PAN AMERICAN HEALTH ORGANIZATION

PAN AMERICAN SANITARY BUREAU • REGIONAL OFFICE OF THE

WORLD HEALTH ORGANIZATION

Annual Report

OF THE DIRECTOR

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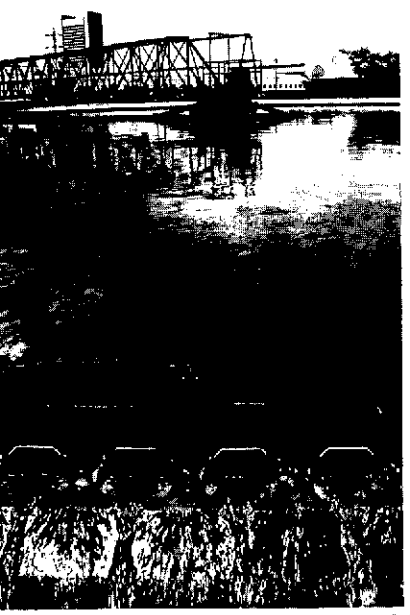
Contents

"It is today accepted that health is an end for each human being and a means for the society to which he belongs."

Ten-Year Health Plan for
the Americas, 1971–1980



(Photos by J. Vizcarra Brenner/PAHO, except bottom left photo, by R. Blessing)

Introduction

A new decade—and a new era in Pan American health—have begun.

During the year this report covers, the Ten-Year Health Plan for the Americas conceived at Santiago in 1972 ended, its successes and failures were analyzed and lessons drawn from them, and the Americas started out toward a new and difficult but not impossible goal: health for all by the end of this century.

Within the process of attaining the goal of health for all by the year 2000, basic national and regional health strategies were worked out and, in many countries, put into effect. Those strategies are predicated on certain fundamental concepts in whose validity health care specialists around the world generally agree. Outstanding among them are primary care in order to upgrade the levels of well-being and extend health services to all people, the participation of the community in health sector matters, the use of technologies appropriate to local conditions, and the necessity of technical cooperation among developing countries and between them and the international organizations at their service. Equally important is the role of women as consumers and providers of health care.

Attaining the goal of health for all by the year 2000 as defined by the hemisphere's countries has obvious but far-reaching implications in economic and social development. In our view it must be regarded not as an isolated sectoral objective but as part of the broader aim that the governments have already endorsed in the United Nations by establishing the New International Development Strategy, the New International Economic Order, and the War on Extreme Poverty. Whether the goal can be attained depends on the extent to which governments introduce changes in their approach and in their systems, as well as on many technical and economic factors and, more importantly, on political conditions and social situations. It is also necessary to strengthen the dialogue between the social and production sectors, which, though long recognized as important, has been delayed by a series of situations to the detriment of the very purpose of development.

For PAHO, 1980 marked a transition from earlier— and what now seem quite conventional—ways of carrying out its mission to new and often experimental modes of technical cooperation with its member countries. Long and careful thought went into elaborating the strategies, but they offer the possibility of providing all citizens of the Americas with adequate health care by the year 2000.

Héctor R. Acuña
Director

Chapter 1

GENERAL DIRECTION OF THE ORGANIZATION

The opening year of the twentieth century's ninth decade marked a further reorientation in the activities of the Pan American Health Organization toward universal health in the hemisphere by the end of the century.

The goal of health for all by the year 2000 springs from two statements of purpose. One is a World Health Assembly resolution (WHA30.43) of 1977 proclaiming that the main social target of governments and the World Health Organization should be "attainment by all citizens of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life." The other is the Declaration of Alma-Ata, adopted a little over a year later at the International Conference on Primary Health Care at Alma-Ata, U.S.S.R., which said that primary health care is the key to the attainment of health for all.

For the Americas, universal health is a goal long sought. The first hemispheric resolution to improve health and health care was the Charter of Punta del Este, which was signed in Uruguay in 1961 and led to the Ten-Year Public Health Program of the 1960s. The next, formulated at the Third Special Meeting of American health ministers at Santiago in 1972, was the Ten-Year Health Plan for the Americas which ended in 1980.

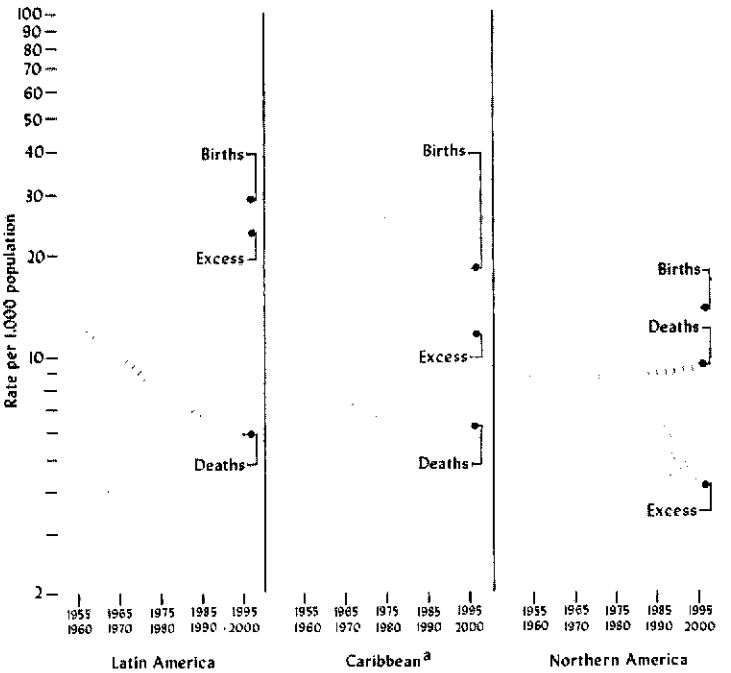
These two decennial plans, which ended in both successes and failures, are now being continued through a far more ambitious regional strategy and plan of action based on national strategies and plans intended to give each of the hemisphere's citizens access to health services within the next two decades.

During the year, 24 nations formulated national health strategies, which naturally varied according to individual countries. Some gave highest priority to the rural or urban poor; others focused on the elderly and ways of caring for them, a reflection of population aging thanks to advances in communicable disease control; still others stressed the need to form new and stronger links between the health sector and other developmental spheres. These were only some of the emphases in national health strategies, many of which combined many themes.

Generally speaking, all the countries as well as PAHO now accept certain premises as essential to advancing health care.

Among them are the extension of health services to the entire population; the basic importance of primary health care as the strategy for achieving complete coverage; the need for technical cooperation among developing countries, between developed and developing countries, and between the latter and the international organizations serving them rather than the older concept of "technical assistance" from extranational and often paternalistic agencies; linkages among

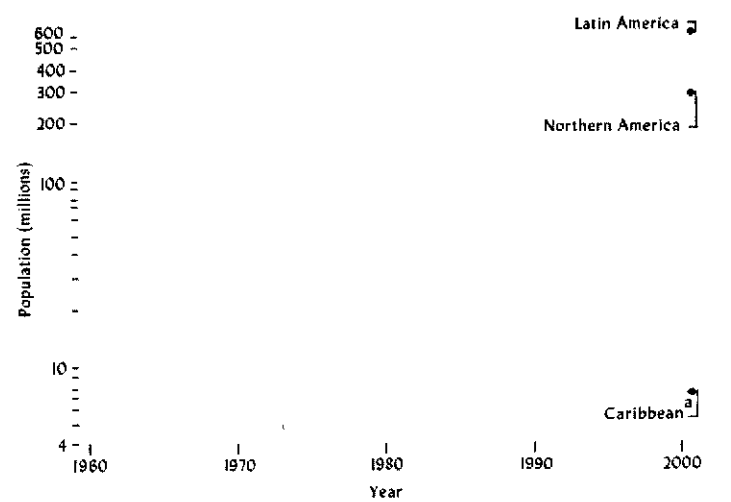
Figure 1. Estimates and projections of births, deaths, and excess of births over deaths per 1,000 population in three regions of the Americas, 1955–2000.



[a] Excludes: Cuba, Dominican Republic, Haiti, and Puerto Rico, which are included in Latin America.

Source: Selected Demographic Indicators by Country, 1950-2000; Demographic Estimates and Projections as Assessed in 1978. New York, United Nations, 1980.

Figure 2. Estimated population in three regions of the Americas, 1960–2000 (in thousands).



[a] Excludes: Cuba, Dominican Republic, Haiti, and Puerto Rico, which are included in Latin America.

Source: Selected Demographic Indicators by Country, 1950-2000; Demographic Estimates and Projections as Assessed in 1978. New York, United Nations, 1980.

economic and social sectors to bring about integrated development; the necessity of community participation in health care so that those served not only have a voice in the way it is provided but serve themselves; and the use of appropriate technology, or equipment, methods, and manpower suitable to local conditions.

Primary health care, the basic strategy, occurs in many subtle variations. In Colombia it is the provision of simple, comprehensive services to protect, promote, and restore the health of individuals, families, and the community, supplemented by arrangements for the community's active participation in matters of health and well-being. In Ecuador it is visualized as a mechanism for meeting the priority needs of families at greatest risk by getting them to use their own resources, while at the same time being able to rely on community health workers who are part of a decentralized health care system. Farther south in Bolivia the emphasis is on traditional and formally trained community workers subject to continuing supervision in conjunction with the institutional system.

Governing Bodies

The Pan American Health Organization (PAHO) is an autonomous Western Hemisphere organization and the world's oldest international health agency, having been established in 1902. The Pan American Sanitary Bureau (PASB) is both that organization's secretariat and one of six regional offices of the World Health Organization (WHO). PASB—and PAHO by extension—is thus a member of the United Nations family of specialized international agencies. Through an agreement concluded in May 1950, PAHO is also charged with advising the Organization of American States on health matters in the hemisphere.

All the Americas are entitled to belong to PAHO and take part in its affairs, as are certain non-American countries with dependencies in the hemisphere. At the end of 1980, it had 30 member* and three participating governments (France, the Netherlands, and the United Kingdom), the latter representing hemispheric territories lacking full sovereignty, and Spain was an official observer.

Constitutionally, PAHO consists of four entities. Its three governing bodies are the Pan American Sanitary Conference, which is defined as its "supreme authority" and meets quadrennially; the Directing Council, which normally meets annually in those years when the Sanitary Conference does not, and the Executive Committee, which meets twice a year and is responsible for organizing matters for consideration by the Sanitary Conference and the Directing Council. The Director of PASB is elected at each Sanitary Conference and appoints the Bureau's other officers and staff.

As required by its constitution, two of PAHO's governing bodies met during 1980, the Directing Council and Executive Committee.

Directing Council

The XXVII Meeting of the Directing Council, which was also the XXXII Meeting of the WHO Regional Committee for the Americas, was held at Washington from 22 September to 3 October. It was attended by representatives of the 33 member and participating governments, and there were 46 observers from intergovernmental and nongovernmental organizations. A new member, Saint Lucia, was admitted, and Spain was given the formal status of observer.

The officers elected were: Dr. Roquelino Recinos Méndez (Guatemala), president; Drs.

*Argentina, Bahamas, Barbados, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Lucia, Suriname, Trinidad and Tobago, United States, Uruguay, and Venezuela.

The 1980 Directing Council. Seated on dais are Dr. Héctor R. Acuña, Director and secretary ex officio; Dr. Roquelino Recinos Méndez (Guatemala), President; Dr. S. Paul Ehrlich, Jr., Deputy Director; Mr. Donald E. Miller (Jamaica), Rapporteur; and Mr. Michel Careau (Canada) Chairman, 84th Executive Committee.
(Photo: R. Molina/PAHO)

Jorge Michelsen (Colombia) and Rodolfo Girón Flores (El Salvador), vice presidents; and Mr. Donald E. Miller (Jamaica), rapporteur. Dr. Héctor R. Acuña, Director of the Pan American Sanitary Bureau, served as secretary ex officio.

Argentina, Jamaica, and Nicaragua were elected to serve on the Executive Committee, replacing Brazil, Canada, and Venezuela.

The Director opened the meeting with an address that set the stage for the deliberations that followed over the next 10 days. In presenting his annual report for 1979, he pointed to the dominant theme of health for all by the year 2000. He went on to state that PAHO is working in collaboration with the governments to assess progress made toward fulfilling the objectives of the Ten-Year Health Plan for the Americas. The resulting information is to serve as a basis for planning and carrying out health care programs over the next two decades.

The Council extensively considered regional strategies for attaining universal health in the Americas by the end of the century. The discussion focused on the adaptation of primary health care to the special and widely differing needs of the American nations. Emphasis was placed on extending health service coverage, environmental improvement, community organization and participation, better mechanisms for intersectoral linkage, development of research and appropriate technologies, manpower development, establishment of national systems for financing the health sector, and reorientation of international cooperation. As a result of these discussions, the Director was asked to prepare an action plan for the Americas encompassing all the strategies agreed on. The plan will include technical and administrative support measures, means for identifying and mobilizing resources, research promotion, development of appropriate technologies, and information exchange, and it will provide for further intra- and intersectoral coordination as well as an overall system for monitoring and evaluation.

The "Study of WHO's Structures in Light of its Functions" addressed the issues of multidisciplinary and intersectoral planning and programming, technical cooperation among developing countries, and interaction between the countries and PAHO. Discussion

of this study led to the adoption of measures to improve the flow of resources for priority programs, synchronization of planning cycles, strengthening PAHO's contribution to the review process of WHO's World Health Assembly and Executive Board, and expansion of the role and responsibilities of country representatives (CD27.10).

During the year multidisciplinary teams of international experts evaluated five Pan American Centers—the Pan American Foot-and-Mouth Disease and Zoonosis Centers, Caribbean Food and Nutrition Institute, Institute of Nutrition of Central America and Panama, and Caribbean Epidemiology Centre. The Centers and the evaluations of them were the subject of detailed discussion. The Directing Council approved resolutions calling for consolidation of their programs on the basis of country priorities and, in general, increased shifting of responsibility for the Centers to the countries, with PAHO acting primarily as the Centers' coordinator and manager (CD27.18, .26, .27, .29).

Consideration of the role of women in development resulted in a resolution stressing equality of the sexes in education, the special needs of disabled women, monitoring progress in the United Nations' World Plan of Action for women, and the advancement of women in decision-making positions in the health sector, both generally and within PAHO (CD27.17).

The Director was commended on the speedy execution of PAHO's program to control diarrheal diseases, and the Council recommended that the program continue to be emphasized as an essential component of primary health care (CD27.9).

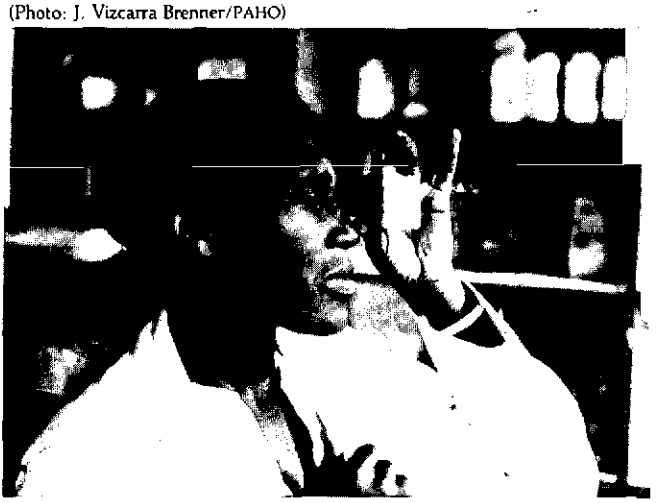
Recognizing the deteriorating malaria situation in the Americas, PAHO has drawn up a plan for the disease's ultimate eradication. The Council urged the governments to press forward with several antimalaria measures, among them coordinated control in border areas, training for program personnel, and integration of malaria operations into primary health care systems (CD27.13).

The Council took note of the progress made in carrying out the Expanded Program on Immunization (EPI), which PAHO launched in 1977 in order to reduce child morbidity and mortality from communicable diseases included in the program, foster self-reliance in providing immunization services, and build up facilities for vaccine production and quality control. Consideration was given to ways to increase PAHO's vaccine purchase revolving fund and to vaccine quality control, training, and cold-chain maintenance (CD27.15).

The Council recognized the increasing impact of noncommunicable diseases on morbidity and mortality, with an attendant rise in demand for related care, and pointed to the aging trend in the population. Its resolution called on the governments to include measures within their programs and strategies to prevent chronic noncommunicable diseases.

A Jamaican technician uses a simple device for diagnosing nutritional anemia developed by PAHO's Caribbean Food and Nutrition Institute at Kingston.

(Photo: J. Vizcarra Brenner/PAHO)



Particular mention was made of hypertension, rheumatic fever and rheumatic heart disease, diabetes mellitus, and cervical cancer, for which effective control methods exist (CD27.16).

Several of the countries cited the benefits to be gained through technical cooperation among developing countries, and the Council adopted a resolution stressing that program's value in making the countries "nationally and collectively self-reliant" (CD27.14).

Fully cognizant of the important role played by nurses in providing primary health care, the Council recommended that they be given broader responsibilities in treating common diseases, health planning and administration, and basic decision making. It also called for upgraded training for nurses and nursing auxiliaries to include instruction in such subjects as epidemiology, the social sciences, community health, primary care, and evaluation and research methods (CD27.19).

Among other subjects the Council dealt with, drug abuse was recognized to be an increasingly serious problem, and the governments were urged to incorporate programs for its prevention in their health systems (CD27.41). Because of the hemisphere's vulnerability to so many kinds of catastrophe, disaster relief was of special interest, and the Council noted PAHO's efforts to build up an emergency preparedness system locally, nationally, and regionally (CD27.40). The Council also noted progress made under the medium-term human resources development program (CD27.22).

For the first time, owing to the changeover from annual to biennial budgeting, PAHO's budget was not on the agenda. There was debate, however, about the collection of quota contributions and other financial matters. The Council commended the Director on PAHO's sound financial position (CD27.25).

The Council's two-day technical discussions dealt with "Community Health Education: Evaluation of Present Programs, New Approaches, and Strategies." The resolution based on the discussions (CD27.34) urged the governments to promote community health education more vigorously, provide for community participation in national health plans and in developing primary health care techniques, include community education in all health care training, apply operations research techniques to this important field, prepare guidelines for educational activities, and exchange information on the subject. "Managerial Analysis of Health Systems" was the topic chosen for the 1982 technical discussions.

Executive Committee

The 84th Meeting of the Executive Committee, held at Washington from 23 to 27 June, was attended by representatives of Brazil, Canada, Chile, Guatemala, Guyana, Mexico, Peru, United States, and Venezuela, with observers from Colombia, Cuba, Nicaragua, and Trinidad and Tobago. The officers were Mr. Michel Careau (Canada), chairman; Dr. Carlos Luis de Paredes Soley (Guatemala), vice-chairman; Dr. Luis David Marcial (Mexico), rapporteur; and Dr. Héctor Rodríguez (Chile), rapporteur pro tempore. Dr. Héctor R. Acuña served as secretary ex officio.

The 24 resolutions adopted over the five days of deliberation reflected the Committee's interest in a wide range of subjects. Of special interest was the formulation of regional strategies for attaining health for all by the year 2000.

Progress in several programs was reviewed. The Committee's proposals and recommendations were reflected in the decisions made by the Directing Council, as noted above. In particular, the following activities were studied: the diarrheal disease control program, whose fast pace was noted; the hemispheric malaria control program against a disease that has recrudesced and demands total eradication; the noncommunicable disease control program, which deals with conditions that

(Photo R. Molina/PAHO)

The 84th Meeting of the Executive Committee. Dr. Héctor R. Acuña, Director, left, and Mr. Michel Careau (Canada), Chairman, sign the Final Report.

are causing major changes in American morbidity and mortality and proposes measures for combating them; and the Expanded Program on Immunization, whose strategies were endorsed and for which additional financing was proposed. Evaluations of the Pan American Centers were also reviewed.

The Committee called on the governments to formulate programs to meet the health needs of adolescents and youth. In addition, it examined the abuse of narcotic and psychotropic substances, to be included on the agenda of the Directing Council, and malnutrition and nutrient deficiency-induced mental retardation.

Specific consideration was given to means of strengthening WHO's regional structures and functions. The Committee recommended the subject to the Directing Council for full debate, asking that it consider ways of linking regional strategies to efforts to strengthen WHO's structures and, in general, that it contemplate actions that will help further the decisions and policies of the World Health Assembly. The Committee entrusted preparation of a full study of the matter to a working group.

The provisional draft of WHO's 1982-83 biennial program budget for the Americas was reviewed and forwarded to the Directing Council with the recommendation that it be approved.

Note was taken of the decision to grant the 1980 PAHO Award for Administration to Dr. Jair de Oliveira Soares of Brazil.

The 85th Meeting of the Executive Committee, held in Washington on 3 October, was attended by representatives of Argentina, Chile, Guatemala, Guyana, Jamaica, Mexico, Nicaragua, Peru, and the United States, as well as observers from Brazil, Cuba, and the Dominican Republic. The officers were Dr. Ramón Alvarez Gutiérrez (Mexico), chairman; Dr. Augusto Schuster Cortés (Chile), vice-chairman; and Dr. Oscar H. Gonzáles Carrizo (Argentina), rapporteur. Dr. Héctor R. Acuña was secretary ex officio.

The Committee took note of the resolutions approved by the XXVII Meeting of the Directing Council and commented on points to be discussed in its future debates. Jamaica and Nicaragua were designated a subcommittee to examine the World Plan of Action for women. Argentina was elected to replace Brazil on the PAHO Award for Administration committee. Jamaica was designated to replace Venezuela on the Standing Subcommittee on Inter-American Nongovernmental Organizations. Mexico took Canada's place on the Subcommittee on Long-Term Planning and Programming.

In a resolution on buildings and installations, a working group of the representatives of Chile, Jamaica, and the United States was created to study and make recommendations on the Governor Shepherd building, the headquarters annex in Washington.

American Region Programming and Evaluation System (AMPES)

This system has been designed for programming, monitoring, and evaluating PAHO's technical cooperation as requested by its member governments. AMPES is an instrument of PAHO as a whole, with methods that allow an objective dialogue with the countries in specifying their health goals together with the allocation of PAHO resources which contribute to achieving those goals. It is also a uniform procedure for describing PAHO's resources and its regional programs as derived from resolutions of its governing bodies.

The system, which in 1980 began its third year of operation, underwent a variety of improvements in both methods and structure. A complete draft reference manual was prepared and is expected to be distributed in 1981. The manual modified most document formats, simplified the preparation of materials, and introduced medium-term programming to coincide with PAHO's two-year budget cycle.

An Operations Manager's data unit was fully established for data entry, maintenance, and selected retrieval using PAHO's digital computer and word-processing equipment. Internal controls and work flow procedures were initiated to facilitate accurate logging, data entry, verification, and retrieval, and distribution of all AMPES documents and reports.

Long-Term Planning

A long-term planning office was established in January. Reporting to the Director and acting under his immediate supervision, it is responsible for coordinating and participating in strategic and operational analyses and preparing proposals to the Director about various long-term PAHO activities. Its principal functions are to:

- Analyze the implications for the governments and PAHO of global, regional, and national policies, situations, and trends with respect to the development of strategies and their plans of action for attaining the goal of health for all by the year 2000.
- Study and propose new analytic methods and possible solutions to problems that affect or in the medium or long term may affect PAHO's policies or strategies for cooperating with the countries in achieving those purposes.
- Coordinate monitoring and evaluation of regional strategies and plans of action to achieve universal health.
- Program, organize, and supervise, in accordance with the Director's instructions, the work of such internal or external interdisciplinary groups as may be created to perform such studies and analyses.

During 1980 the office focused on cooperating in the evaluation of the Ten-Year Health Plan for the Americas and assisting the governments and PAHO in formulating regional strategies for achieving health for all, designing a method for developing the relevant action plan, preparing PAHO's contribution to the document being drafted by the United Nations Economic Commission for Latin America on economic and social development strategies for that area in the 1980s, and aiding the Inter-American Development Bank in drawing up the health sector chapter of its study of its role in the hemisphere during the same decade.

Management

A number of significant changes occurred in PAHO's management during the year. Some of the highlights were:

- Execution of recommendations by the advisory committee of international banking experts on shifting certain local currency assets into high interest accounts and establishing local currency conversion plans for minimizing losses due to monetary fluctuation.

(Photos: S. Siefken/PAHO)

In December 1980 the Director recognized the Women's Resource and Development Group (WRDG) at PAHO to advise on women's issues. At top, Mrs. E. N. Roberts, WRDG coordinating committee president, with the Director and Deputy Director at a panel discussion on career women in international development agencies; above left, a WRDG reception; above right, Ms. S. Yudelman of the Inter-American Foundation addresses the panel.

• Submission of a proposal to the U.S. Internal Revenue Service requesting simplified PAHO/WHO reporting of U.S. income, a change approved in November. The principal advantage of this change is a considerable saving in reporting time and lessened tax pyramiding for individual staff members. The new system was effective for the 1980 tax year.

• Introduction of an advanced telecommunication system (OCR-COMPUSCAN) and a special courier service to certain countries.

• Collaboration with the International Civil Service Commission in developing an improved classification program with master standards which will be applied to all professional posts starting in 1981.

• Development of classification standards for general service posts in field offices and centers.

• Continuing review of PAHO's accounting and financial management system to effect certain improvements on a continuing basis.

The program to evaluate the Pan American Centers continued to provide innovative and constructive ideas for management improvements as well as improved communication and participation with the countries.

Financial administration. Quotas collected during 1980, both current and arrears, amounted to $37,190,595, compared to

$33,828,098 for 1979. Though the total amount collected exceeded that of the previous year, the ratios of collections to amounts due on January 1 of each year decreased slightly.

Total miscellaneous income, mostly from interest on investments, amounted to $1,533,508, compared to $1,415,485 for the previous year—an increase of approximately 8.34 percent. Expenditures from trust funds continued to increase, from $7,897,102 in 1979 to $9,406,581.

Personnel. At the end of 1980, PAHO's staff numbered 1,337 (including 60 temporary employees), as compared with 1,317 (including 36 temporary employees) a year earlier. Of the 1,277 regular staff, 459 were assigned to headquarters, 90 to area and field offices, 490 to intercountry projects, and 238 to country projects.

In accordance with 1980 Directing Council recommendations (CD27.17), renewed efforts were made to increase the proportion of women on the staff and enhance their status. Among these measures were urging the governments to nominate more women for professional positions in PAHO and establishing hemispherewide contact with professional women's organizations and universities to enlist their cooperation in advertising vacancies. Plans are underway to expand the use of a computerized roster of applicants to ensure identification of all possible candidates for each vacant post. As far as possible, arrangements will be made to have women represented in selection committee proceedings.

Conference services. The conference services supported 229 PAHO, subregional, or national meetings in Washington or elsewhere. A total of 436 man-days of translation, editing, and précis-writing and 635 man-days of interpretation were needed to service these meetings. Through staff or contractors the language services unit translated a total of 14,566 pages in four working languages (Spanish, 60.5 percent; English, 30.4 percent; Portuguese, 8.6 percent, and French, 0.5 percent).

Production machine translation (MT) became a reality. PAHO's system for automatically translating Spanish into English, under development since 1976, now conveys the informational content of an original Spanish text in fully understandable English and can easily be postedited. In PAHO's system—SPANAM—translations can be made while other tasks are performed simultaneously on the IBM 4341 computer. The text is submitted as an ordinary document from a word-processing station through a telecommunication interface. The output can be retrieved on a word-processing terminal screen, revised there as necessary, and then printed, or it can be printed directly on paper, revised by hand, and the handwritten changes incorporated by an operator.

The average production rate for one operator for complete MT throughput is 5,000 words a day. This figure improves steadily as experience is gained with the system, as the

Mrs. M. León edits a machine translation on the screen of a PAHO's word-processing terminal, as Ms. A. Krinsky (left) and Mrs. M. Vasconcellos, head of PAHO's machine translation project, observe.

(Photo: J. Vizcarra Brenner/PAHO)

MT dictionary is enlarged, and as continued enhancements are made in the basic software.

Management and computer services. Continued emphasis was placed on reviewing PAHO activities at headquarters and in the field to ensure that efficient management systems are established and practiced and that management information systems allow effective information flow. To achieve this, management studies and surveys were conducted, new technologies evaluated, and, when feasible, advanced microprocessor systems installed.

As a result of studies completed during the year, field activities were improved through continued decentralization. Examples were an increase in local purchase ceilings, in-service training sessions for staff, installation of a pilot Country Representative administrative filing system in Trinidad and Tobago, and the complete revision of the PAHO/WHO field operations manual.

Technologic advances included the installation of microfiche equipment to save space and retrieval time, the introduction of optical character-recognition equipment to speed and simplify the dissemination of telex communications to the field, linking headquarters word-processing and computer systems, and the introduction of a data base capability in the computer system.

PAHO also continued its advice to health ministries on developing their computerized information systems.

Health information and documentation. The health information and documentation center at headquarters concentrated mainly on providing basic information and scientific support to PAHO's technical divisions. Requests for bibliographic searches continued to be processed through MEDLINE/ELHILL III and DIALOG computer terminals. A total of 1,005 bibliographies were compiled, three-quarters of them for field staff. More than 10,000 photocopies of articles in scientific journals were supplied at the request of various officers. By the end of the year the number of technical or scientific documents prepared by WHO, PAHO, other regional offices, and the governments stored in the PAHO documentation system (PAHODOC) data bank totaled more than 11,000.

Relations with Other Organizations

PAHO maintains close working relations with a variety of other United Nations, hemispheric, subregional, and private organizations in carrying out its many missions. Many, such as international lending agencies, are not directly involved in health matters and use PAHO to manage programs in which they invest; others are interested in specialized areas of health and channel funds through PAHO in their fields of concern.

This section covers only the highlights of PAHO's relations with other organizations. Because of their specific nature, most such relationships are described in the later program chapters of this report.

The United Nations held its second high-level meeting to review technical cooperation among developing countries (TCDC) in Geneva in late May and early June. PAHO prepared and submitted to the meeting a progress report on TCDC in health as WHO's global focal point for TCDC activities.

Since extrabudgetary funding is becoming ever more important to PAHO's programs, senior PAHO staff and their counterparts from the Inter-American Development Bank (IDB) and United Nations Development Program (UNDP) met in Washington and New York during the year. The meetings with IDB allowed the two organizations to develop a strategy for complementary action in technical cooperation programs in the Americas. The meetings with UNDP were to review proposals for four regional programs prepared by PAHO to be included in UNDP's 1982-86 work cycle.

PAHO and the international cooperation system

United Nations Children's Fund (UNICEF). PAHO and UNICEF continued 20 years of joint activities by holding a workshop to discuss further collaboration in developing drinking water supply and basic sanitation programs for dispersed rural inhabitants. In addition, the two organizations worked with a World Bank-sponsored project in Paraguay to expand coverage of its village water program.

United Nations Development Program (UNDP). UNDP continued to finance many projects—particularly in environmental control and community health and veterinary public health training—in which PAHO acts as its executing agency.

PAHO assisted in designing and organizing three subregional and eight country projects to be funded by UNDP which are to begin in 1981 and in which PAHO will act as executing agency. The main content of these projects is management development in health services and defining the development and maintenance of their physical infrastructure. In designing them, PAHO emphasized the concepts of mutual support and technical cooperation among developing countries.

United Nations Disaster Relief Office (UNDRO). During 1980 the Caribbean suffered the ravages of one of the most devastating hurricanes of the century. PAHO and UNDRO worked together to help Barbados, Haiti, and Jamaica carry out relief and rehabilitation operations.

United Nations Economic Commission for Latin America (ECLA). Joint PAHO/ECLA activities have expanded as a result of the International Drinking Water Supply and Sanitation Decade. PAHO cooperated with ECLA in preparing a document on Latin American financial requirements for achieving Water Decade goals. It also took part in planning a Latin American seminar, to be held in early 1981, on horizontal Water Decade cooperation in identifying and defining approaches, mechanisms, and proposals for activities in the water and sanitation sector.

PAHO participated in a meeting early in the year to draft the action plan for a joint UNEP/ECLA project for environmental management in the wider Caribbean at which staff presented an overview of environmental health in the area.

United Nations Environment Program (UNEP). PAHO and UNEP continued to collaborate in planning and executing regional activities related to the human environment, as set out in their memorandum of understanding signed in 1977 and due to be reviewed in 1981. UNEP served as the focus of cooperation among more than 20 international and inter-American organizations and in that role sponsored two workshops. The first was on environmental training and resulted in plans to prepare an inventory of training activities and programs. The second dealt with environmental information systems.

United Nations Food and Agriculture Organization (FAO). PAHO increased its collaboration with the Joint FAO/WHO Codex Alimentarius Commission and Joint FAO/WHO Food and Animal Feed Contamination Monitoring Program. The senior officer of FAO's food science, control and consumer protection group visited Washington to promote greater cooperation between FAO and PAHO in food protection activities of mutual interest.

United Nations Fund for Population Activities (UNFPA). PAHO officials held an important meeting in Washington with senior UNFPA policy and technical staff to conduct a detailed review of the two organizations' joint policies and operations, inasmuch as PAHO is the executing agency for various UNFPA-funded projects in the hemisphere.

European Economic Community (EEC). Contact was established with EEC to discuss its interest in financing a multidisciplinary project under which PAHO would assist Bolivia, Colombia, Ecuador, and Peru in devising comprehensive development and integration of selected primary health care

projects.

League of Red Cross Societies. The League aided several of PAHO's disaster management and relief projects.

World Bank. The World Bank and PAHO worked closely in the health field, exchanging information and reports and holding consultative meetings. Much of the Bank's interest was in preparatory studies for the International Drinking Water Supply and Sanitation Decade which PAHO helped carry out.

World Food Program (WFP). Close relations continued between PAHO and this United Nations affiliate, which has food distribution projects in several countries of the Americas.

PAHO and the inter-American system

Organization of American States (OAS). The tenth regular session of the OAS General Assembly, at which PAHO was represented, was held at Washington in November. PAHO representatives took part in the ad hoc country review meeting of the Permanent Commission of the Inter-American Economic and Social Council on Paraguay and Guatemala in April and June, respectively, and attended the Inter-American Economic and Social Council meeting at Washington in October.

PAHO staff participated in an OAS-sponsored June meeting of representatives of the small island territories of the Caribbean at San Juan, Puerto Rico, to review major oil-spill risks and identify cooperative needs and oil-spill control technologies. Staff likewise took part in a followup meeting of representatives from throughout the wider Caribbean in Barbados in November to draw up an oil-spill contingency plan for the islands and consider means for putting it into effect.

Inter-American Development Bank (IDB). IDB is the international financial agency supplying the largest share of funding for health infrastructure development projects in the Americas. Each loan is normally accompanied by a technical cooperation component to assist the country in making the improvements in technical and administrative systems required for developing health services. PAHO generally assumes responsibility for technical cooperation in projects of this type at the request of the country concerned and with IDB's approval.

PAHO continued to serve as executing agency for technical cooperation projects financed by IDB, particularly institutional development programs associated with loans for developing health services, as well as studies to determine the feasibility of projects for investment in health. During 1980, work under such projects continued in seven countries, four new projects were initiated, and five additional cooperation projects to begin in 1981 were approved and the relevant agreements signed.

To plan future cooperative activities, PAHO environmental health staff participated in a joint PAHO/IDB working session during which they briefed IDB officials on future health needs in the water and sanitation sector. An expansion began of the IDB-sponsored water supply and sewerage agency operation and maintenance project at PAHO's Pan American Center for Sanitary Engineering and Environmental Sciences at Lima.

IDB continued to play an important role in foot-and-mouth disease control programs in Latin America in which PAHO acts as executing agency.

Inter-American Institute for Cooperation on Agriculture. PAHO cooperated with this organization in an advanced training course for Caribbean veterinarians in Guyana.

Subregional groups

Conference of Ministers Responsible for Health in the Caribbean. The sixth meeting of Commonwealth Caribbean health ministers was held in Grenada in mid-July. PAHO was represented and a senior staff member gave an address. The areas discussed in which PAHO's technical cooperation was requested were food safety, control of sexually transmitted diseases, cancer, smoking, medical

education, and continuing education in health care.

Caribbean Community (CARICOM). A joint meeting between PAHO and Caribbean Community secretariat staff was held in Grenada in mid-July. The main items discussed were funding for a subregional primary health care workshop in 1981, food safety, health information systems, and disaster preparedness.

Caribbean Development Bank (CDB). CDB agreed to finance two joint activities, a leak detection survey in connection with the Caribbean basin water management project and a seminar on water supply project preparation and financing. CDB and PAHO jointly funded a seminar for 18 managers and senior engineers of Caribbean water utilities which provided technical information on improving project preparation and helped familiarize the participants with the policies and procedures of lending institutions.

CDB cooperated with PAHO in carrying out water supply and sanitation sector studies in Antigua, British Virgin Islands, Grenada, and St. Vincent.

Ministers of Health of the Andean Pact Countries. The Director General of WHO and the Director of PAHO attended the seventh meeting of the Andean health ministers at Quito in June. The main health topics with implications for PAHO were the training and use of family medical practitioners, the manufacture of pharmaceutical and biological products, the production of oral rehydration salts, a basic environmental plan for the Andean subregion, and technical cooperation in health care and food and nutrition among the Andean countries.

Foreign Ministers of River Plate Basin Countries. The PAHO Area Representative attended the annual meeting of the foreign ministers of the River Plate countries at Buenos Aires in December. Five areas of interest to PAHO were reviewed: schistosomiasis control, *Aedes aegypti* surveillance programs, foot-and-mouth disease campaign coordination, food and nutrition programs, and training of nutrition professionals.

Ministers of Health of Central America and Panama. The Director addressed the simultaneous meetings of health ministers and directors general of health of Central America and Panama at their meetings in Tegucigalpa in August. The meetings' subjects of major interest to PAHO were communicable disease control, extension of health care coverage, control of sexually transmitted diseases, analysis of community health problems, urban and periurban health problems, and health care standards.

Bilateral agencies

Canadian International Development Agency (CIDA). CIDA, PAHO, and 10 Caribbean countries signed a memorandum of understanding to extend the Caribbean basin water management project through the end of 1981, with a CIDA contribution of Canadian $370,000. CIDA has also been supporting a PAHO-managed continuing health care education project in Bolivia, Colombia, Cuba, Dominican Republic, Ecuador, Guatemala, and Honduras since 1978 and veterinary assistant training for the Caribbean at Georgetown.

Canadian International Development Research Centre (IDRC). IDRC agreed to continue support to the Pan American Network for Information and Documentation on Sanitary Engineering and Environmental Sciences (REPIDISCA) at Lima. Having supported the network's first phase, in which system tools were designed to improve accessibility of information on sanitary engineering and the environment, IDRC signed an agreement for a two-year operational phase grant to test the design, improve user access to information, and exchange that information among participating institutions.

The Canadian agency also expressed interest in following up a previous IDRC-funded research project to evaluate the engineering efficiency of the San Juan stabilization ponds near Lima where wastewater treatment and reuse are being tested. The prospects are

good for ever greater use of reclaimed water in agriculture and fish culture. The proposed new project would determine implied potential health hazards by quantifying the presence of toxic compounds and pathogenic bacteria and carrying out related sociologic and epidemiologic studies.

German Technical Cooperation Agency (GTZ). The second phase of the Federal Republic of Germany's International Water Supply and Sanitation Decade national planning project began. The 10 participating countries throughout the world include three in the Americas—Bolivia, Haiti, and Paraguay. GTZ provided $300,000 to cover costs of PAHO technical assistance in the three countries, which includes specialized consultants, planning workshops, and certain administrative support costs. The general aims of the project are to promote and advise on planning for extending water supply and sanitation services to underserved communities, encourage faster development of the sector, and increase the flow of external resources to it.

U.S. Agency for International Development (USAID). Numerous meetings, workshops, and seminars were held to help coordinate and expand the technical cooperation services of PAHO and USAID to the countries. During the disaster relief efforts following Hurricane Allen in the Caribbean, PAHO and USAID collaborated to ensure coordination in bilateral actions and those of the United Nations agencies.

U.S. Centers for Disease Control (CDC). This major component of the U.S. Public Health Service collaborated with PAHO in several laboratory development projects and as a biologicals reference center.

U.S. National Institutes of Health (NIH). NIH, the foremost biomedical research center in the United States, cooperated extensively with PAHO in several investigative programs. An agreement with NIH enabled PAHO to continue its cooperation with Brazil, Colombia, and Peru in their primatology programs. A workshop on managing and breeding simians in their native habitats was held at Iquitos, Peru, under NIH auspices.

Foundations

Pan American Health and Education Foundation (PAHEF). A continuing PAHO collaborator, PAHEF supported 36 PAHO-administered projects. In addition to trust funds carried forward from 1979, PAHEF received $940,000 from 19 public organizations, private foundations, corporations, and individuals for use in Latin American health endeavors. Major donors or grantors included the W. K. Kellogg Foundation, IBM, United Kingdom overseas development ministry, and various pharmaceutical companies. The projects supported are mainly in education (dental, medical, nursing, and nutrition) and disease control (cardiovascular disease, leprosy, and leptospirosis).

The PAHO/PAHEF textbook and instructional materials program, financed by IDB loans to PAHEF, continued its expansion from medicine and nursing into other health fields as well as into materials for technicians and community health care workers.

W. K. Kellogg Foundation. Relations between the W. K. Kellogg Foundation and PAHO continued and close contacts were maintained. Execution of the two main joint programs—coordination and support of health care administration education in Latin America and the Caribbean, and the regional program of perinatal and maternal and child care with emphasis on primary health care—advanced satisfactorily. A joint meeting between representatives of the Foundation and PAHO was held in October at Battle Creek, Michigan, where current programs were examined and ways to improve coordination considered.

(Photo: M. Montecino/PAHO)

Chapter 2
HEALTH SERVICE SYSTEMS

PAHO's collaboration with the countries in developing health services focuses on the primary health care strategy for doing so. Given its components and the variety of ways in which the countries are carrying it out, PAHO has grouped its activities in health service development into three major areas. These are:

Development of health services. Particular attention is being given to defining the priority components of primary care. Special emphasis is placed on identifying the needs of unserved groups, applying techniques to include intersectoral linkages and community participation in primary care programming, developing appropriate technology for administering and delivering services, and updating health worker training. PAHO also seeks to organize health care levels to meet the requirements of primary care and to improve the quantity, quality, and accessibility to care levels of greater complexity.

Technology in health and service to special groups. This category includes promotion and development of such areas as nutrition, family health, and health education. It also involves new fields of cooperation such as promoting the participation of women in economic and social development, care of the elderly, and development of appropriate health care technologies.

Development of health systems. Because of the need to expand the capacity of health systems and make systematic evaluations of their use, impact, and efficiency, PAHO also supports health planning and the development of methods for programming intersectoral activities to regionalize health care systems and expand installed capacity, and promotes administrative development and strengthened national health information systems.

Medical Care Systems

The hemisphere's medical care systems—despite significant recent changes—still require substantial reform and reorientation to adjust their organization and operating procedures to the new and expanded objectives of health for all.

