important role in stimulating and strengthening the

resources and capabilities for biomedical research in the Americas. These efforts resulted in the development of research projects in a wide range of fields: 1,001 projects in all were sponsored, supported, and/or carried out by PAHO between 1961 and 1983. Of these, 32% were related to zoonoses and foot-and-mouth disease; 14% to food and nutrition; 10% to infectious diseases; 25% to environmental health, parasitic and chronic diseases, and perinatology; with the remaining projects (19%) covering other public health topics. PAHO staff conducted 634 of these projects, and 367 were carried out by local researchers. A more comprehensive scrutiny of PAHO's research activities requires a consideration of all research- related technical cooperation activities, such as those related to health promotion and the provision of advisory services and information. For example, 7% of the 5,703 technical cooperation activities programmed for 1984 were considered to be, in essence, research activities, and technical cooperation in the area of research accounted for 17% of all activities programmed in the countries. There have been significant variations in the PAHO budget devoted to research. However, establishing how much has been invested in Research has been a challenge because resources for research are not exclusively channelled through the Research Promotion & Development; most resources will be channelled through country offices, technical teams, and PAHO Centers.

When classified by functional approach, the allocation of resources by biennial program budget showed that for the 1998–1999 biennium, Regional programs devoted more than three times for research promotion than what Country Offices had. Yet, only 6% of the total operational budget (post funds were excluded) was allocated for this functional approach. Furthermore, using the same classification, the amount allocated in the above-mentioned biennium was half of that allocated in 1990 (90).

During the late 1980s, PAHO began using functional approaches as a way to differentiate the type of technical cooperation provided to Country Members. Such classification complemented the Organization's efforts to develop a work plan tailored to the needs of its members. Six functional approaches were identified: a) resource mobilization; b) information dissemination; c) training; d) norms, plans and policies; e) research promotion; and f) direct technical cooperation (91).

The budget for research governance has been increasingly provided by the regular budget: in 1984, more than 50% of that budget came from the PAHO regular budget, in contrast with 1967, when the regular budget represented only 18%. In the past biennium (2006-2007) nearly all the budget for PAHOs research governance came from the regular budget. To better characterize research in PAHO, an electronic tracking system that links research throughout the Organization is being implemented and is should be functional in 2009 (57-59).

A study on research proposals considered by the PAHO Governing Bodies during the 1942–1984 period found that about one-third of the proposals addressed communicable diseases, 21% the planning and administration of health services, and the remaining 49% was divided among work in the areas of chronic diseases, nutrition, environmental health, maternal and child health, material resources, and other health programs. Several indicators for research and development in Latin America and the Caribbean improved during the 1990s, as compared to the 1980s, and expenditure increased by 56% between 1990 and 1996 in Argentina, Brazil, and Mexico (82–84).

Beginning in 1969 and spanning over more than four decades, INCAP has conducted a series of longitudinal and follow-up studies. This research assesses the effects of intrauterine and preschool nutrition on growth, development, and human capital formation and has also focused on the following areas: physical development, medical history and cardiovascular risk, schooling attainment and cognitive functioning, occupational income and wealth, mother-child interaction, and diet and physical activity. This study has resulted in more than 200 publications influencing knowledge about the impact of early life nutrition on a variety of key human development aspects (92).

c. Bibliometric Assessment

According to the Organization for Economic Cooperation and Development, a bibliometric assessment is an "instrument which permits observation of the state of science and technology through the production of scientific literature as a whole, at a determined level of specialization. Bibliometry is a means of situating a country's production in relation to the world, an institution in relation to its country and even scientists in relation to their own communities" (93).

In 1991, the ACHR recommended establishing an internal commission for the assessment of PAHO's scientific production in its regional and subregional Pan American centers, including inviting independent reviewers to assess research and establishing an ad hoc committee for the preparation of policy guidelines for scientific and technological research. A 1993 report found that Argentina, Brazil, Chile, Cuba, Mexico, and Venezuela

accounted for more than 90% of the indexed scientific papers published in Latin America and the Caribbean. Between 1979 and 1988, 77,925 papers were identified as having been published in those six countries. In 1986, a reduction in scientific production of approximately 25% was noted in all Latin American countries; this was probably associated with a reduction in expenditures in scientific and technological research that affected the Region during 1982 and 1983 (83).

A study analyzing the Science Citation Index (SCI) found that during the decade covering 1992 to 2001, scientific output in the Americas experienced a moderate growth, with an average annual rate of 0.6%, while the global annual rate growth stood at 1.75%. Although Canada and the United States accounted for 96% of regional production, the average annual growth for Latin America and the Caribbean was 7.1%; Argentina, Brazil, and Mexico produced approximately 80% of the citations for research conducted in Latin America and the Caribbean. The proportion of publications reflecting work being carried out by a single center (i.e., non-collaborative) and originating in Latin America and the Caribbean decreased between 1992 and 2001, reflecting an opening of scientists from this subregion to collaboration. According to the Ibero-American Network of Science and Technology Indicators (RICYT), the rate of publications in SCI SEARCH per capita and the total number of papers published in MEDLINE originating from Latin America and the Caribbean doubled during the 1990– 2004 period. Publications indexed in the Latin American and Caribbean Literature in Health Sciences (LILACS) database also increased during this period, as well as publications cited in the SCI (an increase of 140% between 1994 and 2003). During the 1980-2004 period, 34 countries publishing public health research results were identified in LILACS-SP (100,883 records), as were 26 countries in MEDLINE (29,751 references). Five countries (Argentina, Brazil, Chile, Colombia, and Mexico) produced 73% of the total number of citations in these two databases; Portuguese was the dominant language (44.7%), followed by Spanish (37.1%) and English (17.6%) (83). International collaboration in research can be recognized by identifying the number of coauthored articles involving at least one researcher with institutional affiliation in Latin America or the Caribbean and the other(s) in another country. Thirty percent of the articles in the SCI database reflecting research originating in Latin America and the Caribbean during the 1993–1999 period were internationally coauthored, principally by researchers from Canada and the United States. At the same time, there was an increase in Latin American and Caribbean interregional collaboration, most notably among Argentina, Brazil, and Uruguay (94).

3. Improving Competencies for Health Research

a. Formulation of Recommendations

During the 1960s and 1970s, the ACMR focused its recommendations on improving the skills of researchers by encouraging a sharper research orientation at the basic university educational level, during postgraduate coursework, through the development of traineeships in specialized knowledge fields, and among laboratory and fieldwork teams.

During this period, the AMCR noted the lack of opportunity for stable careers in the research arena, including inadequate salaries and other monetary incentives, and recommended that each country establish a national research council and utilize this entity to carry out an assessment of public health and related scientific programs and identify ways to stimulate research activities. Health research training in public health and medical schools was one strategy adopted to spur research development. The Advisory Committee stressed that the most important handicap to the advancement of research lay in the shortage of trained and skilled specialists at all levels, and it supported the implementation of long-term training programs for graduates and postgraduates in the health sciences, including provisions for the continued full-time support of trainees in field research and in educational research methodologies. During the 1960s and 1970s, PAHO organized and supported numerous capacity-building activities covering a wide range of fields and topics.

Regional health centers were established to study local problems, provide local solutions, and build local research capacity aimed at reducing the dependency on developed countries for this type of assistance. Training activities were organized in the PAHO scientific and technical centers with emphasis on the development of skills in the analysis of scientific papers and in the preparation of research projects. For example, the United Kingdom-based Wellcome Trust funded fellowships in pathology to increase the availability of skilled pathologists in Latin American countries. The Medical Committee emphasized the catalytic effect such grants could produce “by providing a needed piece of equipment or a regular supply of materials that may be extremely productive at modest expense”.

In the 1980s, focus was placed on the creation of public and private postgraduate programs to increase the

number of skilled epidemiologists and to promote and strengthen scientific and technical exchange.

In the 1990s, the ACHR recognized the need to have qualified researchers throughout the Americas capable of conducting health systems and services research and to foster a deeper appreciation for the role of research in helping to improve national decision-making and policy formulation processes. In 1993, the Regional Program of Bioethics was established by PAHO to promote knowledge of this discipline (44, 45).

Since 1995, PAHO has continued to promote strategies to improve health research competencies by designating research and training centers, awarding fellowships, and advising Member States to provide resources to adequately fund these vital areas.

Beginning in the 21st century, the ACHR has focused, among other topics, on the evaluation of policies for intellectual property rights. The 2001 Doha Declaration of the World Trade Organization stated that public health should take precedence over industrial property rights: "The use of generic drugs is one of the most effective health interventions, and making them accessible to the population plays a fundamental role in achieving equity in health" (95, 96).

b. Impact of Contributions on Health Care and Research

The training of human resources for health research grew considerably during the final two decades of the 20th century in Latin America and the Caribbean. Fellowships for doctoral programs abroad began to receive substantial financial support from the public sector through national councils of science and technology, and through loans from diverse entities. Favorable conditions were created in such Member States as Argentina, Brazil, Chile, Colombia, Mexico, and Venezuela to develop doctoral-level national research training programs. Countries began to develop partnerships and agreements to establish cooperative programs and to integrate doctorate studies utilizing the expertise of local academic and research institutions.