The changes required are of many kinds. Essentially, the contents of service programs need to be revised to include primary care and community participation. It is imperative to reexamine and strengthen their institutional structure to achieve equitable access for different groups according to their health care needs, and rationalize and optimize resource use, both in planning and developing health facilities and within the facilities themselves in using personnel and technology. The latter are often expensive and exert a decisive influence on overall costs, which in turn largely determine how much services can be extended.

(Photo: J. Vizcarra Brenner/PAHO)

(Photo: L. de Lucia/PAHO)

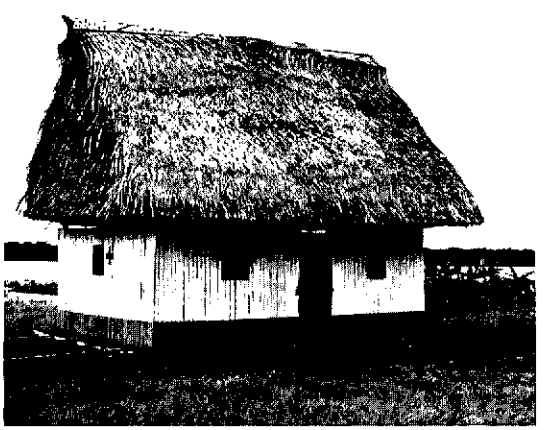
Faces of primary health care in Pampa Cano, Peru. Above, a folk medicine practitioner prepares a herbal remedy, as a nursing auxiliary and villagers watch. Left, a briefly trained health promoter of the Cecoya Indian tribe. Below, the same traditional healer as above treats a sick man.

(Photo: J. Vizcarra Brenner/PAHO)

(Photo: J. Vizcarra Brenner/PAHO)

Left, in a launch donated by PAHO to the Iquitos hospital area in Peru, health workers approach a remote village to provide treatment. Center, a group waits for care at the health center in Ixtlahuaca, Mexico. Bottom, a health promoter's hut at San Miguel, Loreto, Peru. Right, Salvadoran refugees line up for treatment at Heredia, Costa Rica.

(Photo: M. Montecino/PAHO)



(Photo: J. Vizcarra Brenner/PAHO)

(Photo: M. Montecino/PAHO)

Most of the countries are trying to bring about these changes. PAHO's technical cooperation in support of these efforts falls into three main areas: (1) optimizing resource use in developing health facilities, (2) strengthening coordination between health ministries and social security agencies, including technical assistance to the latter, and (3) promoting alternative forms of service organization to make them more accessible and efficient.

Development of health facilities. PAHO assisted the Andean countries in preparing final documents for five national service organization and plant management projects. In addition, a subregional interdisciplinary seminar on health facilities programming, development, and maintenance was conducted in Venezuela for 72 health officers from 14 American countries. These activities were carried out by a group of experts from the five Andean countries. PAHO and the secretariat of the Hipólito Unanue Agreement provided overall coordination, and the work was carried out under the auspices of UNDP, with which funding negotiations were initiated.

In the same area, cooperation in teaching and research was initiated with the Health Facilities Research Center of the University of Buenos Aires, and further support was provided to the hospital development projects in Guatemala, Guyana, and Trinidad and Tobago. Work to strengthen and develop the infrastructure of the Ecuadoran social security institute's various health services continued, and assistance was given in formulating and initially executing a preinaugural plan for the Guayaquil Children's Hospital.

Technical cooperation with social security agencies. PAHO continued to encourage and strengthen working relations with national social security institutions. Highlights in this field were its collaboration with Ecuador described above and the initiation of a technical cooperation agreement with the Peruvian social security institute to review its health care programs and recommend improvements in the technical and administrative procedures of its operating units. The agreement also calls for assistance in designing and executing health education programs for social security beneficiaries, manpower development and training, particularly at management levels, and dissemination of scientific information for refresher and continuing education courses for the institute's technical staff.

PAHO also helped make a comprehensive analysis of the Costa Rican social security institute to identify aspects of the organization and its general service policies that might need to be adjusted to the government's development and administrative reform policies.

PAHO participated in various regional social security meetings. These included a week-long seminar on the role of social security in coverage extension programs at Lima and the Inter-American Social Security Conference at Santo Domingo.

General improvement of medical care systems. In this third area of technical cooperation, PAHO supported specific projects in various countries to program services by ascending levels of care. It advised on the preparatory work and design of such a project in Chile and collaborated with Peru's health ministry in preparations for national seminars at which echeloned care under specific conditions in various parts of the country will be discussed and analyzed. PAHO worked with Uruguay's health ministry in the same field and studied the possibility of introducing the concept of levels of care at a large hospital in Montevideo.

It also continued promoting and supporting improvements in hospital organization and operation as part of coverage extension programs, ambulatory care schemes, and emergency services, particularly in metropolitan areas.

In the hospital field, a compilation of organizational and operating standards in the different countries was begun. Cooperation

was provided to the Bahamas, Costa Rica, Ecuador, El Salvador, Honduras, and Nicaragua in organizing and programming medical records and statistical services in new hospitals. The Dominican Republic and Guyana received assistance in preparing projects to improve their medical and statistical records in order to create national health information systems. In Costa Rica, PAHO cooperated in following up the development of the national cancer registry.

The medical care systems of the Americas have undergone significant changes in recent years.

The first such change has been the increasing participation of social security agencies in health care. An important development in this regard was the almost complete initiation of a program of basic health services for 10 million farmers in Mexico. This program, undertaken by the federal government and the Mexican social security institute, is of far-reaching importance because of its national impact and its possible adoption in other countries. It represents a substantial change in the ways in which social security is funded, and it is designed to provide health care not only to the working population but also to people who do not contribute to social security. This is accomplished through contributions by the government to the institute.

This initiative, together with those of Brazil, Costa Rica, Panama, and other countries that have adopted similar policies, will be highly influential in speeding universal social security coverage and thus the greater participation of social security in health care.

A second change is the integration of health care programs. In several countries, more emphasis is being put on determining ways to achieve more efficient resource use through gradual amalgamation of previously vertical programs into integrated agencies which provide a comprehensive package of services. As this trend toward programmatic and operational integration has advanced, the need has become apparent to strengthen central medical care organizations so as to endow them with enough capacity to enable them to supervise, guide, and evaluate the comprehensive delivery of services.

A third change is the countries' greater concern with finding effective solutions to the problem of delivering services in urban areas, particularly in the poor fringes of major cities. Developments in this area were the initiation of research on selected metropolitan health services at the Health Facilities Research Center in Buenos Aires and a national seminar on this subject at Medellín in which an attempt was made to establish ties between health service and general urban planning.

Health Planning

Planning health services that are more efficient and effective and provide equitable coverage for all continues to be a fundamental concern.

Most of the countries have explicit policies and strategies to guide the formulation of their health plans and programs. Some have formulated programs to extend health service coverage, others have prepared necessary institutional plans, and still others have developed sectoral plans in which all agencies providing health services participate.

Some inconsistency is apparent between policies and activities to carry them out. For example, general development policies commonly provide for multisectoral projects embracing health services, housing, education, agriculture, and other sectors, but health services often continue to perform their traditional activities in isolation from the other sectors.

The present situation must be replaced by one in which the different parts of the health infrastructure (planning, administration, information systems, human resources, investment projects) are considered together in

planning the development of services so that they will be properly balanced.

These were some of the events that occurred in health planning in the Americas during the year:

- Argentina's health ministry sponsored an 11-week course in health planning and programming. It also began applying nationally a unified guide containing technical, programming, information, and administrative standards.
- In Brazil the major development was the formulation of the PREVSAUDE draft project for investing more than $3 billion over six years in establishing 11,000 health posts, 17,000 health centers, 10,000 beds, and 3,700 emergency units and training 300,000 health workers. PREVSAUDE involves all agencies in the country providing health services in one way or another.
- Chile's health ministry is now transforming the entire sectoral structure and developing new ways of financing services based on a larger role for the private sector and greater user responsibility.
- In Colombia the national integration plan, including chapters devoted to the health sector, was published in March. The government reached agreement with WHO on a program, to be funded by the Netherlands, to develop the plan's primary health care aspects. Numerous health planning activities are underway in Colombia, including a national health survey which will provide information of fundamental importance for carrying out and revising the national plan.
- In Dominica a team of PAHO consultants helped formulate a national health plan.
- Grenada, with assistance from PAHO, established a planning group which prepared a guide for and then began formulating a national health plan.
- Guatemala, with PAHO assistance, continued to carry out its 1978-82 health plan and extended service coverage, a project being financed by IDB. A project was formulated and a new IDB loan negotiated for building three hospitals at a combined cost of $50 million.
- In Honduras, the annual health operations plan, based on the 1979-83 national plan, was carried out. The country's record in coverage extension has been one of systematic advances, such as an increase in yearly consultations per capita from 0.2 in 1975 to 1.0 in 1980 and a rise in hospital discharges from 2.6 to 7.2 per 100 inhabitants over the same period. The Netherlands is supporting coverage extension by providing funds for equipment and training.
- In Paraguay, PAHO provided technical advice and IDB financed planning to carry out coverage extension. The health ministry also programmed health services in the area of the Yacyretá hydroelectric dam between Paraguay and Argentina.
- In Peru the health ministry issued an emergency health sector plan. Immediately thereafter, participants in a seminar at Paracas on health sector management coordination drew up comprehensive short-term guidelines for reorganizing the sector. As a result, a national health plan for 1980-85 was prepared in the last quarter. PAHO provided continuing support to Peru's endeavors.

National Health Information Systems

The countries are endeavoring to establish national health information systems to produce the data required for effective health care decision making.

PAHO supports these efforts in accordance with governing body resolutions (WHA30.46, WHA32.2, WHA32.8, and CD27.20). Its assistance is based on the need to overcome limitations in the health statistics infrastructure and the use of statistics by programming and management organizations. It aids in strengthening national health statistics systems, improving data registration and storage, adjusting data processing to the needs and capabilities of the countries, developing reporting systems providing necessary information for control and evaluation, training, and related matters.

Before 1979 PAHO oriented its statistical training activities toward data producers. In that year it reoriented its training toward statistics users in health ministry management. Since then, four workshops—in Grenada (in conjunction with CARICOM), Guyana, Jamaica, and Paraguay—have been conducted for senior health officials.

Argentina received assistance in revising and preparing teaching materials for the three health information courses conducted in that country. In Bolivia, El Salvador, and

Area health chiefs meet at the Costa Rican health ministry in San José to discuss uniform statistical procedures.

(Photos: M. Montecino/PAHO)

A staff member records a baby's medical history at the Ramón González Coro Mother and Child Hospital in Havana.

Nicaragua, PAHO provided instructors for a general course on medical records and statistics. In Chile, it collaborated in a critical analysis of the present course and made recommendations for improving it so it will meet Chile's needs and those of other Latin American countries. It helped Costa Rica and Peru conduct special refresher courses for personnel who had completed regular medical records courses and were called upon to assume responsibilities in meeting the new demands on the health services. Eleven fellows from Cuba, Honduras, Mexico, Nicaragua, and Panama attended the refresher course in Costa Rica. In Venezuela it helped analyze three existing intermediate and auxiliary courses in order to restructure them and plan for a university-level course.

A total of 315 students completed the 1980 courses, compared with an average of 258 a year from 1970 through 1979, an indication of PAHO's increased emphasis on training.

In redesigning their information systems, certain countries sought to develop modular information procedures. Thus, Costa Rica fully integrated information collection for its rural health, health care for the underserved urban population, and nutrition programs and introduced "balance sheets" to adjust programming to their actual needs. Similar redesign activities were carried out in Chile, Colombia, Dominican Republic, Ecuador, Guyana, Honduras, Jamaica, Nicaragua, Paraguay, and Turks and Caicos.

Regional activities to stimulate the improvement of basic programs in vital health statistics and medical and health records continued in nearly all the countries. In this area, PAHO cooperated with Ecuador and Nicaragua in developing general guidelines for organizing medical records and statistical units in new hospitals as part of their coverage extension programs. In the Bahamas, Costa Rica, El Salvador, and Honduras it helped improve existing services to develop

adequate health information systems. In the Dominican Republic and Guyana, it aided in developing country projects to improve medical and health records (including statistical records) to design health information systems. With PAHO's assistance, the maternal and child health departments of Costa Rica and Panama began to standardize perinatal clinical history forms.

Management Systems

Achieving health for all by the end of this century calls for further adjustment in PAHO's technical cooperation in improving the administrative efficiency and effectiveness of health services and assuring that their benefits are distributed more equitably.

PAHO's management advisory activities embraced most of the countries through projects financed regularly or extrabudgetarily. Administrative development programs have gradually been integrated as far as possible into broader institutional development efforts within the context of extending health service coverage.

This has been possible primarily in large-scale development programs carried out with external financial assistance. In such cases administrative improvements are generally sought in planning, service regionalization, financial management, supply administration, personnel management, and legislation. PAHO provided technical assistance in continuing or starting projects of this type in Bolivia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Nicaragua, and Paraguay. A wide range of activities—from the preparation of manuals for standardizing procedures to comprehensive health system studies—was carried out in these projects.

PAHO continued to advise on resource administration, especially in basic health services. Case studies were made in Ecuador and Panama of drug supply management at health posts and centers and community hospitals. Analyses of financing, accounting, cost control, and budgets were intensified in Guyana and Jamaica.

In Ecuador, Honduras, and Panama, PAHO provided assistance in designing, equipping, and staffing new hospitals. This was supplemented by advice on specific medical records, information systems, financing, maintenance, and nursing problems.

Problems in administering regional service networks, and especially relations between institutions, took shape as a new field of collaboration. PAHO began revising its published materials on referral systems, patient flow, appointment and admission procedures, and multi-institution administration.

It also collaborated with the Costa Rican social security institute in a comprehensive analysis to identify that agency's priority problems. In Colombia the last touches were put on a broad administrative development project embracing supply, administration, finance, maintenance, and institutional management with a strong emphasis on training. This project is receiving UNDP financial assistance. Organizational behavior investigations were initiated in Chile and Brazil.

Financing Health Services

Financial limitations have traditionally been one of the main obstacles to extending health services to meet coverage targets fully. These constraints will become even more critical during the 1980s and 1990s when all the countries will have to make extraordinary efforts to finance capital and operating costs.

Briefly summarized, the financial constraints the countries face are: an insufficient proportion of gross national product devoted to the public health sector, inadequate revenue generation within the sector, ine-

quitable distribution of funds among health subsectors, management problems in optimizing resource use, inflation, and of course increasing demand for services.

The countries are trying to strengthen the health sector financially in various ways. Among them are external financing to develop physical and institutional infrastructures; institutional integration to achieve a better socioeconomic balance in generating, distributing, and using the sector's financial resources; revision of health plans to speed growth and facilitate development project financing; improvements in financial administration, cost containment, and optimization of resource use; and advances in intersectoral linkage and community participation as means of sharing financial responsibilities, reducing costs, and assuring better use of common resources.

PAHO cooperated with the countries in the following areas directly or indirectly dealing with service financing:

- In nine countries it participated in feasibility studies to establish alternatives for physical infrastructure development projects and facilitate their external financing.
- In four countries it initiated or continued its assistance in improving the financial administration of health services, with emphasis on budgetary programming techniques, and in designing ways to monitor productivity, revenues, and costs in highly complex health systems.
- In four countries it helped secure external loans for development projects, especially for institutional development and strengthening units responsible for carrying out the projects.
- It improved coordination among financial agencies operating in the health field and helped obtain funds from nontraditional sources.

Health Facilities Maintenance

During the 1970s PAHO concentrated on creating an awareness of the importance of health facilities maintenance because of its effect on the quality and cost of health care. Increasing investment in infrastructure and the progressive introduction of sophisticated installations and equipment have resulted in the paralysis of a high proportion of installed capacity because of poor maintenance.

Still, there were advances during the decade. Mexico and Venezuela led the way in establishing national maintenance systems, a movement that gradually spread to other countries.

In 1980 PAHO's primary emphasis shifted to developing simple methods for detecting and analyzing maintenance problems in health services largely devoted to primary care. These methods are a tool for determining ways to prevent and correct such problems. A start was also made in formulating simpler means of solving the most common problems through training and the use of guides. Some progress along these lines was made in Central America and Jamaica.

With less PAHO participation than in the past, the national maintenance centers, especially in Colombia, Costa Rica, Ecuador, El Salvador, Mexico, and Venezuela, took on more substantial training functions. In several countries the national centers began to offer training in hospital maintenance to skilled and technical personnel.

Health care has traditionally been regarded as a labor-intensive sector requiring relatively little capital investment. This situation has been changing, and the sector is now both labor- and capital-intensive because of its growing reliance on technology. Appropriate technology is an excellent means of rationalizing maintenance program priorities. The magnitude of this task makes it necessary to have close collaboration between the public and private sectors and between producers and users of equipment and installations.

To discuss this issue, PAHO, the American Society of Hospital Engineering, and Partners of the Americas participated in the annual meeting of the International Society of Hospital Engineering. This new relationship

among the three organizations marked the beginning of a major effort to include engineering associations and schools in the analysis and solution of the increasingly serious problems in biomedical and health engineering.

The growing impact of energy costs has spurred initial efforts to examine unconventional energy alternatives. In Barbados, an initial cooperative project was begun. To contain costs, Costa Rica started a major experiment in using simple technology to recover silver from x-ray plate development. Such experiments may become demonstrations for other countries.

In Ecuador, El Salvador, Honduras, and Panama, PAHO collaborated in developing maintenance programs in advanced medical centers where a variety of problems are posing increasing challenges to technicians and administrators.

PAHO continued its cooperation with the Pan American Development Foundation in distributing emergency equipment to hospitals, with emphasis on maintenance components.

Efforts in 1981 will be concentrated on developing methods for maintaining equipment in basic health services, making better use of national training and vocational education centers, conducting appropriate technology experiments, and particularly on increasing the interaction of experts in this field through a collaborative network of centers and programs.

(Photo: M. Montecino/PAHO)

Community leaders meet in a converted railroad car in a Panama City suburb to discuss local health problems.

Health Education

Health education has been an essential component of programs to promote health through extension of primary care services and community participation to improve health and development conditions. As an integral part of programs to prevent or reduce health risks, health education efforts were strengthened in programs to better the health of families, with particular emphasis on children, adolescents, and mothers.

To reaffirm the major role of health information and education in achieving health for all and increasing awareness among American governments that primary health care cannot be attained without adequate health education, the Directing Council began the new decade by devoting its 1980 technical discussions to community health education. Studies were made in 23 countries to determine the current status of such education and indicate new strategies and techniques.

Health education activities were included in 18 major maternal and child health and family planning projects, and training in and development of family life education activities were conducted under UNFPA sponsorship in Antigua, Bolivia, Dominica, Panama, St. Kitts-Nevis, and Saint Lucia.

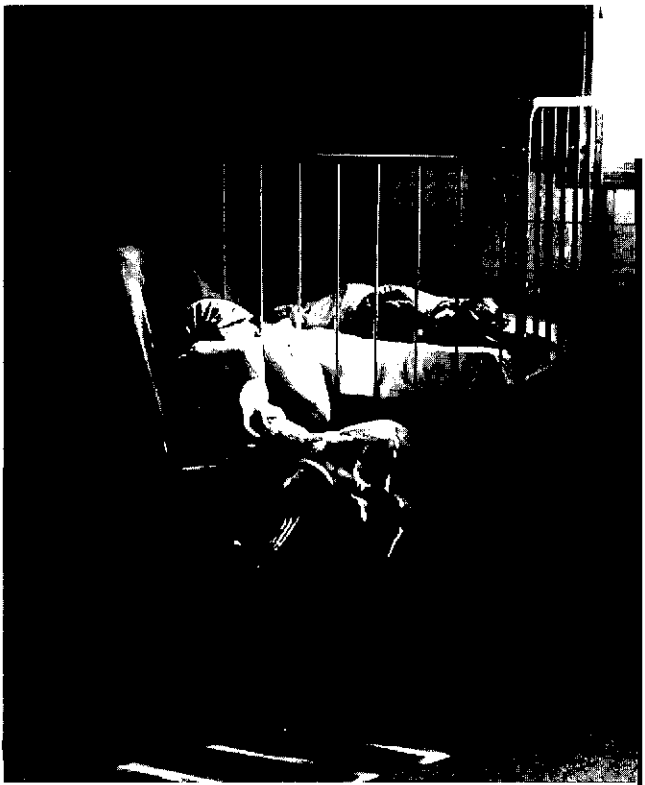
PAHO worked with USAID and the University of the West Indies to include health education in the curricula of primary school students in Antigua, Barbados, Belize, British Virgin Islands, Dominica, Grenada, Montser-

rat, St. Kitts-Nevis, Saint Lucia, and St. Vincent.

A health education workshop was held in July in conjunction with the University of the West Indies. Participants from Bermuda, Haiti, Jamaica, and Trinidad and Tobago developed a provisional strategy for health education in the Caribbean, drafted a constitution for a Caribbean health education association, and planned a Caribbean health education newsletter. The first national health education council in the Caribbean—an autonomous body of 60 voluntary agencies, clubs, and cooperating governmental departments—was established in the Bahamas.

PAHO provided fellowships to train health educators from Antigua and the Bahamas in master's degree programs in the United States.

In the area of community participation in health and development, PAHO participated with USAID, the American Public Health Association, World Bank, and IDB in planning strategies for community participation in primary health care projects. In the United States, PAHO also collaborated with the National Council for International Health in planning a program to train and support primary health care workers to start in 1981.



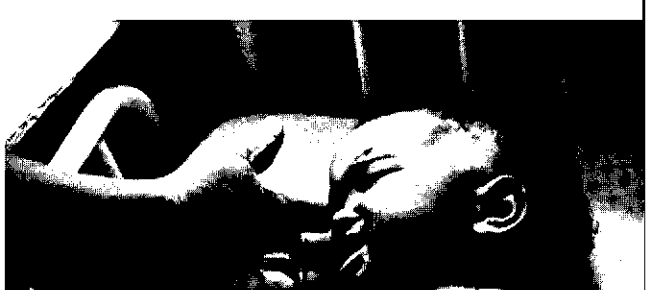
(Photo: M. Montecino/PAHO)

The Havana Pediatric Hospital encourages parents to spend time with their sick children (above). And a mother comforts a sick baby at the gastroenteritis ward of the Bustamante (Children's) Hospital in Kingston.

Maternal and Child Health and Family Welfare

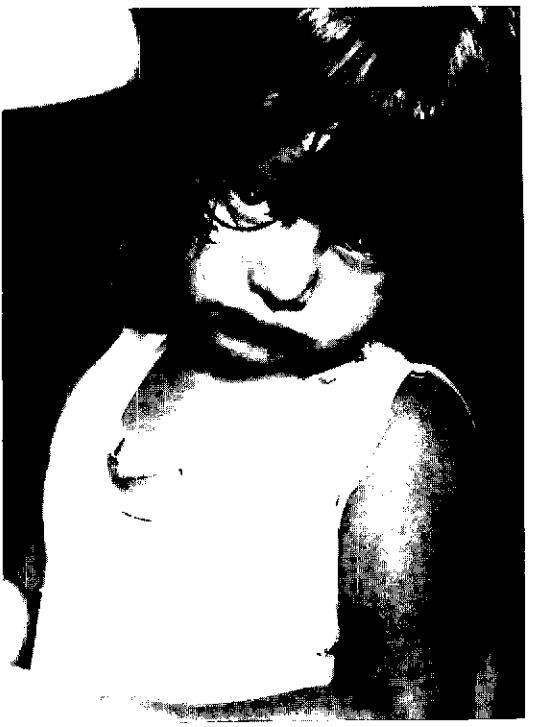
In carrying out its maternal and child health program, PAHO places special emphasis on applying epidemiologic methods in detecting and preventing risks to mothers and children, particularly in poor urban and rural families which are considered especially vulnerable to health problems.

Priority was given to developing comprehensive activities encouraging interdisciplinary solution of health problems and



(Photo: J. Vizcarra Brenner/PAHO)

(Photo: M. Montecino/PAHO)



(Photo: M. Montecino/PAHO)

(Photo: J. Vizcarra Brenner/PAHO)

Children require much care and training in good health practices. Counterclockwise, starting at left, a girl is just immunized at Carrizal, Costa Rica; a boy is examined at the San José Children's Hospital; a mother receives instruction in feeding her baby at Harbour View Health Center, Kingston; a pupil at the Education and Nutrition Center in Carrizal; a boy learns to wash his hands at the center; a mother and child at Harbour View.

(Photo: J. Vizcarra Brenner/PAHO)

(Photo: M. Montecino/PAHO)

(Photo: M. Montecino/PAHO)

promoting intersectoral linkages. Thus, maternal and child health and family planning programs were coordinated with activities in nutrition, mental health, and health education and community participation, and links were established with other development sectors such as education, agriculture, planning, and labor.

PAHO acted as executing agency for maternal and child health and family planning programs to which UNFPA contributed $8,972,401 in 23 countries and territories (Anguilla, Antigua, Bolivia, British Virgin Islands, Cayman Islands, Chile, Colombia, Cuba, Dominica, Ecuador, El Salvador, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Peru, St. Kitts-Nevis, Saint Lucia, St. Vincent, Trinidad and Tobago, and Uruguay). In almost all of them, family planning and maternal and child care activities were coordinated with coverage extension and primary health programs. PAHO provided technical and administrative support to countries with projects already underway and those that began formulating proposals.

In addition, UNFPA contributed $1,961,620 for such regional and subregional activities as family health and population dynamics, studies on mortality and indicators of health and well-being, health and youth, continuing education in family health program administration, and studies of the linkage of family planning with primary mother-and-child care. It began evaluating the regional projects it supported from 1974 to 1980, and with PAHO held eight meetings to evaluate projects in Cuba, Dominica, Ecuador, Haiti, Mexico, Panama, St. Kitts-Nevis, and Uruguay.

PAHO cooperated with UNICEF in national mother-and-child health programs and in following up regional activities begun in 1979 to mark the International Year of the Child. In some countries it and UNICEF were coexecuting agencies for UNFPA-financed maternal and child health programs. Since the health of children is adversely affected by unwholesome environmental conditions, UNICEF provided funds for building rural water supply and excreta disposal systems in various countries.

A perinatal and maternal and child care program with emphasis on primary care, financed largely by the W. K. Kellogg Foundation, was launched early in the year. The program's purpose is to create demonstration areas where primary care, training, and epidemiologic and health service research can be associated. Twelve such projects began in Brazil, Colombia and Uruguay, and proposals were initiated for similar projects in the Dominican Republic and Mexico.

Regionally, PAHO supported studies on indicators of family health and well-being. A working group on mortality in children and indicators of health and well-being representing 10 countries met at Brasília, and as a result various national programs undertook studies or improved the research designs of their existing maternal and child health projects. Four countries (Argentina, Bolivia, Trinidad and Tobago, and Uruguay) initiated studies on general morbidity and mortality among children and mothers according to PAHO/WHO methodologic guidelines.

Several countries started studies of risk factors in mother-and-child care as a tool for developing prediction models based on risk principles and extending coverage. A group of experts met at Washington in October and drew up guidelines for using the risk concept in extending coverage through primary care.

PAHO's training activities relating to the health of women and children ranged from courses for midwives and community health workers to those for administrators of national maternal and child health programs. The latter included a maternal and child health seminar on for 40 professionals from eight countries, a course on pediatric primary health care for 26 professionals from nine countries, and an international course on perinatal public health for 52 participants from 12 countries.

PAHO's Latin American Perinatology and Human Development Center at Montevideo has long been a leader in perinatal research, perinatologist training, and promoting knowledge of the underlying principles of obstetrics. In recent years the Center has focused its efforts on simplifying perinatal care, developing appropriate technologies for primary care, and investigating obstetric services to further the extension of their coverage.

The Center provided advisory and training services to the countries, conducted courses and seminars, and coordinated Latin American collaborative research projects.

In the training area it conducted 14 courses and seminars on subjects ranging from appropriate technologies for nurses and midwives to the scientific principles of fetal, maternal, and newborn care for more than 300 participants. In research, it further expanded the standardization of perinatal care records to a total of 15 countries. In the Latin American collaborative survey of standards for managing premature infants, it began to tabulate the findings from maternity clinics in 12 countries in order to establish general standards of care in the future.

Nutrition

Despite the political commitment and financial effort of the governments to increase programs of major social impact, 1980 did not necessarily reflect a significant advance in solving the hemisphere's food and nutrition problems. The situation continued to be characterized by clear imbalances in the production, distribution, and consumption of basic foods, especially among the urban and rural poor.

As a result of this imbalance, energy-protein malnutrition affects about 60 percent of children under age five, endemic goiter affects about 20 percent of the population in some countries, and iron-deficiency anemias affect 29 to 63 percent of pregnant women and other susceptible age groups. In contrast, the number of people affected by vitamin A deficiency decreased significantly in those countries where vitamin A-fortified sugar was introduced. Other countries began studies of the prevalence of hypovitaminosis A and formulated means of controlling it.

Serious problems related to the physical, social, and cultural environment also persisted which help aggravate the situation because of their negative effect on food intake and the use of essential nutrients. Among these problems are the high prevalence of diarrheal and acute respiratory diseases, inadequate potable water and excreta disposal, lack of sanitation in handling and consuming food, prejudices about the nutritive value of certain foods, and erroneous practices in feeding infants and very young children as seen in the decline in breastfeeding in urban areas and the influence of commercial advertising that may cause people to spend money they cannot afford on expensive foods of questionable nutritional value.

Though it is not as critical in its acuteness and severity as in other parts of the world, the nutritional panorama in most of Latin America contrasted unfavorably with the situation in nations such as Argentina, Canada, some Caribbean countries, and the United States, where the main nutrition problem was excessive energy consumption with resulting overweight and obesity, conditions commonly associated with chronic and degenerative diseases such as diabetes mellitus, hypertension, and coronary insufficiency.

In addition, chronic malnutrition afflicted countries with great potential for satisfying domestic food needs or for developing other unexploited resources and so employ under- or unused labor and thus increase the ability

(Photo: J. Vizcarra Brenner/PAHO)

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(Photo: M. Montecino/PAHO)

Aspects of child nutrition: A small patient and nurse's aide at the Pedro de Valdivia Nutrition Center in Santiago; a mother breastfeeds her baby in Kingston; a small boy eats a well-balanced meal at the Education and Nutrition Center, Carrizal, Costa Rica.

of the poor to buy goods and services.

According to data supplied by the Latin American and Caribbean countries, the daily consumption of calories per capita at the beginning of the 1970s was 12 percent above the WHO-FAO recommendation. At mid-decade, however, about eight countries still had deficits in average daily calorie intake while 16 countries were above the recommendation. Obviously, the availability and actual consumption of calories and proteins varied among countries and even within individual countries. The problem was most critical among the poor, whose deficit was estimated at between 10 and 20 percent of the recommendations.

That malnutrition persists despite the apparent adequacy of foods suggests that solving the problem lies beyond increasing food production alone and therefore that the countries' efforts should be directed toward searching for solutions in which multisectoral strategies and programs are applied, including improving the real income of the poor, integrated health protection, and raising social and educational levels.

As in previous years, PAHO conducted its technical cooperation efforts in nutrition regionally, subregionally, and in individual countries. Its activities of greatest importance—often carried out by staff from its two nutrition centers, the Caribbean Food and Nutrition Institute (CFNI) at Kingston and the Institute of Nutrition of Central America and Panama (INCAP) at Guatemala City—were:

- Assistance in designing and starting nutritional information and surveillance systems in Bolivia, Chile, Colombia, Costa Rica, Honduras, Panama, St. Kitts-Nevis, and Venezuela.
- Formulation and execution of multisectoral food and nutrition policies and plans in Bolivia, Brazil, Colombia, Dominican Republic, Haiti, Peru, and several Central American and English-speaking Caribbean countries.
- Analysis of the structure and functions of technical nutrition units in the health ministries of several countries, which was a basis for the meeting of a technical group convened by WHO at New Delhi in December.
- Participation with the Hipólito Unanue Agreement in reviewing and analyzing supplementary feeding programs for mothers and children in Bolivia, Colombia, Ecuador, Peru, and Venezuela. This study was the basis of an Andean subregional meeting held with PAHO support at Bogotá in November.
- Sponsorship with WHO and USAID of a subregional seminar on breastfeeding and maternal and infant nutrition at Cali in October.
- Sponsorship with WHO of national seminars for the English-speaking Caribbean and a subregional seminar for the Southern Cone countries at Santiago in November on maternal and infant nutrition and breastfeeding.
- Organization of a meeting on action-oriented research in nutrition through primary health care services at Bogotá in June. The study group prepared guidelines for formulating national projects with emphasis on infant feeding.
- Participation with USAID in an international conference on food and nutrition planning at Guatemala City in May in which the experiences of various countries in the Americas and other parts of the world were reviewed.
- Participation in the Latin American Nutrition Society's congress at Puebla, Mexico, and the Sixth Congress on Nutrition in the Western Hemisphere at Los Angeles, both in August.
- Assistance to Latin America's nutrition and dietetics schools in reviewing their plans and curricula, training instructors, and organizing national associations of nutrition and dietetics schools.
- Support in planning and developing nutrition education programs at the INCAP and CFNI subregional centers.
- Collaboration with PAHO's textbook program in reviewing bibliographic materials and recommending contents for the *Manual on Community Nutrition* to be published in 1981.
- Establishment of a system for selectively disseminating scientific information on food and nutrition to nutrition and dietetics as well as other health science schools.

World Food Program. PAHO and the governments actively participated in developing food aid projects financed by the World Food Program (WFP), a United Nations affiliate. This included formulation of new proposals and monitoring and evaluation of current projects. Particular support was given to mother-and-child health, school feeding, and nutrition education programs, hospital

food services, rural community development, and food emergency projects.

Since WFP began operation in the Americas, it has approved 140 projects in 29 countries. During 1980 it approved five new projects totaling $26 million: (1) rural and community development in the Jequitinhonha Valley, Brazil, $9.8 million; (2) further assistance for nutrition education and preschool feeding in Cuba, $8.5 million; (3) further assistance to improve environmental sanitation through community development in Guatemala, $3.9 million; (4) supplementary feeding for pregnant and preschool children and lactating women in Nicaragua, $12.6 million; and (5) improvement of food and dietetic services in 32 hospitals in Nicaragua, $1.2 million.

Efforts were made to improve the efficiency of and develop simple methods for evaluating WFP projects with specific nutrition and health objectives. PAHO collaborated in a subregional seminar in Colombia to review and develop guidelines for planning supplementary feeding programs in the Andean countries.

CFNI. PAHO's Caribbean nutrition center reoriented its basic policy toward achieving nutritional well-being for all by the end of the century. It also adopted four new subgoals: eliminating undernutrition as a public health problem in all groups, reducing anemia to functionally acceptable levels, lowering the incidence of obesity and the prevalence of nutrition-related diseases such as obesity, diabetes mellitus, and hypertension, and ensuring that an adequate and stable supply of nutritious, safe, and acceptable food is accessible and available to all.

To achieve these objectives, CFNI cooperated with the Caribbean countries in drawing up policies, strategies, and action plans, developing nutrition agencies institutionally, training, public education, and diagnosis and surveillance activities.

Six WHO-funded national breastfeeding seminars were held in which countries developed action plans. A CFNI teaching package on breastfeeding served as the major resource for the seminars and later activities in each country, and an evaluation of the package's effectiveness was started in Montserrat.

Inadequate encouragement during prenatal consultations and in maternity wards is a major constraint on satisfactory breastfeeding. Consequently, CFNI and the pediatric and obstetrics-gynecology societies of Jamaica conducted a meeting on obstetrics management and its effect on subsequent child development. This resulted in a document entitled, "Obstetrics Management, Breastfeeding, Bonding and Subsequent Child Development: Guidelines for the Caribbean."

Existing data from each country on the prevalence of nutritional anemia, its causes, and current control programs were collected. Measurement techniques and criteria were reviewed and a comparative study of alternative methods for monitoring anemia, including a low-cost instrument designed by CFNI, was started. Screening for anemia in primary health care systems began in some countries, as did an assessment at CFNI of the iron content in Caribbean sugar and its absorbability. A public information leaflet on preventing anemia in school children was designed, and an anemia control plan was drawn up for the Cayman Islands.

Scientific understanding of the importance of diet in the causation, prevention, and treatment of diabetes mellitus, hypertension, and cardiovascular diseases has increased in the past decade. These conditions, as well as obesity, are now recognized as major nutrition-related health problems in the Caribbean which deserve urgent and coordinated attention. Although considerable information about them has been collected, it is scattered, and so efforts were made to bring together, analyze, and evaluate the data.

The growing population of the Caribbean has put a steadily increasing demand on food supply. Competing requirements for limited

landspace—particularly in the island territories—create a need to integrate policies for food, nutrition, and economic development.

Responsibility for collecting data on total food availability, market flows, and household consumption rests on the government agencies concerned, and in particular on trade and agriculture ministries. CFNI compiled food import and production data from Grenada, Montserrat, and St. Kitts-Nevis in a format suitable for nutrition planning and tested a simplified food balance sheet in the last country.

In December 1977, two of the 17 countries and territories sponsoring CFNI had national food and nutrition policies. At the end of 1980 the figure stood at nine. National food and nutrition councils provide the institutional framework for controlling multidisciplinary food and nutrition plans and programs. A CFNI workshop in May pooled ideas on elaborating and developing council activities.

Developing food and nutrition manpower is an important CFNI objective. This includes curriculum development and training of trainers. CFNI gave its second three-month intensive course on food and nutrition planning and two short refresher courses for graduates of its diploma in community nutrition program.

Considerable improvement in nutrition training for nurses was achieved. Guidelines for basic nursing curricula were developed, and similar nutrition guidelines for public health nurse training are being compiled. A two-week nutrition module to train family nurse practitioners for the smaller territories in a course in St. Vincent was developed and taught by CFNI's staff.

Three national workshops were held at the request of the governments to train people in planning and carrying out community nutrition education.

INCAP. INCAP carried out its customary training, technical assistance, and research activities for the benefit of the Central American countries and Panama.

INCAP's training activities and academic courses were carried out through the Center for Higher Studies in Nutrition and Food Science in cooperation with the University of San Carlos at Guatemala City. One hundred twenty-two students—about a sixth of them from hemispheric countries outside Central America—were enrolled in the nutrition school, food science and technology and food science and animal nutrition courses, and the postgraduate courses on public health with a specialization in nutrition and maternal and child health and on biochemistry and human nutrition. Twenty-seven of the students graduated.

Thirteen professionals participating in the INCAP/United Nations University advanced tutorial training program were in residence, along with 66 persons who received tutorial training in specific areas and techniques. The 13 professionals who participated in the advanced tutorial program represented a total of 86 fellowship-months and came from nine countries, including Japan and the Philippines.

INCAP provided technical assistance to all six countries it serves.

In Costa Rica it advised the national nutrition program on defining, programming, and maintaining the quality of its data processing systems. In addition, INCAP supported the country's multisectoral food and nutrition planning in its preliminary stages and collaborated with the Costa Rican Nutrition and Health Research and Training Institute in developing cooperative projects to be carried out in 1981.

In El Salvador a member of INCAP's professional staff was stationed until September at the agriculture ministry's livestock development center to assist in a medium-sized and small farmers' program to produce foods of animal origin intensively. The country also continued to receive assistance in improving and updating its food balance sheets.

In Guatemala, INCAP aided the ministry of economy in revising its food balance sheets and an accompanying operations manual for preparing them. It also collaborated with the national economic planning council in making a functional classification of malnutrition. Cooperation was provided in analyzing the country's food supplementation program. INCAP also continued to support Guatemala's vitamin A fortification of sugar and salt iodization.

In Honduras, INCAP continued to advise on organizational development of the country's food and nutrition analysis and planning system and the 1979-83 national food and nutrition plan. This covers distribution of food to vulnerable groups, integrated development in areas with a high prevalence of malnutrition, and promotion of nutrition science and technology. Advice was also given the national agencies responsible for sugar fortification with vitamin A.

In Nicaragua, INCAP collaborated with the education ministry in developing a model for monitoring the food and nutrition status of school children. There was continued close cooperation with the endemic goiter control project, particularly in monitoring salt iodization during production and distribution. INCAP also helped promote breastfeeding, define the country's basic food basket as part of a project to determine how well Nicaragua's basic food requirements are being met, and prepare a request to WFP for food assistance for the country's hospital program.

In Panama, INCAP assisted in a multisectoral analysis of the food and nutrition situation, a trial project to fortify sugar with iron in Veraguas Province, and an evaluation of the supplementary feeding program in the same province. Further support was also provided in reorganizing the food services in the country's hospitals.

An indispensable complement to INCAP's research activities is technology transfer, which for practical reasons is now concentrated on matters related to food. These were some of the activities carried out in this area during the year: introduction of multiingredient flour in Guatemala's bread industry, construction of a vegetable dehydration plant for the community of Santiago Sacatepéquez in Guatemala, organization of a firm to produce baby formulas based on corn and soy beans in Honduras, and development of a feed and fodder processing plant in Nicaragua.

INCAP's research activities varied widely. These were some of them:

The purpose of basic food studies is to improve the nutritional quality of the cereals and legumes widely consumed in Central America. To this end, INCAP has developed the concept of "nutritional productivity," or the yield per unit of land sown, expressed not only in terms of the final product (grain) but also according to nutrients and what the product represents. INCAP's study of the nutritional characteristics of corn and the correlation between nutritional quality, farming practices, genetic varieties (especially the Opaque-2 gene), and the effects of processing continued. Similar studies have been initiated of rice and sorghum.

A nutritional and organoleptic evaluation of legumes, especially the common bean (*Phaseolus vulgaris*) which is the basic dietary staple in the area, continued. The reasons for consumer acceptance, from both the organoleptic and practical standpoints (cooking, consumption patterns, productivity, and resistance to spoilage) are being studied.

In this area of nutrient sources, an attempt is being made to determine the potential nutritional value, possible toxicity, and acceptance by humans and animals of nontraditional Central American foods. Studies therefore continued to identify harmful factors in coffee pulp, quinua, and other vegetables.

The thrust of activities in food technology was toward developing methods to improve the use and preservation of traditional foods

and byproducts nutritious to humans or animals. Thus INCAP continued to develop appropriate technologies to prevent the hardening and biodeterioration of common beans and other legumes. Technical advice was given to farmer groups interested in preserving and packing vegetables by dehydrating, pickling, and canning them. Studies were also initiated of the use of bananas and their wastes as animal feed and of the fruit itself for human consumption.

An analysis of findings from a study of the protein-energy requirements of preschool children made in 1979 was completed. The results indicate that well-nourished preschoolers meet their protein-energy needs and grow satisfactorily when their diet includes sufficient amounts of basic foods (beans, corn, bread) to satisfy their appetite, a greater energy density through the addition of oil or sugar to certain foods, and the presence of an older person to encourage or help the child to eat. A new phase in the project was begun to determine if foods normally available in poor households and prepared and served traditionally can provide sound nutrition to such children, and whether the preliminary findings are applicable to children with mild or moderate malnutrition.

In collaboration with Guatemala's child nutrition agency, INCAP began designing a system for the early diagnosis, prevention, and correction of malnutrition in children and pregnant women in poor urban areas. The system includes much community participation and close coordination with local health services.