According to the RICYT database, the number of Latin American and Caribbean researchers has increased over the past decade from 2.4% of the world's total in 1994 to 2.9% in 2004. Furthermore, over the same period of time, the proportion of researchers from Latin America and the Caribbean per 1,000 health care workers and the number of these researchers with a master's or doctorate degree doubled. However, these countries still have an insufficient number of researchers needed to conduct high-quality research. In 2000, there were approximately 0.89 researchers for every 1,000 economically active individuals; the rates for Spain and the United States are 10 and 15 times higher, respectively (83). The participation of female researchers in science and technology in most Latin America and Caribbean countries ranged between 30% and 50% of the total number of researchers in 2000. Furthermore, a significant proportion of researchers work in the public sector, especially in universities; few are employed in the private business sector (83).

Patents are among the indicators of successful innovation, despite the limitations of this surrogate marker. According to the RICYT database, the number of patent applications increased from 33,554 to about 50,000 (49%), but the number of patents granted increased 15% between 1994 and 2004, and the majority of these were granted to Latin American researchers who did not reside in their native countries. When data from the U.S. Patent and Trademark Office is added, including U.S. residents from all the countries of Latin America and the Caribbean, the figures doubled between 1999 and 2000 alone (83).

To stimulate the production of scientific literature, the Fred L. Soper Award for Excellence in Health Literature was created in 1990 as a result of a partnership between the Pan American Health and Education Foundation (PAHEF) and PAHO. Similarly, to stimulate the strengthening of capacities for bioethical analysis among young researchers, the Secretary of Health of Mexico, PAHEF, and PAHO partnered to create the Manuel Velasco-Suárez Award in Bioethics in 2002. Recipients of these awards are given a cash prize and a certificate of recognition in a special PAHO ceremony.

4. Developing and Maintaining Sustainable Health Research Systems

a. Formulation of Recommendations

The primary purpose of the ACMR throughout the 1960s and early 1970s was to provide PAHO's support to scientific research in Latin America to solve health problems and thus promote human welfare. As a consequence, PAHO developed a broad and ever-growing program of research projects in biology, medicine, and the social sciences (2).

In the mid-1970s, the ACMR promoted the strengthening and extension of epidemiological surveillance systems and supported the performance of biomedical research covering a wide range of issues. In 1974, after Dr. Hector R. Acuña was elected Director of the PASB by the 19th Pan American Sanitary Conference, an

evaluation of the Ten-year Health Plan was conducted. It pointed out a number of weaknesses in the essential areas of epidemiological surveillance, food and nutrition policies, immunization services, child and maternal health care, and rural water supply (2). The "Health for All by the Year 2000: Strategies" and the "Plan of Action for Health for All by the Year 2000" documents, both approved in 1980, served as a framework for PAHO and the Member States to develop and maintain sustainable health research systems.

The ACHR stressed the importance of formulating and making the necessary adjustments to health policies, improving health systems planning and administration, and developing health information systems and human resources in order to achieve greater equity in access to health services.

By the mid-1980s and under the direction of Dr. Carlyle Guerra de Macedo, a fundamental shift took place in PAHO from an approach of merely promoting the growth of health research toward "management of knowledge," in which "promoting the generation of knowledge, compiling it, critically rethinking and renewing it, disseminating it, and helping the countries to use it" (39) became the cornerstone of PAHO's activities in this field. During this period, the Caribbean countries also established a strategic framework for health cooperation focusing on joint actions and resources for priority health areas. Cooperation activities focused on the establishment of laboratory networks and support of laboratory operations, as well as the monitoring and improvement of national and regional case surveillance systems. PAHO provided technical guidelines and supported the development of emerging national disease prevention and control programs. During the opening years of the 21st century, the ACHR has stressed the need for a better understanding of evolving health research financing trends in the Americas and for supporting researchers and institutions in securing resources. "These trends are seen at both the macro level, with respect to amounts and sources, and the micro level, with respect to the criteria and mechanisms for allocating resources for projects." Since the 1990s, PAHO has focused its work on addressing and overcoming the Region's longstanding patterns of social inequity and thus help to alleviate the difficult health challenges still faced by many Latin American and Caribbean nations today (97). Invoking humanitarian and social development principles and ideals highlighted in Summit of the Americas declarations of 2004–2006 and under the direction of Dr. Mirta Roses, PAHO has launched an unprecedented regional plan to combat the social ills that perpetuate underdevelopment, using as its platform the eight Millennium Goals promoted in the United Nations Millennium Declaration. Countries are currently facing the simultaneous burden of communicable and noncommunicable diseases that have emerged from the demographic and epidemiological evolution of recent years and the occurrence of several major natural disasters that have placed significant demands on the public health services infrastructure.