INCAP collaborated in a Central American breastfeeding workshop at Tegucigalpa in March. As a result, guides for promoting breastfeeding and improving mother and child nutrition were prepared, published, and distributed to pediatricians, obstetricians, and various public and private institutions in Central America and Panama. Work also went forward on developing methods to determine infant feeding practices before and after weaning in developing countries. Trials were carried out to determine the feasibility of using strained black beans and corn meal or bread as a supplement to mother's milk. These trials indicated that the formulas are tolerated by children between four and six months of age, do not interfere with breastfeeding practices, and are accepted by mothers.

Health Service Research

The many and varied problems confronting American health services in their effort to obtain the goals of universal accessibility and coverage require systematic research to create new thinking about health service problems and how to solve them.

This research is multi- and interdisciplinary in nature and embraces systems analysis, industrial engineering, and other disciplines, all of which must form a harmonious whole to support decision making in health care.

PAHO's governing bodies, after considering policies and strategies for attaining universal health by the end of the century, have made specific recommendations for promoting and using health service research.

Serious problems arise in executing these recommendations. Generally speaking, Latin America and the Caribbean lack the critical mass of investigators required to carry out such research meaningfully. Communication between health workers who confront real daily problems and researchers is generally inefficient, and there is still a shortage of trained operations researchers with the necessary understanding of health and medical care systems. Health service staff require more information and greater motivation to accept and develop this type of research systematically. Moreover, in most of the countries areas of major interest for research have not been completely identified

and the funding needed to finance it is unavailable.

Despite these constraints, some important advances have been made. Several postgraduate health administration training programs have included operations research, and some undergraduate programs in industrial and systems engineering have participated in developing operations research on health services. Though still on a limited scale, some of the countries are carrying out coverage extension programs which include research components.

PAHO has initiated a health service research program whose general goal is to promote and collaborate in developing and coordinating this type of research. In furtherance of this goal, support has been provided mainly in encouraging and strengthening local capacity to conduct operations research on health services, and promoting and supporting the transfer and adaptation of operations research techniques in various health service fields.

In the former area, assistance was furnished in conducting a survey to identify health areas and personnel involved in health service research in the industrial engineering and operations research programs of Latin America and the Caribbean, and support was provided in designing various research protocols. These included operations research on drug administration in hospitals, development of supply administration, sterilization centers, and infection control centers in hospitals, and investigations of appropriate technology in health facility maintenance. In the latter area, issues of health service research were discussed during meetings on the development of physical infrastructures of health institutions in Venezuela and of a working group on the risk approach to maternal and child health care at Washington.

PAHO prepared and distributed the final reports on a regional operations research seminar, training in health operations research in Latin America, health service operations research in Latin America, and information systems and decision making on administrative research in the health services, and a bibliography on health service operations research.

It also cooperated in intercountry health service research and introducing operations research into the regional programs in this field. A health service research workshop is scheduled for January 1981 at Washington. Specialists in epidemiology, sociology, systems engineering, economics, health administration, teaching and research programs, and health services will attend.

Chapter 3

DISEASE PREVENTION AND CONTROL

Communicable diseases continue to be among the principal health problems in most countries of Latin America and the Caribbean. They are responsible for high morbidity and mortality, especially among the poor, for whom they are an obstacle to socioeconomic development. Endemic infectious or parasitic diseases place a heavy burden on health during individual growth and development and the productive years. They are responsible for a wide variety of disabilities and lessen work capacity.

Cases of several diseases subject to international regulation occurred in 1980: jungle yellow fever in the Andean countries and Brazil, plague in Bolivia, Brazil, and the United States, and imported cases of cholera in Canada and the United States.

The resistance of the vectors of malaria and other parasitoses to insecticides and of *Plasmodium falciparum* to certain drugs continued to be a problem.

Noncommunicable diseases such as cardiovascular conditions, diabetes, and cancer are a major cause of mortality in most of the countries. Others such as rheumatic fever and chronic allergies are common causes of morbidity and disability. Accidents, especially occupational and vehicular, continued to grow in importance and were another important cause of death.

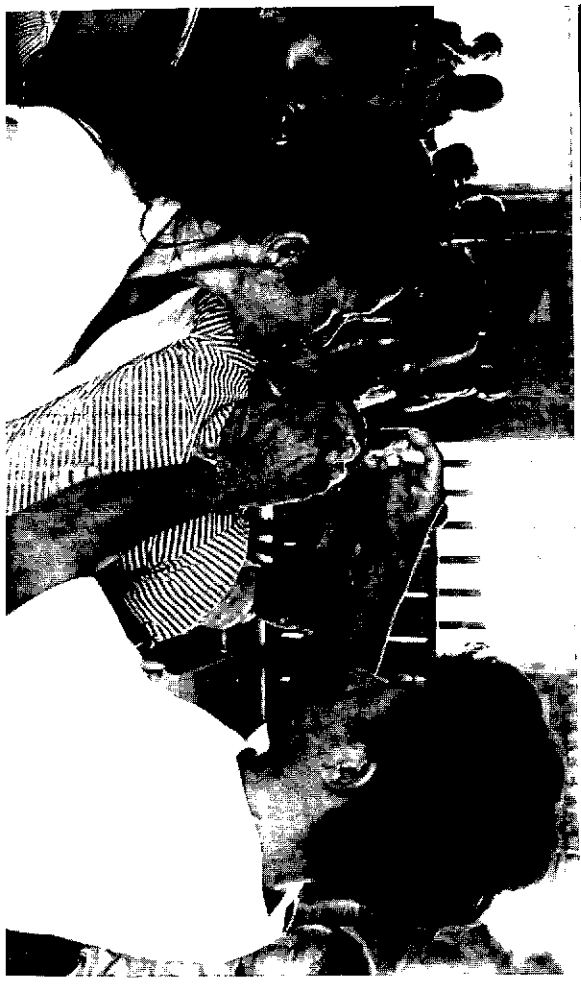
On the positive side, the Latin American and Caribbean countries made significant progress in formulating and developing disease prevention and control programs, especially in integrating such activities into their regular health services as part of primary care and in training personnel at various levels for those activities.

In the years ahead an increase in the prevalence of chronic diseases and accidents is foreseen, as well as a need for greater emphasis on hospital infections control and the reliability and adequate transportation of biologicals. Promising advances are apparent in immunology and the production of new vaccines, drugs, and insecticides for the fight against bacteria and other pathogenic agents, reservoirs, and vectors.

In both its direct cooperation with individual countries and its regional activities, PAHO gave priority to helping programs against those diseases or groups of diseases that affect the largest numbers of people and for which effective means of prevention and control are available, and to services supporting such programs. These diseases included diarrheas, tuberculosis and acute respiratory infections, diseases preventable by vaccination, malaria, and preventable or controllable chronic conditions.

PAHO participated in efforts by health ministries to develop their epidemiologic services so as to improve their operational capability through better program organization and administration and integration of specialized activities into the primary care provided by existing health services. The

(Photo: J. Vizcarra Brenner/PAHO)



(Photo: M. Montecino/PAHO)

(Photo: J. Vizcarra Brenner/PAHO)

development of support programs, such as those involving morbidity and mortality information, epidemiologic surveillance, laboratory services, research, and training, was also promoted. Assistance was extended in procuring effective, high-quality supplies for prevention, diagnosis, and treatment and such other critical items as biologicals, drugs, insecticides, reagents, and equipment.

PAHO also continued its assistance in carrying out intercountry programs to control certain diseases that are highly prevalent or are assuming greater importance in specific areas. This was to demonstrate the efficacy and feasibility of preventive and therapeutic measures and gain experience helpful in setting up permanent control programs with wider coverage. A modular short course on the principles of epidemiology in preventing and controlling disease was developed during the year after trials in three countries; it is scheduled for wide dissemination in 1981.

Publication of the *Epidemiological Bulletin* in Spanish and English was initiated in 1980. This pragmatically oriented newsletter is based essentially on information supplied by the countries.

The goal of the Expanded Program on Immunization is to vaccinate all children and pregnant women against six common preventable diseases by 1990. Top and bottom, vaccination at a health center at Miraflores, Loreto, Peru; center, a vaccinator at work in a home in Carrizal, Costa Rica.

Communicable Diseases

Expanded Program on Immunization

As the 1980s begin, the Americas are vigorously carrying out the 1977 resolutions of the World Health Assembly and PAHO's Directing Council (WHA30.53, WHA30.54, and CD25.27) on developing the Expanded Program on Immunization (EPI). The program's goal is to provide immunization for all children in the world by 1990, especially against diphtheria, tetanus, whooping cough, poliomyelitis, measles, and tuberculosis, and to reduce morbidity and mortality from other selected diseases of public health importance for which safe and effective vaccines exist or will become available.

According to available information, of the more than 80 million children born in the developing world each year, about 5 million die of the common contagious childhood diseases, largely because less than 10 percent of them are protected through immunization.

EPI's primary target diseases are diphtheria, tetanus, whooping cough, poliomyelitis, measles, and tuberculosis. This high priority program is directed toward high-risk infants and pregnant women and rests on integrating immunization activities in general health services if such services are available. As stated in the Declaration of Alma-Ata of September 1978, immunization is an essential component of primary health care and should be viewed as the starting point for extending health service coverage.

Although immunization was one of the priorities of the Ten-Year Health Plan for the Americas established at Santiago in 1972, few countries have shown any real progress in controlling vaccine-preventable diseases as the plan nears its end. When EPI was launched in the Americas in 1977, PAHO's Directing Council identified some of the major problems hindering the expansion of immunization activities. These problems were

related to planning, management and evaluation of immunization activities, vaccine procurement, the availability of suitable cold-chain equipment, and logistics. The fact that national information and epidemiologic surveillance systems are still undeveloped has exacerbated the difficulties of evaluating the impact of immunization activities nationally and regionally.

PAHO's technical cooperation thus focuses on five major activities: training, operation of a revolving fund to buy vaccines and related supplies, developing and testing cold-chain equipment, information systems and program operation evaluation, and information dissemination.

Training. In 1980 the second phase of training activities, which followed the regional workshop held at Lima in 1979, included national middle management EPI workshops in Argentina, Brazil, Chile, Honduras, Nicaragua, and Paraguay which 300 participants attended. Some of these countries have already started a third phase of training for local workers organized and conducted by persons who participated in the national workshops. In the English-speaking Caribbean, the first subregional workshop was held at Port-of-Spain in June with one or two participants from each country and territory in the area. National workshops followed in Belize, British Virgin Islands, Cayman Islands, Guyana, and Jamaica. The total number of national workshops held was 17 at the end of the year, and it is expected that all countries participating in the program will have held workshops by the end of 1982.

Another result of the national workshops has been the preparation, publication, and distribution of national standards and operations manuals. By the end of the year the health ministries in Bolivia, Colombia, Ecuador, Honduras, and Peru had distributed such manuals throughout their countries.

EPI training materials were also presented to a regional meeting at Washington of representatives of Latin American public health schools to encourage the schools to include such materials in their regular curricula. Some schools have already done so and are also taking part in training workers for immunization activities.

The training materials are included in PAHO's expanded textbook and instructional materials program. More than 1,200 sets have been requested and distributed to various countries, evidence of their interest in carrying out this component of the program.

Revolving Fund. Since the establishment of the EPI Revolving Fund in 1979, its membership has gradually increased to embrace almost all countries and territories in the hemisphere. During its first year of operation, 23 members bought their EPI vaccines through the Fund. Nine new countries and territories joined the Fund in 1980, bringing its membership to 30.

Figure 3 shows the number of doses of each type of vaccine purchased through the Fund in 1979 and 1980. A total of 41.8 million doses were acquired through the Fund in 1980, 1.8 million or 4.5 percent more doses than in 1979.

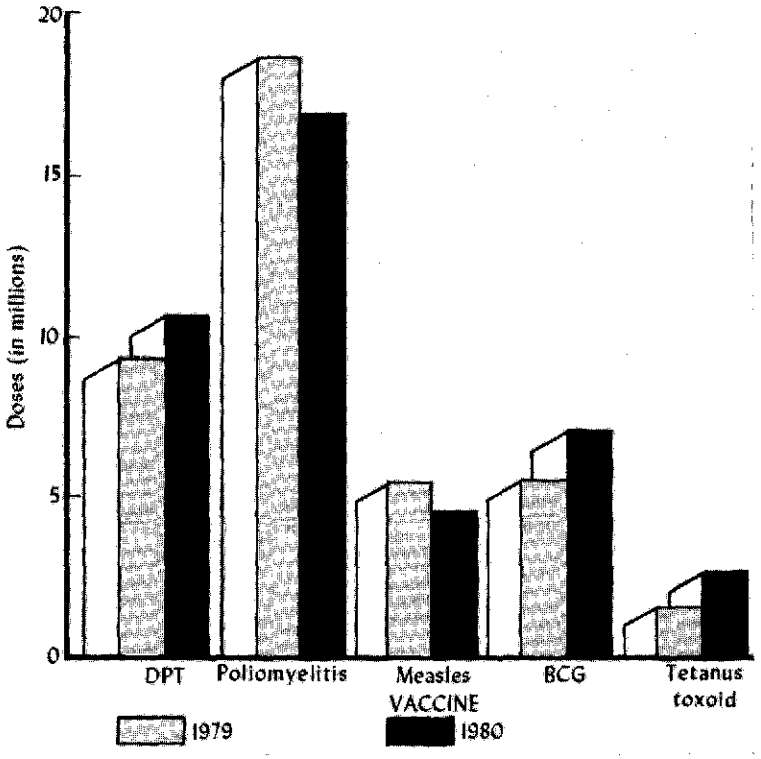
A problem the Fund experienced during the year was that two countries cancelled their quarterly orders a month or two after placing them. Another was that some countries were slow in paying their invoices. During the third quarter of the year 20 of the 30 Fund participants were delinquent for more than two months in their payments, and as of year's end total arrears were $575,843.

Operating costs were approximately $3 million, an increase of 11.1 percent over 1979.

Together, increased operations, delinquent reimbursements, and limited capitalization of the Fund resulted in delays in placing orders with vaccine suppliers averaging about a month until funds became available.

New vaccine purchase contracts were issued for the period June 1980 to July 1981. The price of measles vaccine, usually the costliest of the four EPI vaccines (measles, poliomyelitis, DPT, and BCG), decreased an

Figure 3. Comparison of 1979 and 1980 EPI revolving fund vaccine procurements.



average of 18.2 percent per single-dose vial from 1979. The price of the same vaccine in 10-dose vials decreased even more (29.6 percent). BCG vaccine showed the largest price increase per dose, an average of 22 percent.

Overall, the average cost of EPI vaccines increased by only 3.73 percent over the previous year. Excluding the decrease in the price of measles vaccine, the average cost of the other vaccines increased by 11.03 percent over 1979.

PAHO is now studying the possibility of obtaining an additional $1.7 million to reach the $4 million capitalization originally thought necessary for the Fund's smooth, uninterrupted operation.

PAHO has been active in providing technical advice on vaccines purchased through the EPI Revolving Fund. More than 25 production and control protocols submitted by vaccine suppliers were reviewed and acted upon. Clearance was given in most cases.

Cold chain. The regional focal point for cold-chain development and testing, as called for by PAHO's Directing Council (CD26.21), was established in cooperation with Colombia's health ministry and the Center for Multidisciplinary Research in Rural Development (CIMDER) at the Universidad del Valle, Cali, Colombia.

In 1980, Latin American manufacturers were contacted to determine their interest in and ability to produce the vaccine carriers for transporting and storing vaccines between the different links of the cold chain. Design specifications for several prototype con-

A vital link in any immunization program is a proper cold chain with an adequate vaccine supply, as seen here in the central cold room at San José.

(Photo: M. Montecino/PAHO)

tainers were transmitted to them and those interested were invited to submit bids. Based on these tenders, a certain number of cold boxes and vaccine carriers will be produced for testing at the Cali center to determine their suitability for EPI use.

In conjunction with the Universidad del Valle's thermal sciences laboratory, CIMDER built an environmental testing chamber, which was tested with excellent results and fully meets PAHO/WHO specifications.

One of the many problems in the EPI cold chain is that of continuously monitoring the temperatures at which vaccines are stored. To assure that suitable instruments are available for monitoring the temperature of vaccine storage refrigerators daily, PAHO/WHO has designed a thermometer for EPI use. Water resistant, it consists of liquid crystals affixed to a paper backing with a strip of foam. Samples were distributed to all countries in the hemisphere and are already in use in several.

The cold chain, an integral though often silent and unperceived part of immunization activities, is one of the components that go wrong most frequently. It is therefore essential to have personnel who are proficient in understanding and running the cold chain and others who can repair and maintain existing equipment.

Peru, in collaboration with PAHO, organized a six-week course on cold-chain equipment maintenance at Chiclayo in August and September. The 12 participants reviewed EPI goals and standards, studied the principles of refrigeration thermodynamics, examined different refrigeration systems, and participated in several laboratory exercises with different kinds of equipment.

Since the Peruvian cold-chain course was the first of its kind, PAHO is reviewing its curriculum and evaluating the feasibility of offering a similar course in other countries.

Information systems and evaluation. Progress in developing information systems and evaluation remains slow, not only because of constraints imposed by the scarcity of EPI management staff nationally and within PAHO but also because national health information systems are maturing slowly. During the year PAHO initiated an EPI information system in which participating countries submit information to it, particularly about the program's high-priority target groups—infants and pregnant women. Of particular importance are information systems for measuring vaccination coverage and morbidity and

Table 1. Reported cases of EPI diseases per 100,000 population, 1979.

Country or other political unit	Measles	Polio-myelitis	Whooping cough	Diph-theria	Tetanus	Tuber-culosis[a]
Antigua	—	—	—	—	—	2.7
Argentina	36.7	0.1	69.3	0.5	0.9	68.9
Bahamas	715.1	—	—	—	1.3	27.7
Barbados	6.0	—	0.7	4.9	2.6	10.0
Belize	—	—	—	—	—	21.5
Bermuda	—	—	—	—	—	5.1
Bolivia	82.7	7.1	33.1	0.7	2.2	144.6
Brazil	51.2	1.9	28.7	3.8	2.3	69.2
Canada	94.8	0.0	8.9	0.3	...	10.7
Cayman Islands	—	—	—	—	—	5.9
Chile	310.7	—	4.0	3.1	0.2	80.6
Colombia	68.9	1.8	42.5	0.6	2.6	41.0
Costa Rica	318.4	—	14.4	—	1.1	25.8
Cuba	76.2	—	1.5	—	0.3	11.6
Dominica	214.5	—	1.2	—	2.4	6.3
Dominican Republic	145.4	0.2	13.3	3.8	4.8	41.3
Ecuador	52.0	0.1	24.6	0.3	1.1	38.7
El Salvador	231.4	0.1	18.1	—	2.5	51.4
French Guiana	—	—	—	—	—	44.9
Grenada	3.1	—	6.2	—	2.1	9.1
Guadeloupe	—	—	—	—	—	8.4
Guatemala	49.2	0.4	21.3	0.1	1.0	80.8
Guyana	108.5	—	...	0.6	3.2	8.2
Haiti	5.3	—	4.4	0.1	1.5	105.4
Honduras	137.3	6.3	68.8	0.1	1.3	37.7
Jamaica	3.8	—	1.7	0.4	0.6	6.7
Mexico	48.8	1.1	7.1	...	...	73.0
Montserrat	—	—	—	—	—	9.1
Nicaragua	51.2	4.7	10.8	0.4	—	42.9
Panama	231.1	—	38.6	—	2.1	26.5
Paraguay	96.5	1.0	61.0	0.4	11.1	87.3
Peru	121.3	0.9	115.6	1.1	4.4	140.9
Saint Kitts-Nevis/ Anguilla	—	—	—	—	—	1.5
Saint Lucia	—	—	—	—	—	37.2
Saint Vincent	—	—	—	—	—	20.6
Suriname	...	0.3	...	0.3	...	18.1
Trinidad and Tobago	34.2	—	4.1	0.1	2.8	4.4
United States of America	6.1	—	0.6	—	—	12.6
Uruguay	45.1	—	8.0	—	0.6	66.1
Venezuela	192.0	0.5	16.1	—	...	48.5
Virgin Islands (UK)	—	—	—	—	—	—
Virgin Islands (US)	—	—	—	—	—	3.8

... Data not available.
— No cases.
[a]Data for 1979 or more recent year.

Table 2. Percentage of population of children under one year of age and pregnant women receiving vaccinations, 1979.

Country	Population under one year of age	BCG	DPT			Measles	Poliomyelitis			Tetanus toxoid[a]
			1st dose	2nd dose	3rd dose		1st dose	2nd dose	3rd dose	
Argentina	...	...	...	...	...	...	...	...	...	...
Bahamas	4,250	90	68	48	37	1	66	47	35	44
Barbados	4,400	...	73	68	60	...	73	66	58	40
Bolivia	176,600	27	34	18	10	13	48	26	12	...
Brazil	3,619,620	54	...	50	...	48	51	...	49	12
Canada	...	...	...	...	...	...	...	...	...	...
Chile	261,340	85	89	87	82	84	88	83	81	...
Colombia	826,900	41	46	25	16	11	43	25	16	...
Costa Rica	62,000	65	91	74	60	71	87	68	54	...
Cuba	196,400	...	62	54	53	39	72	74	...	...
Dominica	1,650	—	85	56	45	...	110	69	45	...
Dominican Republic	...	...	...	...	...	...	...	...	...	...
Ecuador	124,400[b]	28	32	23	15	17	33	23	13	—
El Salvador	174,000	72	78	61	40	63	77	60	40	34
Grenada	2,500	...	...	...	5	...	...	...	6	...
Guatemala	...	...	...	...	...	...	...	...	...	...
Guyana	23,000	59	57	46	33	...	61	54	37	...
Haiti	162,300	15	10	4	8	1	5	30	4	...
Honduras	156,600	15	64	39	21	22	74	48	27	...
Jamaica	...	...	...	...	...	...	...	...	...	...
Mexico	...	...	...	...	...	...	...	...	...	...
Nicaragua	...	...	...	...	...	...	...	...	...	...
Panama	...	...	...	...	...	...	...	...	...	...
Paraguay	115,600	19	27	18	10	1	28	17	5	22
Peru	666,000	49	40	23	15	21	39	22	17	...
Suriname	...	...	...	...	...	...	...	...	...	...
Trinidad and Tobago	28,500	...	52	41	28	—	55	42	28	...
United States of America	...	...	...	...	...	...	...	...	...	...
Uruguay	55,400	54	89	65	53	3	84	60	...	33
Venezuela	484,200	41	67	52	56	36	114	89	22	...

... Data not available.
— None.

[a] Includes only population in areas/provinces where EPI has been carried out (40% of total population).
[b] Pregnant women.

mortality. Putting such systems into effect will allow EPI programs to be evaluated.

Program evaluation is taught in EPI training courses. Emphasis is on reviewing operations through frequent supervisory trips to guide peripheral staff and on performing sample surveys, either for routine use in assessing vaccination coverage or for exceptional use to estimate the incidence of clinical disease or perform serologic studies.

Other aspects of evaluation which received increased emphasis were comprehensive program reviews (or "audits") using independent staff and strengthened disease surveillance.

A comprehensive and more general program evaluation methodology was elaborated and tested in collaboration with the health ministries in Bolivia and Colombia late in the year. In the multidisciplinary methodology, a group of eight to 10 professionals from various health ministry departments and two to four international staff members work together for two weeks, during which they examine all aspects of the national program and its relationship to other components of primary health care at all levels.

The experiences in Bolivia and Colombia proved highly productive. Observers from other countries who were present during the evaluations are already planning to use the same methods for evaluating their own program activities.

Another major activity was the preparation and publication in December of a document entitled "Surveillance Guidelines for the Expanded Immunization Program" whose Spanish version is to be published in 1981. It outlines simple methods of data collection, analysis, and use often applicable locally. The manual will be distributed to the countries in early 1981.

Tables 1 and 2 show the status of the hemisphere's immunization programs and reported cases of EPI diseases per 100,000 population. These data are an index of the regional program's progress, though it is recognized that their incompleteness is itself a reflection of the immaturity of different countries' information systems.

Information dissemination. The *EPI Newsletter*, which first appeared in May 1979 and is published bimonthly in English and Spanish, is distributed throughout the hemisphere to health personnel working in immunization services at all levels. Its function is to report on the new procedures, techniques, and practices constantly being developed in the various EPI fields. It also serves as a forum for exchanging information and new ideas about how to solve problems identified in national programs.

Information on the availability of cold-chain equipment and its suitability for use in national programs is periodically distributed to program managers throughout the Americas to enable them to choose the best equipment for their programs.

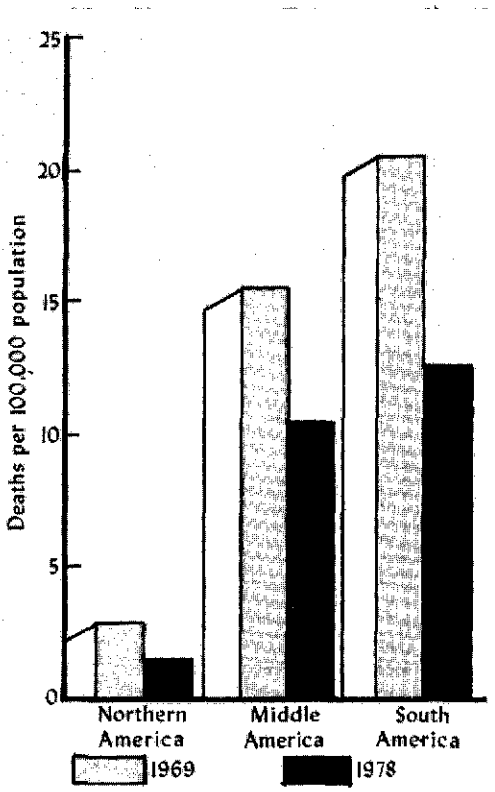
Periodic regional meetings of national program managers, the first of which will take place in 1981, will maintain the interest of immunization workers and keep them up to date on the latest knowledge and techniques in the field.

Tuberculosis

Tuberculosis is still a serious health problem which causes 40,000 deaths annually in the hemisphere. Despite the decline in mortality during the decade 1969-78 in the Americas (Figure 4), 200,000 new cases are reported every year. Though tuberculosis mortality is declining at about 5 percent yearly, this is still far below what can be expected from current treatment.

Within the last decade, all countries in the hemisphere have integrated tuberculosis control activities into their general health services, though many must still quantify the activities' objectives and improve the supervision and evaluation of tuberculosis control. The progress made in integrating diagnostic

Figure 4. Deaths from tuberculosis per 100,000 population around 1969 and 1978 in three regions of the Americas.



activities into primary health care and in the adequacy of new case reporting has resulted in an increase in reported incidences in some countries.

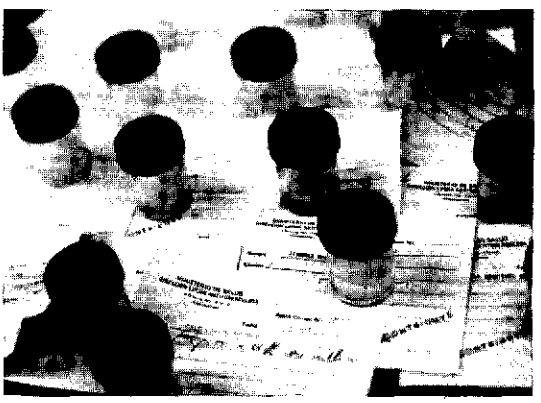
PAHO's recommended control strategies are to locate patients among coughers and people with respiratory symptoms, treat those whose sputum is positive on microscopy, and perform BCG vaccinations. All these activities are or should be part of general health services.

As in previous years, PAHO's cooperation with the countries in controlling tuberculosis included regular distribution of technical information, advisory services by permanent staff and 14 consultants, the provision of drugs and testing materials, and coordination with reference centers and international institutions. It helped organize international courses in Argentina, Chile, Cuba, and Mexico to train managers of tuberculosis epidemiology and control programs, and its Pan American Zoonosis Center (CEPANZO) in Argentina held a regional tuberculosis bacteriology course. CEPANZO also collaborated with official animal and public health agencies in Argentina in activities related to the national tuberculosis control program, advised the Buenos Aires Province public health department on producing and controlling freeze-dried BCG vaccine, and aided El Salvador, Mexico, Paraguay, Peru, and Uruguay on tuberculin testing, tuberculosis laboratory methods, and production and control of tuberculin.

The use of six- to nine-month courses of treatment with highly effective drugs such as isoniazid, rifampicine, or pyrazinamide was extended with PAHO's advisory assistance. Infant vaccination also spread, primarily because of the inclusion of BCG vaccination in expanded immunization programs. The limited effect of tuberculosis control activities is attributed mainly to insufficient simple diagnostic testing and to patients' premature abandonment of treatment. Both these problems are health system responsibilities, and experience indicates that integration of activities must be accompanied by constant program monitoring and evaluation.

In several Caribbean countries, where tuberculosis has been only a minor problem, higher rates were reported as a result of better case-finding after two seminars at the Caribbean Epidemiology Centre at Port-of-Spain in 1979. Though the benefits to be expected from BCG vaccination are smaller in these countries, most of them continue to vaccinate.

The 1980 World Health Assembly recommended (WHA33.26) that a worldwide study of the tuberculosis situation be made, that the success of tuberculosis programs as part of primary health care be investigated, that national procurement of tuberculosis drugs be



Testing for tuberculosis, San José.

(Photos: M. Montecino/PAHO)

facilitated, and that more money be provided for tuberculosis control. The suggested study was initiated in the Americas with two surveys, one on the incidence of the disease and the other on the status of tuberculosis programs. Their findings are to be submitted to PAHO's governing bodies in 1981 and analyzed by a panel of experts to be convened by WHO and the International Union Against Tuberculosis.

Two WHO study groups analyzed the unfavorable results of a BCG vaccination study in south India. A controlled trial of a Danish and a French BCG vaccine was made in an area of 360,000 people just west of Madras between July 1968 and March 1971, and 7.5 years later its preliminary followup showed that vaccination conferred no protection on those who had received it. WHO's experts concluded that the preliminary findings were not directly applicable to BCG vaccination of children, the control measure should be continued, and epidemiologic surveys need to be made in individual countries so that expected benefits can later be compared with those actually achieved through the vaccination of children. Epidemiologic conditions warrant BCG vaccination of newborns and infants in all Latin American countries, which continue to apply this policy as recommended by PAHO.

Acute respiratory infections

Because of the considerable morbidity and mortality from acute respiratory infections in children and the serious health and socioeconomic problems caused by acute and chronic respiratory diseases in adults, the 1979 World Health Assembly recommended (WHA32.33) a program against such infections.

Though few of the Americas have reliable incidence data because acute respiratory infections are not reportable, data from the mid-1970s suggest that infant mortality due to such infections may vary from 50 per 100,000 population in Canada and the United States to 1,052 in continental Middle America. More than 22 percent of infant deaths in continental Middle America were caused by pneumonias or, to a lesser extent, influenza. According to those data, acute respiratory infections were one of the three commonest causes of death in infants in 19 and in children under five years in 18 in 24 countries.

Since acute respiratory infections are a

leading cause of infant and child mortality and technical resources are available to diminish such deaths, PAHO has given this problem high priority. Together with expanded immunization and diarrhea control programs, appropriate technology can diminish child and infant mortality if carried out extensively through primary health care systems.

Several of the Americas declared their interest in this program. In April PAHO sponsored three consecutive meetings in Rio de Janeiro on this subject: a course for virologists on diagnosing respiratory viruses, a regional seminar on acute respiratory infections, and a meeting of experts from various countries to prepare a research protocol on the etiology, clinical treatment, behavior, and course of pneumonia in children seen in health services.

With PAHO support, Brazil and Mexico began research on the program's epidemiologic and operational aspects to obtain data necessary for organizing national control programs. Other countries, such as Argentina, Bolivia, and Venezuela, have started epidemiologic surveys and programming activities.

Leprosy

Leprosy continues to be a major public health problem in Latin America and the Caribbean, where a quarter-million cases are registered in 31 countries and territories and almost 20,000 new cases are reported yearly. Half of all new cases are of the lepromatous or infectious type.

Although leprosy control is still hampered by the low efficacy of available measures against it, significant advances in treatment were made during 1980 thanks to the introduction of a new drug (rifampicine), integration of case-finding and therapy into primary health care, coordination with tuberculosis control programs, and development of a promising vaccine.

In 1972 the health ministers of the Americas recommended at their Santiago meeting that leprosy surveillance and control activities be further developed and improved as integral parts of general health services and that a regional leprosy training and research center be established to help define uniform control methods. These recommendations, reinforced by several WHO and PAHO resolutions (WHA29.70, WHA32.39, CD26.37), have gradually been carried out.

PAHO provided advisory services through its regular staff and consultants. Five national control programs were provided drugs, and five others received grants for various field activities.

It also provided training to eight fellows from several countries in the yearly leprosy control course conducted at the Pan American Center for Research and Training in Leprosy and Tropical Diseases (CEPIALET) in Caracas and through a seminar in Saint Lucia for 17 participants from three Caribbean countries. An Andean subregional seminar on leprosy control at which the national programs of Bolivia, Colombia, Ecuador, Peru, and Venezuela were analyzed was held at Lima in July.

PAHO signed two important leprosy agreements during the year, one with Venezuela for further research and training at CEPIALET and the other with the Dominican Republic to provide advice on a combined leprosy-tuberculosis control program in that country.

In the area of research, CEPIALET continued to develop a leprosy vaccine mixing live BCG and killed leprosy bacilli.

Voluntary organizations continued to support leprosy control, either directly to the countries or through PAHO. A contribution by the Japanese Shipbuilding Industry Foundation (JSIF) allowed a regional post for a nurse to develop training aids and programs to be created and the second meeting of the standing committee on leprosy control in the Caribbean to be held. JSIF and the German Leprosy Relief Association financed a subregional seminar at Lima in which

representatives from Bolivia, Colombia, Ecuador, Peru, and Venezuela participated. The Damien Foundation contributed funds for a special combined leprosy and tuberculosis control program in the Dominican Republic. A PAHO program for the Caribbean received support from the International Leprosy Association (ILA), JSIF, and Emmaüs Suisse, and several other countries in the hemisphere received program support from ILA and its national affiliates.

Diarrheal diseases

Although acute diarrheal diseases remain a leading cause of childhood morbidity and mortality in most of the Americas, prospects for their control are steadily improving. Intensive research in recent years into almost all aspects of diarrheal diseases has led to a number of breakthroughs and technical innovations which, added to traditional prevention and control measures, provide a basis for controlling them.

Diarrheal diseases are the leading cause of death in children under five years in 10 of 24 Latin American countries (Table 3). Rates for Latin America range from 75.9 in the Caribbean to 381.5 in continental Middle America.

Initiated by the 1978 World Health Assembly (WHA31.44) as a global high priority and further supported by the PAHO Directing Council (CD26.38, CD27.9), the diarrheal disease control program relies on five major strategies: early treatment of acute diarrheal episodes through oral rehydration therapy and suitable dietary management; improved child care practices, including promotion of breastfeeding, proper weaning, and personal hygiene; health education; improved water supply, environmental sanitation, and food hygiene; and epidemiologic surveillance.

The program's medium- and long-term objectives are to reduce diarrheal disease mortality and morbidity by integrating its activities in existing primary health care systems. Such integration is now underway in several member countries, while others plan to begin it in 1981.

The program has two main components, operations and research. In the former area, PAHO has sponsored several regional and subregional planning meetings over the past three years in which representatives from more than 30 countries have participated. Two regional training centers, in Costa Rica and Jamaica, have been designated and receive PAHO support. Technical cooperation in national programming or manpower training has been provided to 12 countries. Increased activity is expected in this area in 1981, particularly as new training manuals and course materials become available and are adapted to the needs of specific countries. Subregionally, two courses for national program managers are planned for 1981.

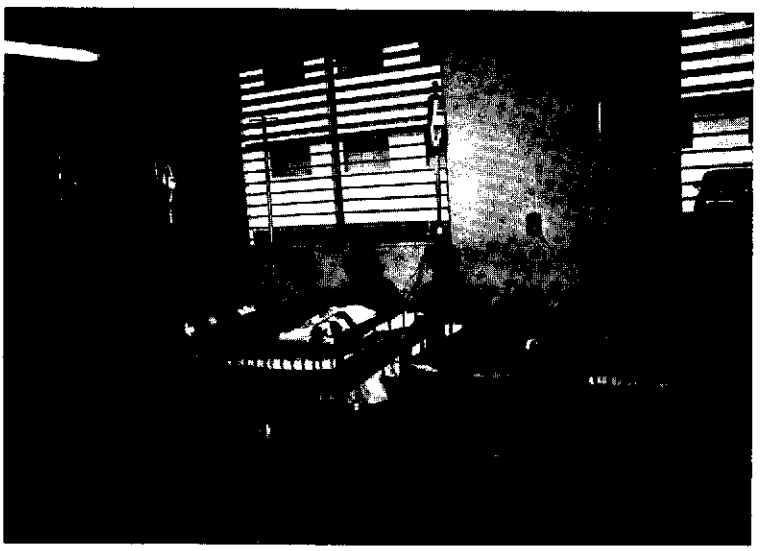
In planning their national programs, PAHO urges countries to adopt as their medium-term goal the reduction of diarrheal case fatality rates to less than 1 percent. Other suggested goals are reducing hospital diarrheal admissions by half and, as an indication of the cost-effectiveness of oral rehydration therapy, reducing annual government expenditures to treat acute diarrheal diseases by 50 percent or more. Preliminary results indicate that several countries have achieved or surpassed these goals in the last two years.

To maximize therapeutic benefits, PAHO has adopted the goal of regional self-reliance in producing oral rehydration salts by 1984. In close coordination with UNICEF and WHO, PAHO consultants have so far advised 17 countries on local production and quality assurance, and at least 15 are now producing the salts. Colombia has announced its intention to start production in sufficient quantities to satisfy national and, eventually, subregional requirements. UNICEF and WHO will contribute equipment and raw materials to this project. To ensure that local formulations conform to WHO/UNICEF specifications, a regional production workshop will be held at Bogotá in 1982.

To complement program operations,

Table 3. Number and percentage of total deaths from diarrheal diseases among children under 5 years of age, with rates per 100,000 population, in the subregions of the Americas, around 1978.

Subregion	Age in years								
	<1			1–4			<5		
	No.	Rate	%	No.	Rate	%	No.	Rate	%
Northern America	788	21.3	1.6	66	0.5	0.7	854	4.9	1.4
Middle America	38,839	1,137.3	22.4	16,876	126.5	25.2	55,715	332.4	23.1
Caribbean	1,595	340.8	13.0	448	20.2	12.7	2,043	75.9	13.0
Continental	37,244	1,263.8	23.1	16,428	147.7	25.9	53,672	381.5	23.9
South America	24,737	825.0	17.7	11,848	105.7	20.8	36,585	257.6	18.6
Tropical	20,958	1,031.8	20.8	11,342	144.3	22.4	32,300	326.6	21.3
Temperate	3,779	390.6	9.7	506	15.1	7.9	4,285	99.3	9.5
	64,364			28,790			93,154		



Oral rehydration for diarrheal episodes is advancing rapidly in the Americas, helping to reduce the frequent overcrowding of hospital intravenous rehydration wards in Port-au-Prince, as shown above. A nurse's aide feeds a baby a glucose-electrolyte solution, and a father performs the same task.

(Photos: M. J. McQuestion/PAHO)

regional research activities are shifting from the major clinical studies of the past two years toward operations research in the field. WHO awards grants for basic diarrheal disease research, while each regional office administers funds for operations research. During 1980, PAHO provided technical or financial support for research in nine countries, and assistance for at least four more projects is planned in 1981. Most of these projects focus on refining program delivery methods; others deal with behavioral, fiscal, clinical, and training problems in specific countries.

Finally, human rotavirus enzyme-linked immunosorbent assay reagents were distributed to more than 30 regional laboratories, each of which currently participates in a laboratory proficiency-testing system administered by PAHO's Institute of Nutrition of Central America and Panama at Guatemala City. This system will considerably enhance the diagnostic capabilities of major national laboratories, since rotaviruses have recently been found to account for almost half of all infant diarrheas.

Bacterial diseases

The chief aim of PAHO's bacterial disease program is to provide technical expertise in response to national requests, particularly in emergency or epidemic situations. The diseases of principal interest are plague, meningococcal meningitis, and typhoid fever.

Sporadic cases of plague occurred in at least three countries (Bolivia, 23; Brazil, 91, and the United States, 18), though it is thought that most cases go unrecognized. As a result of a PAHO-sponsored subregional course at Piura, Peru, revised surveillance procedures using domestic sentinel animals as indicators of local plague activity were introduced in Peru and will be initiated in Bolivia in 1981. An international plague consultation is planned for early 1982 at PAHO headquarters.

Although endemic in the hemisphere, meningococcal meningitis occurred in small outbreaks in Cuba, Panama, and Paraguay in late 1979. PAHO provided technical cooperation for the resulting epidemiologic investigations.

A large-scale prospective trial of an experimental oral typhoid vaccine in Chile continued to receive PAHO support, but last-minute problems in producing the vaccine set the study back a year. Several collateral studies on the basic epidemiology of typhoid and the role of carriers were conducted or are planned for 1981 in connection with this vaccine trial. Their composite findings may become the basis for a nationwide typhoid control effort.

Sexually transmitted diseases

The magnitude of the problem of sexually transmitted diseases (STD) remains essentially unknown throughout the Americas. Some countries such as Canada, Costa Rica, Cuba, and the United States have relatively reliable data on the incidence of gonorrhea and syphilis. No information is collected, however, on the incidence of other STD such as chlamydia-associated nongonococcal urethritis, trichomoniasis, *Herpes simplex* infections, hepatitis B, amebiasis, and salmonella infections.

Most of these diseases are important because of their serious, debilitating, long-term complications, foremost among which is pelvic inflammatory disease (PID). PID is responsible for sterility, ectopic pregnancy, and chronic pelvic pain. The magnitude of this problem is only now being recognized in the United States, where 600,000 to 900,000 cases occur each year at an economic cost of $1.25 billion. The severity of PID as a public health problem throughout the Americas is unknown. In April, PAHO cosponsored an international PID symposium at CDC.

With the exception of the four nations mentioned above, few countries have well-

organized STD control programs. Although most countries have developed guidelines and standards for diagnosis and treatment, few have undertaken the epidemiologic studies needed to define high-risk groups, identify priority areas for intervention, and carry out disease control strategies. Each country must decide the most suitable mixture of case-finding, screening, contact tracing, surveillance, and laboratory techniques from knowledge of STD epidemiology in its population. It is clear, however, that the interventions chosen must be provided through existing primary health care systems.

PAHO again sponsored an international STD training course in Chile and assisted in developing and carrying out a research protocol to assess the efficacy of several treatment regimens for gonococcal infection and the susceptibility of *Neisseria gonorrhoeae* to antibiotics. It also encouraged surveillance of special penicillin-resistant (penicillinase-producing) *N. gonorrhoeae* strains. Isolates had earlier been identified in Argentina, Canada, Mexico, and the United States, and in 1980 the strain was identified in Panama and the United States reported an upsurge in isolations.