Within the framework of the macroeconomic reforms of the 1980s and 1990s, most countries implemented progressive reforms of health systems and services, in particular with regard to the participation of the private sector and insurers and transformations in the structure and organization of services provision. Although Dr. Roses has noted that "public health spending is one of the main public policy tools for assuring universal access to health services," many countries have not yet achieved a distributive impact on this spending among lower-income groups. The PASB's Strategic Framework for the 2003-2007 period (Table 5) focuses on ways to reduce health inequities and to foster social inclusion (97).

TABLE 5. Strategic Framework for Technical Cooperation, Pan American Sanitary Bureau, 2003-2007.

- To complete the unfinished health agenda (by reducing high maternal and childhood mortality rates, improving health indicators, fighting persistent preventable or curable "neglected" diseases, reducing malnutrition and food insecurity in the Region's poorest communities, and increasing the coverage of potable water supply and sanitation services)
- To protect accomplishments already made (by increasing vaccination coverage, improving local health development and governance, improving public health in border areas, strengthening primary health care, and developing and promoting solid public policies for improving the population's quality of life)
- To face new and unmet challenges (the spread of HIV/AIDS, violence, severe acute respiratory syndrome [SARS], avian influenza virus, the smoking epidemic, and natural disasters)

In addition, PAHO engaged in joint activities with other partners and stakeholders, such as the Global Fund to Fight AIDS, Malaria, and Tuberculosis; the Global

Forum for Health Research; the Council on Health Research for Development; and a broad range of networks. The Organization launched an initiative to address a series of "neglected" diseases that include Chagas' disease, *Mycobacterium ulcerans* infection, yellow fever, cholera, foodborne trematode infections, treponematoses, hantavirus infection, plague, cysticercosis, leishmaniasis, hydatidosis, leptospirosis, lymphatic filariasis, onchocercosis, schistosomiasis, geohelminth infections, trachoma, and hemorrhagic fevers of viral origin.

b. Impact of Contributions on Health Care and Research

Examples of direct accomplishment of PAHO (and WHO), under the guidance of the ACHR, are the 189 successful Collaborating Centers/programs established in LAC (http://www.bireme.br/whocc/). The WHO Collaborating Centers include institutions such as research institutes, parts of universities or academic centers that carry out activities in support of the Organization's programs on areas such as nursing, occupational health, communicable diseases, nutrition, mental health, chronic diseases and health technologies.

In 1966, the 19th World Health Assembly requested the WHO Director-General to initiate action to achieve a worldwide smallpox eradication program that included producing the vaccine, training technicians, providing essential supplies, and organizing programs in the countries. Historically, the eradication of smallpox remains one of the greatest achievements of WHO: in 1980, the 33rd World Health Assembly endorsed the conclusions of the Global Commission for the Certification of Smallpox Eradication that smallpox had been eradicated; previously, in 1973, the XXII PAHO Directing Council had declared the disease eradicated from the Americas, making this Region the first to achieve this status (2).

In 1985, PAHO proposed interrupting the transmission of wild poliovirus in the Western Hemisphere by 1990; the proposal was endorsed by all Member States and supported by key international partner agencies and organizations (27). The Organization sponsored international research, collaborated in trials of live attenuated poliovirus vaccine, assisted in organizing vaccination programs, and supported the supply of vaccines and equipment (2, 85-87). By 1993, regional coverage among children with at least three doses of oral poliovirus vaccine was 87%; 33 of 38 countries had achieved and maintained vaccination coverage levels of more than 80%; and in 1994, the International Commission for the Certification of Poliomyelitis Eradication in the Americas announced that wild poliovirus transmission had been interrupted in the Americas (85-87).

A program for the eradication in the Americas of Aedes aegypti, the vector of both yellow fever and dengue, was planned and initiated by PAHO in 1946. Substantial progress was made, and several countries were able to eradicate this mosquito and stayed Aedes aegypti-free from 1961 to 1974. But some countries gradually became reinfested over time, and the increasing occurrence of dengue fever and dengue hemorrhagic fever epidemics during the 1990s revealed a setback in the goal of achieving eradication (87-89). PAHO, through its Regional Program on Tuberculosis, prepared a Hemisphere-wide plan to combat this disease, and by 1973, mortality from tuberculosis had fallen by 90%, compared with 1953 rates.

The ACMR recommended programs and collaborative studies on maternal and child health and disease prevention, to plan and implement immunization programs, to promote breast-feeding and health education of mothers, and to strengthen prenatal and perinatal health services programs (2). Since its earliest days, the ACMR has endorsed strategies to increase access to clean drinking water and provide adequate sanitation services for the Region's underserved populations and has encouraged the production of needed research in this area. PAHO has provided technical cooperation to Member States to support basic sanitation infrastructure and services, and, on an ongoing basis, studies the determinants of unequal distribution among countries and geographical regions within countries, and between urban and rural settings. Although improvements have been scored over the past few decades, access to water and sanitation services differs substantially among and within countries and remains insufficient, particularly in rural areas. By 2002, nearly 15% of the population of Latin America and the Caribbean remained without access to safe water and 21% lacked access to basic sanitation. Yet the implementation of water and sanitation programs, alongside those aiming to reduce the spread of diseases and control of diarrheal diseases, has led to a decrease in infant mortality in Latin America and the Caribbean. Another major achievement of PAHO, through its inter-American Investigation of mortality research project conducted during the 1960s that collected information on some 35,000 child mortality cases. The database provided input for the development of child mortality prevention projects and further research, which ultimately resulted in a reduction in childhood deaths.

Iron, vitamin A, and iodine deficiencies have been the three most common forms of micronutrient deficiency disorders and affected at least one-third of the world's population, with a greater burden on developing countries

(96). Food fortification has a long history of use in industrialized countries and has expanded progressively in the less industrialized countries. A consensus among the governments of the Americas urged the formulation of a food and nutrition policy aimed at substantially reducing malnutrition and eliminating its most severe forms. In 1967, PAHO strengthened its activities in this area by establishing the Caribbean Food and Nutrition Institute in Kingston, Jamaica and the ACMR supported projects and programs in nutritional deficiencies (2). Several studies have found that salt iodization controls iodine deficiency. This process, introduced in the early 1920s in the United States, is now standard in most countries (96,98). Various projects of salt and oil iodization for the prevention of goiter and deafness, and fluoridation for the prevention of dental caries, have been developed and/or supported by PAHO, and activities to allow standardizing of methodologies and training of personnel in laboratories have also been carried out. A recent study that applied a standardized assessment strategy to evaluate iodine nutrition in Latin America showed remarkable success in the elimination of iodine deficiency through consumption of iodized salt in all but 1 of the 13 countries studied (99). Over the past decade or so, mandatory fortification of folic acid to lower birth defects has been introduced in Canada, the United States, and many Latin American countries.

During the 1960s, INCAP research developed Incaparina, a low-cost, high-protein dietary supplement based on cottonseed flour, or soya and vegetables, and enriched with vitamins and minerals, and initiated its mass production in Central America (2, 96). Activities to reduce chronic malnutrition have been successful in this subregion, largely due to PAHO's efforts to provide technical cooperation, mobilize resources, and transfer technologies and methodologies to national institutions. Through its Regional Program on Disability Prevention and Rehabilitation, PAHO has provided technical cooperation to Member States for the generation of policies, plans, interventions, and projects to prevent disability and to enable the rehabilitation of disabled people (97). With the participation of PAHO/WHO Collaborating Centers, various countries have adopted surveillance systems for occupational accidents. In 2005, participants in the Ibero-American Summit held in Salamanca, Spain, approved the creation of four Ibero-American health cooperation networks: the Donation and Transplant Network, coordinated by Spain; the Public Health Teaching and Research Network, coordinated by Costa Rica; the Tobacco Control Network, coordinated by Brazil; and the Drug Policy Network, coordinated by Argentina (97).

Recent developments endorsed by the ACHR include the implementation of Evidence-informed Policy Network (EVIPNet) in the Americas, the International Clinical Trials Registry Platform (ICTRP), an evaluation of PAHO/WHO guideline methodology and subsequent recommendations to strengthen them, and beginning the development of a formal PAHO research policy. During the 2003–2007 quinquennium, PAHO implemented a strategy for knowledge management and information technology aimed at turning the institution into a knowledge-based learning organization based on collaboration and the formation of networks and associations (57-59, 97).

In April 2008, the 1st Latin American Conference on Research and Innovation for Health, organized by PAHO and five other organizations, was held in Rio de Janeiro, Brazil, with strong support by the ACHR. The conference sought practical answers to confront the shared challenge of ensuring that research addresses national health priorities and contributes to equitable development. Emphasis was placed on the creation, development, and strengthening of national health research systems, as well as the use of regional cooperation as a means of taking advantage of existing resources and reducing asymmetries. The conference brought together 120 strategic actors from the Region, including authorities in the fields of health, science and technology, and education and representatives from technical cooperation and development agencies, research networks and organizations, and specialists from PAHO and WHO. The conference produced reports describing 14 national health research systems; facilitated the development of working relationships between countries, networks, international agencies, and funding sources. The meeting also resulted in a preliminary agreement regarding subregional cooperation in Central America and the commitment to follow up with a second conference to evaluate progress (100, 101).