PAHO's policy is to strengthen available human resources through clinical, laboratory, epidemiologic, and managerial training. The United States has established a Spanish-language STD training center in Puerto Rico. PAHO has helped organize the first world congress on STD, to be held in Puerto Rico in 1981.

Rickettsial and viral diseases

PAHO's basic approach to rickettsial and viral diseases has been to develop adequate laboratory diagnostic capabilities through training programs, reagent provision, consultations, manual development, and proficiency testing. It conducts surveillance programs for diseases that can be effectively controlled and distributes information bulletins about several.

Rickettsia. Two important rickettsial diseases in the Americas are louse-borne epidemic typhus and Rocky Mountain spotted fever. Although they are endemic in certain areas, little is known about the true extent of the morbidity and mortality they cause.

In 1980 five countries (Bolivia, Costa Rica, Ecuador, Peru, and Trinidad and Tobago) reported 67 cases of louse-borne epidemic typhus, of which Peru accounted for two-thirds. Rocky Mountain spotted fever occurs sporadically throughout North and South America. It was suspected to exist in Middle America as well, but confirmation did not occur until 1980 when three fatal cases in Costa Rica were carefully investigated and *Rickettsia rickettsii* was isolated from one.

Influenza. Nine laboratories in the Americas monitored influenza as collaborating centers in WHO's global influenza surveillance program. These laboratories are located in Argentina, Brazil, Canada, Chile, Colombia, Guyana, Jamaica, Peru, and the United States. Much more information on the epidemiology of influenza viruses in countries other than Canada and the United States is needed to formulate vaccination and control policies.

Hepatitis. The three forms of hepatitis—A, B, and non-A/non-B—are a major public health problem in rural and urban areas throughout the world. Two hundred million people are chronically infected with type B alone. The magnitude of the problem in Latin America and the Caribbean is not well understood for lack of systematic, laboratory-based serologic studies, but 1.2 to 1.5 million cases of type A and a half-million cases of type B are thought to occur yearly. The non-A/non-B type probably occurs, but its extent is unknown.

It is now clear that sexual transmission may be primarily responsible for the spread of type B in certain populations. A successful human field trial of a new hepatitis B vaccine

in the United States produced 96 percent serum conversion rates and an efficacy rate of 92 percent.

Hemorrhagic fever. Several viral hemorrhagic fevers continue to be focal problems in some countries. A special project conducted by Argentina's National Center for the Study of Argentinian Hemorrhagic Fever at Pergamino, advised by PAHO's Pan American Zoonosis Center and financed by UNDP, to develop a vaccine against Junín virus, the agent causing Argentinian hemorrhagic fever, has progressed satisfactorily and will continue until human field trials can be completed. A seed virus has been developed as a candidate vaccine.

Dengue. Dengue, like yellow fever, is spread by the *Aedes aegypti* mosquito. The dengue type 1 pandemic that occurred in the Caribbean in 1977 and continued there the following year has now tapered off. In 1980 there were between 8,500 and 9,000 reported cases, mostly of type 1—a sharp contrast to the almost half-million cases reported in 1977.

The disease spread northward through Mexico as anticipated. Late in the year the United States reported the first indigenous continental transmission of dengue since 1945. Seventeen persons who had not traveled abroad developed the disease. Only three countries (Colombia, El Salvador, and Honduras) reported more than 1,000 cases each. Surveillance was strengthened to detect dengue hemorrhagic fever, but no cases were reported.

Yellow fever. Since 1972 the incidence of jungle yellow fever has been upward. The disease peaks in two- or three-year cycles and is gradually spreading to areas where no cases were previously reported. In 1980 seven American countries—Bolivia, Brazil, Colombia, Ecuador, Peru, Trinidad and Tobago, and Venezuela—together reported 116 cases.

Following a 1979 outbreak in humans and simians in Trinidad and Tobago, PAHO collaborated with that country's health ministry in a study to determine the extent of yellow fever virus in monkeys. This included an assessment of the simians and their movements, monkey capture, and virologic sampling. Virus was isolated from sick and apparently healthy *Alouatta palliata.*

In response to the relatively large number of cases of jungle yellow fever in 1978 and 1979, PAHO sponsored an international meeting on yellow fever at Belém, Brazil, in April.

PAHO is acting to ensure that adequate supplies of 17-D yellow fever vaccine are available for routine and emergency use. Production of lyophilized yellow fever vaccine in the Americas ranges from 8 to 13 million doses

Vaccination against yellow fever in Colombia.

(Photo: J. Moquillaza/PAHO)

per year. The main producers of the vaccine are the Oswaldo Cruz Foundation (FIOCRUZ) at Rio de Janeiro (8 to 10 million doses annually) and Colombia's National Health Institute (1 to 3 million doses). Because their facilities have not been renovated or replaced, considerable concern exists about their capacity to maintain their present level of production in the future.

The paradox of yellow fever's spread at the same time vaccine availability is fast diminishing led the participants in the Belém meeting to call for a review of vaccine production technology. Two actions were undertaken as a result. First, a regional cooperation program was begun in October with technical assistance from the U. S. Food and Drug Administration's bureau of biologics, which is the PAHO/WHO yellow fever vaccine reference laboratory. The first lots of yellow fever vaccine from FIOCRUZ and the Colombian institute are being tested. It is hoped that certification of the vaccines by the reference laboratory will increase the 17-D vaccine produced in the Americas available for international trade, and at the same time strengthen the Brazilian and Colombian vaccine control laboratories.

It was also decided at Belém to convene a PAHO-assisted meeting in January 1981 to consider how recent developments in virology could help modernize yellow fever vaccine production and testing and so bring about a cheaper, more effective, and safer vaccine.

Aedes aegypti *eradication*

Vector-borne diseases such as dengue and yellow fever—both spread by *Aedes aegypti*—continue to be among the world's most important health problems, but progress in controlling them has been slow. Funds for control operations have decreased, fewer new insecticides are reaching the market, the resistance of vector species to chemical insecticides is growing, and people sometimes overreact to the fact that haphazard pesticide use causes environmental pollution.

A. aegypti infestation remains widespread and appears to be increasing in the Americas. Many towns in the Caribbean, Colombia, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, United States, and Venezuela are affected. The risk of urban yellow fever transmission is greatly increased, though no documented outbreaks have so far occurred.

Several activities during the year focused attention on *A. aegypti* and may lead to improvements in control and eradication programs. Participants in PAHO's Belém meeting noted the relative lack of information on the epidemiology of jungle yellow fever, its potential for invading towns and cities near endemic areas, and the need to improve vector surveillance and control. Three countries registering cases of jungle yellow fever—Bolivia, Colombia, and Trinidad and Tobago—had *A. aegypti* infestations in communities close to endemic areas.

PAHO increased its manpower, equipment, insecticide, and financial resources to meet the new challenge. It began preparing vector control manuals and guides and encouraging countries to incorporate research in their control programs. To ensure better cooperation with health ministries, technical staff were assigned to the Caribbean, Central America, and Colombia, and coordination of information and activities between them was improved.

No notable changes in *A. aegypti* surveillance and control occurred in the Caribbean, where many islands are infested. Financial restrictions do not allow active control measures, though almost every country and territory increased its control budget in 1980. Aruba, Bermuda, Bonaire, Cayman Islands, Saba, and St. Eustatius were in the consolidation phase.

In Central America, the 24 localities found reinfested in Costa Rica in 1977 were negative and the health ministry there placed a high priority on control activities. Guatemala con-

(Photo: J. Moquillaza/PAHO)

Aedes aegypti mosquitoes, the vectors of yellow fever and dengue, often infest houses. Here a health worker in Tuluá, Colombia, searches for them.

tinued to control *A. aegypti* in the principal towns in Coatepeque, Escuintla, Retalhuleu, and Suchitepéquez Departments. There were coordinated control activities on the Mexican border through an agreement between Guatemala and Mexico. Honduras was able to maintain house infestation indices of 1 percent in Tegucigalpa and Comayagüela. In San Pedro Sula, however, spraying was limited to ultralow-volume malathion applications and there were deficiencies in technical staffing. Nicaragua developed an operations plan to control *A. aegypti* in three areas in Chinandega Department. Panama, after being free of the mosquito for more than two years, discovered a small reinfestation in Colón and brought it under control.

In South America, Argentina, Chile, Ecuador, Paraguay, Peru, and Uruguay were free of *A. aegypti* but kept up their surveillance programs. Brazil's *A. aegypti* eradication program is active in Bahia State and Rio de Janeiro. A surveillance system is in operation throughout the country, especially in vulnerable areas such as sea and airports.

To improve *A. aegypti* control throughout the hemisphere, PAHO began evaluating the way in which national *A. aegypti* program activities are reported to it and is examining ways of improving the reporting system. It also started a reevaluation of its own research and training projects to find better answers to *A. aegypti* control problems.

PAHO reinstituted its monitoring for insecticide resistance in *A. aegypti*. This was especially timely because of unconfirmed reports of organophosphorus resistance in the Caribbean. Regardless of the reports, temephos against larvae and malathion or fenitrothion against adults continue to be the mainstays of control.

Because *A. aegypti* biology and ecology are poorly understood, PAHO's *A. aegypti* unit in Colombia and entomologists from its Caribbean Epidemiology Centre and Trinidad and Tobago began a series of studies to increase knowledge of the ecology and vectoral capacity of these mosquitoes. Through a grant from the Netherlands this research will be increased. Though primarily devoted to the anopheline mosquitoes that spread malaria, PAHO's vector research unit at Tapachula, Mexico, began investigating the distribution of *A. aegypti* in the southern part of that country.

PAHO's Research and Reference Center on Vector Biology and Control at Maracay,

Venezuela, tested the insect growth regulator methoprene as an *A. aegypti* attractant in ovitraps, and Anguilla initiated an islandwide control program using it.

To be truly effective, research information must be broadly disseminated. To accomplish this, courses on modern insecticide and mass immunization equipment were given in Colombia. PAHO's vector control unit in Colombia's National Health Institute at Bogotá and the Maracay center trained entomologists, parasitologists, and vector control specialists from throughout the Americas. This union of research and training will be expanded and additional courses are in preparation.

Research and the development of new ways to control vector-borne diseases have been severely hampered by the lack of professional medical entomologists. To improve this situation, a degree course in medical entomology has been offered at Valle University in Guatemala and master's degree courses are being planned in Panama and Venezuela.

As training of vector control specialists and medical entomologists expands, certain routine activities such as monitoring developing resistance, vector distribution studies, and equipment and insecticide evaluation will become national responsibilities.

Malaria

The number of malaria cases recorded in the Americas continued to rise. While some countries were able to keep malaria under control, the situation deteriorated in others. No significant change occurred in relation to the population in areas of different phases of eradication.

Of the 230,366,000 people living in the hemisphere's originally malarious areas at the end of the year, 58,659,000 (25.4 percent) were in areas where transmission still occurred (attack phase), 57,087,000 (25.1 percent) were in areas where malaria transmission had been interrupted (consolidation phase), and 114,620,000 (49.5 percent) were in areas where malaria had been eradicated (maintenance phase).

The malaria situation at the end of the year (Figure 5) can be summarized by dividing the countries into four groups to describe the progress achieved, problems encountered, and projects for improvement (Table 4).

Group I. Twelve countries or territories with a population of 72,844,000, or 31.5 percent of the population in the hemisphere's originally malarious area, had eradicated the disease (Chile, Cuba, Dominica, Grenada and Carriacou, Guadeloupe, Jamaica, Martinique, Puerto Rico, Saint Lucia, Trinidad and Tobago, mainland United States, and the U.S. Virgin Islands). More cases were registered in this group in 1980 in comparison with previous years, but all were imported and there was no evidence of transmission.

Group II. Eight countries or territories with a total of 15,002,000 people, or 6.5 percent of those in the originally malarious area, had interrupted or almost eliminated malaria transmission, with the exception of Belize, Dominican Republic, and Guyana where the number of cases increased. The epidemiologic situation deteriorated in those countries, due mainly to the importation of more cases from neighboring countries, insufficient coverage, or untimely application of antimalarial measures and inadequate budgeting for equipment, materials, and transportation. In previous years, however, the situation in the three countries had responded favorably to attack measures.

Group III. The five countries in this group continued their antimalarial activities but made little progress during the year. In Brazil, DDT spraying was suspended in an area of 47,481 km^2 with 680,671 inhabitants, and another area of 11,641 km^2 with 58,297 inhabitants was transferred from the consolidation to the maintenance phase. More malaria cases were registered in the country because of outbreaks in new human settlements in the Amazon basin. The epidemiologic situation in Suriname deteriorated due to an outbreak

Figure 5. Status of the malaria program, 31 December 1980.

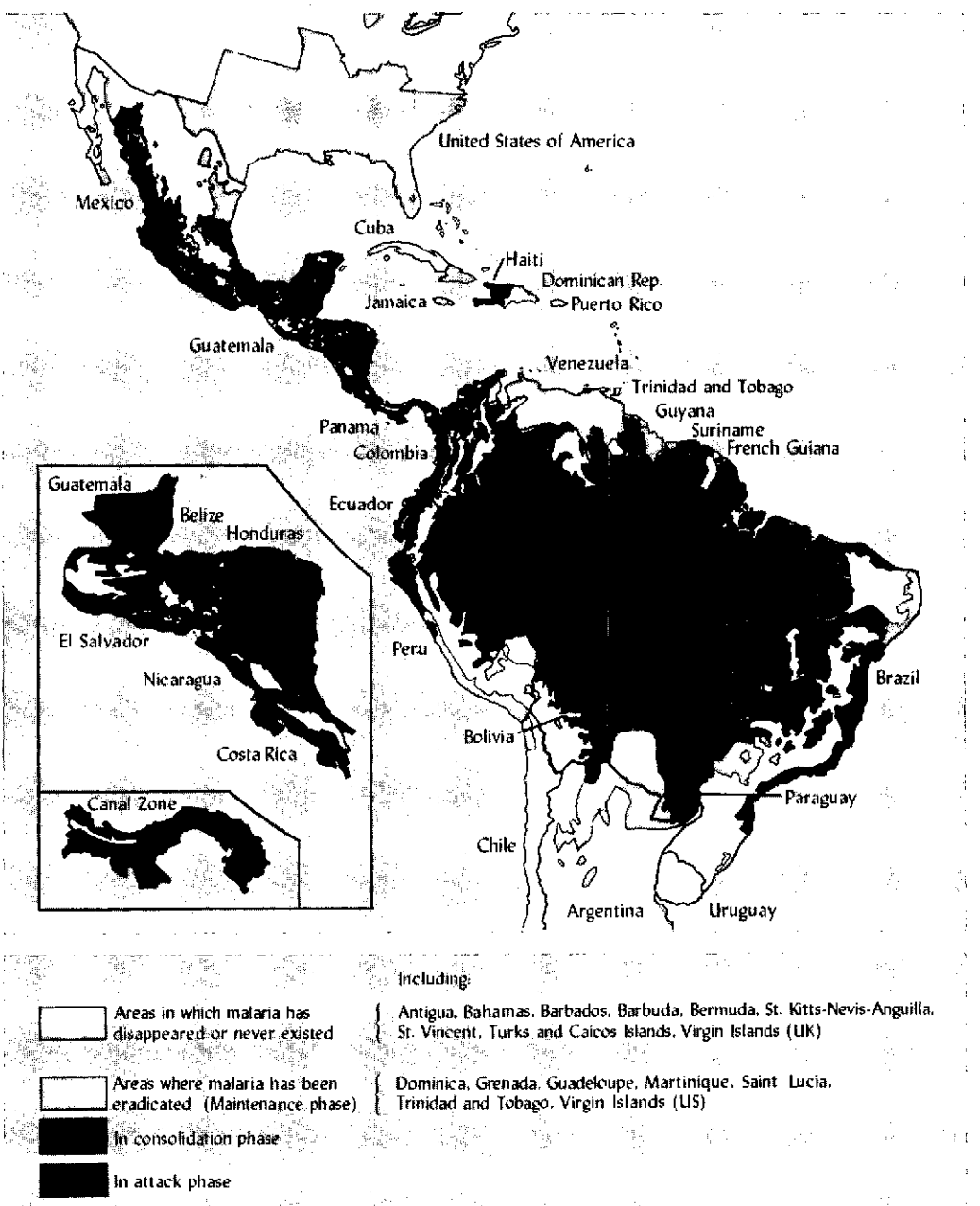


Table 4. Reported cases of malaria, 1977–1980.

Group	Population in originally malarious areas, 1980 (*in thousands*)	Cases registered			
		1977	1978	1979	1980
Group I					
12 countries or territories in which malaria eradication has been certified	72,844[a]	531	718	1,162	2,187
Group II					
Argentina	3,342	463	325	936	341
Belize	158[a]	894	1,218	1,391	1,529
Costa Rica	642	217	313	307	376
Dominican Republic	5,397	745	1,531	3,080	4,270[b]
French Guiana	65	488	266	604	829[c]
Guyana	900	1,563	927	2,294	3,202
Panama	1,882	674	263	316	300
Canal Zone	45	4	5	0	6
Paraguay	2,571	156	156	116	140
Subtotal	15,002	5,204	5,004	9,044	10,993
Group III					
Brazil	49,757	104,436	121,577	147,630	124,977[d]
Ecuador	4,890	11,275	9,815	8,207	8,748
Mexico	36,360	18,851	19,080	20,983	17,875[e]
Suriname	284	993	876	903	4,445
Venezuela	10,365	5,304	5,065	4,705	3,895[c]
Subtotal	101,656	140,859	156,413	182,428	159,940
Group IV					
Bolivia	2,002	10,106	10,897	14,712	16,619
Colombia	16,659	63,888	53,412	60,957	57,346
El Salvador	4,228	32,243	52,521	75,657	95,835
Guatemala	2,730	34,907	59,755	69,039	62,657
Haiti	4,378	27,679	60,472	41,252	48,880[b]
Honduras	3,267	39,414	34,554	25,297	42,814[c]
Nicaragua	2,733	11,584	10,633	18,418	23,741[c]
Peru	5,867	32,410	20,376	17,127	11,379[f]
Subtotal	41,864	252,231	302,620	322,459	359,271
Total	231,366	398,825	464,755	515,093	532,391

[a] Mid-year 1979, last available population figure.
[b] Up to November.
[c] Provisional data.
[d] Up to September.
[e] Up to October.
[f] Up to August.

along an interior river. No major changes were observed in the other three countries.

Group IV. There was general deterioration in the remaining eight countries. The problem of vector resistance to all common insecticides used along the Pacific coast of Central America obliged El Salvador, Guatemala, and Nicaragua to use costly and geographically limited alternative antimalarial measures. Honduras had serious administrative and operational problems in addition to vector resistance. Since 1979, when the malaria program was integrated into Honduras' general health services, antimalarial measures have not been applied with enough coverage and supervision.

In Haiti, vector resistance to DDT was confirmed. Peru merged its malaria program in its general health service in 1978, and since then no systematic antimalarial measures have been applied. Epidemiologic information provided by a network of voluntary collaborators has decreased so much that precise evaluation of Peru's malaria status is not possible, but the situation appears to have deteriorated seriously. Colombia continued to carry out antimalarial activities according to its new policy of stratifying malarious areas and concentrating resources and efforts in accordance with malaria endemicity and its effect on socioeconomic development.

The lack of progress in malaria control has aroused the concern of American governments during the past two years. In 1978 the Pan American Sanitary Conference adopted a resolution reaffirming that eradication is the final goal of the malaria program in the Americas. The Directing Council reviewed the malaria program in 1980 and asked the governments and PAHO to reformulate national malaria plans according to each country's specific situation, give high priority to financing and executing such plans, explore all possible sources for supporting malaria activities nationally and regionally, strengthen training, and increase field research.

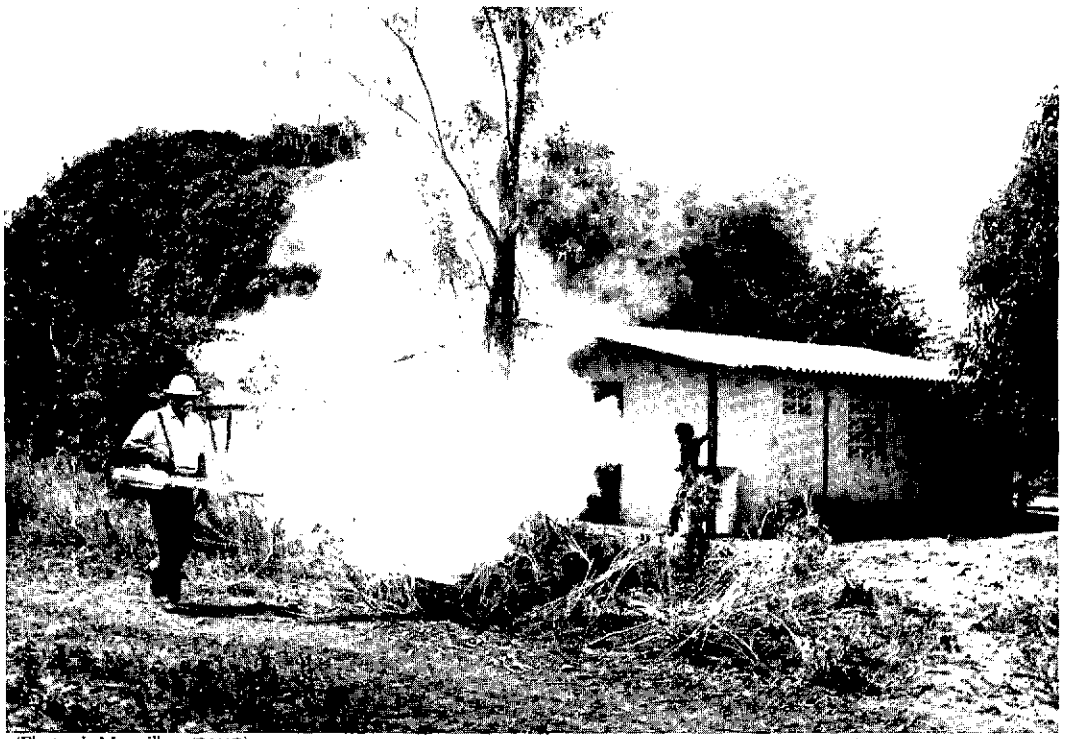
In compliance with these resolutions, PAHO and the governments have carried out the following major activities: a review and reformulation of the national malaria plans in 12 countries; elaboration of a hemispheric plan in support of the malaria programs and presentation of the plan at the subregional planning meetings in Buenos Aires, Guatemala City, Lima, and Port-of-Spain; studies of training needs, existing teaching institutions, and possible sources of training funds in seven countries (Brazil, Colombia, Cuba, Guatemala, Mexico, Peru, and Venezuela); and promotion of national research activities and reorientation of PAHO's research project at Tapachula, Mexico.

Despite several constraints, the following research activities were in progress during the year:

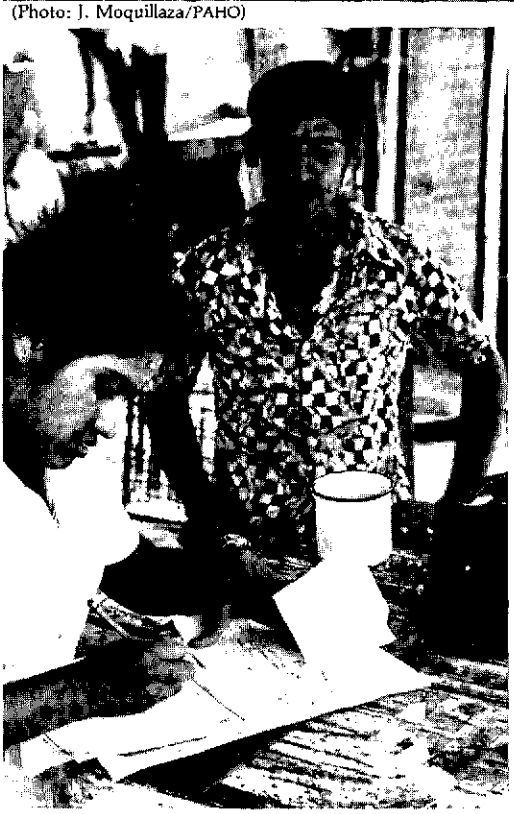
In insecticide field trials, extensive studies of mosquito susceptibility to new insecticides were conducted in El Salvador to design combinations of multiple attack measures. Contact bioassays with moderately and highly resistant *A. albimanus* strains showed acceptable mortalities for up to 40 days on wood surfaces, while noncontact bioassays showed practically no fumigant effects.

Residual house spraying with deltamethrin was tested in Guatemala. Furniture, hanging objects, and household articles were not sprayed. Preliminary bioassay results showed *A. albimanus* mortalities of 98.3 percent on wood and 85.9 percent on block surfaces seven months after spraying. Residents of the test houses showed some irritation to the sprays which is being quantified.

A field trial began in February in Haiti to compare the relative efficacy of DDT, malathion, and fenitrothion under local conditions in 11,000 to 13,000 houses. Although it is still too early to evaluate the results, bioassays of fenitrothion-sprayed surfaces showed 100 percent *A. albimanus* mortality throughout the three-month cycle, whereas mortality was considerably reduced with DDT and malathion by the end of the cycle. In a trial of fenitrothion in Les Cayes, one of the



(Photo: J. Moquillaza/PAHO)



(Photo: M. Montecino/PAHO)

Because a malaria case occurred in the house above in Venezuela, it is sprayed to kill potential new vectors. Below left, a health worker at Ciudad Madero, Mexico, records data during an antimalaria campaign, and at right pricks a boy's finger to draw blood for malaria parasite infection testing.

(Photo: M. Montecino/PAHO)

two most important foci in the country, malaria transmission was considerably reduced after six four-month cycles.

The biologic control agent *Bacillus thuringiensis israeliensis* was used in a small field trial against anopheline larvae in Venezuela.

In the area of immunology, the malaria unit at Colombia's National Health Institute at Bogotá is carrying out primate investigations to help develop a malaria vaccine. It is developing suitable simian models for studying human malaria and evaluating simian hosts for their usefulness in testing malaria antigens and the optimal methods for collecting, reproducing, and preserving parasites for antigen preparation. The unit has developed immunologic tests such as continuous *in vitro* cultivation and serologic and immune complex techniques. It has also typed South American plasmodial parasite strains according to their response to antimalarial drugs and started preliminary research to characterize such strains biochemically and antigenically.

In the area of chemotherapy, *in vitro* assessment of *Plasmodium falciparum* sensitivity to chloroquine showed that 80 percent of isolates studied in Brazil, Colombia, Ecuador, and Panama are resistant to 1.5 nanomoles or more of chloroquine diphosphate per milliliter of blood.

In Haiti, isolates showed that *P. falciparum* maintains great susceptibility to the same levels observed in 1971. In El Salvador and Honduras no indication of resistance has been observed. Results in Nicaragua were somewhat different since 1.25 nMol of chloroquine per milliliter of blood were required to inhibit schizont maturation instead of the 0.75 nMol/ml observed in 1976.

Clinical and routine followup observations in Brazil and Colombia suggest an increasing number of failures to treat *falciparum* infections with combined pyrimethamine and sulfadoxine.

Brazil, with PAHO cooperation and financial support from the Special Program for Training and Research in Tropical Diseases, completed the second phase of an investigation of the efficacy, tolerance, and pharmacodynamics of mefloquine, an alternate antimalarial belonging to the quinolinomethanol group. Analysis of the clinical and pharmacologic data produced at the Barros Barreto Hospital in Belém, Brazil, is underway.

Other parasitic diseases

Diseases caused by protozoan and helminthic infections, a serious public health problem in the Americas, are advancing rather than receding despite efforts to control them. Several reasons explain this situation, most of which are social and economic rather than medical. Rapid urbanization increases the transmission of water- and food-borne diseases, including parasitic infections, because cities are ill equipped to provide safe water and sanitary facilities to large influxes of people. Migrations to open new lands for agriculture, animal husbandry, and mineral and oil prospecting as well as the seasonal movements of agricultural workers are also recognized factors in the spread of parasitism.

Because of the importance of socioeconomic factors in the transmission of parasitic diseases, existing technology, however advanced, has not been able to cope with these problems, particularly in tropical and subtropical climates.

Recognizing this situation, PAHO promotes integrated parasitic disease control. The Special Program for Research and Training in Tropical Diseases (TDR) sponsored by WHO, UNDP, and the World Bank also cooperates in this effort. Among TDR's target diseases are Chagas' disease, schistosomiais, filariasis, and leishmaniasis.

Chagas' disease. Trypanosoma cruzi, the causative agent of Chagas' disease, occurs in a variety of mammals to such an extent that an equilibrium has been established between the parasite and the host and the disease is considered a typical zoonosis.

Humans become naturally infected when their skin or mucous membranes come in contact with feces of infective triatomine vectors. This situation is more likely to happen when housing conditions allow insects to breed in homes and when animal reservoirs are close by. After an acute period, the disease enters a chronic stage in which the heart and other organs are affected. Sudden death may occur in young persons, and those who survive may have shortened lives.

Ten to 15 million people in the Americas are infected. Because of migration from rural to metropolitan areas, blood transfusion transmission is becoming a problem in addition to natural infection.

Control measures are based on short-term vector control though insecticiding and long-term housing improvements. Chemotherapy is effective in acute cases, which are difficult to detect, but treatment is less effective in chronic cases.

The health ministries are becoming increasingly aware of the problem, to the extent that Argentina, Brazil, Uruguay, and Venezuela have established national control programs, while Ecuador, Paraguay, and Peru have established similar programs in high-prevalence areas.

Epidemiologic studies and pilot control activities are being carried out in Bolivia and Chile. In addition, Colombia, Costa Rica, Cuba, El Salvador, Guatemala, Mexico, and Panama are carrying out basic epidemiologic work on this problem. Some countries—both industralized and developing—are carrying out basic parasite and chemotherapy research (Argentina, Brazil, Federal Republic of Germany, United Kingdom, United States, and Venezuela, among others).

Through its Research and Reference Center on Vector Biology and Control at Maracay, Venezuela, PAHO supported studies on housing, parasite strain characterization, and vector ecology and insecticide screening, as well as training in vector taxonomy and biology.

The study of the effect of house modification on the transmission of *T. cruzi* continued in Trujillo State, Venezuela. The country allotted a substantial budget to supplement the Edna McConnell Clark Foundation's grant to this project. A site was chosen for building experimental houses to test various surface plastics and other construction materials. The better materials will be used in village trials.

The Maracay center also continued its evaluation of insecticides against *Rhodnius prolixus*. Field trials with fenitrothion and pirimephos-methyl were begun and gave good results during the first three months. The field trial of bendiocarb which began in August 1979 was terminated in June when 30 percent of the treated houses became reinfested. A new trial using another formulation is planned.

With TDR support, PAHO sponsored or helped organize meetings on serodiagnosis (São Paulo), clinical epidemiology (Brasília), and the epidemiologic, social, and economic aspects of present and future methods of Chagas' disease control (Mexico City).

Schistosomiasis. Of the three major flukes that cause schistosomiasis in tropical and subtropical parts of the world, only one—*Schistosoma mansoni*—occurs in the Americas. Transmitted by snail hosts, the disease occurs in Brazil, Dominican Republic, Guadeloupe, Martinique, Puerto Rico, Saint Lucia, St. Martin, Suriname, and Venezuela.

Chemotherapeutic agents against the disease are effective and relatively safe, but because it is difficult to cure all cases in endemic areas, chemotherapy must be complemented by other measures, particularly adequate water and excreta sanitation and the use of molluscicides where there is major human-snail contact.

PAHO's activities were geared toward obtaining better knowledge of the disease's distribution and epidemiology. It also supported training in epidemiologic surveillance of areas hitherto free of schistosomiasis but where snails are potential intermediate hosts

and there is an influx of migrants from known endemic foci. Areas where large hydroelectric dams are being built, particularly in South America, warrant special surveillance.

Leishmaniasis. A protozoan parasite infection, leishmaniasis exists in all Latin American countries except Chile. The visceral form of the disease (kala-azar) causes high mortality, particularly among children. Mucocutaneous leishmaniasis is chronic in evolution and causes deformity, especially of the nose and pharynx. Diffuse cutaneous leishmaniasis is also chronic and incapacitating, and the anergic form produces a marked granulomatous reaction and lepromatoid lesions. This last form has been found in Brazil, Dominican Republic, Mexico, and Venezuela.

PAHO and Venezuela's health ministry sponsored an international seminar on leishmaniasis diagnosis and treatment at CEPIALET in Caracas for 25 participants from Brazil, Colombia, Cuba, Mexico, Nicaragua, Peru, and Venezuela.

Blindness Prevention

It is estimated that between 20 and 40 million people in the world are blind, if the definition of blindness is a visual acuity of less than 3/60 or its equivalent, and that three-quarters of them live in developing countries. Two-thirds of the causes are preventable, and one-fifth of the world's blind can be cured.

The Americas have all six of the blinding conditions WHO identifies as important to prevent—trachoma, glaucoma, cataracts, traumatic eye injuries, xerophthalmia, and onchocerciasis.

Onchocerciasis, a filarial disease, is predominantly rural. Eye lesions and blindness may result if it goes untreated. The disease occurs in well-defined parts of Africa and, in the Americas, where it was first discovered in Guatemala in 1915, in that country and Brazil, Colombia, Ecuador, Mexico, and Venezuela.

Antionchocerciasis measures are aimed first at preventing blindness, second at controlling the *Simulium* black flies that vector *Onchocerca volvulus,* the parasitic worm that causes the disease, and third at controlling and eventually eradicating the parasite. Blindness prevention is based on medically supervised chemotherapy and nodule removal.

PAHO continued to emphasize the need to integrate blindness prevention in general health services and especially in primary health care activities. The regional advisory committee on blindness prevention met at Belo Horizonte, Brazil, in July.

National programs exist in Brazil, Canada, Colombia, Guatemala, Panama, and the United States. The programs in Peru and Venezuela are pilot ones, but it is expected that they will be expanded into national programs. In eight other countries from which information is available there are scattered blindness prevention activities, but as yet their governments have not formulated or accepted national programs.

PAHO stressed establishing national blindness prevention committees in all countries. Such committees must represent the entire spectrum of interested governmental (health, agriculture, industry, and other ministries) and nongovernmental organizations (ophthalmologists, epidemiologists, other health care professionals, media leaders, and the community).

Coordination of PAHO's blindness prevention program with the activities of nongovernmental organizations was deemed desirable not only to use available resources better but to convene and support regional workshops in training, program planning and resource assessment and mobilization—areas in which such organizations have particular expertise.

In addition to these considerations of program development, recommendations for

training included development of health education materials for eye care and blindness prevention programs, inclusion of instructional material in medical school and postgraduate curricula, and provision of PAHO fellowships for training in primary eye care and blindness prevention.

PAHO supported training in the diagnosis and treatment of onchocerciasis in Guatemala and Mexico. Guatemala's National Committee for the Blind and Deaf held a regional seminar on primary eye care training techniques. Conclusions from these meetings related to the use of Snellen notation for recording visual acuity, need for eye examination of all children beginning school, continued prophylaxis of ophthalmia neonatorum, and a major emphasis on community education. Along these lines, it is noteworthy that educational and training materials used in primary eye care were developed for PAHO by the International Eye Foundation.

The highest priority for the future is training workers for various levels of eye care—administrators responsible for developing and executing national programs, ophthalmic assistants, technicians, and primary health care workers in villages. This training is being conducted with the help of WHO's five blindness prevention collaborating centers in the Americas, one in Guatemala City, one in Lima, and three in the United States.

Noncommunicable Diseases

Noncommunicable diseases are growing in public health importance in most of the hemisphere's countries. This trend results principally from the gradual control of communicable diseases, increases in life expectancy at birth, and environmental changes.

In response to the concerns expressed by the countries, PAHO has in recent years considerably increased its cooperation with the governments in developing criteria and planning adequate programs to control noncommunicable and chronic diseases.

PAHO's program and activities focus mainly on cancer, hypertension and rheumatic fever, chronic rheumatic diseases, diabetes mellitus, and chronic allergies. This program was reviewed at length and endorsed at the 1980 Directing Council meeting (CD27.16).

Cancer

Malignant neoplasms have been identified as the second most frequent cause of death in 30 of 37 American countries and territories. Age-adjusted death rates for malignant neoplasms in the Americas range from 38.5 in continental Middle America to 80.8 in temperate South America. Hemispheric mortality rates from cancer are shown in Table 5, together with death rates for cancers of selected sites in males and females.

Health ministries are paying increasing attention to cancer as an important public health problem and creating comprehensive control and treatment programs. A 1978 survey revealed 62 institutions in 16 countries in Latin America and the Caribbean exclusively devoted to cancer research and treatment.

PAHO continued its efforts to obtain extrabudgetary funds to strengthen cancer control institutions in the Americas. It also promoted the training of junior medical and auxiliary personnel, gathering and studying epidemiologic data, and collecting and disseminating cancer research information. Much of this activity is conducted through the Latin American Cancer Research Information Project (LACRIP), a joint PAHO-U.S. National Cancer Institute (NCI) effort.

LACRIP provided 981 custom CANCERLINE searches requested by 255 oncologists throughout Latin America and the Caribbean. NCI's CANCERLINE data base provides worldwide coverage of published and current cancer research activities.

Table 5. Age-adjusted death rates from malignant neoplasms per 100,000 population, by selected sites,[a] in 24 countries of the Americas, around 1978.

Country or other political unit	Both sexes	Male			Female				
	All malignant neoplasms	All malignant neoplasms	Lung	Stomach	All malignant neoplasms	Lung	Stomach	Cervix	Breast
Argentina	80.9	97.4	25.3	10.0	66.6	3.3	4.9	3.2	12.6
Barbados	65.3	73.0	9.5	13.5	61.4	2.0	8.6	7.0	11.6
Canada	77.0	92.9	27.5	6.3	64.7	6.4	2.8	2.5	14.5
Chile	74.4	82.7	11.0	25.8	68.8	2.7	11.3	9.5	7.1
Colombia	59.8	57.3	5.0	17.0	62.4	2.6	11.9	6.0	4.1
Costa Rica	69.3	74.4	6.7	25.2	64.7	3.1	13.3	7.4	6.0
Cuba	65.3	73.7	20.6	5.2	56.0	7.1	3.0	3.2	9.1
Dominican Republic	24.6	24.8	2.5	1.8	24.5	1.5	0.9	2.2	2.0
Ecuador	37.4	36.1	2.5	12.2	39.0	1.0	8.5	3.4	2.0
El Salvador	20.5	16.4	1.4	3.2	24.6	0.8	2.7	3.0	0.5
Guatemala	34.3	31.0	1.1	9.1	37.5	0.9	8.2	4.2	1.4
Honduras	18.8	14.9	0.7	2.3	22.6	0.2	2.9	0.2	0.2
Martinique	67.1	94.4	10.3	12.0	47.1	1.1	3.4	2.9	7.7
Mexico	40.7	36.2	5.8	5.3	44.9	2.6	4.8	7.8	3.5
Nicaragua	15.2	11.6	0.5	0.1	18.4	0.0	0.3	0.0	0.0
Panama	42.6	46.8	6.6	9.0	38.3	1.9	4.1	5.3	4.2
Paraguay	55.8	52.7	5.9	8.2	58.9	1.8	5.1	5.7	5.0
Peru	34.6	32.8	3.7	9.4	36.4	1.6	6.6	4.0	2.9
Puerto Rico	58.0	69.7	9.1	9.7	47.1	3.1	5.1	2.8	6.3
Suriname	40.0	41.3	4.5	8.0	39.0	1.6	2.7	7.4	6.1
Trinidad and Tabago	55.0	62.4	7.1	9.3	51.5	2.1	5.6	9.0	8.2
United States of America	78.4	95.8	31.2	3.6	65.8	9.2	1.8	2.3	13.8
Uruguay	95.1	121.2	29.0	13.6	73.4	2.5	6.9	3.7	14.8
Venezuela	60.7	60.1	8.9	14.5	61.8	3.6	8.7	6.8	6.0
Northern America	78.3	95.5	30.9	3.8	65.7	9.0	1.9	2.3	13.9
Middle America	43.4	43.1	7.7	6.0	43.8	2.9	4.5	5.9	4.1
Caribbean	56.4	64.1	14.5	6.0	48.6	4.8	3.3	3.5	7.3
Continental	38.5	34.7	4.9	5.9	42.1	2.2	5.0	6.7	3.0
South America	67.0	74.6	14.8	13.4	60.6	2.7	7.6	4.9	8.1
Tropical	50.1	48.3	5.1	13.5	52.1	2.3	9.1	5.3	3.9
Temperate	80.8	96.5	22.8	13.3	67.6	3.1	6.4	4.6	11.6

[a] International Classification of Diseases, Eighth Revision.

(Photo: J. Vizcarra Brenner/PAHO)

A paraplegic technician at the Brazilian Cancer Control Institute in São Paulo performs a cytologic examination for cervical cancer.

(Photo: M. Montecino/PAHO)

Two expectant mothers wait for breast cancer examinations at the Curundu Health Center in Panama City.

The Latin American literature included in CANCERLINE is screened and contributed by PAHO's Regional Library of Medicine and the Health Sciences (RLM) at São Paulo, which delivered 345 articles during the year. LACRIP's selective information dissemination services, carried out in collaboration with RLM and subcenters in Mexico and Venezuela, was extended to more than 3,500 oncologists throughout the hemisphere.

The Mexican social security institute joined the 45 institutions in Argentina, Brazil, Chile, Colombia, Mexico, Peru, United States, and Uruguay belonging to LACRIP's Collaborative Cancer Treatment Research Program (CCTRP). During the program's second annual meeting at Bogotá in June its principal investigators reported the results of 29 protocols on breast, head, and neck cancer, gynecologic malignancies, melanomas, sarcomas, lymphomas, leukemia, and gastric cancer with an accrual of 1,160 patients. The meeting also marked the creation of working groups to study gastric cancer, osteosarcomas, and cervical cancer in Latin America, topics chosen because of their regional public

health importance. The results of the three studies will be compared with experience from other areas of the world.

CCTRP also awarded research training grants to nine junior oncologists and nurses, financed the exchange of 18 principal investigators, provided drugs for treating patients, and gave grants of $6,000 to $14,000 to the Latin American centers.

PAHO's cancer program expanded to include a comprehensive four-year project to determine the possible carcinogenic and teratogenic effects of pesticides in humans. This project is a collaborative effort between PAHO, Colombia's National Health Institute, University of Miami, U.S. Environmental Protection Agency, NCI, and WHO's International Agency for Research on Cancer at Lyons, France.

Other noncommunicable diseases

Cardiovascular disease (particularly hypertension and rheumatic and coronary heart disease), diabetes, and chronic rheumatic diseases are being given high priority in the Americas. The Directing Council approved a resolution (CD27.16) urging that health ministries include programs and strategies in their national health plans to counter the risk factors causing increased morbidity and mortality from these diseases. The resolution also recommended that the countries promote general health service activities to prevent and control such diseases, with special attention to conditions that can be effectively controlled such as hypertension, rheumatic fever and heart disease, and diabetes.

The resolution also asked the Director to support improved geriatric care programs; continue to support national noncommunicable disease prevention and control programs and cooperative activities among the countries, and continue efforts to obtain extrabudgetary funds for such programs.

The PAHO working group on hypertension control, composed of representatives from Argentina, Bolivia, Brazil, Chile, Colombia, Cuba, Ecuador, Mexico, Peru, and Venezuela, met at Bogotá to discuss the results of the first three years of collaborative hypertension studies and plan future activities, including draft guidelines for community hypertension control which are now being edited.

Representatives of the countries taking part in PAHO's rheumatic fever and rheumatic heart disease prevention program (Argentina, Bolivia, Brazil, Chile, Ecuador, Peru, and Venezuela) met at Santiago to discuss progress during its fourth year. The final registry of patients after a five-year followup was made in September, and results of the collaborative study will be analyzed in 1981.

The final version of an operating manual for community-based programs to prevent and control rheumatic fever and diabetes is in press and will be published in 1981.

The disability caused by chronic rheumatic diseases and their burden on health services have been under joint study since 1978 by Argentina, Brazil, Chile, Mexico, Uruguay, and Venezuela. The advisory study group met at Washington to discuss preliminary results and future activities, including preparation of guidelines for adequately treating some of the most common rheumatic conditions by nonspecialized medical and paramedical personnel.

Argentina, Brazil, Chile, Colombia, Mexico, Peru, Uruguay, and Venezuela have been participating since 1979 in a study of the morbidity and disability caused by chronic allergies, their relation to various risk factors, and the burden they place on medical services. Its results will be analyzed in 1981-82.

Mental Health

There is a substantial gap between the magnitude of mental health problems and the human and material resources available for

dealing with them in the Americas. This situation is particularly critical in rural and marginal urban areas where there is a high prevalence of psychologic disorders and anomalous behaviors stemming from the adverse conditions in which their inhabitants live. The rates of suicide, homicide, accidents, and voluntarily inflicted injuries are rising steadily in various countries. Moreover, epidemiologic surveys reveal a high incidence of neuroses, alcoholism, drug dependency, and behavioral problems in children. Psychiatric and mental health facilities are not meeting the clear demand for curative services, and health promotion and disease prevention activities are barely underway in the major cities.

A growing interest is apparent in the study of psychosocial factors that influence health and well-being and in developing measures to help control harmful factors and promote beneficial ones.

PAHO's governing bodies have dealt with mental health several times (CSP15.13, CSP16.15, CD16.21, CE84.6). At the Directing Council's 1979 meeting, a resolution (CD26.17) was approved recommending that updated information be obtained on the influence of such factors as malnutrition and other adverse environmental conditions on the development of children. Another resolution from the same meeting recommended that, in preparing their health programs, governments take account of the psychosocial factors in child development and include measures in such programs to foster harmonious maturation.

During 1980 PAHO continued to cooperate with the countries in developing ways to modernize psychiatric services, including mental health activities in general health programs, and for injecting psychosocial considerations into the programs. Further assistance was provided in organizing mental health, alcoholism, and drug dependency services, disseminating technical information, and extending support to mental health training and research centers.

The Executive Committee asked the Director (CE84.11) to draw up a report of drug abuse programs in the hemisphere. In its later discussion of the report, the Directing Council emphasized the need for further and continuous updating of epidemiologic data about drug abuse and for strengthening multisectoral efforts to reduce illicit drug demand.

Two technical meetings at PAHO headquarters helped to reorient the mental health program both regionally and in specific country projects.

The first of these PAHO-sponsored meetings, in March and April at Washington, was of a working group on the inclusion of psychosocial components in primary health care. Representatives of Bolivia, Brazil, Colombia, Guatemala, Honduras, Panama, Peru, United States, and Venezuela attended. The functions of the primary health worker as a mental health agent were discussed, and recommendations were made for developing training materials.

The second meeting, in May in Washington, was of a group studying the influence of malnutrition and other environmental factors on child development. Seven specialists from Chile, Colombia, Guatemala, Jamaica, Mexico, United States, and Uruguay participated. The group's working documents and final report have been distributed.

Closer ties were developed with the WHO collaborating centers on mental health, alcoholism, and drug dependency in Canada, Colombia, Mexico, and the United States, and a neurologic sciences collaborating center was designated in Colombia. Twenty-two specialists from 10 countries met at one of the collaborating centers (Cali, Colombia) to review ways to extend mental health services. Another technical group, which met at Washington, discussed problems pertaining to a classification of mental diseases multiaxially—or biologically, psychologically, and sociologically—in which criteria based on the social environment and its psychologic conse-

(Photo: M. Montecino/PAHO)

Occupational rehabilitation activities at the Pavas Psychiatric Hospital in San José.

(Photo: M. Montecino/PAHO)

quences and attendant disabilities as well as purely medical criteria were considered.

A mental health team visited Brazil to assist one of its states in developing plans for extending mental health services and integrating them into the primary care system.

PAHO cooperated with new mental health officials in Argentina, Dominican Republic, and Ecuador in analyzing those countries' revised mental health programs, all of which are based on developing community care services as an alternative to traditional institutionalization. Consultants worked with the mental health departments of Chile, Grenada, and St. Vincent in evaluating their services.

Modernization of psychiatric nursing services and a shift in the role of the nurse to that of active community agent was one of the cooperative activities PAHO undertook with Argentina, Colombia, Dominican Republic, and the English-speaking Caribbean countries. Staff members and consultants made visits and conducted workshops.

Surveys of the epidemiology of alcoholism in Ecuador and Honduras and a study of community responses to alcoholism problems in Mexico were completed. Groundwork was laid for developing a system of epidemiologic surveillance of drug abuse and traffic accidents in Argentina, Mexico, and Peru.

Service support, training, and research programs were started in Bolivia and Peru with financial assistance from the United Nations Fund for Drug Abuse Control (UNFDAC). New drug abuse project agreements were signed with Colombia and Ecuador.

A seminar on the safe use of psychotropic substances and narcotic drugs was held at Buenos Aires under the auspices of the Argentine government, UNFDAC, and PAHO to examine problems and propose practical solutions in carrying out the 1961 Single Convention on Narcotics and the entry into force of the 1971 Agreement on Psychotropic Substances. Ten countries and five international organizations were represented.

In the future, PAHO's cooperative activities will be aimed primarily at extending mental health services as part of general health services and at using primary care workers as community mental health agents.

Dental Health

Dental disease continues to plague the Americas. There has been little improvement in the situation or in the resources available to prevent and arrest the two most prevalent dental ailments, caries and periodontal disease.

The availability of dental services is still the almost exclusive domain of the dental professional and the untrained practitioner, and only limited numbers of dental professionals are to be found in rural and marginal urban areas where needs are greatest. With the exception of the English-speaking Caribbean countries and Suriname where school programs using dental auxiliaries have been developed, little emphasis has been placed on training auxiliary or intermediary workers to provide dental services in underserved areas and extend services where professionals are present.

Despite the increase in dental schools to approximately 120 and increases in their class size, little if any change has occurred in the dentist-population ratio in most Latin American countries. The ratio of dentists in the public health sector to the population to be served is often more than 1 to 100,000. The estimate that 90 percent of the dental manpower in many countries provide service to 10 percent of the population likewise reveals the extent of the problems and the burden on the public sector.

Dental disease affects almost everyone in Latin America. National epidemiologic studies in the 1970s in Colombia and Venezuela demonstrated the early onset of dental disease in children and the need to emphasize preventive programs. Similarly, data from many countries show the lack of restorative care, particularly in younger age groups.

Dental health appears to receive little attention in national health service planning and, in view of the universal nature of the disease involved, little priority. This is often seen in the financial support allocated to dentistry in the public sector.

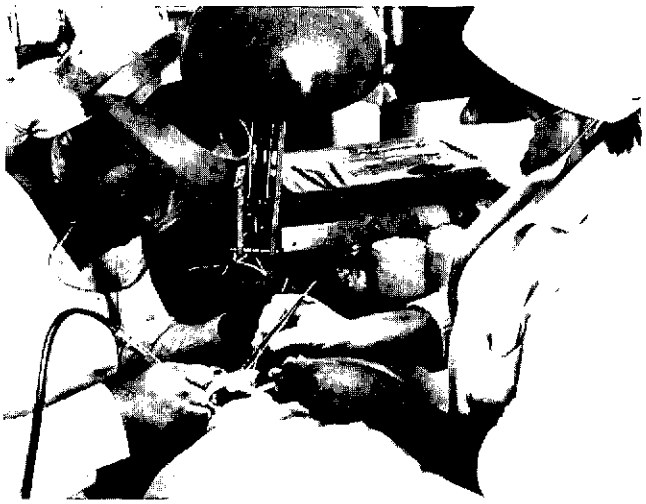
The 1970s also showed the need for application of modern concepts and technology in providing dental services and the problems associated with a shortage of dental maintenance and denture technicians.

During 1980 PAHO collaborated with national health authorities in developing dental health programs in the Bahamas, Cuba, Dominican Republic, Ecuador, Guyana, Jamaica, Nicaragua, Peru, Suriname, Trinidad and Tobago, and Venezuela. Attention was directed to problems associated with the extensive periodontal disease in the countries, particularly those of the Caribbean and northern South America where its extent is being identified.

At their annual meeting, the Andean health ministers again expressed interest in developing a dental program for and increasing the use of auxiliaries in that area. Continued progress was made in carrying out the resolutions passed by the Commonwealth Caribbean health ministers.

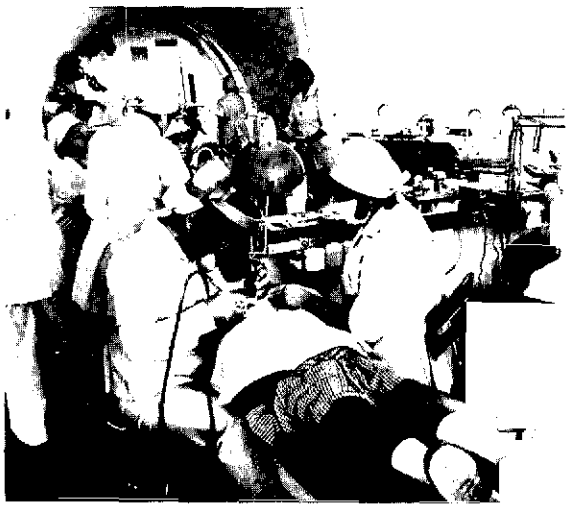
A complete review of existing dental services was made in Nicaragua and changes were made in them to increase the availability of care, particularly in rural areas. Continued emphasis was placed on improving the delivery of dental services in Mexico and Venezuela, together with systems for analyzing extended coverage and providing primary care. Advice was given to Ecuador on developing methods for collecting oral epidemiologic data, and a simplified system for gathering dental disease data was instituted in certain Caribbean countries.

Until an effective vaccine or other new



(Photo: M. Montecino/PAHO)

A dentist and her assistant extract a tooth at Ciudad Netzahualcóyotl Hospital on the outskirts of Mexico City.



(Photo: M. Montecino/PAHO)

The dental unit at Ciudad Netzahualcóyotl Hospital can treat many patients at the same time.

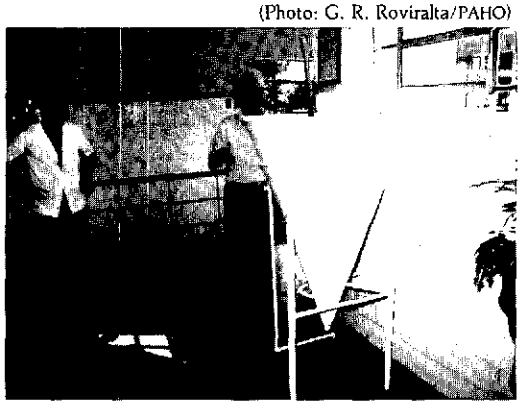
mass preventive agent is developed, fluoride will continue to be the mainstay in preventing caries because it has proved remarkably effective when administered in different vehicles. The two principal ones are drinking water and table salt, and through them fluoridation is easy to carry out and inexpensive. In the absence of mass measures or as complementary dental care procedures, fluoride may be usefully administered in tablets, solutions, gels, and pediatric drops. Special school fluoridation programs are also possible.

Drinking water is fluoridated in about 15 countries. The total population with access to fluoridated water supplies in Latin America and the Caribbean at the end of the year was estimated at 40 million. Fluoridation of community water supplies was promoted in areas where the measure appears most feasible or most acceptable.

PAHO emphasized training professional and technical staff in standard fluoridation techniques. This included promotional activities, preliminary studies, project preparation and execution, surveys of fluoridation system op-

A saturation-suspension cone such as this one in Brazil can be used to fluoridate water in towns of 2,000 to 150,000 population.

(Photo: G. R. Roviralta/PAHO)



eration and maintenance, and research. The development and use of simply designed and inexpensive dosing equipment was promoted and information disseminated about it.

Naturally overfluoridated drinking water is a serious problem in some parts of Argentina, El Salvador, Mexico, and Peru. Argentina is now the only country where part of the fluoride is removed from water as a regular practice. Other countries voiced interest in adopting this practice.

Special emphasis was put on preventive programs in response to the Directing Council's 1979 resolution (CD26.39) on salt fluoridation to prevent dental caries. This measure will especially benefit rural areas and small communities where water fluoridation is impractical. Salt fluoridation has been studied in Colombia and proposals were made for its wide use there. Initial reviews were made and discussions held with governments interested in carrying out this preventive measure in suitable places, and Mexico, Nicaragua, St. Kitts-Nevis, and Saint Lucia began considering its feasibility.

Laboratory Services

Laboratory services are a set of structured procedures to produce data for improving patient diagnosis and treatment, determine the prevalence of pathogenic agents in the community, and identify their presence in the environment. As health programs develop, laboratories play a more important role in supporting them.

The problems in carrying out health plans, including training and infrastructure development, are reflected in miniature in laboratory activities.

PAHO continued to cooperate in establishing laboratory systems able to meet the growing demand for them. As executing agency in a project to strengthen laboratory systems in the smaller English-speaking Caribbean islands which UNDP approved during the year, PAHO will provide assistance in improving existing hospital laboratories, training, and setting up programs to service biomedical equipment and maintain quality control. These laboratories will also begin clinical chemistry, pathology, microbiology, and similar studies in collaboration with the larger central laboratories in Barbados, Guyana, Jamaica, and Trinidad and Tobago.

Chile, with PAHO and UNDP assistance, pressed forward with its program to strengthen its public health laboratory and consolidate and expand peripheral laboratories in the national network. The Dominican Republic, with assistance from PAHO, prepared a request for UNDP aid to strengthen and expand laboratory services throughout the country. Ecuador received PAHO assistance in formulating a plan to strengthen its National Institute of Hygiene and Tropical Medicine and extend its regional and local laboratory network. Mexico, with PAHO assistance, planned to establish a national laboratory system to satisfy increasing demands in medical care and environmental protection. The authorities there are seeking UNDP financial support for a 1982-86 program to strengthen central reference laboratories, establish 14 regional laboratories, and provide minimal laboratory facilities in health institutions requiring them. Uruguay, which requested PAHO technical advice in preparing a request for UNDP financial aid, strengthened its regionalized laboratory system, including its central laboratory and departmental and local facilities. Venezuela asked PAHO's help in converting its laboratories into a national network.

Representatives of 23 countries attended a regional seminar on biologic reagent production and control held by PAHO and the Mexican health and welfare secretariat at Oaxtepec in November. The participants reviewed procurement and use of biologic reagents and drew up recommendations to establish quality control laboratories in each country,

designate laboratories as collaborating centers to produce and distribute reagents, and appoint a permanent regional committee to oversee the recommendations' execution.

PAHO continued its program of external quality control in bacteriology in Caribbean laboratories and in serology in all the countries as part of CDC's worldwide program to evaluate syphilis serology. Also in cooperation with CDC, the national laboratories of Argentina, Chile, and Colombia began evaluating serologic techniques for diagnosing hepatitis B. CDC participation in these programs and its expansion into other areas, including hematology, will ensure that data obtained by laboratories in different countries are comparable and reliable and make possible more precise assessments of health conditions.

Following up a course conducted at Mar del Plata, Argentina, in late 1979 on quality control in clinical chemistry, PAHO initiated arrangements to include Argentina, Barbados, Belize, Colombia, Costa Rica, Cuba, Ecuador, Guyana, Honduras, Panama, Uruguay, and Venezuela in a new WHO clinical chemistry quality control program centered at Birmingham, England.

Laboratory work entails exposure to biologic, chemical, and physical agents, with consequent risk of work-related infections or lesions. The risk is especially high in microbiology, where infections continue to be reported frequently. To institute safety measures to help control this risk, WHO sponsored a meeting of representatives from all parts of the world at which the global situation was reviewed and recommendations made. PAHO thereafter developed plans for two regional courses, in English and Spanish, to train instructors who in turn will give national courses on returning to their own countries. A manual of safety standards and procedures—to be distributed to all the countries in the hemisphere—was prepared for use in the regional courses, which will be offered in cooperation with CDC and NIH.

PAHO cooperated with the countries in organizing seminars, courses, and other meetings by providing experts, scholarships, and teaching materials. In cooperation with the University of São Paulo's institute of tropical medicine, a two-month course on the serodiagnosis of parasitic diseases was given for 15 Brazilians and two participants from other countries. PAHO also provided an expert to Chile for a course on the same subject for provincial laboratory directors. A course on quality control was organized in conjunction with Uruguay for staff of its clinical medicine laboratories.

In cooperation with WHO, PAHO designed a three-phase pilot program to determine the laboratory tests, materials, manpower, logistics, and supervision necessary to support primary health care programs. The program will be tested in Honduras and Mexico to determine its worldwide applicability.

PAHO continued to supply materials to facilitate the transfer of appropriate technology, including manuals, reference antigens and antisera, cell lines, and standard substances.

It also coordinated the cooperative project financed by Merck Sharp & Dohme to determine the prevalence of various antigenic types of pneumonia streptococci in 10 countries. The study is to identify the types most prevalent in the hemisphere's clinical syndromes and include them in a widely used vaccine. Four hundred fifty strains with antigenic types different from those in the vaccine have so far been identified, and it is hoped that the project can be completed in 1981.

The role of immunology in the diagnosis of communicable and noncommunicable diseases, the pathogenesis of degenerative and tumoral diseases, and the treatment of certain clinical syndromes has given this discipline an importance that calls for establishing special immunology laboratories.

PAHO has been helping develop laboratory manpower, diagnostic services, and research

programs through two collaborating centers, one at the Butantan Institute in São Paulo and the PAHO/WHO immunology collaborating center comprising several laboratories in Mexico City.

Increasing interest in immunology prompted the establishment of a network of immunology centers in the Caribbean with the assistance of the Netherlands. This program, which began in 1977 with training at the WHO Collaborating Center for Immunology Training and Research (ITR) in Amsterdam, has been carried out in Cuba, Jamaica, Suriname, and Trinidad and Tobago. A Dutch and PAHO evaluation team verified the program's benefits in diagnosis, foreign exchange savings through local reagent production, and training.

Costa Rica, Guatemala, and Honduras have already expressed interest in participating in the program, which may ultimately be extended to other countries.

An advisory group consisting of immunologists from Cuba, Jamaica, Suriname, and Trinidad and Tobago met at PAHO headquarters in February to plan a Caribbean immunology seminar in 1981 to establish standards for extending the Caribbean program to other countries.

Vigorous action continued in training immunology personnel. ITR trained 29 scientists from Cuba (14), Jamaica (7), Suriname (6), and Trinidad and Tobago (2). The São Paulo center conducted its annual basic immunology course, which is designed for instructors, and its counterpart in Mexico offered a course on clinical immunology. Venezuela's National Clinical Immunology Center in Caracas initiated training courses for physicians (three years), scientists (two years), and technicians (nine months). In cooperation with Switzerland and WHO, identical courses in French and in English on the immunology of infectious diseases were offered at WHO's immunology training and research center in Lausanne. Three participants from the Americas attended.

Correct diagnosis of an immunologic syndrome is important since adequate treatment depends on it. To standardize procedures and obtain comparable and reliable data, PAHO invited the countries to participate in CDC's immunodiagnosis proficiency testing program. It is planning to organize regional refresher courses on immunology methods to enable participants to evaluate the efficiency of their laboratories.

Epidemiologic Surveillance

PAHO made several improvements in its epidemiologic surveillance program through its headquarters and field staff. The mechanism for weekly and annual collection of epidemiologic data was strengthened to meet the operational requirements of the various disease prevention and control programs and automated data processing will be introduced in 1981. Its new *Epidemiological Bulletin* began to appear in Spanish and English, with pressruns of 5,500 copies per issue.

A modular short course on the epidemiologic principles of disease prevention and control was prepared with Rockefeller Foundation support to train health service professionals. The preliminary material was tested in Uruguay and later Cuba and Mexico, and then revised in light of results from the trial courses. The course will be distributed generally in 1981 and, as a complement, preliminary steps will be taken to reformulate the program for training intermediate epidemiologists.

To bring the Pan American Sanitary Code into consonance with the International Health Regulations, the code's disease-reporting chapter will be revised and updated in 1981.

Eleven epidemiologists and three associated experts assigned to PAHO country programs, as well as the staff of the Caribbean Epidemiology Centre, worked with national

counterparts to strengthen epidemiologic systems and develop various disease prevention and control programs.

PAHO's Caribbean Epidemiology Centre (CAREC) at Port-of-Spain was established at the beginning of 1975 after having been operated by the Rockefeller Foundation and University of the West Indies as the Trinidad Regional Virus Laboratory. It is sponsored and financed by the English- and Dutch-speaking governments of the Caribbean.

USAID awarded CAREC a $1,160,000 grant in 1979 to develop national surveillance systems and supporting laboratories. During 1980 CAREC used funds from the grant to establish a training unit and develop new modular training manuals for physicians, students, public health nurses and inspectors, and statistical surveillance officers. These will be a vital tool in introducing simple epidemiologic techniques, including graphic presentation of how to measure health and the provision of primary care.

CAREC's program was revised in detail by its scientific advisory committee and council and endorsed by the Commonwealth Caribbean health ministers at their July conference in Grenada.

Since 1979 CAREC's program has been one of consolidation. There are now 18 international and 80 local staff. The national programs are based on annual workshops formulated by national epidemiologists who meet at CAREC in May. The annual workshops for epidemiologists, laboratory directors, and statistical surveillance officers are of fundamental importance in developing the surveillance system. Special emphasis was put on laboratory management and on-the-job training in laboratory techniques in the smaller islands using USAID funds. CAREC worked closely with the Trinidad public health laboratory.

Dissemination of information is a key component of the program. The *CAREC Surveillance Report* was published monthly with a circulation of 2,500 copies. There was an encouraging rise in the number of consultations by the countries without an increase in the requests for on-site epidemic assistance. A meeting to review disease in the Caribbean was convened in association with PAHO headquarters to plan a reassessment of Caribbean health priorities.

The outbreak of yellow fever in Trinidad in 1978-79 and the continuing threat of dengue have highlighted the need for good arbovirology diagnostic facilities and techniques. During the year a joint project was designed by Trinidad and Tobago, CAREC, and Canada's IDRC to develop the uses of insect cell lines in viral isolation and diagnosis.

Malaria remains indigenous in Belize, Guyana, and Suriname, and infections occurred throughout the year. Because CAREC's laboratory proficiency testing had indicated a lack of diagnostic expertise in malaria, two courses for technicians were conducted.

Communicable disease cannot be geographically isolated. Continuing efforts are made to improve contacts with surrounding countries. CAREC has particularly strong links with CDC, which seconds staff to it. New links are being established with the Canadian national surveillance system.

The appointment of a West Indian as laboratory superintendent and training officer was a major step in carrying out the policy to train West Indies nationals for all the senior posts at CAREC.

CAREC research programs continued in streptococcal disease, filariasis, leptospirosis, and ischemic heart disease. Support came from the British Medical Research Council, NIH, IDRC, and a grant from PAHO for yellow fever research.

Biologicals

Vaccine control

Vaccine control in Latin America varies greatly and in general is advancing very

slowly. Though most vaccine producers test their own products, very few have testing laboratories that are independent from production. The concept of national control laboratories as part of governmental biologics regulation is still nascent. At its 1980 meeting the Directing Council reminded governments (CD27.15) of the importance of national control laboratories and urged more vigorous action to strengthen them.

In Argentina, the control department of the Carlos A. Malbrán Microbiology Institute, which was modernized during the year, tests the protective potency of pertussis vaccine. Through a collaborative study with the U.S. Food and Drug Administration's bureau of biologics, PAHO's designated pertussis reference laboratory, the efficiency of the Malbrán laboratory is being evaluated. PAHO is providing services to the new Brazilian federal laboratory being built at Rio de Janeiro for testing biologicals and vaccines, particularly those supplied to the national immunization program through the federal drug supply agency.

In Chile, the Institute of Public Health's vaccine control laboratory at Santiago was given responsibility for testing vaccines produced in and outside the country, a task that will require better premises, improved equipment, and a larger staff. In Colombia, a new control laboratory separate from production has been established, though it has far to go before it can effectively support the National Health Institute's vaccine production. These developments culminated the consultations PAHO had provided in the last two years.

A new agreement between PAHO and Mexico provides for PAHO assistance in converting the control department of that country's public health laboratory into a national vaccine-testing facility. In time the laboratory will also assume responsibility for testing vaccines from neighboring countries, a function now carried out by the National Virology Institute under the Directorate General of Biological and Reagent Production.

PAHO provided testing advice to Chile, Colombia, and Venezuela about pertussis vaccines and to Peru about tetanus and pertussis vaccines because those countries' laboratories continue to face problems with the antigenic quality of the pertussis produced in submerged culture.

Recognizing the importance of viral vaccine surveillance in expanded immunization programs, the Directing Council recommended (CD27.15) that national control laboratories be strengthened so they can titrate live viral vaccines. As a result, PAHO is establishing a collaborative program to build technical skill and help national laboratories acquire experience in assaying the potency of viral vaccines. Yellow fever vaccine is also included in this program because of that disease's importance in many countries. Apart from direct technical advice by a vaccine expert, laboratories eligible for participation in the program will receive training assistance, laboratory manuals in English or Spanish on standard testing procedures, and reagents and reference preparations. Argentina, Brazil, Colombia, Cuba, Dominican Republic, Ecuador, and Mexico have voiced their interest in joining the program.

To build up vaccine-testing experience, PAHO encourages national control laboratories to have their tests verified by an outside reference laboratory it designates. During the year such a laboratory provided DPT vaccine reference testing to Argentina, Bolivia, Brazil, Colombia, Ecuador, Guatemala, Peru, and Venezuela. In the light of results reported by the laboratory, fresh seeds have been provided to replace old ones and reference vaccine was made available to most national laboratories. Another laboratory provided reference services for testing yellow fever vaccine produced in Brazil and Colombia.

Drug quality control

Despite rapidly growing national expen-

ditures on pharmaceutical products in Latin America and the Caribbean (more than $7 billion in Latin America in 1980, a 22 percent increase over 1979), the public health sector continues to suffer from a scarcity of essential drugs needed for extending health care to the medically underserved.

To assist governments in overcoming these difficulties, the Directing Council instructed the Director (CD27.23) to study the establishment of a revolving fund or other mechanisms for collectively purchasing large quantities of selected drugs. An internal working group undertook a preliminary study of possible financing mechanisms for and PAHO's role in the acquisition of critical health supplies. The group's findings and recommendations will be presented to the Executive Committee in June 1981.

To strengthen the infrastructure required to deliver medicaments, particularly in primary health care, an interdisciplinary operations research project was begun to assess the management and use of drugs in health center hospitals and health posts. Preliminary findings showed deficiencies in all areas of the pharmaceutical supply systems studied—from selection and procurement through distribution and use. A 1981 meeting is planned to analyze these problems and develop solutions to them.

Information on drug safety and efficacy is being provided regularly through a special quarterly section of the *Boletín de la Oficina Sanitaria Panamericana*. This information is particularly useful to government agencies concerned with regulating the use of drugs in both the private and public sectors.

Recruitment of professional staff brought the Caribbean Regional Drug Testing Laboratory at Kingston a step closer to full operation. The start of specialized microbiologic and pharmacologic analyses of pharmaceutical products the English-speaking Caribbean islands produce or import was postponed to 1981 because of delays in the arrival of necessary equipment contributed by CIDA.

In Brazil, the PAHO-assisted Drug Quality Institute (DQI) at São Paulo, which is operated by the Oswaldo Cruz Foundation, worked closely with a UNDP project to develop an integrated national drug control system and build and staff the Foundation-operated federal laboratory at Rio de Janeiro, whose construction was almost complete at year's end. The training and advisory services provided by DQI during the year included specialized analytic courses, seminars on evaluating drug combinations, and a symposium on national drug policies.

Through its permanent staff and temporary consultants, PAHO also provided technical collaboration to drug control programs and courses in Argentina, Chile, Colombia, Costa Rica, Cuba, El Salvador, Guatemala, Peru, Trinidad and Tobago, and Venezuela.

The demand for pharmaceuticals is expected to increase in the foreseeable future due among other things to expanding health coverage and rapid urbanization. PAHO's efforts will be directed toward closer collaboration with government agencies responsible for the control and use of drugs to ensure their reliable supply at affordable prices. To promote comprehensive regional and national pharmaceutical supply policies and identify areas for intercountry cooperation, PAHO will hold a regional meeting on drug policies and management in late 1981.

Blood banking

Blood is in short supply in most Latin American and Caribbean countries. Blood components and plasma derivatives are rare commodities which must be imported at high cost for lack of necessary technology to process blood. In the absence of regulatory systems to control the quality and safety of blood products, it is difficult to protect blood donors and recipients adequately.

The dependence of many existing blood centers on the remunerated donors who provide more than 60 percent of Latin American

and Caribbean blood requirements has abnormally increased the risk of hepatitis B infection. This situation could also result in an increase in the incidence of liver cancer.

The change from whole blood administration to blood component therapy in treating various clinical illnesses is progressing very slowly, largely because the complexity of plasma component fractionation and freeze-drying technology has hampered the availability of such components for clinical purposes. Large blood banks in capital cities are producing a quite limited amount of blood components, but most of what is required has to be imported. Fractionation facilities able to produce large amounts of serum exist in Argentina (1), Brazil (2), and Mexico (3). Only the plants at Córdoba, Argentina, and the Mexican Institute of Hygiene are noncommercial.

Governing body resolutions in 1975 (WHA28.72 and CE74.21) urged health ministries to establish national policies to ensure that blood and its products are safe, of good quality, and available in adequate quantities. In 1980 PAHO therefore decided to invite the hemisphere's governments to begin planning long-term national blood programs. Cuba and Nicaragua have national policies and programs; Brazil, Uruguay, and Venezuela have blood banking laws; and other countries are drafting or should soon pass such legislation.

The first regional planning meeting will take place at Bogotá in 1981 with financial assistance from WHO and the League of Red Cross Societies.

The International Society of Blood Transfusion (ISBT) gave PAHO permission to translate four of its guides into Spanish, and so far PAHO has distributed more than 100 sets free to blood banks in all Latin American countries. A generous contribution by the American Association of Blood Banks enabled PAHO to distribute 120 sets of books on blood transfusion to 75 educational institutions and national blood banks in Latin America and the Caribbean.

During 1981 PAHO will increase its cooperation with the League of Red Cross Societies and ISBT in extending blood program coverage to provincial areas while strengthening the supportive role of national blood banks.

Radiation Health

Radiation health deals with the development and use of medical ionizing radiation and protection from radiation hazards, whatever their source. Radiation medicine comprises three distinct areas: diagnostic radiology, radiotherapy, and nuclear medicine.

In rural and marginal urban areas of Latin America and the Caribbean most people do not have access to diagnostic radiology, which has become the most important and expensive single method of clinical diagnosis in modern medicine. Many hospitals do not have the most basic x-ray equipment or staff adequately trained to use it. When it is available, x-ray equipment is often oversophisticated and prone to breakdown. In most countries medical students receive no experience in radiologic services before beginning their careers. There are few schools for radiologic technicians and no organized training programs for other professionals such as medical physicists or dosimetry specialists.

The situation in radiotherapy and nuclear medicine is similar in most American countries. In a well-developed cancer control program it is estimated that at least half of all patients will benefit from radiation therapy, yet in many countries adequate staff and equipment are not available. In addition, there are extremes between the very modern and advanced equipment in a few medical centers and the obsolete equipment in most other hospitals.

In the area of radiation protection, many patients, health workers, and community members are exposed to unnecessarily high risks due to faulty diagnostic x-ray equip-

ment. High-intensity radiation sources are used in industry and agriculture, and serious accidents have been reported. Nuclear research reactors have been built in Argentina, Brazil, Chile, Colombia, Mexico, and Venezuela. Power reactors are in operation or under construction in Argentina, Brazil, and Mexico, and are being considered in other countries. National radiation protection services have been established in 13 health ministries and some countries have such services in their labor ministries or nuclear energy agencies, but even where they exist most are understaffed and unable to cope with the problems noted above.

Mindful of the need to support primary health services, PAHO's efforts in radiation medicine in 1980 focused on developing a basic x-ray system for health centers and front-line hospitals. The system includes not only a simplified x-ray machine, which has been designed according to PAHO/WHO specifications and is easily installed, rugged, and simple to maintain, but also three-month training of community operators and instruction of local general practitioners in how to evaluate the images the equipment produces. Meetings were held with x-ray manufacturers and national authorities, and the plan for a clinical field trial of the basic radiology system was completed. Pending the delivery of satisfactory prototypes by the manufacturer, the field trial is scheduled to begin in Colombia in 1981.

In the radiotherapy area, quality assurance was promoted through the Intercomparison Study for Cobalt-60 Teletherapy Units carried out in collaboration with WHO and the International Atomic Energy Agency (IAEA) in Vienna. This study involves comparison of the radiation output of a cobalt-60 teletherapy unit, which is calculated by the participating national center, with the radiation dose as actually measured by a thermoluminescent dosimeter. The measurement is made by the IAEA laboratory which provides the necessary dosimeters and accessories, laboratory instruments, and technical laboratory staff. PAHO and WHO cooperate by coordinating the participation of national authorities. PAHO provided followup technical cooperation to identify sources of dosimetry errors through a radiologic physicist's visits to radiotherapy centers in Chile, Colombia, Ecuador, Peru, and Uruguay.

Collaboration to strengthen radiotherapy services was also provided through consultation with Chilean and Haitian authorities and through PAHO participation in the third congress of the Circle of Ibero-Latin American Radiotherapists at Mexico City and a subregional radiotherapy workshop at Santiago.

In the nuclear medicine area, quality assurance was stimulated through cooperation with the Federated Council of Nuclear Medicine Organizations in organizing a workshop to be held at PAHO headquarters in April 1981, and with Colombia in organizing a regional quality assurance workshop to be held at Bogotá in May 1981.

Technical advice on radiation protection was provided in PAHO staff and consultant visits to Barbados, Chile, Mexico, and Peru. Topics about which guidance was provided were the organization of protection services, instrumentation and methods for radiation measurement, calculation of radiation shielding, personal dosimetry services for workers, radiation control regulations and inspections, courses, and preparation for radiation accidents and emergencies.

The cooperative pilot program with Argentina, Colombia, Educador, Guyana, Jamaica, Mexico, Peru, and Venezuela to measure environmental radiation levels was completed and the final report prepared. Information was provided to radiologic specialists throughout the hemisphere through monthly distribution of the *Bibliography of Recent Publications* containing author and title entries in 16 journals and through distribution of the newsletter of the Latin American Association of Societies of Biology and

Nuclear Medicine. Arrangements were made with the American Association of Physicists in Medicine to provide the scientific literature it publishes free of charge to WHO's radiation health collaborating centers in Latin America. In cooperation with the U.S. Food and Drug Administration's bureau of radiological health, the bureau's scientific literature was made available free to radiologic workers throughout the Americas.

Contact was also maintained with various authoritative international radiologic organizations such as the International Commission on Radiation Units and Measurements and the International Commission on Radiological Protection to assure relevance and uniformity in PAHO's efforts to promote the use of internationally accepted radiologic standards throughout the hemisphere.

Accident Prevention

Accidents as a group are one of the five principal causes of death in all age groups in 26 of 36 American countries and territories. In addition, the overall accident rate has increased in all but one of the American subregions—temperate South America. The use of hospital services also reflects the importance of accidents as a health problem. In six of the 10 countries providing reliable hospital discharge data, accidents are the principal reason for hospitalization. In all countries, accidents rank no lower than second as the major cause of hospitalization.

Motor vehicle injuries will become a critical problem for the Americas during the 1980s as road networks and vehicle densities increase. An exacerbating problem is that many of the hemisphere's countries have difficulty obtaining automotive spare parts because they do not manufacture their own, and hence vehicle maintenance lags and contributes to high accident rates. Legislation, education, and road and vehicle safety design have so far not kept pace with these problems.

PAHO continued to collect statistical information on traffic accidents for inclusion in a WHO survey to determine the magnitude and nature of traffic accidents in the developing world. Eight American countries took part in the survey—Argentina, Chile, Colombia, Guatemala, Jamaica, Mexico, Peru, and Venezuela. The survey data will be the basis of a WHO meeting in Mexico City in November 1981 on the same subject, a meeting in whose planning and organization PAHO continued to participate. Health, law enforcement, road planning, construction, and maintenance specialists will represent 60 countries.

At the request of the Caribbean Community, PAHO assigned a short-term consultant to study the traffic accident situation in Antigua, Barbados, Belize, Guyana, and Saint Lucia. Data collection and analysis will continue through 1981 to help develop plans and programs to reduce the magnitude of this serious problem.

In the field of national activities, Mexico and Peru created intersectoral national commissions to analyze their traffic accident problems and highway safety education experiences.

(Photo: J. Vizcarra Brenner/PAHO)

Chapter 4

ENVIRONMENTAL HEALTH AND PROTECTION

Socioeconomic development in Latin America and the Caribbean has in recent years resulted in exponential urbanization and industrialization. More than 600 million people—twice the population of 1970—will inhabit the hemisphere by the close of the century. Migration to urban areas is expected to result in a population of 450 million in communities of more than 20,000 people by the year 2000. Now burgeoning industrialization will multiply many times over. These factors—population growth, migration to towns and cities, and increased industrialization—will characterize and aggravate environmental health concerns in the Americas in the years to come.

Water supply and sanitation continued to be a major problem in most countries during 1980. In urban areas at the end of 1979, 157.2 million people had house connections or easy access to water supply systems, and in rural areas only 41.4 million had these services.

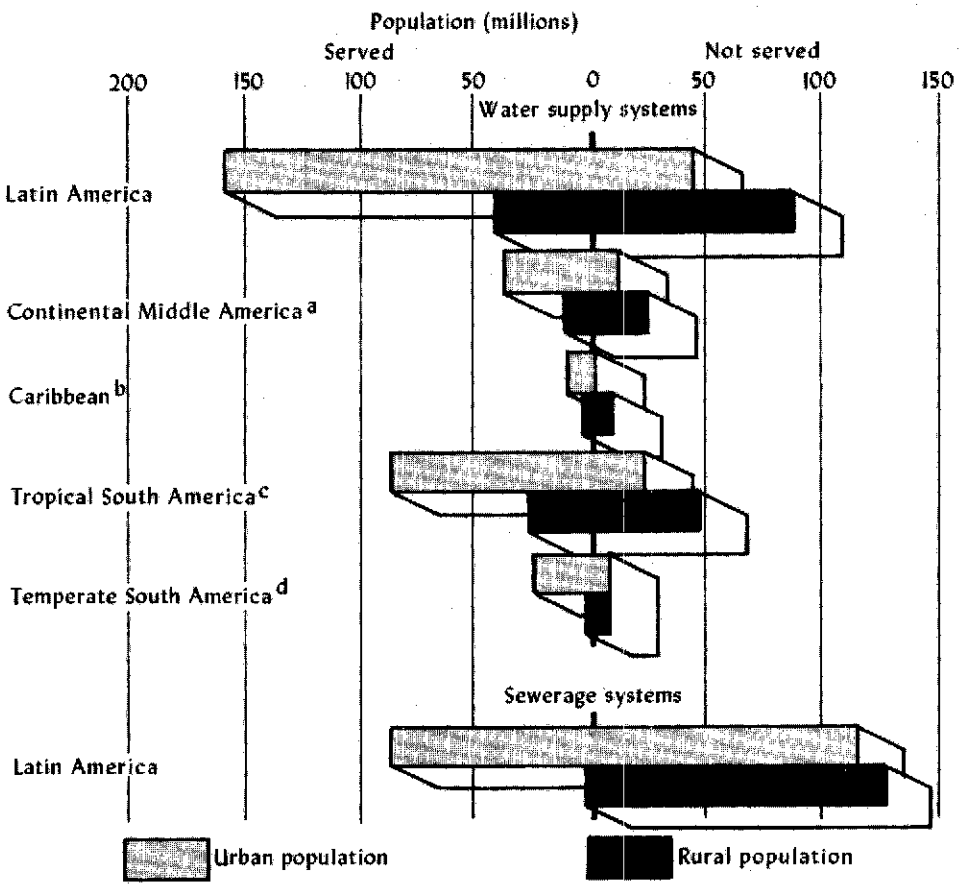
These data are shown in Figure 6, together with the most recent estimates of population served by sewage disposal systems. Though data about sewerage are less complete, the population served is less than 86 million urban and 1.3 million rural residents.

The International Drinking Water Supply and Sanitation Decade (1981-90), officially launched in November at a special session of the United Nations General Assembly, aims to provide these basic needs to the rural and urban poor. The Water Decade grew out of the United Nations Water Conference at Mar del Plata, Argentina, in March 1977 and is a globally coordinated effort to ensure that all the world's peoples have adequate drinking water and basic sanitation by 1990. To achieve this goal, strategies to combat the major constraints of the past will have to be adopted. These strategies include planning, manpower training, institutional development, appropriate technology, and financing.

Management of solid wastes poses increasing problems, despite the efforts of public health authorities to deal with them. Solid waste collection was especially critical in several large metropolitan areas where garbage production actually outpaced the urban growth rate. This often requires the institution of emergency measures to avert major environmental disasters. Nevertheless, greater awareness of the problem and its implications has led to national solid waste management planning and the allotment of national or external funds.

Cities, particularly industrial ones, are experiencing increasing air, water, and soil pollution and food contamination. Though many governments have applied or are con-

Figure 6. Urban and rural population served by water supply and sewerage systems, Latin America and subregions at year-end 1979.



[a] Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama

[b] Bahamas, Barbados, Cuba, Dominica, Dominican Republic, Guadeloupe, Haiti, Jamaica, Montserrat, St. Kitts, Trinidad and Tobago, Virgin Islands (UK)

[c] Bolivia, Brazil, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Venezuela

[d] Argentina, Chile, Uruguay

sidering applying measures to monitor pollution and establish controls, they may now have to delay or curtail such actions because of the persisting energy crisis.

The workplace often poses a threat to workers' health, as shown by high occupational disease and accident rates. The governments are becoming aware of the importance of occupational risks not only as health problems but also as a hindrance to productivity.

PAHO's areas of cooperation in environmental health are water supply and basic

sanitation, solid waste management, institutional development, environmental and other health hazards and pollution control, occupational health, fluoridation, and food protection.