In the Caribbean, PAHO has worked in coordination with the Caribbean Health Research Council and other partners in the development of capacity-building activities, such as workshops on public health research priority-setting and the establishment of a Clinical Epidemiology Research Center linked to the University of West Indies and the International Clinical Epidemiology Network.

5. Health Research Alliances and Collaboration

From its creation, the ACMR (and later, the ACHR) have stressed the importance of catalyzing the development of and strengthening strategic partnerships to advance health research. Since 1962, PAHO has received invalu-

able support from an important number of organizations, agencies, institutions, and individuals.

To list only a few, the U.S. National Institutes of Health (NIH), for example, provided a grant for PAHO to establish the Office of Research Coordination (currently the Research Promotion and Development team), and the Organization received substantial support from grant agencies, among which the NIH/U.S. Public Health Service figured most prominently during the early 1960s. The ACMR recommended that the regional reference center Adolfo Lutz Institute collaborate with the regional reference center at the U.S. Centers for Disease Control and Prevention in Atlanta, Georgia. The Caribbean Food and Nutrition Institute began operation as a collaborative project between PAHO, the Food and Agriculture Organization of the United Nations, the University of West Indies (22, 24), and the Governments of Jamaica and Trinidad and Tobago, with support from the William Waterman Fund. An agreement with Milbank Memorial Fund for a program for rational development of human resources for health in the Caribbean and cooperation with Brazilian libraries and the biomedical community became part of these strategic partnerships developed upon recommendations issued by the ACMR.

The Pan American Health and Education Foundation (PAHEF) was established in 1968 to support the work of PAHO by mobilizing resources that were unavailable to the Organization from the public and private sector. Between 2003 and 2007, PAHEF mobilized over US$ 7.8 million to improve health and health education in PAHO Member States (36). The Regional Interagency Task Force for Maternal Mortality Reduction that supports topic related international initiatives comprises of PAHO, the World Bank, the Inter-American Development Bank, United Nations Children's Fund (UNICEF), United Nations Population Fund (UNFPA), the United States Agency for International Development (USAID), the Population Council, and Family Care International.

The NIH sponsored research on computer applications in the life sciences. In the mid-1970s, the U.S. National Library of Medicine announced plans for testing the MEDLINE system in Brazil and establishing an audiovisual center at the PAHO Regional Library of Medicine (today known as the Latin American and Caribbean Center on Health Sciences Information, or BIREME) with funds from the United Nations Development Program (UNDP), the Government of Brazil, and the State of São Paulo. Funds were provided to PAHO by the Rockefeller Foundation for the Regional Vaccine System (SIREVA), which was launched in 1994 to promote a regional quality control network and certification system.

Established in 1975, the Special Program for Research and Training in Tropical Diseases (TDR) is cosponsored by UNICEF, UNDP, the World Bank, and WHO. The program aims to help coordinate, support, and influence global efforts to combat a portfolio of major diseases focuses on neglected infectious diseases, including African trypanosomiasis, dengue, leishmaniasis, malaria, schistosomiasis, tuberculosis, Chagas' disease, leprosy, lymphatic filariasis, and onchocerciasis. In 2003-2004, the TDR engaged with 1,038 research partners (76% of whom were from developing countries), and TDR-sponsored research accounted for 426 research publications (more than 52% of these publications had first authors from developing countries) (102). In addition to supporting research projects, the TDR has collaborated with PAHO/WHO Collaborating Centers in the implementation of a "train-the-trainers" scheme to develop sustainable research project management skills in PAHO Member States (102).

The "Convergence Project" should also be mentioned as an interagency initiative aimed at promoting technical cooperation among developing countries for the creation of projects and programs in the area of the health sciences and technology. Its partners include the Latin American Economic System, UNDP, the Economic Commission for Latin America and the Caribbean, the United Nations Educational, Scientific, and Cultural Organization, and PAHO.

More recently, other multilateral cooperation agreements, such as for the Regional Research Exchange Network for the Development of Latin America and the Caribbean, Coordination for Latin American and Caribbean Graduate Programs, the Common Market of Scientific and Technological Knowledge, the Hemisphere-wide Inter-university Scientific and Technological Information Network, the Hemispheric System of Student and Professor Exchange, and others were done.

Over the last three decades, the nations of the Caribbean Community (CARICOM) have established five regional health institutions: the Caribbean Epidemiology Center, the Caribbean Food and Nutrition Institute, the Caribbean Environmental Health Institute, the Caribbean Health Research Council, and the Caribbean Regional Drug-testing Laboratory.