Water Supply and Basic Sanitation

The provision of adequate safe drinking water and basic sanitation measures such as improved excreta disposal and housing have long been recognized as keystones in establishing and maintaining a healthful environment in which families can live and work. When the International Drinking Water Supply and Sanitation Decade was launched, the world's nations rededicated themselves to the principle that the universal provision of these basic health services is attainable. They committed themselves to providing safe water supply and adequate sanitation service to all by 1990, with special attention to underserved peoples in rural and marginal urban areas.

This effort will mean that 254 million additional people in the Americas will need adequate safe drinking water and about 390 million will require excreta disposal services between 1981 and 1990. The estimated cost of this effort will be $50 billion, which roughly equals the combined gross national products of Peru and Venezuela for 1979.

The actual cost and the coverage achieved will depend greatly on the technologic mix (the number of house connections as compared to public standpipes, or latrines to sewerage systems) and the type of service (low-cost, simplified technology) the countries adopt.

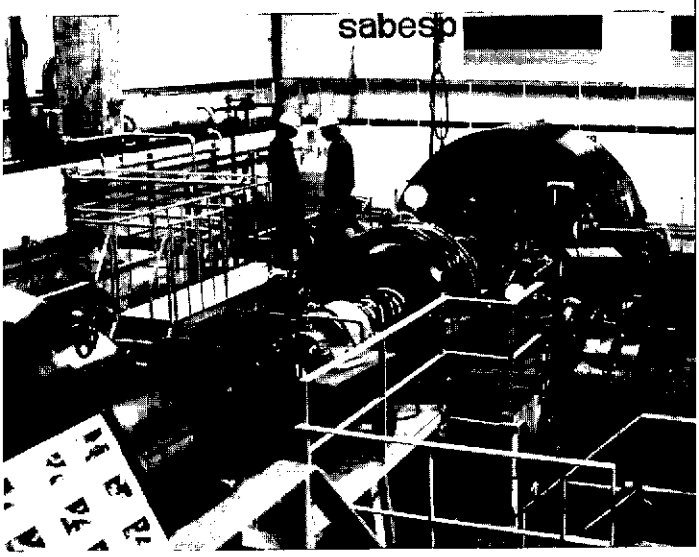
This will be the third time the Americas have set special water and sanitation goals. Each time they have focused their attention on different targets within the sector. In the 1960s it was water supplies for urban residents; in the 1970s, water supplies and sewerage for urban areas and drinking water and sanitation for villages; in the 1980s it is to be safe drinking water and adequate basic sanitation measures for rural and marginal urban areas.

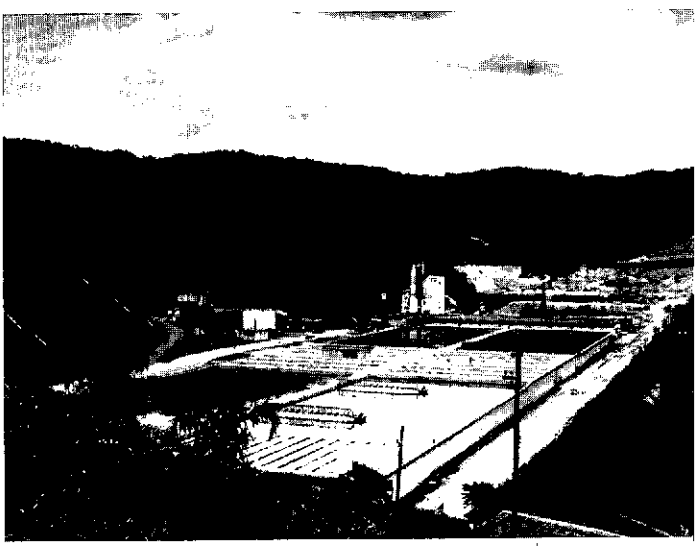
To prepare for this massive effort, the Americas have worked hard in recent years to maximize their use of existing resources and find ways to focus their water and basic sanitation efforts on programs to strengthen their primary goal of health for all by the end of the century. In 1980, for example, they emphasized strengthening national planning capabilities by establishing national Water Decade action committees in seven countries, with five more about to be established; continued their efforts to develop sector studies (22 country studies covering 99 percent of the hemisphere's population have now been completed), and worked closely with technical cooperation agencies to help identify and develop realistic programs and projects for financing.

Bolivia, Haiti, and Paraguay were included in an international cooperation project sponsored by the Federal Republic of Germany's technical cooperation agency (Gesellschaft für Technische Zusammenarbeit, or GTZ) and WHO for planning the Water Decade. Project activities were initiated late in the year and will continue through 1981. Agreements were signed for two new rural water and sanitation projects in El Salvador—one for national planning financed by USAID and the other for designing expanded rural water programs financed by UNDP. In Chile and Mexico the authorities initiated actions to reformulate sectoral plans to reflect Water Decade goals. In Argentina, Bolivia, Colombia, Guatemala, and Peru meetings were held to review the sectoral situation in light of the Water Decade. Together with the Caribbean Development Bank, PAHO and the World Bank conducted project preparation and execution activities.

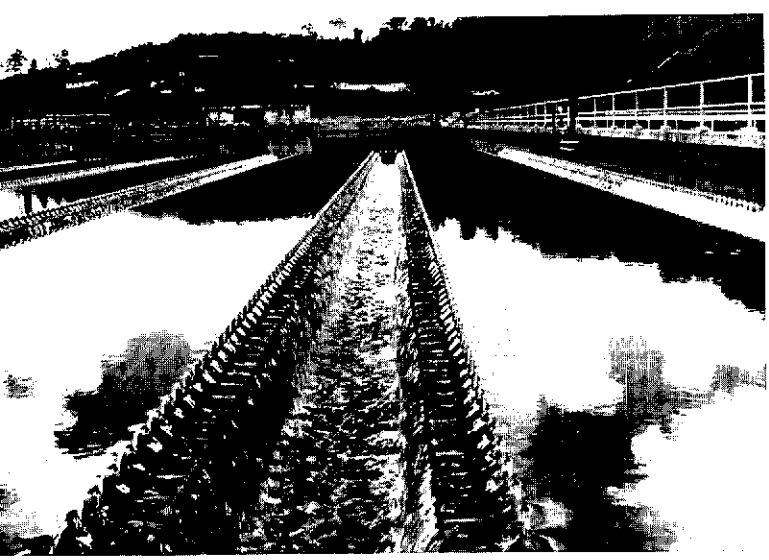
In examining the needs of the Americas, the countries looked beyond the Water Decade's cost to the very real human conse-

Rapidly growing cities demand ever more water. At right and in the center are scenes from a major water treatment plant at São Paulo.

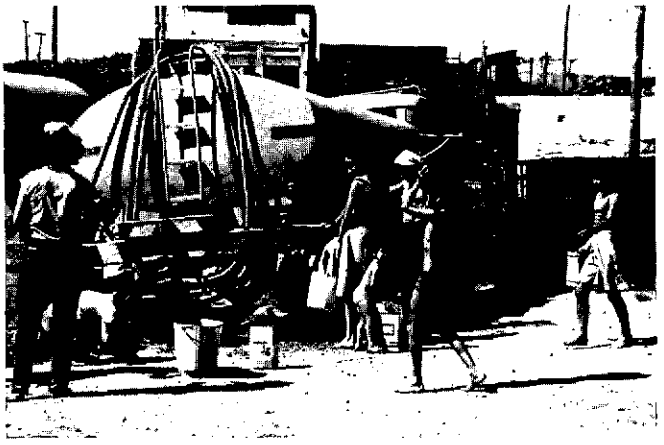




(Photos: J. Vizcarra Brenner/PAHO)



The Viscachitas Water Treatment Plant near Santiago.



Urbanization often outstrips water-main laying. Here a tank truck delivers potable water to residents of a marginal São Paulo suburb.

(Photo: J. Vizcarra Brenner/PAHO)

quences that result from the lack of these basic services. It has been estimated that diarrheal diseases alone account for 200,000 deaths a year. To this must be added the hours of personal drudgery spent in obtaining pitiful amounts of water, often of dubious quality. Recognizing that 39 of every 100 people still lack access to drinking water systems and 76 lack adequate excreta disposal, the countries sought to do three things: (1) improve existing services by upgrading the quality of available human and technical resources; (2) construct new services to expand existing ones, and (3) strengthen current operation and maintenance capabilities.

To carry out the strategies established by the Directing Council in 1979 (CD26.22), PAHO's water and basic sanitation program focused on four kinds of activity: (1) assisting countries in preparing for the Water Decade; (2) identifying and developing programs and projects for presentation to financing agencies; (3) carrying out activities to increase the number, type, and quality of the sector's manpower; and (4) executing projects to improve the quality of drinking water and sanitation services.

Special Water Decade activities included joint efforts with ECLA to prepare two regional meetings to discuss horizontal cooperation, the first to be held at Santiago in early 1981 and the second a few months later. In addition, planning went forward with ECLA to launch the Water Decade in the Americas during its meeting at Montevideo in May 1981.

To strengthen national capacities for program or project identification and development, PAHO continued its cooperative program with the World Bank. Technical advice was also given to Costa Rica, Panama, and Uruguay on water tariffs and to Montevideo on a sewerage project expected to cost $100 million which it is anticipated will be financed by IDB. Aid was also given to Argentina in preparing a multicity water supply project which will cost $600 million and be financed by the World Bank.

Recognizing that the countries' resources vary widely, PAHO emphasized developing networks of water and sanitation institutions which can collaborate on common problems, exchange experiences, and share resources. This concept was furthered when the newly founded Association of Water and Sanitation Institutions of Central America and Panama agreed to support the Costa Rican water and sewerage authority's La Uruca training center as the focal point for training trainers who will in turn develop the thousands of technicians needed throughout the subregion. Financing for this project was discussed with GTZ and IDB. As this concept is applied and

proved in Central America, it will be expanded to other subregions.

A prerequisite for preparing and carrying out country programs is the availability at all levels of skilled personnel who understand and are able to execute governmental and institutional policies. To help increase the pool of these technicians, engineers, and managers, PAHO helped the countries create the basis for an increased regional training effort. Through the Pan American Center for Sanitary Engineering and Environmental Sciences (CEPIS) at Lima, it continued to cooperate with Peru to ensure that the materials and results of the IDB-sponsored project for technologic development of sector institutions (DTIAPA) are made available to all water and sanitation agencies in the hemisphere.

To help countries develop technologies that more realistically reflect local human, technical, and financial resources, several operations research projects were established. To improve the quality of the water being provided, investigations of the technical and managerial aspects of simplified disinfection techniques were conducted with water authorities in Argentina, Colombia, Costa Rica, and Peru. CEPIS research results on simplified, low-cost water treatment plants were adapted to conditions in Costa Rica and Honduras, and in the future will be extended to other countries.

Awareness of the need to resolve operational problems was reflected in an increase in the number of projects to help countries reduce the unaccounted-for water losses many are suffering. An agreement was signed with CIDA and the Caribbean Development Bank to cosponsor a leakage detection training program based in Barbados. Trinidad and Tobago's water and sewerage authority started its joint IDB- and UNDP-sponsored project to improve various technical areas such as distribution system maintenance and leak detection. A UNDP-sponsored project in Uruguay helped that country's public works agency conduct studies to reduce unaccounted-for water lost because of leakage.

Water leak detection in Bridgetown.

(Photo: J. Vizcarra Brenner/PAHO)

Institutional Development

The strengthening of water supply and sanitation institutions and the sector itself has been recognized as a crucial element for attaining the goals of environmental health services and programs. Through its institutional development program, PAHO collaborated with 13 countries in establishing and strengthening their environmental health institutions. This will enable them to help the sector attain the goal of water and sanitation for all by 1990.

Cooperating with 34 national and local institutions responsible for both rural and urban area services, PAHO functioned as a catalyst in carrying out sound management techniques. Through a holistic system approach, staff members and short-term consultants worked in close collaboration with

institutional staff, establishing organizational and information systems to support management in decision making. This included development of human resources as well as legal, financial, and organizational aspects.

These planned changes improve the effectiveness of the institutions and results in an increase of coverage and better quality of services. Among the principal goals of institutional development projects are: improvement of planning, operation, and maintenance, project preparation and execution, and institution of adequate tariffs and commercial systems to increase revenues.

In addition to the use of PAHO resources, these projects are financed by the agencies themselves or by loans and contributions from national and international financial organizations such as IDB, the World Bank, and UNDP.

(Photo: M. Montecino/PAHO)

Local labor and materials are keys to the rapid expansion of rural water supply systems, as shown above in Utive, Panama.

To support national institutional development projects and programs, CEPIS prepared and executed the first of five modular workshops to train trainers in the commercial aspects of water supply and sanitation agencies. PAHO adapted the models prepared by Brazil's National Housing Bank (BNH) with PAHO's technical cooperation to develop that country's state water and sewerage authorities institutionally. This five-year project, completed in July, carried out most of its scheduled activities in cooperating with Brazil's 21 participating state water and sewerage authorities. BNH incorporated the project in its regular programs and created a unit to run it, as well as lines of credit to finance the state agencies in executing similar projects including training. To assist BNH in carrying out the program nationally, Brazil requested a two-year PAHO cooperative program, which began in July.

Barbados, with PAHO advice, completed the establishment of its new national water and sewerage authority, a project begun in 1978.

In Colombia, PAHO cooperated with the National Institute for Municipal Development in several continuing environmental programs in such areas as water supply and sanitation, solid waste management, markets, and training.

In Haiti, PAHO continued the technical cooperation project it started in 1977 with the national water service in setting up management, operation, and maintenance systems and developing water sources. On completion of bidding procedures, work began on water supply systems for 10 medium-sized cities.

Two main projects were underway in rural water supply and sanitation. One, dating from 1977, was to develop and strengthen the executive unit of Guatemala's rural water supply program. The unit's organizational structure was created and improvements were made in promoting community participation, which gave the communities served a share in the responsibility for operating and maintaining their water systems. Other achievements were new data

processing systems, simplified operating procedures, and improved information for decision making.

The other project, also started in 1977, was carried out by Paraguay's environmental sanitation agency with PAHO cooperation. Its purpose is to improve the agency's managerial and operational capability in executing a $6 million World Bank loan for rural water supply and sanitation works, as well as to prepare the institution and rural community boards for managing, operating, and maintaining the systems.

PAHO expanded its institutional development program to solid waste disposal and pollution control agencies. The continuation of the CEPIS workshop modules for training trainers will be strengthened by assigning a staff member responsibility for these activities. Finally, workshops and pilot experiments were programmed to foster community participation and health education, mainly in rural and slum areas.

Solid Waste Management

During the second half of the 1970s, solid waste collection and disposal came to be recognized as a critical problem in Latin American and Caribbean cities.

Most municipal sanitation services in the hemisphere were organized 20 to 50 years ago when the cities they served were much smaller than accelerating urbanization has made them today. In 1960, for example, 21 cities in Latin America and the Caribbean had more than a half-million population, but in 1980 there were 50 such cities. As a city grows, it has been found, each of its residents generates more daily waste. It has been estimated that each of the 1,200 Latin American towns and cities with more than 20,000 inhabitants generated 137,000 tons of solid waste daily in 1980, and that in 1990 they may each generate 230,000 tons a day, an increase of almost 70 percent. The problem worsens in direct relation to the size of cities, since in Latin America towns with fewer than 20,000 inhabitants generate only 5 percent of total urban solid waste.

Present urban sanitation is far from satisfactory in the hemisphere. Thirty percent of the paved streets in Latin American and Caribbean cities are not regularly cleaned; a third of the trash in those cities is not collected; and only 40 percent of the waste that is collected is disposed of in sanitary landfills. Nineteen of 20 towns and cities with 20,000 or more inhabitants still dispose of their detritus in open dumps.

That the hemisphere's cities can control the solid wastes they produce is seen in Rio de Janeiro, whose Companhia Municipal de Limpeza Urbana (COMLURB) has become perhaps the best urban sanitation system in the area in the past 15 years through integrated operations, administration, financing, and training. Rio de Janeiro's $10 per capita annual expenditures on solid waste management and COMLURB's $52 million annual budget are considerably less than those in many major cities of the industrialized world, yet thanks to good management the results are better.

Other cities with improving solid waste management systems have adopted measures to suit their specific conditions, an example of which is Buenos Aires' metropolitan ecologic protection scheme (*cinturón ecológico*), a circumferential forest belt. During the last three or four years several cities such as Buenos Aires, Rio de Janeiro, and São Paulo have tried to control air pollution resulting from trash burning by prohibiting building incinerators and increasing refuse collection.

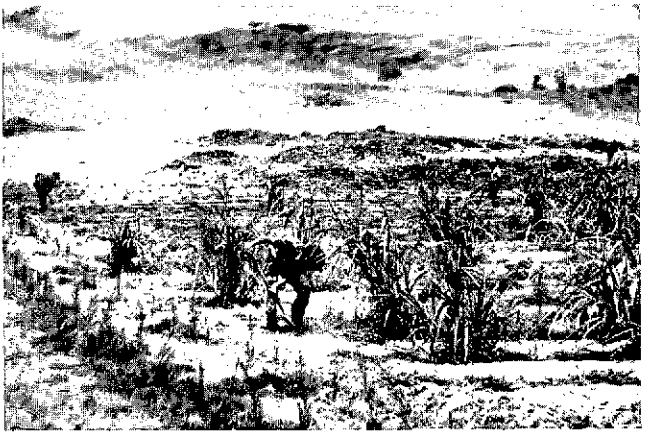
Despite these advances, solid waste management remains a critical problem in the hemisphere.

The phenomenal growth of large metropolitan areas in Latin America—Lima's population is now estimated at 5 million, Bogotá's at 4 million, and Guayaquil's at 1 million, for instance—makes them particularly susceptible

(Photo: J. Vizcarra Brenner/PAHO)

The Renca Sanitary Landfill outside Santiago.

When full, sanitary landfills like this one outside Lima, can often be turned to other purposes such as farming.



(Photos: J. Vizcarra Brenner/PAHO)

(Photo: M. Muntecino/PAHO)

Automated trash collection in Havana.

to crises in solid waste collection.

The same difficulties of financing, organization, day-to-day management, and strikes by ill-paid sanitation workers that plague municipal sanitation services throughout the world exist in Latin America and the Caribbean. The major financial problem is not capital investment, but appropriations for operation and maintenance, since investments in equipment are now only about 10 percent of current annual expenses. Further, the national plans that have been drawn up in the past two or three years in various countries to extend street cleaning and trash collection and disposal services will mean increased operating and maintenance costs.

Two problems seem especially common in Latin American cities because of their continuing reliance on open dumps. One is scavenging animals, in particular pigs, which spread trichinosis and other diseases.

The other and socially more serious is human dump scavengers, of whom there are thought to be 160,000. The lives of Latin America's *segregadores* are disfigured by alcohol, drugs, disrupted family ties, and disease. Various solutions have been proposed for giving them a measure of physical, social, and economic well-being, but almost none has proved successful.

Most cities in the hemisphere have space for sanitary landfills, and some areas such as Guanabara State in Brazil have recovered some of the cost of maintaining fills by selling methane from them. Other possible uses of refuse are recycling materials such as metal and plastics or creating new lands.

Because of mounting awareness of the solid waste problem, most of the countries began or continued major efforts in 1980 to formulate, finance, and execute studies, plans, and projects to deal with it.

PAHO, through its solid waste management specialists in Washington, CEPIS, and the countries, actively aided in solving the problem. A solid waste sector study—the first of several planned—was carried out in Chile with World Bank financing and the assistance of four staff members.

National urban sanitation plans were formulated in Bolivia, Brazil, Costa Rica, Dominican Republic, Guatemala, Honduras, and Nicaragua. Their goals for 1990 are generally to achieve 100 percent cleaning of all paved streets and collection of solid waste in towns and cities of 20,000 or more people, as well as to dispose of all waste collected sanitarily.

Advice was also provided on plans for street cleaning in several cities such as Curitiba in Brazil; Santiago; Neiva, Pereira, Tunja, and other cities in Colombia; Santo Domingo in the Dominican Republic; Tegucigalpa in Honduras; Managua in Nicaragua, and Cuzco and Iquitos in Peru.

Financial management analyses were undertaken, with positive results as in the case of the Empresa Distrital de Servicios Públicos in Bogotá, which succeeded in tripling its revenues over the start of 1979.

To further the training of solid waste sector workers, PAHO used its limited resources to carry out projects that had a multiplying effect in the countries by holding subregional workshops and national courses to train trainers. A solid waste workshop was held at Guatemala City in June for 28 participants from Central America and Panama to discuss and propose strategies for each of the countries. PAHO held its fifth regional course on street cleaning in October at the University of Buenos Aires' sanitary engineering institute for 26 professionals from various countries. PAHO also cooperated in sponsoring short courses in Colombia which 80 people attended such as a seminar on evaluating street-cleaning services in Melgar, an urban sanitation workshop at Bogotá, and a solid waste symposium in Cúcuta.

PAHO also cooperated in formulating basic proposals for a program to control toxic and industrial solid wastes in Brazil and in initial planning to improve urban sanitation services in the 14 cities with more than 500,000 population in the Andean Pact countries.

Control of Pollution and Other Environmental Health Hazards

Accelerated population growth, industrialization, and socioeconomic development in general have resulted in greater pollution of the air, water, and soil throughout the Americas. Unfortunately, this growing problem has not been coupled with increased construction of pollution treatment facilities or execution of pollution prevention programs. Since pollution is known to be detrimental to human health and well-being, PAHO provides technical cooperation to the countries in pollution monitoring, prevention, and control.

Strong environmental protection programs require broad national policies and financial and manpower commitments. These are being stimulated by individual projects in the countries and the Global Environmental Monitoring System (GEMS), carried out by UNDP, UNESCO, World Meteorological Organization, and WHO. As part of GEMS, air monitoring data began to be collected in 1978 and water quality data a year later in the Americas.

CEPIS is the regional focus for monitoring activities. As such it relays information received from GEMS stations to WHO, distributes technical information on monitoring, responds to country requests, and cooperates in system operation and determination of equipment needs through missions to the various stations.

PAHO also provides assistance in evaluating and improving national pollution control programs, formulating and preparing project proposals to be submitted to lending agencies, identifying human resources, and defining terms of reference for air and water quality monitoring activities.

In Brazil, PAHO has collaborated in developing several UNDP-funded environmental pollution control projects. In Rio de Janeiro a project to develop the state's environmental control program, carried out by the state's Environmental Engineering Foundation and with PAHO as UNDP's executing agency, was completed in 1980. Its final report recommended the restoration of Lake Rodrigo de Freitas, used for recreation but badly polluted, control of air pollution, management of solid wastes, improvement of heavily contaminated Guanabara Bay, and prevention and control of pollution in the Paraiba do Sul River, the major water supply source of the city of Rio de Janeiro. To complement that project, UNDP financed an additional small project late in the year to study ways to control air, water, and soil pollution due to toxic chemicals.

In support of environmental pollution control carried out in São Paulo by the State Company for Technology in Basic Sanitation (CETESB), PAHO assisted as executing agency in a UNDP-funded project to develop a research and environmental pollution control program. It included assistance in institutional development, water pollution control, establishment of a water quality monitoring network, air pollution monitoring, solid waste disposal, urban noise control, and training in environmental pollution control methods. As followup to that project, CETESB and PAHO signed an agreement to carry out a water, soil, and air pollution control program for São Paulo State, to be financed by CETESB.

In the area of pollution control in the city of São Paulo and its environs, CETESB will conduct a three-year World Bank-financed industrial pollution control project for which PAHO technical cooperation is planned to reduce industrial particulate emissions, industrial discharges of toxic substances into rivers, and health risks, as well as treating industrial wastes and strengthening CETESB's capacity to plan and carry out a long-term pollution control program.

PAHO also collaborated in a UNDP-funded project to formulate a plan for restoring Lake

(Photos: J. Vizcarra Brenner/PAHO)

Lake Paranoá, a once badly polluted artificial recreational lagoon in Brasília, is now being restored to its former quality. Above, technicians from the local water utility take samples of the lagoon's water.

Industrial air pollution, São Paulo.

Paranoá, an artificial lagoon in Brasília whose water quality has deteriorated because of domestic and agricultural pollution, and maintain the water quality of Lake Descoberto, which is to serve as Brasília's source of drinking water.

Recife was the site of a seminar, attended by Brazilian and foreign participants, on water resources in arid and semiarid locales, the purpose of which was to analyze short- and medium-term solutions for water resource use in northeastern Brazil.

In Colombia, several pollution control projects have been underway. As part of a project to develop the Cauca River watershed, PAHO arranged travel seminars and provided advisory services in designing and locating industrial waste treatment plants and using chromatography equipment to analyze pesticides.

PAHO provided advice and support to a project for researching, monitoring, and controlling pollution in Cartagena Bay and surrounding areas, especially attempts to define alternative and economical technical solutions to the problem.

PAHO and Colombia signed an agreement for technical cooperation in protecting the Bogotá savanna water resources, including advisory services in the organization required for integrated control and management of the basin of the Bogotá and Suárez Rivers as well as establishment of water quality criteria and standards. Collaboration began on studies of industrial liquid waste pollution, especially that resulting from tanning.

A wastewater treatment and disposal project in the city of Bogotá received PAHO support through advisory services in analysis of alternatives to wastewater treatment and in water chlorination and through training from travel seminars.

In Costa Rica, technical cooperation in preparing an environmental protection program has focused on advisory services in collecting information on water and air pollution and in soil pollution control with emphasis on pesticides and fertilizers.

In Venezuela, PAHO executed a UNDP-financed environmental pollution research project to develop and strengthen the national environmental research directorate; establish norms, strategies, and activities for environmental preservation; evaluate the impact of development on the environment; and investigate pollution. Activities included study of water quality and pollution discharge in Lakes Maracaibo and Valencia and all their tributaries, sediment analysis, and evaluation of eutrophication in the two lakes.

Air pollution in the Caracas Valley, development of a sanitary landfill on Margarita Island, research on stabilization lagoons, and the environmental effect of petroleum extraction and refining were other activities in Venezuela. Decision makers have used the results of these studies to determine suitable courses of action.

Human illness and death from exposure to environmental health hazards continue to increase in frequency and severity.

PAHO has for many years been meeting national requests for information about chemical safety. In the 1970s, for instance, it collaborated with Argentina, Barbados, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Mexico, Trinidad and Tobago, and the United States in their attempts to resolve problems associated with the continued indiscriminate use of toxic substances. Because such use of toxic substances is a worldwide problem, the World Health Assembly voted to create an international chemical safety program.

The program, a joint activity of several United Nations specialized agencies, aims to: (1) make and disseminate evaluations of the effects of chemicals on human health and environmental quality; (2) develop guidelines on exposure limits for all types of chemicals such as acceptable daily intakes and maximum permissible or desirable levels in air, water, food, and the working environment; (3) develop guidelines on methods for toxic-

ity testing, epidemiologic and clinical studies, and risk and hazard identification, quantification, and evaluation; (4) coordinate international laboratory testing and epidemiologic studies when suitable, and promote research on dose-response relations and mechanisms of the biologic effects of chemicals; and (5) develop information for coping with chemical accidents and promote effective international cooperation and training and manpower development in this field.

About 50 nations are interested in the global program, including Canada, Mexico, the United States, and possibly Brazil.

PAHO cooperates in the program in the Western Hemisphere through its headquarters and the Pan American Center for Human Ecology and Health (ECO), which was founded at Mexico City in 1975 and in June moved to its new center at Metepec, 80 km west of the Mexican capital. In addition to its toxic substance control research and advisory services, ECO's staff also counsels national authorities on the health effects likely to result from activities which may produce major ecologic changes, such as colonization or dam construction.

Interior of the Pan American Center for Human Ecology and Health, Metepec, Mexico.

(Photo: M. Montecino/PAHO)

During the year ECO finished a critical review of organochlorine pesticide residues in human milk and the health risks they pose and began an inventory of human resources in toxicology in the hemisphere. Since ECO is located close to a Mexican agricultural research and extension center, joint efforts have begun with local officials to develop Spanish-language correspondence and classroom courses for agricultural extension workers on the safe handling of pesticides. When finished, the courses will be tested in the state of Mexico and later made available regionally. Another ECO activity related to toxic substance control was a visit to advise the Nicaraguan Institute of Natural and Environmental Resources on hazards associated with mercury contamination in Lake Managua resulting from gold ore refining.

The WHO environmental health criteria program, established in 1973 with UNEP support, published six more criteria documents during the year. PAHO disseminated these materials and completed plans for translating them into Spanish, while translating and publishing three other criteria documents in that language. The purposes of the WHO program are to assess existing information on the relationship between exposure to environmental agents and human health, and to provide guidelines for setting exposure limits consistent with health protection.

Also part of the GEMS programs sponsored by WHO and UNEP is a pilot project, begun in 1978, to assess human exposure to metallic and organochlorine pollutants through biologic monitoring. Because of the nature of the study and financial constraints, the project's metals component is limited to 10 countries and its organochlorine compounds component to 12 countries.

Mexico and the United States participate in both of the program's components, and Peru has joined the metals component in order to monitor pollution in the Mantaro River, which is to serve as Lima's water source. PAHO's main interest in the new GEMS program is in encouraging hemispheric govern-

ments to develop an understanding of their own problems and start monitoring programs, and it has provided some equipment for the latter activity.

Occupational Health

The labor force of Latin America and the Caribbean is now estimated to number between 100 and 110 million workers. It has been conservatively estimated that these workers suffer 10 million occupational accidents and 50,000 fatalities annually. Occupational diseases are also widespread and increasing. Studies carried out in various countries show that disability due to industrial accidents and occupational diseases may average about 10 percent of the annual gross national income of developing countries, including direct and indirect costs of bonuses, reduced working hours, extended vacations, and early retirements.

The Third Special Meeting of American health ministers at Santiago in 1972 included protection of 70 percent of workers exposed to occupational risks in the 14 countries with fully operating occupational health programs and of 50 percent of workers in countries without well-developed programs among the goals in the Ten-Year Health Plan for the Americas (1971-80).

Although those goals were not reached, many countries have made major progress in protecting their workers. The Andean countries are developing a subregional occupational health program, and the English-speaking Caribbean countries have begun defining the problem in their islands and organizing programs to deal with it. The social security institutes of most of the countries have also interested themselves in occupational health, and occupational health training institutions have been established or are being established in at least six countries.

In 1980 CEPIS sent representatives to Hipólito Unanue Agreement meetings on occupational health, responded to national requests for information and advice on the subject, and organized a programming workshop intended to have a multiplier effect once participants return to their own countries. In the Caribbean, it and ILO cooperated in planning an early 1981 workshop for that subregion's occupational health program.

PAHO also advised the health ministries of Bolivia, Chile, Ecuador, and Paraguay on the creation or improvement of their occupational health programs.

Food Protection

Food protection lags seriously in Latin America and the Caribbean since perhaps only a half-dozen countries have organized food inspection programs. Some are financed nationally and others are supported in whole or part by UNDP, which has received more requests for aid in this area than it can immediately finance.

Though the food protection problems noted in previous years persisted in 1980, at least half the hemisphere's countries showed some degree of interest in establishing or improving their food protection programs. Two factors principally account for this increased interest. First, morbidity and mortality from food-borne diseases continue to be a significant percentage of the reported hospital discharges and deaths in most of the countries. And second, the increasing cost of food in domestic and world commerce has led to awareness that reducing domestic food losses averaging 30 percent from wastage due to contamination and inadequate distribution could help a country's balance of payments and lower the expenses of treating patients with food-borne infections and intoxications. The developing countries are producing less food, particularly nutritive protein, than they could and are losing more than they should.

In consequence, the health ministers have

Little or no control over food sanitation exists in open-air markets such as these in Lima.

(Photos: J. Vizcarra Brenner/PAHO)

adopted resolutions at several of their subregional meetings asking PAHO to help in planning, designing, and carrying out food protection programs. As an example, the Commonwealth Caribbean health ministers recommended at their 1980 annual meeting that each country in the English-speaking Caribbean develop a food safety policy and that, with PAHO's help, a technical group be formed to draw up a subregional food safety policy and guidelines. An initial planning meeting for the Caribbean food safety program was held in Barbados in September.

Often through its Pan American Zoonosis Center (CEPANZO) in Argentina, PAHO advised national food control services in Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Honduras, Panama, Peru, and Trinidad and Tobago. These are examples of some of PAHO's advisory services to the countries:

- CEPANZO continued its research on microbiologic criteria for controlling Argentine cheese and completed its studies of soft and semihard cheeses, developed microbiologic criteria for controlling Argentine curds, and conducted counts of *Staphylococcus aureus* in powdered milk.
- Under an agreement with the Dairy Industry Technology Research Center (CITIL) of Colombia's National Institute of Industrial Technology, CEPANZO continued to cooperate in organizing and developing CITIL's dairy products microbiology laboratories. It also continued its assistance to Colombia in organizing a national food control laboratory network.
- Honduras' meat inspection service, which was operating only in export packing plants, extended its oversight to municipal slaughterhouses processing meat for domestic consumption. Inspectors were also stationed at poultry slaughterhouses and sausage plants. Quarantine services are being extended as technical improvements are made in the program, with strict surveillance maintained at overland checkpoints and sea and airports to prevent the importation of diseases harmful to the country's livestock industry.
- In Trinidad and Tobago, PAHO provided further assistance under the milk control and slaughterhouse quality evaluation programs. Assessments of the government slaughterhouses at Princes Town, Roxborough, San Juan, Scarborough, and Tunapuna were completed on the two islands. The desirability of centralizing the slaughtering facilities for both islands to improve the sanitary quality of meat was pointed out.

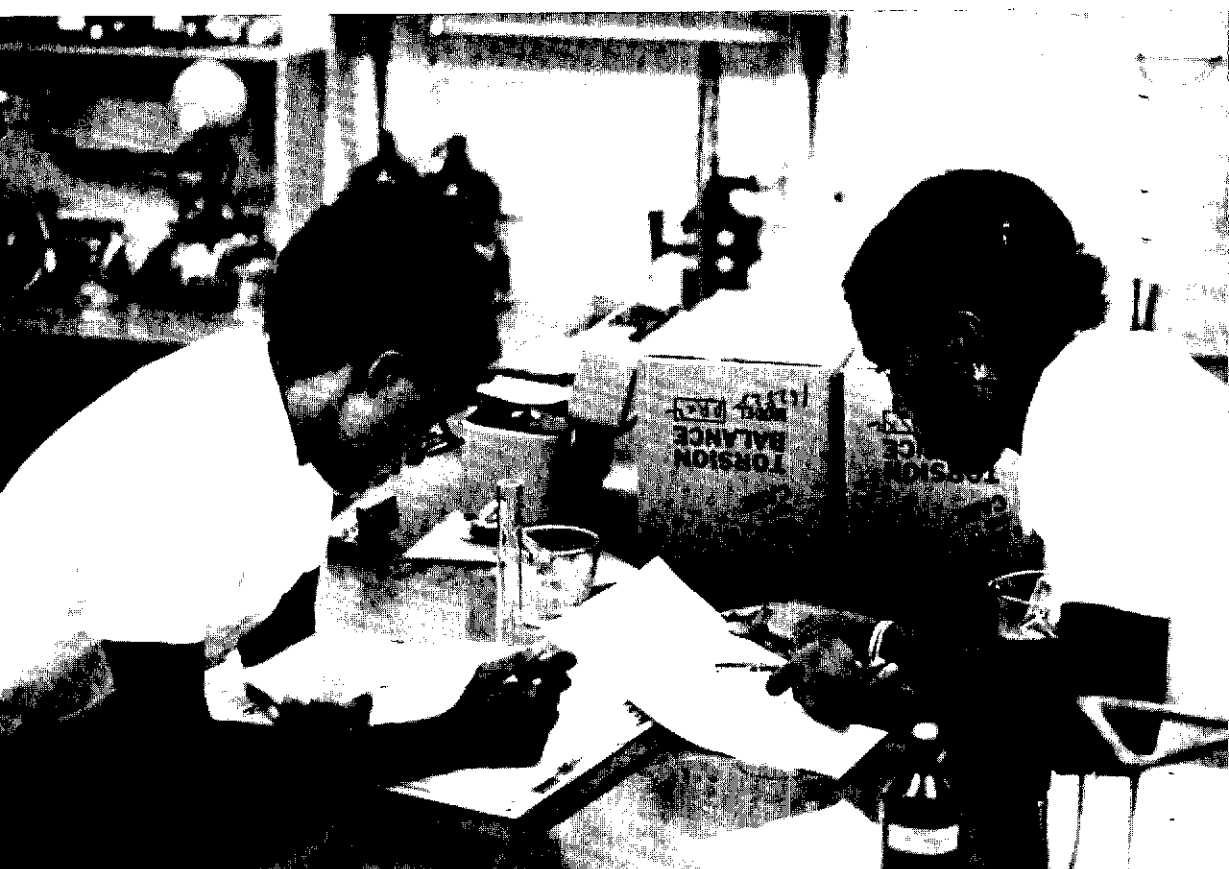
PAHO was particularly active in helping train food inspection workers of varying degrees of seniority during 1980. The hemispheric educational program in food protection, in collaboration with Colombia's School of Public Health at Medellín, graduated 22 food inspectors from its 22-week food protection course. Four of the students were from other countries. The Medellín school also offers five or six month-long international courses in various countries for professionals every year using its own faculty and short-term consultants.

Specialized national courses in food protection for professionals were conducted jointly with national authorities at Barranquilla, Colombia, and in Panama.

In addition, PAHO cooperated with the public health school at Tulane University in New Orleans, Louisiana, in training veterinarians and lay health workers from the English- and Dutch-speaking Caribbean to become public health inspectors with a strong emphasis on food inspection. Such students are first entered in the school's core public health master's degree program as auditors and then assigned to on-the-job training positions in the New Orleans area suitable to their previous education. Supported by fellowships from PAHO's country programs, they generally receive five or six months of training.

Cooperation also continued with two joint WHO/FAO bodies, the Codex Alimentarius Commission and Food and Animal Feed Contamination Monitoring Program. A senior FAO food protection specialist visited PAHO headquarters to discuss activities of mutual interest.

PAHO staff and consultants gathered information from selected countries to prepare the working document for the technical discussions of the 1981 Directing Council meeting. The first draft of the document was reviewed by several experts representing regulatory agencies, international organizations, and academic institutions.


TORSION
BALANCE

Chapter 5
HUMAN RESOURCES AND RESEARCH

Planning and training the personnel needed for coverage extension programs based on primary care was the main focus of human resource development in the Americas in 1980. Programs to train technical and auxiliary personnel received special emphasis. In university programs, an effort was made to include new primary care concepts and practices.

Just as health care organization requires determining levels and areas in which programs are to operate, so must the types of health workers to be used in them be determined. This makes it possible to allocate better roles in meeting program requirements and staffing facilities and to evaluate performance. Rising service costs, inflation, and underuse of health professionals in many countries make it imperative that human resource development be taken properly into account in any coverage extension effort, since labor costs account for more than 60 percent of health sector budgets.

Practical training in medical laboratory technology at Community College, Bridgetown.
(Photos: J. Vizcarra Brenner/PAHO)

These problems have prompted efforts to develop human resource programs that promote retraining with continuing education in order to solve shortcomings detected through supervision. Indeed, an effort is being made to modernize all training in accordance with the latest principles of health administration.

A marked discrepancy nevertheless exists between manpower requirements and output as a result of inadequate planning. In addition, overall development planning is not providing an adequate framework for educational and particularly human resource planning. This is due to weak organizational ties between the two levels of planning, theoretical disagreements as to the proper place of education in general planning, and the many practical obstacles confronting planning in unstable environments with few and fluctuating resources. Special attention is accordingly being given to supporting health ministry manpower units to help them surmount these obstacles.

The development of coverage extension programs requires the development of scientific research as well. During the year, therefore, health service investigations were promoted in order to develop action-oriented research to provide continuous scientific solution to the problems of health services. PAHO also continued to support biomedical and socioepidemiologic research, particularly in its priority fields of work.

The Advisory Committee on Medical Research increased its interest in specific areas, among which were health service, socioepidemiologic, nutrition, and diarrheal disease research. Finally, the Special Program for Research and Training in Tropical Diseases has stimulated the development of research institutions and investigations dealing with the diseases the program covers.

Infrastructure Development and Manpower Planning

PAHO continued to provide technical assistance to the countries in developing health care training institutions and programs. This included institutional analysis, problem identification, and preparation of remedial plans which in some cases go beyond training alone and envisage changes in administrative and physical infrastructure.

The establishment of training project networks has led to extensive exchanges of experience among representatives of national plans and programs and the institutions making up those networks. Initial evaluations of networks of subcenters in nursing education technology, advanced health administration studies, public health schools and graduate schools of preventive and social medicine, continuing education programs, and the supervisor training program show the value of such networks in developing the hemisphere's health schools and programs.

Special mention should be made of the first intercountry technical cooperation programs in health education. One is between the Universities of Santiago, Cuba, and Guadalajara, Mexico, and the other is between Cuba and Nicaragua. Both train middle-level technical personnel.

PAHO continued its projects to strengthen training institutions comprehensively with the support of IDB and other lending agencies. In the Dominican Republic it assisted the Catholic University of Santiago; in Honduras it resumed its support of the development of the medical school and its teaching hospital, and continued its program to train personnel at other levels of the health ministry, and in Nicaragua it provided further assistance to the university development and technical and auxiliary personnel training program. In the community health training program for Central America and Panama (PASCCAP), it sought to provide comprehensive support to training centers in their efforts to produce health workers better equipped to serve in coverage extension programs.

In the area of human resources planning, PAHO collaborated with the health ministry of Barbados in a survey to identify the manpower needed to carry out that country's proposed national health insurance scheme. In Trinidad and Tobago, it worked with health and finance ministry officials to prepare a report on present and projected manpower needs for that country's health services.

In collaboration with the Colombian health ministry, PAHO sponsored a second international course on manpower planning for 18 participants from 10 countries. A followup course was designed which will give participants the specific skills needed to develop national health manpower plans.

Education and Training

Medicine

PAHO's main regional activity in medical education during 1980 was a joint effort with the Pan American Federation of Medical School Associations (FEPAFEM) to define minimal requirements for new medical schools. As a result of the explosive growth in the number of medical schools in Latin America and the Caribbean in recent years, there are now nearly 300 with more than 250,000

students. This growth will probably continue.

PAHO and FEPAFEM therefore suggested that minimal requirements be established to guide countries in authorizing the creation of new schools. A set of such requirements, essentially based on providing the personnel health services needed to respond to the needs of the population, was developed in preliminary meetings at Caracas and in Brazil.

PAHO initiated country activities in conjunction with national medical school associations. A guide for evaluating schools of medicine previously used in all six Peruvian medical schools and in proposals for establishing new schools was the basic document for the first national meeting, held in Peru in September. At the meeting, which was attended by participants from all Peruvian schools of medicine, observers from the associations of Ecuador, Colombia, and Mexico, and FEPAFEM, and delegates from the Peruvian health ministry and social security institute, conclusions and recommendations were reached on ways of rationalizing the establishment of medical schools by taking existing health plans and overall health manpower planning into account to ensure full and gainful physician employment.