The Program for Research and Training in Public Health was established with the Carlos III Institute of

Health in Madrid, Spain, through an agreement signed by PAHO and the Government of Spain. The Latin American Biological Network and PAHO signed an agreement to finance biomedical research projects of interest to public health; an additional agreement between the International Clearinghouse for the Health Sector Reform Initiative (ICHSRI/NADIR) and PAHO was also signed to support research on sectoral reforms and their effects, access to health services, and their financing and utilization in developing countries.

Between 2003 and 2007, the PASB focused on mobilizing resources and forging strategic alliances and partnerships with bilateral and multilateral entities. It maintained a constant, ongoing dialogue with its partners in the international community, enabling all parties to select issues of mutual interest through a comparison of the particular institution's or agency's cooperation policy priorities with the public health priorities of the Bureau and the PAHO Member States. To support neonatal health actions in the Region within the continuum of maternal, newborn, and child health care, an interagency alliance was created comprised of PAHO, UNICEF, USAID, the CORE Group, Basic Support for Institutionalizing Child Survival (BASICS), Plan International, the Latin American Association of Pediatrics, and the Save the Children's Saving Newborn Lives initiative, among other groups (97).

And to promote broader participation of society in research, partnerships have been forged to make novel educational resources available to the public (103).

6. From Health Research Production to Knowledge Translation

In the early 1960s, the ACMR recommended developing a medical library center for Latin America and the Caribbean. PAHO's Regional Library of Medicine (today BIREME) was created to contribute to the improvement of health in the countries of Latin America and the Caribbean through the development and strengthening of national capabilities for providing and increasing access to scientific information. The mission of BIREME was—and remains today—rooted on the conviction that universal and equitable access to scientific information is necessary for the development of health. By 1969, periodical subscriptions to BIREME had increased from 350 to 1,200, the monograph collection had grown to 3,800 volumes (including 850 donated by the U.S. National Library of Medicine), and a free reprography service allowed for the delivering of 500 copies of scientific articles monthly. With the jointly support of PAHO and PAHEF, clinical textbooks were published in Spanish and Portuguese and, along with diagnostic instruments, were made available to students of the health sciences in Latin America and the Caribbean at reduced prices.

In the early 1970s, a plan to develop multimedia learning resources at the PAHO Regional Library of Medicine was organized. It allowed the library to become an educational tool for students, a demonstration center for educational technology development, and a focal point for the training of librarians, for providing students with self-instructional learning materials, and for the development of a pedagogic laboratory for health science teachers. Non-print materials, such as motion pictures, videotapes, and audiotapes, as well as slide presentations, microfiches, and programmed instructional materials, were produced and provided to health professionals and researchers. By 1976, a monthly update of MEDLINE was operating in seven Brazilian cities through BIREME. The Ten-year Health Plan structured at the end of the decade aimed to transform BIREME into a continuing education program by extending library services from individuals to institutional users, disseminating a wide range of health information from non-periodic sources, and processing research papers in the form of abstract summaries.

During this period, the Advisory Committee expressed concerned that the great wealth of knowledge being produced across the public health spectrum was not being applied in the health services in a timely manner, thereby creating the need "to bolster mechanisms and instruments to disseminate and utilize this information" (30). The ACHR recommended the promotion of health systems and services research and the collaboration of key actors involved in knowledge generation, dissemination, and utilization. At the same time, it stressed the importance of strengthening research at the local level, particularly through an analysis of experiences, which required strengthening information systems and data analysis capacity and the creation of a "publication culture" in the Region. Throughout the decade, a significant increase was observed in the number of scientific articles being published. However, the growth rate varied by country and by type of research. As a result, PAHO and BIREME have worked in recent decades to improve the quality of scientific and public health journals published in the Region and have advocated for their inclusion in international databases.

Based on the recommendations of the BIREME External Evaluation Committee, the Virtual Health Library (VHL) was created and implemented to respond to the new demand for technical cooperation with respect to

Internet-based products and services. Under the leadership of BIREME, the VHL represented an expansion of the previous model of technical cooperation, using technological advances through networks and offering universal access in English, Portuguese, and Spanish. Conceived as a virtual intermediary between the producers and users of knowledge, the VHL saw as its next challenge that of building a bridge between researchers and policymakers. PAHO played an essential role by working with both groups; in the case of researchers, by opening avenues for the efficient dissemination of their findings, and in the case of policymakers, by promoting the effective application of the gamut of evidence-based scientific knowledge currently available.