PAHO continued to support individual countries' medical education programs on request, mainly to achieve closer integration between training and service institutions, as the primary care strategy dictates. Teaching-service integration seminars were held in Chile, Paraguay, and Peru. Community health-oriented medical education programs continued in Brazil, Colombia, Cuba, Jamaica, Mexico, and Venezuela. Special support was extended to IDB-funded medical education programs at the Catholic University of Santiago in the Dominican Republic and in Mexico.

Guatemala's school of medicine received assistance in reforming its curriculum and developing an audiovisual unit, for which PAHO's Latin American Health Education Technology Center (CLATES) at Rio de Janeiro supplied educational video cassettes. Support was given to the University of Honduras' medical school in solving the problems of its relationship with its teaching hospital. In Peru, audiovisual instruction and educational technology support was provided to the medical schools of San Marcos and Cayetano Heredia universities.

The University of Panama's medical school received assistance in pedagogic training. In the same area, professors of medicine continued to receive advanced training in educational methods at CLATES.

PAHO provided support to the University of Costa Rica's medical school for an epidemiology training program which, though begun as a national activity, had participants from all of Central America.

In Colombia, the Military School of Medicine and Social Sciences, established in 1979 with PAHO's advice, inaugurated a new building to house a regional pathology center, library, and basic science laboratory. The school also received audiovisual aids from CLATES.

The schools of medicine of Santiago, Cuba, and Guadalajara, Mexico, conducted joint activities in curricular improvement and instructor retraining. They also jointly produced a mother-and-child care textbook. The coordinational arrangements were developed in periodic meetings, the last of which, held at Guadalajara in December, determined the final composition of the textbook.

Public health and social medicine

Educational programs in public health and social and preventive medicine are now required to assume greater responsibility for meeting the training needs of present health workers and new personnel who will be active in the 1980s and 1990s.

A revision of public health structures and programs to adjust them to the countries'

needs began in 1980. Schools of public health initiated plans to decentralize their instruction through regionalization of basic courses involving interaction between health services and universities. Impressive initial results were achieved in Brazil, Colombia, and Venezuela. While continuing their graduate programs, public health schools and departments of social medicine are trying to institute a wide variety of short-term programs, seminars, and workshops in priority areas of administration, planning, and research on teaching methods. Such projects were particularly active in Chile, Colombia, Ecuador, and Mexico.

The Latin American Association of Public Health Schools (ALAESP), which comprises graduate public health and social medicine programs, continued its activities with PAHO support. Its headquarters was moved from the National School of Public Health at Medellín to that at Rio de Janeiro.

In December the public health school at São Paulo sponsored a meeting on health service research methods as a followup to the promotional activities ALAESP had initiated. The public health schools of Colombia and Venezuela revised their structures and programs. In Cuba, a health development institute continued to organize and conduct its training and research programs, including an international health program. A seminar for provincial heads of epidemiologic services was held with PAHO assistance. Mexico's School of Public Health continued to offer its training course for health administrators and planners in collaboration with PAHO.

PAHO continued to prepare in-service epidemiology training materials which were field-tested in Cuba, Mexico, and Uruguay. After they are revised, they will be made available to countries requesting them.

Health care administration

One of PAHO's concerns, particularly during the last three years, has been to support health administration training programs in Latin America and the Caribbean. The existing programs in the hemisphere were identified jointly with the W. K. Kellogg Foundation and, subsequently, subregional meetings were held in Puerto Rico in 1976 and Brazil and Colombia in 1977 to lay the groundwork for strengthening schools responsible for such training and eventually expanding their training capacity.

In March a new stage in this program was inaugurated. Its goals are to: (1) develop a system to provide information on and foster effective communication among health administration training programs, (2) improve such programs' procedures and content, (3) develop continuing education programs based on health service requirements, (4) promote research to integrate education and health services, and (5) establish new health administration training programs.

Between March and December visits were made to the programs in Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Mexico, and Venezuela.

All the training programs were used as vehicles to promote health service research to develop new and alternative care models and encourage teaching-service integration. The following studies were undertaken with PAHO support: (1) a medical care model for underserved urban residents, (2) the organizational behavior at the University of São Paulo's medical school and its teaching hospital, (3) a review of the literature on health care costs and their control, (4) a similar review on health service evaluation and planning, and (5) another literature review on organizational behavior in health services.

Workshops were conducted to improve the procedures and content of the health administration training programs in various countries. They covered training in organizational behavior, health service evaluation and planning, and the economic and financial aspects of health cost containment.

The program increased its commitment to assist in training executive and middle-

management personnel, and further progress has been made in the consolidation of programs of advanced education in administration in Rio de Janeiro, São Paulo, and Cali. At the same time, a start was made on designing new programs in Costa Rica and the Dominican Republic. Ecuador and Peru launched new regular educational programs in this field in 1980. The network of 49 existing educational programs is being progressively expanded and collaborational links are being strengthened.

Nursing

Nurse training was strengthened in most of the countries, particularly through middle-level technical programs.

The creation of technical-level programs has significantly increased the supply of nurses in the hemisphere, though the programs' orientation has not been fully worked out and in many of the countries professional associations have yet to accredit them.

University nursing programs are generally being strengthened. Advanced licentiate-level courses are being initiated, and postgraduate and master's degree courses are being improved or started in various countries, among them Brazil, Chile, Colombia, Costa Rica, and Mexico. These programs have not had the expected impact, however. Except in a few countries, nursing education at this level is still very limited and at times divorced from reality.

Graduate training has not been as widespread as it should be, nor has sufficient effort been made to put it on a sound scientific basis through researcher training. With a few exceptions, nursing research is incipient and tends to focus exclusively on the profession's social aspects.

In recent years, the new reliance on primary care to extend health services has created a need to redirect nurse training at all levels to prepare nurses for primary care duties.

The expansion of nursing programs has required that large numbers of professors and instructors be trained. To this the nursing education technology subcenters in Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, and Peru have contributed greatly.

By the end of 1980 each subcenter had trained more than 800 nursing professionals through programs oriented to train instructors in teaching methodologies. Special atten-

Working under a graduate nurse's supervision, student nurses learn by doing at the Ramón González Coro Mother and Child Hospital in Havana.

(Photo: M. Montecino/PAHO)

tion was also paid to preparing educational materials and determining the various schools' educational needs.

The regional research project to prepare nurses properly equipped for and committed to research, which stresses improvement in training and the performance of services, is another important activity in some Latin American countries. Well-developed research groups already exist in Riberão Preto, Brazil, and Quito, and, to a lesser degree, in Cali. These groups are completing their research and submitting their findings. Their research topics are the influence of selected factors on the demand for nurses at Riberão Preto, nurses' dissatisfaction with their work at Quito, and factors influencing acceptance of nurses' expanding roles at Cali.

Specific activities in nursing education were carried out in nearly all Latin American countries. In Costa Rica and the Dominican Republic, nursing education was largely directed toward expanding nurses' clinical roles. In El Salvador, Panama, and Peru, interesting efforts were made in community nursing. In Mexico, special attention was paid to securing the support of nursing schools for curriculum integration, closer relationships between teaching and service, and the development of specific programs for maternal and child health and other fields. In Nicaragua, attempts were made to develop nursing education at the technical and auxiliary levels without neglecting support of higher echelons. In Venezuela, the development of middle-level nursing technicians was of special concern.

In the English-speaking Caribbean, nursing education is primarily oriented toward community nursing. Courses along this line were developed in the Bahamas and Jamaica.

Mental health

Training primary health workers in mental health is one of the priority areas of PAHO's mental health program. A working group, called into session to promote activities in this field, developed guidelines for inclusion in a manual and for use in establishing standards.

The program to train general physicians in mental health and basic psychiatry continued in Argentina and Chile. Ecuador received support for its psychiatry specialization program, while Peru received further assistance in continuing education for psychiatrists. A neurologic sciences course for professors in that specialty was conducted in cooperation with Mexico.

Mental health teaching in nursing schools was promoted in the English-speaking Caribbean countries, Argentina, and the Dominican Republic by regular staff and consultants. In cooperation with national technical staff, curricula were reviewed and seminars conducted in psychiatric nursing in Argentina, Barbados, and Jamaica.

Courses on various aspects of alcoholism control were supported in Argentina, Chile, Ecuador, and the U.S. Virgin Islands. Seminars on the prevention and treatment of drug dependence and the execution of international drug treaties were given in Argentina, Bolivia, and Peru.

Dentistry

PAHO advised Costa Rica, Dominican Republic, and Trinidad and Tobago on the development of new dental schools. The dental school of the Catholic University at Santiago, Dominican Republic, initiated a joint program with the health ministry to provide dental care at the José María Cabral y Báez Hospital in Santiago. A similar joint program was developed in surrounding rural areas using dentists and auxiliary workers.

Dental nurse auxiliaries were graduated from the schools in Guyana, Jamaica, Suriname, and Trinidad and Tobago, and such workers were introduced into the dental care programs in other Caribbean countries. A

meeting of auxiliaries and dentists from Barbados, Dominica, Grenada, Guyana, Jamaica, St. Kitts-Nevis, Saint Lucia, and Trinidad and Tobago was held to evaluate the use of dental auxiliaries in the English-speaking Caribbean. The participants agreed that governments must prepare adequately for the return of auxiliaries from training programs to ensure their rapid incorporation into health care activities and that the health and education sectors should collaborate to develop dental programs for school children.

Interest in training auxiliary workers continued in Colombia, Mexico, Nicaragua, Panama, and Peru.

A course on dental equipment maintenance was planned in conjunction with the Institute of Dental Resources in Quito for the Andean countries, and training programs for dental equipment maintenance technicians were arranged in conjunction with commercial companies in several other countries.

PAHO's first course on social periodontics was conducted in Spanish at Chicago and Washington in conjunction with the University of Illinois. Advice was also provided to countries such as Brazil, Chile, Ecuador, and Peru on conducting continuing education programs emphasizing the prevention and control of dental diseases.

Engineering and environmental sciences

The trend toward subregional training activities in lieu of national short courses continued. Of particular note were the following activities, all oriented to the goals of the International Drinking Water Supply and Sanitation Decade:

- A 10-day course on controlling and measuring water wastage through leaks in water distribution networks. Organized by CEPIS, the course was attended by 30 professional engineers.
- A three-week course on water supply system operation and maintenance for installation managers and supervisors. The course was cosponsored by the Peruvian health ministry's environmental sanitation division, Peru's industrial worker training service, and CEPIS. Twenty-four Peruvian waterworks supervisors and one each from Bolivia and Ecuador attended.
- Preparation, publication, and distribution in all 10 courses participating in the Caribbean basin water management project of performance-oriented training manuals and guides geared to local conditions and the scholastic preparation of the trainees. These publications were prepared by local engineers, technicians, and water utility managers.

Foremost among the national educational activities carried out by local universities, engineering schools, and environmental engineering institutions were a week-long seminar on human ecology, development, and environmental protection in San José sponsored by the Costa Rican health ministry's environmental sanitation division and PAHO's Pan American Center for Human Ecology and Health in Mexico, and a symposium on wastewater reuse sponsored by the National Autonomous University of Mexico with PAHO's cooperation.

The proceedings of the symposium on environmental manpower development held at Rio de Janeiro in November 1979 were published as a three-part manual. The first part describes the symposium's objectives and recommendations, the second discusses three technical topics related to manpower development, and the third contains information on current successful environmental manpower development in the hemisphere and elsewhere.

The symposium's methods were used in organizing two educational activities, in Colombia and Guatemala. PAHO collaborated in a review of Colombia's program to train water and sanitation workers, focusing on human resource development rather than merely training. In cooperation with PAHO, the Regional School of Sanitary Engineering and the Standing Committee on Drinking Water and Sanitation Coordination in Guatemala sponsored a two-day seminar on manpower for the Water Decade.

Veterinary medicine

PAHO continued to collaborate with the hemisphere's schools of veterinary medicine in efforts to unify their curricula. There are now 94 veterinary medicine schools in Latin America, distributed as follows: Argentina (8), Bolivia (2), Brazil (24), Chile (3), Colombia (6), Costa Rica (1), Cuba (4), Dominican Republic (2), Ecuador (5), Guatemala (1), Mexico (27), Paraguay (1), Peru (5), Uruguay (1), and Venezuela (4).

A seminar on curricular unification was held in October at the University of São Paulo. Deans, directors, and professors of veterinary medicine from 14 Latin American countries attended. Recommendations were adopted calling for academic improvements in each country in keeping with its particular conditions and with the problems described at seminars and workshops on veterinary education conducted with PAHO support. It was also recommended that the schools assume responsibility for the entire curriculum and that, with this in view, they try to train instructors able to adapt basic knowledge to the development of new veterinarians and optimal practice of the profession.

Meetings to coordinate the curricula of the various schools were held in Brazil and Chile. A workshop was held at Piura in October to analyze the development of the curricula of Peru's five schools of veterinary medicine.

Professors from three U.S. veterinary medicine schools met in Washington in July to exchange suggestions on a basic curriculum for veterinary medicine and public health. They concluded that no need yet existed to modify PAHO's *A Competency-Based Curriculum for Veterinary Public Health and Preventive Medicine* (Scientific Publication 313) issued in 1975.

PAHO conducted a number of advanced seminars for veterinarians in the Caribbean. One on disease control program management, with emphasis on quarantine procedures, was held in Georgetown in August. Cosponsored by the OAS's Inter-American Institute for Cooperation in Agricultural Sciences and UNDP, it was attended by 60 veterinarians from 12 countries. A seminar on veterinary public health was conducted in Antigua in November for 26 veterinarians from 16 countries. Finally, a seminar on epidemiology and veterinary preventive medicine was held at Kingston in the same month for Jamaican veterinarians.

(Photo: P. Arambulo/PAHO)

Veterinary assistants in training examine a pig at the REPAHA center in Georgetown.

The fourth class to complete the two-year course at Georgetown under the regional program to train animal and veterinary public health assistants (REPAHA) graduated in July. This program, conducted with the support of 16 Caribbean countries, has now graduated 131 assistants. It is jointly financed by CIDA and UNDP. On completion of the first phase

of the program, UNDP and PAHO agreed on a second phase, to run from January 1981 to December 1984, after which it is anticipated that the Caribbean countries will assume full responsibility for the program in 1985.

A continuing education course for REPAHA graduates on poultry industry problems was conducted in Georgetown in September. Eighteen animal and veterinary public health assistants from 11 countries participated.

PAHO's Pan American Zoonosis Center (CEPANZO) in Argentina also continued its professional and technical training program. This included both individual training and intra- and extramural courses, the latter held in the countries with the cooperation of national authorities and institutions. Fellowships for intramural courses were provided by PAHO and such international agencies as FAO, USAID, UNDP, IDB, and national governments and universities. One hundred eighty professionals were trained during the year. Forty-two from 16 countries received individual training at CEPANZO, and 44 participated in intramural and 94 in extramural courses.

Continuing education

After a year devoted essentially to organizing national programs and streamlining regional and subregional coordination, PAHO's continuing education program recorded its first accomplishments in 1980 in most of the eight countries participating in the program's first stage. Continuing education activities were carried out in Bolivia, Colombia, Cuba, Dominican Republic, Ecuador, Guatemala, and Honduras, in every case with CIDA financial assistance. The Canadian agency has been supporting continuing education programs in Latin America since 1978.

Activities in Colombia continued unabated as the health ministry's human resources directorate gradually increased its personnel, and more than 9,000 health professionals and technicians participated in the program. The directorate's audiovisual aids center was strengthened, especially in educational television.

In Cuba, where the program is part of the vice ministry of education and research, significant progress was made. The program branched out in new directions, including a video cassette course in tropical medicine. The first national continuing education workshop, a three-day meeting in November, reviewed the program and recommended new activities.

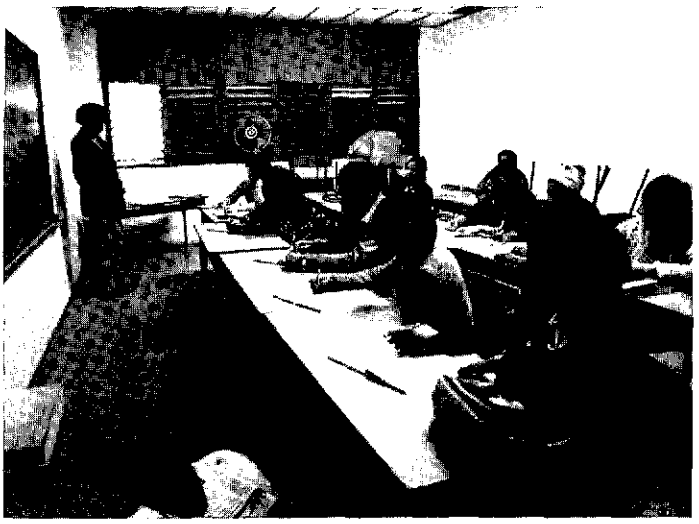
PAHO signed an agreement with the Dominican Republic at mid-year for a program that was later organized and launched.

In Guatemala the thrust was on continuing education for health ministry rural auxiliaries through self-instruction and periodic group evaluation modules. In Honduras, where the program is closely tied to training in supervision, the emphasis was on developing continuing education for individual and entire teams of health workers. A PAHO/CIDA evaluation team made a field inspection of the programs in these two countries and recommended continued financial and technical assistance to both programs as well as their possible future expansion. In December, CIDA agreed to Nicaragua's admission to the program and to provide the necessary financial assistance. PASCCAP was designated the project's reference center.

Technical and auxiliary personnel

Programs to extend health service coverage are underway in various countries. In some cases their financing is almost entirely national, while in others the programs are supported by outside agencies.

The extent of coverage varies widely from country to country and depends on the initial situation and magnitude of the effort to spread it. Many countries have yet to define clearly the personnel they need for their



Future middle-level technicians receive instruction in Havana.

(Photo: M. Montecino/PAHO)

coverage extension programs, and this is especially true of auxiliary and middle-level technical health workers.

The existing structure of health services made it necessary to create a new type of intermediate technical worker equipped to carry out new kinds of health practice in underserved urban and rural areas. Two types of technicians are now found in both health services and training centers—"monovalent" technicians, whose work is limited to aiding professional personnel, and "polyvalent" technicians who work in coordination with university-trained professionals.

Programs to train middle-level technicians are underway in a number of countries, notably Chile, Costa Rica, Cuba, Dominican Republic, Ecuador, Mexico, Nicaragua, Peru, and Venezuela. PAHO continued to support the programs for training intermediate technicians in the Dominican Republic, Mexico, and Venezuela, and in Cuba and Nicaragua, which have a technical cooperation agreement specifically providing for such training.

As an outcome of the first technical cooperation workshop on developing middle-level technical personnel, in 1979 at Camagüey, Cuba, an intercountry program was started to train this kind of worker.

The second such workshop was held in April at Cumaná, Venezuela, with participants from Bolivia, Colombia, Cuba, Dominican Republic, Nicaragua, Peru, and Venezuela. PASCCAP and Hipólito Unanue Agreement representatives also attended. The objectives of the second workshop were to determine the extent of compliance with the first workshop's resolutions and ensure their continuity and feasibility, and review the program's progress and the use of intermediate technical personnel in light of the experience of the various countries participating in it.

The second workshop's participants recommended that instructor training programs be conducted to assure the development and continuing education of middle-level technical personnel, that documentation centers be organized and training materials be produced to facilitate selective dissemination of information about continuing education, and that the scientific and technical knowledge possessed by the countries be placed at the disposal of students.

In Brazil, the health worker training program begun in 1975 was reorganized to include the social welfare ministry in addition to the ministries of health and of education and culture. The program's objectives now

include improving manpower training and planning methods and activities to formulate a comprehensive human resources development plan, improving the integration of teaching and service, fostering continuous improvement in the quality of health care training through curriculum evaluation and revision as well as the application of modern pedagogic techniques, promoting the preparation and supply of better teaching and self-training materials, and upgrading service, training, and research personnel through better coordination among graduate health care training centers.

In the Caribbean, PAHO and the secretariat of the Caribbean Community have been endeavoring to improve coordination among Caribbean schools training technical and auxiliary health workers. The special project organized for this purpose in 1975 completed its second phase in 1980.

Pursuant to recommendations included in an evaluation made in 1979, a proposal was prepared for the project's third phase, to begin in January 1981 and last two years. The project is financed by CIDA, UNDP, which granted $600,000 to cover its regular staff and consultant requirements during the third phase, and UNICEF, which continued to finance the training of community auxiliaries and their use in primary health care activities. As executing agency, PAHO provides support for the project's programs and centers when necessary, though it began making arrangements to transfer its training activities to the Caribbean Community.

In January, PAHO convened a meeting of international agencies operating in the Caribbean to provide them information on requirements for training technical and auxiliary personnel.

In Central America, the technical advisory council of the community health worker training program for Central America and Panama (PASCCAP) met for the second time, at San José in February, and approved the program's 1980 action plan. This covered the following subprograms: health services research and development, educational research and development, social and epidemiologic research, continuing education and training in supervision, training in coverage extension administration, research on and development of intermediate technical personnel, planning human resources for coverage extension, production of educational materials, and development of an information and documentation center.

The action plan was carried out in the countries and at PASCCAP's headquarters in San José. Through its health ministry, Costa Rica made available a building including offices, a meeting room, a print shop, and audiovisual aids and information and documentation rooms.

Two courses for representatives from the countries were held as part of the health services research subprogram, one in San José and the other in Panama City. Visits were made to national groups to determine their research support requirements. Research protocols were prepared and put into effect in collaboration with groups in Costa Rica, Guatemala, and Honduras. In Nicaragua, a group of subprogram advisers held a meeting and defined activities to be carried out in this and other countries.

In the educational research and development subprogram, work began on developing self-instruction modules and incorporating in them the basic strategies of primary care, community participation, appropriate technology, intersectoral linkage, and the principles of pedagogic methodology.

Activities were also carried out in individual countries. In El Salvador, the community nursing school received support, and advice was provided on developing educational methods for training auxiliary and technical personnel. In Guatemala, assistance was furnished in educational development and review of curricula for training auxiliary and community health workers. In Honduras, university faculty in the health area

received assistance in educational development and technology.

As part of the continuing education and supervision training subprogram, technical advice was given to Guatemala and Honduras on continuing education and to all the Central American countries and Panama on training in supervision. With the participation of an advisory group, a subregional continuing education program was conducted in Guatemala. The national coordinators of the supervision program met at Guatemala City in November.

Programs to train local health service unit supervisors and advisers were started in Bolivia, Brazil, Panama, and Peru.

Coordinated by CLATES, a meeting was held at Lima in May to organize the activities to be carried out in Bolivia, Brazil, and Peru. Five representatives from each of the countries and PAHO consultants participated. In Bolivia, it was only in the latter part of the year that educational activities closely tied to the continuing education program were resumed. In Brazil, two activities were carried out, one coordination among the various participating states and the other an attempt to define the national program. Peru's health ministry approved a supervision model designed by the program's multidisciplinary team. Educational activities were initiated, including workshops for metropolitan Lima and the health areas chosen for this stage of the program, Cuzco, Iquitos, and Puno.

In Panama, the program was started at mid-year in accordance with an existing supervision model developed by the health ministry. Several activities were carried out to upgrade the methods used by instructors providing training in supervision at various levels.

Fellowships

PAHO's fellowship program provides the financial and administrative means by which health workers in the Americas may further their academic development, obtain practical training, attend short courses, or visit institutions or colleagues abroad in any field of study or activity related to health. The governing bodies set priorities, but the governments make final determinations of fields of study and candidates.

In 1980 there was a small decrease in the total number of fellowships awarded and in the total number of fellowship months used. Awards declined from 1,289 in 1979 to 1,216 (5.7 percent) and the number of months from 5,250 to 4,330 (17.5 percent).

The total cost of the fellowships awarded increased from $4,400,865 in 1979 to $4,533,620 (3 percent). The average cost of a long-term award (over six months) for study in Canada or the United States rose from $9,448 to $11,362 (20 percent), while long-term training elsewhere rose from an average of $5,970 to $6,789 (14 percent). Short-term fellowships (six months or less) and group fellowships for organized courses increased in cost by 18 percent. The overall average increase in cost per fellowship month rose from $838 in 1979 to $1,047 in 1980 (25 percent). These increases are due to escalating costs of transportation, living, and training. Stipend rates, which had been held back in recent years to restrain the impact of inflation, finally had to be revised to more realistic levels to keep the program alive.

Although the number of awards decreased, total activity in the fellowship program actually increased. This was largely due to a 26 percent rise in the number of fellows from other parts of the world placed for studies in the Americas. In addition, a large number of long-term fellows who had received awards in previous years continued their studies in 1980 under PAHO's administrative and technical responsibility.

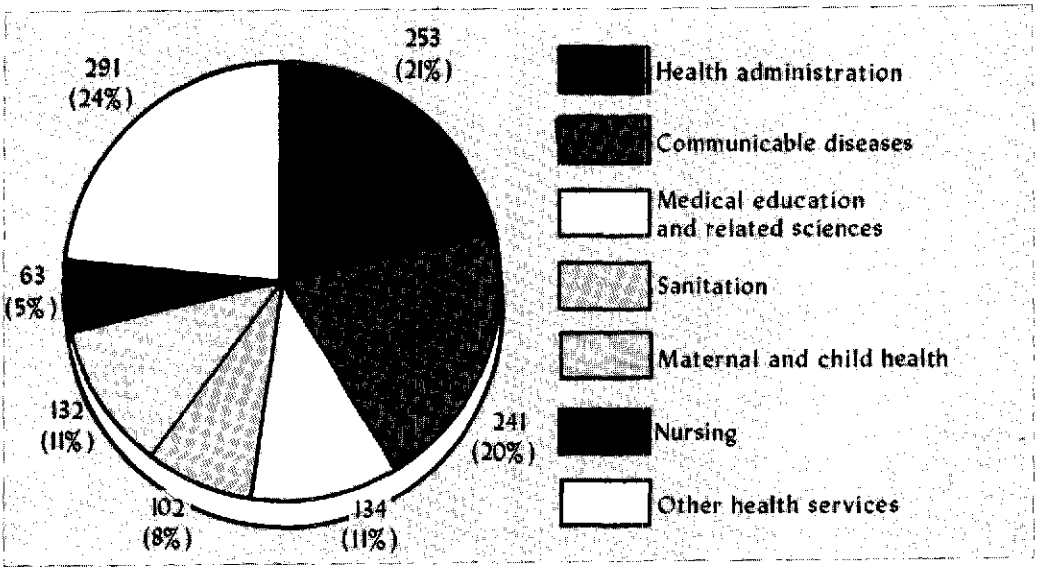
Of the 1,216 fellowships requested by the governments in 1980 (Table 6), 21 percent were in public health administration, 8 percent in environmental sanitation, 5 percent in nursing, 11 percent in maternal and child health, 24 percent in other health services, 20

percent in communicable diseases and clinical medicine, and 11 percent in medical education and related sciences (Figure 7). Changes relative to 1979 included a 74 percent decrease in nutrition awards and a 44 percent decrease in mental health. Malaria and parasitic disease awards rose by 88 percent, and those in clinical medicine by 50 percent. Of

Table 6. Fellowships awarded in the Americas, by country of origin and type of training, 1980.

Country of origin of fellows	Type of training			
	PAHO/WHO-organized or -assisted group courses	Long-term fellowships	Short-term fellowships	Total
Argentina	15	7	64	86
Bahamas	2	7	8	17
Barbados	4	7	13	24
Belize	2	8	2	12
Bolivia	24	1	18	43
Brazil	31	12	38	81
British Territories	6	26	19	51
Canada	—	—	19	19
Chile	19	—	55	74
Colombia	17	3	36	56
Costa Rica	20	11	22	53
Cuba	26	5	37	68
Dominica	4	14	3	21
Dominican Republic	11	7	17	35
Ecuador	14	6	10	30
El Salvador	10	6	3	19
Grenada	6	5	1	12
Guatemala	9	11	11	31
Guyana	1	2	3	6
Haiti	4	6	4	14
Honduras	23	22	29	74
Jamaica	5	13	30	48
Mexico	33	7	42	82
Netherlands Antilles	—	1	—	1
Nicaragua	11	4	7	22
Panama	14	13	26	53
Paraguay	6	3	12	21
Peru	23	2	20	45
Saint Lucia	2	6	1	9
Suriname	1	2	2	5
Trinidad and Tabago	6	—	5	11
United States of America	—	—	9	9
Uruguay	7	3	14	24
Venezuela	22	6	32	60
Total	378	226	612	1,216

Figure 7. Fellowships awarded in the Americas, by type of training, 1980.



134 fellowships in medical education and related sciences, 122 were awarded to professors at schools of medicine, public health, and allied health fields.

There was a small shift in the distribution of awards by type of training. In 1979 short-term fellowships constituted 25 percent of the total and group training fellowships 24 percent. In 1980 these figures were 19 and 31 percent, respectively. The number of long-term fellowships did not change significantly.

PAHO continued its policy of assigning fellows to countries whose language and environmental and health conditions are as similar as possible to those in their own. Most—68 percent—studied in Latin America, and 10 percent in the Caribbean. Only 22 percent went outside their own subregions—two-thirds to Canada and the United States and one-third to other parts of the world.

The administration of fellowships in the English- and Dutch-speaking Caribbean was formally decentralized at the beginning of the year. Except for those financed under grants, all new awards for study in that area (82), were made and administered by PAHO's Caribbean Program Coordinator in Barbados.

Decentralization was formally initiated in Colombia in November after intensive staff training there to ensure the success of this first step in decentralizing fellowship administration to Latin America. No awards were reported before the end of the year.

The Directory of Training Programs in Latin America and the Caribbean was published in final form in December and distributed to all field offices.

Educational Technology and Technologic Resources

Several developments occurred in PAHO's educational technology and technologic resources program.

Pedagogic training for health science instructors was increased, both at the Latin American Health Education Technology Center (CLATES) in Rio de Janeiro and in

various countries with CLATES' support. At the request of the National Autonomous University of Mexico, the former Latin American Health Education Technology Center in Mexico City was converted to a purely national institution, though it continues to maintain links with PAHO.

Headquarters was made responsible for providing methodologic support to all regional, subregional, and national meetings that PAHO coordinates or supports financially and technically. This made it possible to organize meetings more effectively and achieve better results through continuing evaluation. A quarterly directory of PAHO meetings was started and distributed to the countries.

From 1976 to 1980 the W. K. Kellogg Foundation supported PAHO's Latin American Program for Educational Development in Health (PLADES) to bridge the gap between health and education systems. At the beginning of the year PAHO presented a new proposal to the Foundation to develop an evaluation system applicable not only to PLADES but to other Kellogg service-training integration projects. The Foundation agreed, and CLATES began preparing a general assessment of PLADES.

In the educational technology field, CLATES and the countries continued their activities. Work in this field has recently been strengthened through the participation of PASCCAP, which has an educational research and development subprogram, a unit for producing educational materials, and a health science and technology information center. Following startup CLATES support, PASCCAP is expected to begin meeting Central America's educational technology requirements.

CLATES offered nine health education courses and seminars at Rio de Janeiro between January and July. These meetings dealt with health science curricula, evaluation of health sciences instruction, audiovisual aids, group dynamics in education, human resource planning, teaching-service integration, didactics applied to the health sciences, MUMP/MIIS computer programming language for education, and training instructors in comprehensive medicine. More than 500 health science instructors attended these five- to ten-day courses with the help of fellowships awarded by PAHO, their own countries, or Brazil's Superintendency for International Technical Cooperation.

It also continued to participate in the master's degree program in educational technology at the Federal University of Rio de Janeiro and provided courses and advisory services in Bolivia, Chile, Colombia, Ecuador, Honduras, Nicaragua, Paraguay, and Peru.

Within PAHO, CLATES supported the Expanded Program on Immunization (EPI) in producing filmstrips on the cold chain and refrigerators for EPI regional and national training programs, and the emergency preparedness program in adapting filmstrips and translating and adapting disaster relief simulation exercises. It and PAHO's Latin American Center for Perinatology and Human Development at Montevideo reached an agreement to collaborate in the latter's new maternal and child health and community programs.

Nursing education technology activities continued to be carried out through a network of nine national subcenters which provided training to students from other schools and in some cases from fields other than nursing.

The newest subcenter is that in Lima, where the nursing school of Children's Hospital, operated by Peru's health ministry in conjunction with the University of San Marcos, began operations. Several courses on pedagogy and modular instruction were offered for instructors in nursing, medicine, and dentistry. The first courses were conducted with the support of CLATES. The subcenter also collaborated with the health ministry's supervision training program in preparing

specific modules and training future instructors for the program.

The other subcenters, in Brazil (Bahia and Belo Horizonte), Chile, Costa Rica, Colombia (Bogotá and Cali), Ecuador, and Mexico, continued to work in their respective areas. They produced educational materials in various formats, mainly modular and oriented toward integration between nursing schools and health services. All the centers offered courses and seminars on educational technology, in some cases with direct support from CLATES.

Regional Library of Medicine and the Health Sciences

PAHO's Regional Library of Medicine and the Health Sciences (RLM) in São Paulo coordinates a health information network in which it is the regional center for Latin America and the Caribbean, national center for Brazil, and subcenter for São Paulo State.

RLM carried out highly diversified service, training, and administration programs during the year. Its activities included expansion and strengthening of the Brazilian and Latin American health information networks, research, analysis and indexing of Latin American publications, selective information dissemination, publishing, advanced biomedical librarian training, bibliography searches, interlibrary loans, and service to users in the São Paulo area.

At its meeting in May 1979, RLM's scientific advisory committee suggested the establishment of a long-range working group to undertake a detailed study of further expansion of the Latin American health information network. As a consequence of the committee's suggestion, the group was established. With Rockefeller Foundation support, it held four meetings and retained consultants in 1980 to visit various countries and examine the current situation. A proposal to create the health information network was developed for submission to funding agencies.

Plans and studies were made to expand RLM's network of users through better employment of the technology and facilities available in the Latin American countries. Extending and improving bibliographic search services through online telex access to the MEDLINE system and the *Latin American Index Medicus* data base, at a cost within the reach of the countries, is a short-term prospect.

In 1979, RLM began evaluating the circulation of biomedical periodicals locally, in Brazil, and in Latin America to determine the characteristics of users and their requirements in order to guide periodicals acquisition policies and pinpoint reasons for nonfulfillment of periodicals requests.

Continued analysis of the findings of the evaluation furthered administrative planning. Information on titles requested that were available or unavailable at RLM was highly useful in making subscription renewal decisions for 1981 so as to improve its collection without burdening its budget. The data obtained reflect local demand and that from other libraries in the Brazilian and Latin American networks, and so provide a representative profile of the actual use of the available collection.

The semiannually published *Latin American Index Medicus* is making a significant contribution to biomedical information by providing a central source of data on articles in approximately 250 Latin American publications. As the work on this publication goes forward, increasing information becomes available on the output of health institutions and professionals in Latin America, and hence exchanges and cooperation among them are facilitated. The two volumes distributed or prepared during the year covered 6,000 articles.

RLM's programs to disseminate selected in-

formation about cancer (LACRIP), nutrition (INAN), and public health continued their regular operations.

LACRIP provided cancer information to 3,272 professionals in 18 countries (including 1,336 in Latin America) and distributed 32,266 photocopies of articles requested by participating libraries. INAN furnished 5,775 copies of nutrition articles produced in Latin America or published by international agencies to 517 users active in nutrition in Brazil. The São Paulo health department, in charge of the public health bibliography program, compiled bibliographies on 69 subjects.

Under an agreement with the University of São Paulo's public health school, RLM initiated a new publication to disseminate information on public health and related disciplines. "Alerta Bibliografico-Serie I-Saúde Pública" is a quarterly containing summaries of periodicals, books, theses, and other documents.

Two advanced training courses were conducted for biomedical librarians from Brazil and other Latin American countries. Two other courses were offered on the use of RLM's facilities.

Four computer terminals, at RLM and the Belo Horizonte, Rio de Janeiro, and Salvador subcenters, are used to compile bibliographies to meet requests from Brazil and other Latin American countries. During the year, 3,673 searches of the U.S. National Library of Medicine's MEDLINE data base were carried out, including 1,166 made by the subcenters and 2,507 by RLM.

Forty thousand requests for photocopies of scientific articles were received, slightly less than a third of them from countries other than Brazil. RLM was able to fill 82 percent of the requests from its own or the Brazilian network's collections.

A "List of Current Periodicals Available at RLM" was prepared. Some of the titles listed were not available at RLM but were held by libraries in the Brazilian network. This was expected to be a valuable tool in improving the exchange of information among the libraries in the network.

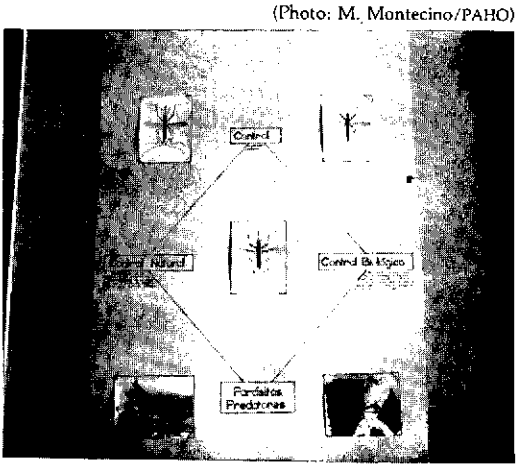
RLM's library department provides basic support to São Paulo-area users, especially those at the São Paulo School of Medicine, which accounted for 50,591 or 73 percent of all local users of its services in 1980. A total of 9,657 books were loaned or consulted and 81,310 requests for publications were received, three-quarters of which were filled locally.

Research Promotion and Coordination

The governments have become more conscious of the significance, relevance, and necessity of scientific and technologic advances in solving current practical problems of public health. PAHO has therefore expanded its research activities by continuously supporting its network of 10 research centers,

Results of research on mosquito control are schematized on a bulletin board at the National Institute of Hygiene and Epidemiology in Havana.

(Photo: M. Montecino/PAHO)



(Photo: J. Moquillaza/PAHO)

Larvivorous fish such as these at an experimental station in Colombia are often used to control mosquitoes.

promoting and funding health service investigations and biomedical research, and backing a number of independent investigators and research teams throughout the hemisphere.

It has also advised the governments on efforts to develop national health research policies. During 1980 it sponsored a meeting along these lines at Montevideo of delegates from Argentina, Chile, Paraguay, and Uruguay. In addition, the bases of future national meetings on health research policies in Brazil and Venezuela were set up during the year.

As a followup to a 1979 meeting in Argentina, a second meeting was held at which the intersectoral study group on the ethical aspects of research presented a draft code of ethics for that country. Work on drafting codes of ethics for research using human subjects also proceeded in other countries. In Colombia and Costa Rica the drafts were well advanced.

PAHO believes that fostering research activities will require development of a critical mass of national institutions. Thus, a program has been initiated to identify and strengthen national research centers having close links with PAHO which will become a network to be used not only as regional training centers and to promote and conduct research projects within PAHO's priorities but also to stimulate technical cooperation among developing countries.

(Photos: J. Vizcarra Brenner/PAHO)

Biomedical research is conducted throughout Latin America and the Caribbean. Left, atomic absorption equipment is being used; right, a technician performs tests in a nearby virology laboratory in São Paulo.

In the area of socioepidemiologic research, PAHO continued examining the effect of research on health care in Latin America, a study started in late 1977. Data from Ecuador, El Salvador, Honduras, and Nicaragua began to be processed and a directory of studies about health research in those countries was prepared. Agreements were signed with government agencies in Argentina and Chile for collecting information on research resources, and data gathering began in those two countries and the Dominican Republic and Peru. Efforts were made to finish gathering information about the remaining countries.

In the area of social sciences applied to health, major activities included an analysis of the situation in Latin America based on PAHO staff and consultant visits to 20 outstanding research and training programs in five countries (Brazil, Ecuador, Mexico, Peru, and Venezuela). PAHO also began preparing a bibliography of social research applied to health in Latin America which by the end of the year contained 1,700 items. The bibliography is being computerized so that its citations may be readily retrieved, sorted, and disseminated.

Advisory assistance was extended to social science projects dealing with nursing in Brazil and Ecuador, the social aspects of malaria in the Dominican Republic and Nicaragua, and the medical job market in Mexico. Ecuador received assistance in postgraduate social science courses applied to health.

In the biomedical research area, PAHO increased its role in research on the parasitic and infectious diseases that are a major impediment to the economic development of tropical American countries. This occurred chiefly through the coordination and collaboration provided by the Special Program for Research and Training in Tropical Diseases, a joint undertaking by WHO, UNDP, and the World Bank.

The complexity of these diseases makes it extremely difficult if not impossible to control them with the technologic tools now available. Those tools are largely too crude, cumbersome, and costly to be used widely and effectively. The Special Program's research component consists of studies in

tropical countries to develop new and effective tools to control six diseases: malaria, schistosomiasis, leishmaniasis, trypanosomiasis (including Chagas' disease), filariasis, and leprosy.

One of the Special Program's components is institutional development to build and reinforce the ability of selected universities and research institutions to carry out investigations. Nine research centers in Argentina, Bolivia, Brazil, Cuba, Peru, and Venezuela received institutional development grants for capital equipment and long-term support. In addition, advanced training through research training or visiting scientist grants was provided to scientists from institutions in Argentina, Brazil, Mexico, Paraguay, and Venezuela.

Investigators in 15 American countries conducted research on the six target diseases. In all, 192 projects supported by grants totaling more than $4 million were active during the year.

Advisory Committee on Medical Research

PAHO's Advisory Committee on Medical Research (ACMR), composed of 18 distinguished scientists chosen for their wide experience and knowledge of health problems in the Americas, met at San José in June. The host institution was Costa Rica's newly established Nutrition and Health Research and Training Institute. ACMR's members had an opportunity to visit this and other scientific institutions in the country, familiarize themselves with their work, and make contact with their researchers.

The ACMR meeting was largely devoted to discussion of the reports of various subcommittees. The diarrheal disease research subcommittee reported on the recommendations from its meeting in Panama in which scientists from 10 countries participated. The health service research subcommittee's report highlighted the social research being conducted in Latin American health services.

Dr. Sune Bergstrom, chairman, ACMR.

The nutrition research subcommittee reported on a proposed regional research program which was later extensively discussed at a PAHO-sponsored meeting of prominent nutritionists at Bogotá. ACMR's members also heard a report from their subcommittee on the ethical aspects of research using human subjects.

As in earlier ACMR meetings, two of PAHO's research and advisory units, the Latin American Center for Perinatology and Human Development at Montevideo and the community health training program at San José, reported on their research activities. The committee also heard and discussed a presentation on malnutrition, mental development, behavior, and learning, papers on the history of health research centers in Latin America, and a progress report on tropical disease research and malaria in the Americas.

Research grants

PAHO continued to carry the program of grants for research and research training that

began in 1970 to support the development of research in priority health areas.

Research applications are rated on the basis of the scientific merit and expected results, the extent to which the proposed research is related to PAHO's priorities, and the availability of funds. Training grant applications are evaluated on the basis of qualifications, working and research conditions at the proposed study site, and the relevance of the training requirements to the needs of their home countries.

As a matter of policy, PAHO gives preference to projects presented by researchers from Latin America and the Caribbean in order to encourage research in those countries. Whenever possible, it also promotes collaborative studies involving institutions in two or more countries.