By 2003, BIREME's cooperation activities reached nearly 800 information centers through LILACS, offering 657 journal titles from 17 countries, and through the Scientific Electronic Library Online (SciELO), with 179 titles. These successful models were applied at the national and regional levels. The VHL contains more than 100,000 full-text articles, including those in the Cochrane Library, which are available free of charge to end users in English, Portuguese, and Spanish. In addition, the formation of networks such as the International Network of Information and Knowledge Sources for Science, Technology, and Innovation Management (SCienTI) have promoted international standardization and the universal availability of science and technology information and activities in collaborative networking to facilitate and strengthen the exchange of information and knowledge management tools and methodologies.

The WHO Evidence-Informed Policy Network (EVIPNet) promotes the systematic use of health research evidence in policymaking by bringing together country-level teams that are coordinated at both the regional and global levels. EVIPNet activities include the identification of regional and global priority policy issues and challenges; evaluating the quality of available systematic reviews, guidelines, and other relevant research findings to help identify and/or formulate policy options; preparing a brief policy, and promoting and monitoring the knowledge translation process.

The mission of the International Clinical Trials Registry Platform launched by WHO in 2006 is to ensure that a complete view of research is accessible to all those involved in health care decision-making. "The registration of all interventional trials is a scientific, ethical and moral responsibility," notes the Platform's Web site. The registry of clinical trials in Latin America and the Caribbean will support this process in the Americas and lead to improved research transparency (104,105).

The ACHR has provided valuable advice geared towards strengthening national health research systems and promoting the use of research to the advantage of the populations that PAHO serves. This includes working in partnerships and developing initiatives to produce and use scientific evidence that informs technical cooperation, identifying knowledge gaps, proposing plans to address key health issues, and engaging with different audiences, including informed public, to better inform decisions about health care. The Reports from the Director to the Governing Bodies, available online, illustrate the cross cutting nature of research with activities reflected across al technical programs. Such diversity requires having robust governance and monitoring systems, good guidance and mechanisms to produce and use research that is useful and relevant, and is of high ethical and methodological standards.

CONCLUSIONS

Since 1962, the Advisory Committee on Health Research has been actively advising and making recommendations to the Director of the Pan American Sanitary Bureau concerning health research. The ACHR has consistently sought to define, monitor, and evaluate principles, requirements, and standards leading to cohesive policies. It has identified and formulated health research priorities and appropriate strategies and coordinated adherence to them. Throughout its history, it has advocated for the development of research and for improving research and safeguards to the public (106,107).

The development and application of research in the Region of the Americas has achieved significant improvements over the past 50 years, and research has contributed to key public health milestones, including the eradication or major reduction of diseases associated with vectors, infections, and chronic conditions. Improvements in global and regional health status provide moving goalposts, and new challenges emerge as benchmarks are reset and the population's awareness grows as regards the right to health. The ACHR has been instrumental in identifying problems and solutions as well as opportunities and in providing direction to PAHO's technical cooperation efforts.

Although the financial resources globally available for health research increased between 1998 and 2003, their distribution among countries varies and there is a gap between what countries investment in health research and the desirable goal (108). A country-by-country analysis shows that only Brazil has consistently increased investment rates for research and development, accounting for 42% of the total in Latin America and the Caribbean. It is essential to invest in the sciences, technology, research, and public health, primary care strategies, and human resources development to improve health status and place the goal of social equity within the reach of developing countries. Latin America and the Caribbean continue to face major social and economic challenges and the scientific and technological research development process needs to be accelerated greatly if it is to serve a new development agenda (109). "Science is not only an instrument, or an exogenous element or an externality to development, it is in fact part and source of human progress and its objectives are strongly based in its cultural dimension" as experts have noted (108). The guidance provided by the Advisory Committee on Health Research will continue to be essential for building the future of health and health research in Latin America and the Caribbean.

CONFLICTS OF INTEREST

None

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USEFUL LINKS

http://www.pitt.edu/~super1/lecture/lec0291/pahomain.htm
http://devserver.paho.org/hq/index.php?option=com_content&task=view&id=138&Itemid=245
http://www.paho.org/Spanish/DBI/ES/pro-salute.htm
http://www.paho.org/english/gov/csp/od329-full-e.pdf
http://apps.who.int/tdr/svc/publications/about-tdr/strategy/10year-strategy

CONTRIBUTIONS

Ludovic Reveiz conducted the systematic review of the reports and background, and summarized the findings. Ludovic Reveiz and Luis Gabriel Cuervo incorporated inputs and proofread the manuscript. Mirta Roses and Luis Gabriel Cuervo reviewed draft versions of this document and provided inputs for its development. Guillermo Mendoza provided additional inputs to the document. Cecilia Isabel Parker and Roberta Okey edited the manuscript.

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