Sixty proposals were received during the year, by the end of which 39 had been evaluated and 20 grants totaling $125,015 had been awarded to applicants from Brazil, Colombia, Costa Rica, Jamaica, Mexico, Panama, Peru, United States, Uruguay, and Venezuela.

(Photo: J. Vizcarra Brenner/PAHO)

Chapter 6
SPECIAL PROGRAMS

Zoonoses and Animal Health

Disease is a major constraint on the development of the livestock industry in Latin America and the Caribbean. Among the many diseases affecting Latin American and Caribbean herds today, foot-and-mouth disease (FMD) and zoonoses are especially important because, in addition to limiting cattle raising, they place restraints on livestock and meat marketing. Zoonoses are diseases common to man and animals in which animals are hosts of pathogenic agents, direct or intermediary vectors, or sources of environmental contamination.

As it has for several decades, PAHO continued to advise the countries on their animal health programs. It did so through headquarters staff, specialists assigned to area or country offices, and its two animal health research units, the Pan American Zoonosis Center (CEPANZO) at Ramos Mejía, Argentina, established in 1956, and the Pan American Foot-and-Mouth Disease Center (PANAFTOSA) at Rio de Janeiro, established in 1951.

With CEPANZO's technical cooperation, the countries have made substantial progress in developing the infrastructure of their veterinary public health services. These were some of CEPANZO's advisory activities during the year:

In Bolivia the ministry of rural and agricultural affairs' FMD, rabies, and brucellosis control service (SENARB) made appreciable progress in building its laboratory and central office, 12 veterinary centers, and 12 quarantine stations. Because of the economic conditions the country faces, SENARB and Bolivia's zoonosis control programs will require continued support from PAHO and specifically CEPANZO and PANAFTOSA.

At the request of Brazil's health ministry, PAHO redesigned the ministry's veterinary public health activities. As priority areas, it was agreed to institute a zoonosis control program in the ministry, which began a survey to identify the country's principal zoonoses as a basis for establishing indicators, and to establish intersectoral cooperation to

A game warden inspects Padre Island in the Amazon River near Iquitos, Peru, where moustached tamarins (Saguinus mystax) *are bred for primate studies and medical research.*

use human and material resources better. CEPANZO advised São Paulo's four-year-old municipal Urban Zoonosis Center on designing a system for collecting statistical data, preparing sampling surveys, and performing periodic evaluations of and making adjustments in such activities. The Center has already been quite successful in controlling rabies and is now developing programs to bring rodents and other zoonoses under control.

In Guatemala, CEPANZO provided assistance in developing field statistical systems, a project which was approved and began to be put into operation, and cooperated with the directorate general of animal health in planning its new structure and specific functions.

In Honduras the organization of the animal health program, begun in 1975, was completed. It consists of 10 central units whose functions are executed by seven area agricultural offices, for each of which buildings were constructed to house laboratory and administrative staff.

In Mexico, a technical and administrative reorganization continued in the animal health directorate general of the agriculture and water resources secretariat. The main thrust is centralization of policy, standards, strategies, and program supervision and decentralization of their execution, including the preparation of local programs.

PAHO also assisted various national animal health diagnostic and production laboratories. CEPANZO and PANAFTOSA continued to supply the countries reference biologicals for their diagnostic and biological production programs and to check biologicals prepared in national laboratories. CEPANZO supplied laboratory animals (guinea pigs, rabbits, hamsters, gerbils, mice, and rats) to enable the countries to start or renew their colonies.

In Brazil, PAHO advised on the installation of a national animal health reference and training laboratory in Belo Horizonte funded by the ministry of agriculture. All construction was completed and equipment imported, and the laboratory is to go into service in 1981. PAHO signed an agreement with the Paraná State Technical Institute to provide CEPANZO advisers and short-term consultants for improving animal experimentation, virology, and immunology laboratories engaged in biological research and production. PAHO's technical assistance is funded by a grant from the state government. CEPANZO also gave advice on serology procedures to the Urban Zoonosis Center in São Paulo.

The eastern English-speaking Caribbean veterinary laboratory project, which was begun in March 1977 and is financed by CIDA and UNDP with PAHO as executing agency, continued its activities in the smaller islands. Now headquartered in Saint Lucia, the project includes eight laboratories, in Antigua, Dominica, Grenada, Montserrat, St. Kitts-Nevis, Saint Lucia, and St. Vincent. Activities in 1980 included the organization of a permanent network of laboratories to serve the islands' animal and veterinary public health services. At the governments' request, CIDA agreed to consider supporting the project's second phase.

PAHO also acted as executing agency in a UNDP-sponsored project to aid Guyana in setting up a veterinary diagnostic laboratory in Georgetown. The laboratory will not only strengthen Guyana's animal health program but also, in conjunction with PAHO's 17-country veterinary assistant training project (REPAHA) at Georgetown, help produce such assistants for Guyana and the rest of the Caribbean. Four experts will participate in the Guyana project. The project director arrived in late 1980, and the other three specialists are to report during the first half of 1981.

Honduras' laboratory unit was reorganized into three departments: diagnosis, biological production control, and research and training. PAHO helped oversee the construction of the central and seven regional laboratories. Equipment layout was planned and the necessary equipment, materials, and reagents were chosen. Training programs for labora-

tory staff were designed and carried out. PAHO also provided guidance to Honduras in establishing a section to control the quality of veterinary biologicals.

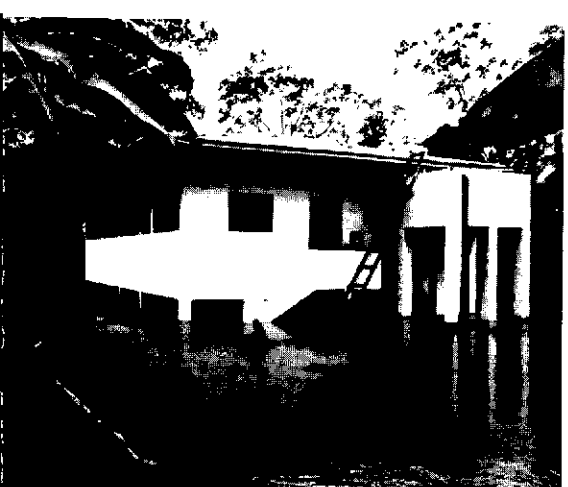
CEPANZO continued to advise Mexico on extending its animal pathology laboratory network.

Through contracts with NIH, PAHO has collaborated during the past five years with Brazil, Colombia, and Peru in establishing conservation and reproduction stations to produce nonhuman primates for biomedical research. It has also promoted censuses and investigations of the distribution, population dynamics, and biologic status of wild primate populations.

Construction began on the first animal shelter at Colombia's new primate center at Armero, which is part of the National Health Institute in Bogotá. It is hoped that the shelter, to be used for raising owl monkeys (*Aotus trivirgatus*) for malaria studies, will be completed in mid-1981.

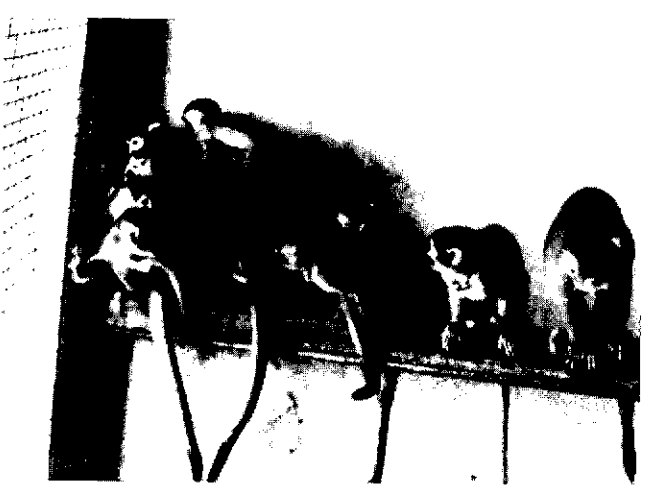
Peru's primatology program advanced notably in 1980, and today there is a conservation and reproduction station at Iquitos with laboratory facilities, shelters, and a quarantine house. Researchers at the Iquitos station have found that the following simians can be reproduced satisfactorily in captivity: squirrel monkeys (*Saimiri sciureus*), used in research on drug behavior, neurology, and control; pygmy marmosets (*Cebuella pygmaea*), used in behavior and vocalization studies; red-chested tamarins (*Saguinus labiatus*), used in hepatitis research, and *A. trivirgatus*.

Studies on Padre and Iquitos Islands in the Amazon River near Iquitos showed that a plan can be carried out to raise nonhuman primates in partial captivity on the islands. A laboratory was built on Padre Island, which moustached tamarins (*S. mystax*), used in hepatitis research, inhabit. The larger Iquitos Island will be used for breeding *Saimiri* and *Aotus*. Several studies to evaluate popula-



Squirrel monkeys (Saimiri sciureus) *raised at the Iquitos primate conservation and breeding center.*

Padre Island primate breeding and research laboratory near Iquitos, Peru. The Amazon River periodically floods the entire island without harming its monkey colonies.



(Photos: M. Moro/PAHO)

tions, capture, animal marking, and population monitoring were carried out during the year.

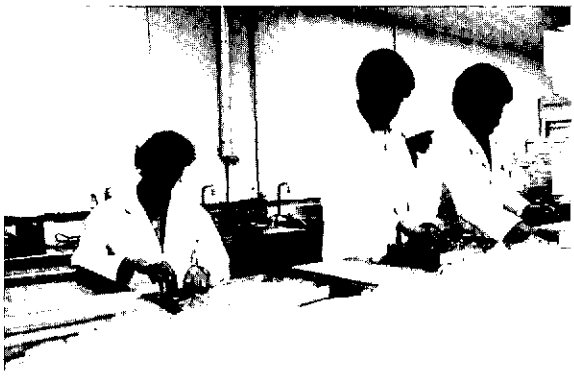
A workshop was held under NIH auspices at Iquitos in November on the management and production of primates in their native countries which 56 scientists from 18 African, American, Asian, and European countries attended. The participants recognized that primate research is and will continue to be essential to many biomedical studies benefiting man. They also discussed subjects related to research on preserving and breeding nonhuman primates. Their papers will eventually appear as a proceedings.

The following was the animal disease situation in the Americas during the year:

African swine fever. This disease, first identified in Africa in 1910 and unrelated to hog cholera, entered the Americas in 1971 in an outbreak in Cuba which was quickly controlled, though at the cost of 500,000 hogs. An outbreak in Cuba in early 1980 was quickly brought under control and later ended. African swine fever has persisted in Brazil, Dominican Republic, and Haiti since 1978. PAHO continued to collaborate with FAO through PANAFTOSA in monitoring the disease.

Brucellosis. CEPANZO assisted in controlling brucellosis in Argentina under an agreement with the national agriculture ministry and San Luis Province on various aspects of a pilot project to control brucellosis in goats. In Bolivia, with PAHO advice, SENARB progressed in controlling brucellosis in Cochabamba and Santa Cruz Departments. Surveys were made in both departments to determine the prevalence of the disease.

CEPANZO continued to advise Colombia's bovine brucellosis control program and laboratories on controlling brucellosis vaccine and antigen production. A number of working sessions on freeze-dried vaccines were held. It also supplied brucellosis antigens to Ecuador for diagnostic activities at the veterinary laboratories in Guayaquil and the research program of the Central University.



(Photo: M. Montecino/PAHO)

National Veterinary Biological Production Company, Mexico City.

PAHO continued to assist Paraguay's brucellosis program. The central laboratory's brucellosis and bovine rabies control laboratories were installed and vaccination against brucellosis was started. CEPANZO continued to advise Mexico on increasing the National Veterinary Biological Production Company's capacity to produce brucellosis antigens and vaccines and improve their quality.

In research, CEPANZO continued its studies to identify *Brucella* strains isolated from humans and animals in Latin America. Studies were also conducted of the factors affecting the preservation of *Brucella* vaccine.

Equine encephalitides. Though there have been outbreaks of Venezuelan and other equine encephalitides in recent years, 1980 saw relatively few cases in animals. Brazil reported 177 cases, Colombia 11, and Nicaragua two. Belize, Brazil, Colombia, El Salvador, Guatemala, Mexico, and Nicaragua together immunized 897,570 horses with various kinds of vaccine.

The only country to report human cases was the United States, which reported 840 cases of primary encephalitides without specification of the causal agent. Most diagnoses of cases in man and animals continue to be reported as "virus unidentified" because in many countries samples are not taken for laboratory examination or the necessary technology for adequate examination is absent.

Foot-and-mouth disease. FMD continues to be one of the animal health problems of most serious concern to the Americas. Its importance lies in its ease of dissemination, its effect in raising production costs because afflicted herds produce less meat and milk, and particularly in the barriers it creates to the sale of cattle and cattle products in international markets.

The Americas north of the Panamanian-Colombian border and the former Guianas are FMD-free, a status they strive to maintain. No outbreaks occurred in those countries in 1980, but vesicular stomatitis, a disease clinically similar to FMD and distinguishable from it only through laboratory analysis, occurred nonepidemically in Mexico (119 cases), all the Central American countries (234 cases), and Panama (12 cases) to about the same extent as in previous years. PANAFTOSA provided diagnostic services to Central America and Panama pending the inauguration of a laboratory built by Panama and the United States on PANAFTOSA's proposal. The laboratory is expected to begin operation in 1981.

In Panama, a project to monitor vesicular diseases epidemiologically was begun with UNDP funding and PAHO as executing agency. Its main objective is to develop national information systems for FMD prevention programs in Central America and Panama. Guatemala and Nicaragua reorganized their FMD control programs and prepared applications for IDB financial assistance with PAHO's technical advice.

In 1964 the South American countries affected by FMD decided to undertake continental control, and today all those affected have national control and eradication programs. FMD morbidity in South America has generally declined in that the number of affected herds has decreased, though in some countries the desired abatement has not been achieved. In certain cases, indeed, outbreaks of epidemic proportion have occurred, as in 1980 in parts of Brazil, Colombia, Ecuador, and Uruguay.

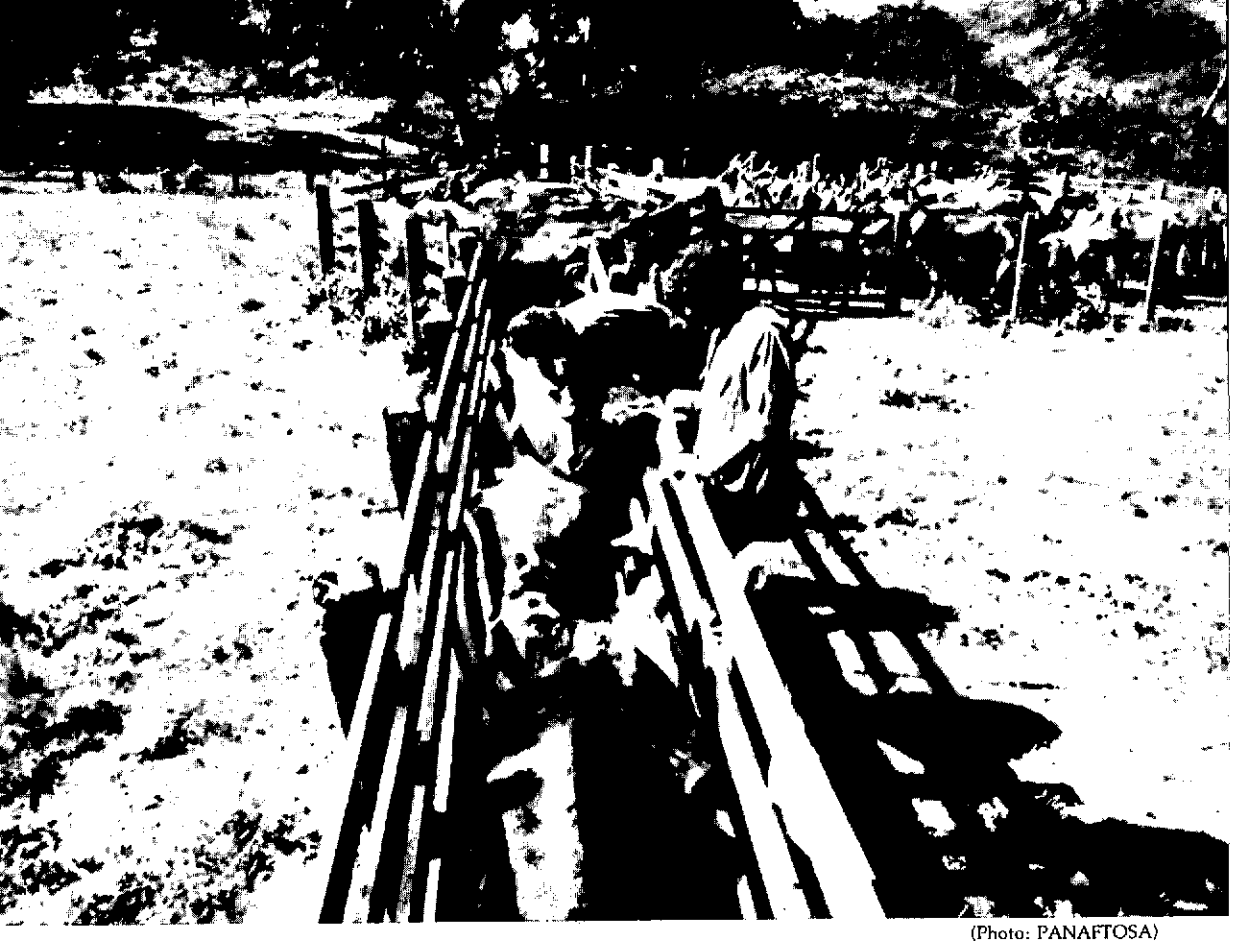
The national programs are coordinated through the South American Foot-and-Mouth Disease Control Commission (COSALFA), which meets once a year to evaluate the status of the disease and the programs. PANAFTOSA acts as COSALFA's ex officio secretariat.

During the year PANAFTOSA disseminated oil-adjuvant vaccine, which provides significantly longer immunity and so needs to be employed less often than vaccines now in general use. It produced 1.5 million doses, which were used to inoculate 700,000 cattle in Argentina, Bolivia, Brazil, Colombia, Paraguay, Peru, and Venezuela.

To emphasize further the execution of FMD control strategies, PANAFTOSA conducted a three-month course on animal health program development attended by 25 veterinarians from 14 Latin American countries. To assess the effectiveness of procedures recommended for eradicating a possible FMD outbreak, a simulation exercise was carried out in Guyana with the participation of English-speaking Caribbean countries. As followup, PANAFTOSA prepared a "Guide for the Eradication of Animal Diseases, with Special Emphasis on Foot-and-Mouth Disease." A Spanish translation will be distributed in 1981.

In services to specific countries, PANAFTOSA reached a preliminary agreement with Argentina, Brazil, and Uruguay to unify their FMD activities in order to eradicate the disease from the River Plate basin.

This decision was based on the experience



(Photo: PANAFTOSA)

On a ranch in southern Brazil, cattle are immunized against foot-and-mouth disease with an oil-adjuvant vaccine developed at PAHO's Pan American Foot-and-Mouth Disease Center in Rio de Janeiro.

of Chile, which brought its control program to a successful conclusion and which, in accordance with the provisions of the International Office of Epizootics' animal health code, was preparing to declare itself free of FMD at the start of 1981. Chile will be the first South American country to have achieved this goal.

In Bolivia, SENARB advanced in its efforts to control FMD in Cochabamba and Santa Cruz Departments. Conditions favorable to FMD's early eradication were found to exist in the Cochabamba Valley, an important dairy area where oil-adjuvant FMD vaccination was initiated. IDB supported the Bolivian FMD control program and PAHO acted as executing agency.

PAHO assistance to Ecuador was addressed primarily to preparing IDB-funded, second-stage projects to prevent or control FMD, bovine brucellosis, equine encephalitis, hog cholera, and African swine fever.

The following were among the more important investigations PANAFTOSA carried out during the year:

- A field evaluation of oil-adjuvant vaccines against FMD. The vaccine was tested in an extensive outbreak of the disease for the first time since experiments in administering it to cattle were begun on a large scale. In Bagé municipality, Rio Grande do Sul State, Brazil, 300,000 of 450,000 vaccinated cattle had received between one and three doses of oil-adjuvant vaccine (given every six months), while the remaining animals had received commercial vaccine every four months. Incidence rates (affected herds, overall morbidity and mortality, and morbidity in the herd) in the latter animals were two or three times greater than in the cattle that had received one dose of oil-adjuvant vaccine and between five and 20 times greater than in those that had received two or three doses.

- Development of methods to control the potency of oil-adjuvant FMD vaccine for swine. A large-scale test was performed to evaluate the quality of the first commercial oil-adjuvant vaccine for hogs, and it was shown to have high immunogenic value.
- Development of a simplified method for maintaining surveillance of latent FMD virus in carrier cattle. The test is made in order to isolate FMD virus from pools of throat swabs from slaughterhouses. The preliminary results demonstrated the method's efficacy in identifying FMD viral strains prevalent in various geographic areas.
- Cooperation with the Federal University of Minas Gerais' veterinary school in studying the risk of spread and endemicity mechanisms of FMD in the Mato Grosso swamps.
- Development of mathematical models of epidemiologic risk.
- Analysis of classification errors in the immune status of animal herds determined by indirect serologic methods.
- Studies of the pathogenesis and epidemiology of vesicular stomatitis.
- Continued research to characterize FMD field virus strains anti- and immunogenically and FMD geographically on the basis of statistics from the countries and the continuous epidemiologic surveillance system. The study of animal losses from FMD also continued, and preliminary results will appear in mid-1981.

Hydatidosis. CEPANZO continued its collaboration with the hydatidosis control programs of Brazil, Peru, and Uruguay. Reagents for immunodiagnosis of human hydatidosis were tested for CDC and two East African medical institutions.

CEPANZO conducted a study of the seroepidemiology of human hydatidosis in Buenos Aires Province and Neuquén and Chubut Territories, Argentina, and the mountains of Peru. It was shown that seroepidemiologic surveys to detect asymptomatic carriers produce basic data useful for evaluating the progress of hydatidosis control programs. Several limitations on hydatidosis epidemiologic surveillance were identified and necessary changes in such surveillance were introduced.

CEPANZO's evaluation of a pilot hydatidosis control program in Neuquén showed that the prevalence of hydatidosis infection in humans, sheep, and dogs there was continuing to decline. Under working agreements with various Argentine provincial governments, CEPANZO provided further advice on applying immunology techniques in diagnosing human hydatidosis, conducting serology surveys to detect carriers with hydatid cysts, and developing laboratories to produce antigens and antisera for immunodiagnosis.

In Peru's hydatidosis control program, activities were extended to Arequipa, Cuzco, and Puno Departments, where health personnel were trained in control methods, and work continued at the Túpac Amaru and Pachacútec agricultural cooperatives in Junín Department.

Leptospirosis. CEPANZO carried out studies of the prevalence of leptospiral antibodies in stray dogs in Argentina. Seventy-three (51 percent) of 143 randomly obtained serum specimens produced results indicating the animals had been in contact with leptospiras in which agglutinins against the canine serovariant predominated (37 percent). Studies were also conducted of leptospirosis prevalence in Argentina's wild animals.

Rabies. CEPANZO cooperated with Argentina's rabies control commission, whose work has led to a striking reduction in the number of rabies cases in the country. No human cases occurred in 1980.

PAHO provided assistance to the Bolivian health ministry's rabies control program, mainly in the cities of Cochabamba, La Paz, and Santa Cruz. Canine surveys throughout the country were the basis for dog vaccination and destruction campaigns begun in the last quarter of the year. It was necessary to import canine rabies vaccine to cover requirements, but mouse breeding colonies were enlarged and this should lead to increased vaccine production in 1981.

Further technical assistance was provided to Brazil's national rabies control program, which was extended nationwide with striking results in most states and territories. As a result of activities carried out by São Paulo's

(Photo: J. Vizcarra Brenner/PAHO)

A dog under observation for possible rabies is treated for external parasites at the municipal pound in Bridgetown.

Urban Zoonosis Center with PAHO assistance, both canine and human rabies remained under control in that city.

The growing incidence of canine and human rabies in Honduras and problems in procuring rabies vaccines were sufficient reasons in themselves for preparing a PAHO technical assistance project to control the disease in that country. In addition, however, because of the urgent need to solve this problem, PAHO is also helping set up facilities to produce rabies vaccine experimentally, which is being pursued with promising results.

The Mexican secretariats of health and welfare and of agriculture and water resources signed an agreement to undertake a national rabies control program. The National Virology Institute had been producing canine vaccine, but not enough to meet the national demand. For this reason, the health and welfare secretariat asked the National Veterinary Biological Production Company to begin producing suckling mouse brain vaccine for dogs in addition to vaccine for cattle to be able to handle the demand generated by the national program.

The rabies control program along the Mexico-United States border made satisfactory progress. Cases of canine rabies occurred in five Mexican border cities: Mexicali in Northern Baja California, Ciudad Juárez in Chihuahua, Nuevo Laredo and Piedras Negras in Coahuila, and Reynosa in Tamaulipas. On the United States side rabies was diagnosed in dogs in El Paso County, Texas, and Imperial County, California.

The number of rabies cases along Mexico's northern border was down 40 percent from 1979, and there were no human cases, as against five the previous year. A total of 186,529 dogs were vaccinated, 8,592 persons

(Photo: M. Montecino/PAHO)

Door-to-door rabies vaccination in Ciudad Netzahualcóyotl, Mexico.

were attacked, and 28,639 stray dogs were captured and 22,540 destroyed. On the United States side of the border, skunks and bats were the species in which rabies was most frequently diagnosed. From 1966 to 1980, 1,829 cases of animal rabies were diagnosed, 35 percent in dogs and cats. No cases of human rabies were reported.

A binational meeting of federal and state officials responsible for rabies control, held in Ciudad Juárez under PAHO sponsorship, adopted recommendations on future rabies control actions along the border. In October, PAHO, with the support of CEPANZO and Mexico's health and welfare secretariat, conducted a workshop on biostatistics and epidemiology emphasizing rabies for 30 federal, state, and local health officials. A model was developed for surveying the canine population in Mexico's 12 northern border cities in the first quarter of 1981.

PAHO also participated in rabies meetings at Midland-Odessa, Texas, and Albuquerque, New Mexico, and in a meeting to develop guidelines for an ecologic study of dogs in cities of developing countries at Ames, Iowa, on WHO's recommendation.

PAHO continued to assist Paraguay's rabies control program. Bovine rabies control and rabies vaccine control laboratories were installed, vaccination against bovine rabies was started, and a pilot plan to eradicate bovine rabies in the Chaco was initiated.

In the area of rabies vaccine production and control, CEPANZO advised three official and two commercial laboratories in Argentina, the National Institute of Animal Biology in Bolivia, the Vital Brasil and Veterinary Research Institutes in Brazil, the Finlay Institute in Cuba, the Biological Institute of Guatemala, the National Veterinary Biological Production Company in Mexico, the Na-

tional Health Institute in Peru, and the National Hygiene Institute in Venezuela. This advisory assistance led to recommendations for improving the production of suckling mouse brain vaccines and to promotion of NIH's technique for testing inactivated vaccines.

CEPANZO continued its investigations to evaluate the immunity conferred by inactivated rabies vaccines on cattle. The inactivated tissue culture vaccine CEPANZO developed (PV-BHK-EI), which had protected 89 percent of dogs for three years after vaccination, was used in these studies. Solid protection lasting for two years was obtained in all cattle immunized with aluminum hydroxide vaccine. The effect of the dose and route of inoculation of rabies vaccine as seen in the serologic response of cattle was also investigated.

CEPANZO also continued studies of human immune response after suckling mouse brain vaccination. One group of test subjects received 14 daily doses of the vaccine plus booster doses on days 10 and 20, while another received seven daily doses followed by three boosters on days 10, 20, and 90. The rapid appearance of high IgG antibody levels suggests the possibility of reducing still further the number of suckling mouse brain vaccine doses used in treating patients exposed to rabies.

Tuberculosis. CEPANZO supplied PPD for diagnostic activities at the National Hygiene Institute's veterinary laboratory in Guayaquil and the Central University in Quito. PAHO continued to cooperate with Jamaica in its efforts to declare the country free of bovine tuberculosis. Eradication of the disease was close at hand.

In research, CEPANZO continued to analyze the results of various tuberculin tests using bovine PPD in Argentine cattle, the bacteriologic diagnosis of nonpulmonary tuberculosis, and atypical mycobacteria in Buenos Aires Province.

Emergency Preparedness and Disaster Relief Coordination

The impact of natural and man-made disasters on the hemisphere's countries and their health services was significant in 1980, though of lesser magnitude than in 1979.

Hurricanes were a persistent threat in the Caribbean, and one—Hurricane Allen—severely affected Haiti, Jamaica, and Saint Lucia. Disasters small enough not to require massive international assistance, such as floods, moderate earthquakes, and local droughts, seriously impeded development.

The health consequences of disasters are likely to increase in the future. Although the frequency and strength of earthquakes and hurricanes will not change, mounting population density, progressive settlement of vulnerable flood-prone and coastal areas, and the continuing construction of health facilities and housing without proper risk analysis and engineering precautions will increase the effect of disasters on public health in the next decade.

Man-made disasters, including those resulting from industrialization and social progress due to greater urbanization, creation of hazardous industries, increased air traffic, and safety legislation that lags behind such advances, are increasingly frequent. Examples of "technologic catastrophes" in recent years in Latin America are a serious fire in a Bogotá skyscraper in 1974, continuing factory-produced chlorine gas contamination of Colombia's Cartagena Bay, and mercury contamination in several parts of Nicaragua resulting from gold ore processing.

Although many vulnerable countries in the hemisphere still lack standing disaster preparedness programs and health sector foci for emergency relief coordination, some countries made considerable progress in 1980. Co-

lombia and Ecuador established units in their health ministries to prepare and update disaster plans and train necessary personnel. In the Caribbean, following the catastrophic 1979 hurricane season, awareness grew of the need for action. Hurricane Allen caught Haiti, Jamaica, and Saint Lucia better prepared. Haiti's health ministry held several coordination meetings with international and bilateral aid agencies; the Jamaican health ministry activated its emergency plan, which resulted in far more effective relief than after earlier disasters; and Saint Lucia mobilized its strengthened high-level emergency coordinating committee to manage the hurricane's aftermath.

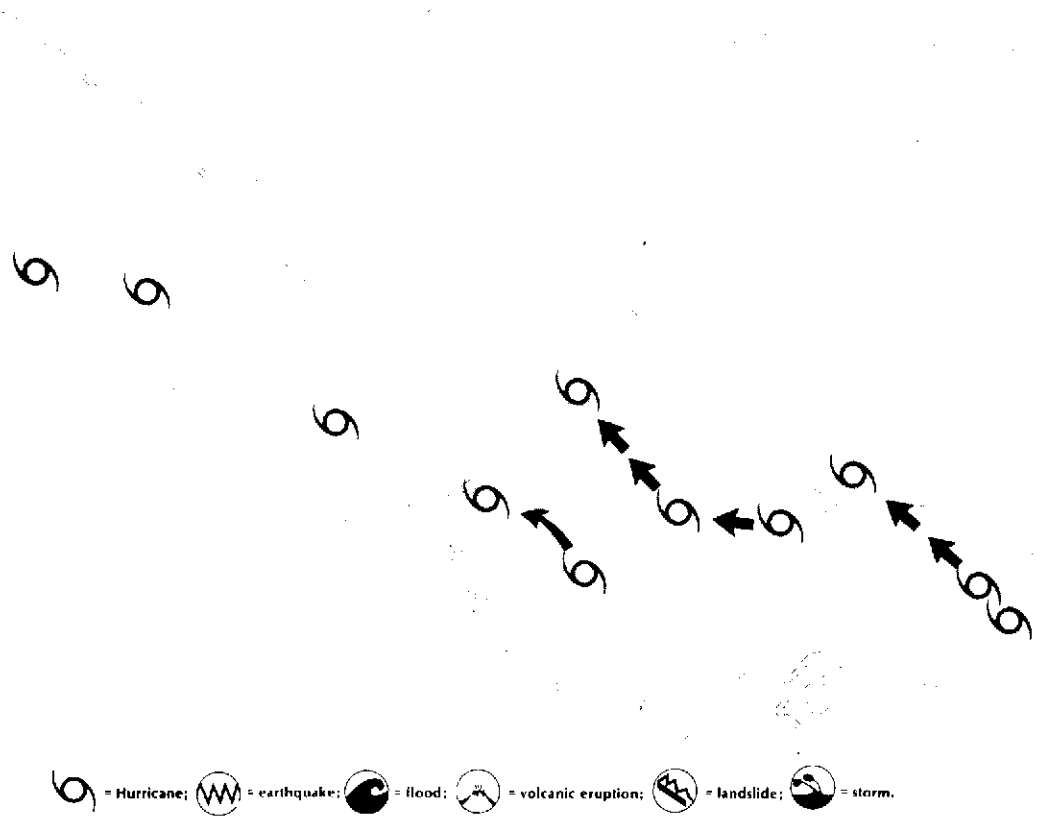
To reflect the countries' increasing concern about emergency preparedness, the Directing Council adopted a resolution (CD27.40) asking the Director to seek extrabudgetary funding to strengthen PAHO's regional and area technical cooperation in emergency preparedness and disaster relief.

Toward this end, grant negotiations were

Chilean disaster preparedness workers inspect an emergency medical relief team supply container in Santiago.

(Photo: J. Vizcarra Brenner/PAHO)

Figure 8. Sudden-impact disasters, Latin America and the Caribbean, 1976–1980.



= Hurricane; = earthquake; = flood; = volcanic eruption; = landslide; = storm.

Criterion for inclusion is at least 50 dead or 500 injured or 5,000 affected. Richter magnitudes of earthquakes are given in parentheses. The $ sign indicates approximate cost of damages.

Hurricane Oliva
Mazatlán, Mexico
October 24, 1975
36 dead; 25 injured; 123,618 affected; $28 million

Hurricane Liza
La Paz, Baja California, Mexico
October 3, 1976
600 dead; 14,000 injured; 200,000 affected; $100 million

Hurricane
Mexico
September 1977
10 dead; 50,000 affected

Hurricane Greta
Southeast coast, Honduras
September 17, 1978
7,000 affected; $1 million

Hurricane Greta
Belize
September 18, 1978
5 dead; 6,000 affected; $6 million

Hurricane David
Guadeloupe
August 28, 1979
20,000 affected

Hurricanes David and Frederick
Dominica
August 29, 1979
38 dead; 2,500 injured

Huricanes David and Frederick
Dominican Republic
August 30, 1979
1,300 dead; 1 million affected

Hurricane Allen
Haiti
August 5, 1980
220 dead; 835,000 affected; $40 million

Hurricane Allen
Jamaica
August 6, 1980
9 dead; 7 injured; 10,000 affected; $30 million

Hurricane Allen
Pinar del Río Province, Cuba
August 7, 1980
88,000 affected

Flood
Northeast and central Brazil
July 1975
96 dead; 748,000 affected; $254.9 million

Flood
Nicaragua
July 1976
7,500 affected

Flood
Santa Cruz Department, Bolivia
January 1977
10 dead; 70,000 affected; $10 million

Flood
North and central Brazil
May 1977
2 dead; 75,000 affected

Flood
Cuba
June 1977
7 dead; 18,000 affected

Flood
Bolivia
February 1978
63,000 affected

Flood
Mexico
March 1978
6 dead; 7,000 affected

Flood
San Martín Department, Peru
March 1978
2 dead; 17,000 affected; $2 million

Flood
Chile
June 1978
4 dead; 16 injured; 6,000 affected

Flood
Santa Cruz Department, Bolivia
December 1978
40 dead; 100,000 affected

Flood
North and central Brazil
January 1979
300 dead

Flood
West coast, Jamaica
April 1979
4 dead; 40,000 affected

Figure 8. Sudden-impact disasters, Latin America and the Caribbean, 1976–1980. (cont.)

Flood
Northern Paraguay
May 1979
70,000 injured; 120,000 affected

Flood
Paraná River, Argentina
May 1979
20,000 affected

Flood
Jamaica
June 1979
32 dead; 160,000 affected

Flood
Veracruz, Mexico
August 1979
60,000 affected

Flood
Northern coast, Honduras
November 1979
1 dead; 40,000 affected; $13 billion

Flood
Northeast Colombia
November 1979
62 dead; 100,000 affected

Flood
Belize
December 1979
17,000 affected

Flood
Northeast Nicaragua
December 1979
30,000 affected

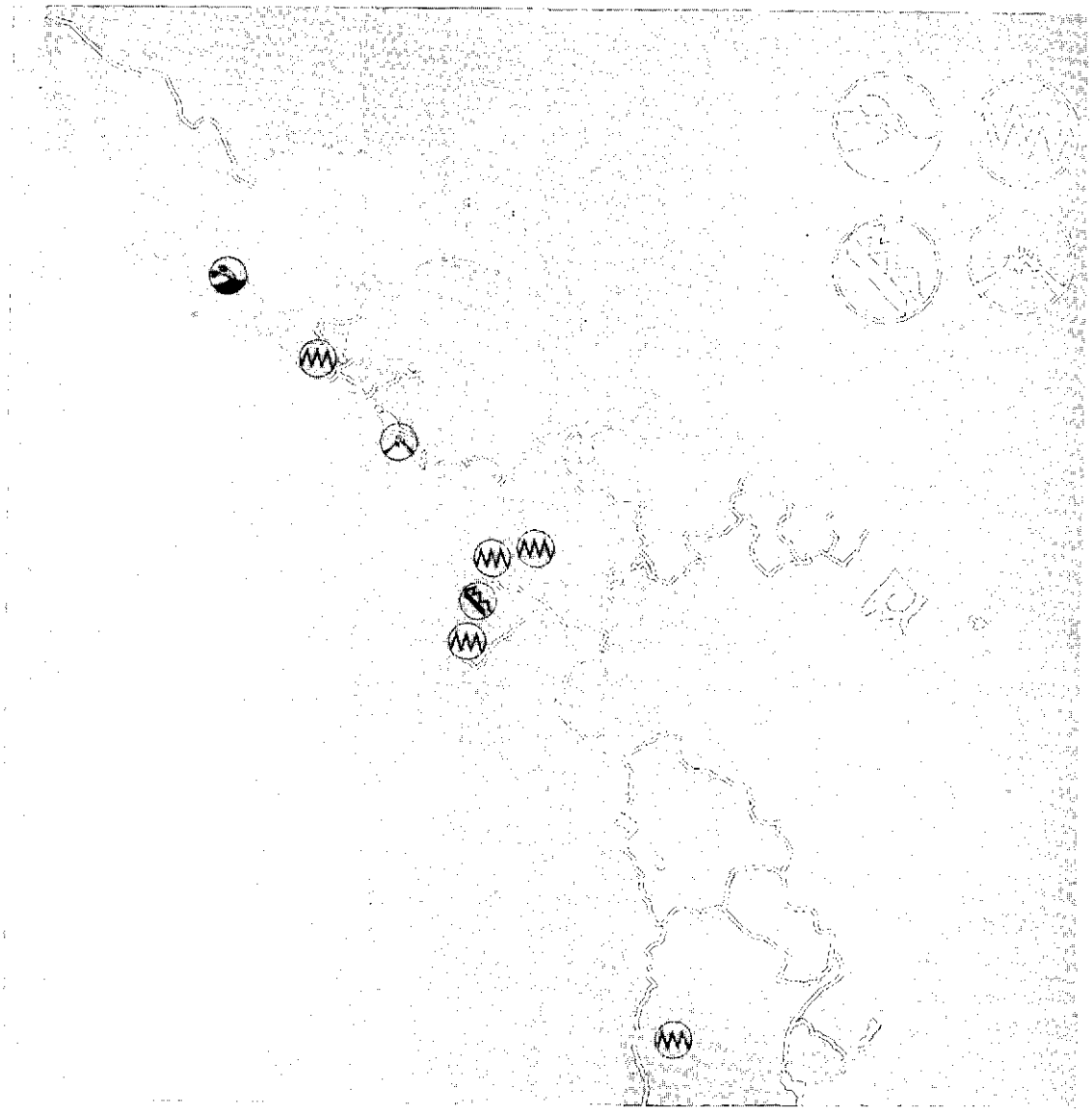
Flood
Northeast Brazil
February 1980
50 dead

Flood
Cuzco, Peru
April 1980
36,000 affected

Flood
Buenos Aires Province, Argentina
May 1980
31 dead; 36,000 affected

Flood
Central Mexico
September 1980
100 dead

Figure 8. Sudden-impact disasters, Latin America and the Caribbean, 1976-1980. (cont.)



= Hurricane; = earthquake; = flood; = volcanic eruption; = landslide; = storm.

Earthquake (7.5)
Guatemala City, Guatemala
February 4, 1976
23,000 dead; 77,000 injured;
3.75 million affected; $1 billion

Landslide
Ecuador
February 1976
60 dead

Storm
East-central Mexico
July 15, 1976
120 dead; 300,000 affected

Earthquake (5.7)
Cotopaxi, Ecuador
October 6, 1976
10 dead; 20,000 affected

Volcanic eruption
Monte Arenal, Costa Rica
October 25, 1976
70,000 affected

Earthquake (7.4)
San Juan Province, Argentina
November 23, 1977
70 dead; 100 injured

Earthquake (6.3)
West-central Colombia
November 23, 1979
60 dead; 600 injured; $20 million

Earthquake (7.9)
Pacific coast, Colombia
December 12, 1979
600 dead; 20,000 injured

successfully completed with the European Economic Community (EEC) and USAID. EEC approved a five-year, $1.5 million grant to help develop national emergency preparedness programs in Latin America. Simultaneous negotiations with several agencies were pursued to secure funding for a comparable five-year program in the Caribbean. USAID committed $99,358 for preparing and disseminating guidelines, manuals, and training aids throughout the hemisphere and pledged an initial $100,000 to strengthen PAHO's disaster preparedness activities in the Caribbean.

The Swedish International Development Authority approved an initial $110,000 grant to underwrite disaster preparedness activities in the Caribbean. PAHO will receive the funds early in 1981.

PAHO organized or cosponsored four disaster preparedness meetings during the year. The first was a Caribbean nurses' workshop on their role in disaster preparedness and relief in Barbados in May. Several of the workshop participants began activities after returning to their own countries. The next meeting was a Caribbean disaster preparedness conference organized by PAHO, USAID, the United Nations Disaster Relief Office (UNDRO), League of Red Cross Societies, and other agencies at Santo Domingo later in May 1980. Officials of various countries and agencies identified 55 possible preparedness projects and formulated a comprehensive five-year preparedness program to be considered by potential funding agencies.

The third meeting was a disaster relief management seminar for 35 senior Caribbean officials at Montego Bay, Jamaica, in June. The last was a three-day meeting of Andean disaster experts jointly sponsored by PAHO and the Hipólito Unanue Agreement at Bogotá in November. The working group reviewed disaster preparedness in the health sector in their countries. Among its most important recommendations was establishment of a special high-level unit with its own budget in each health ministry to improve disaster preparedness and coordinate relief activities.

(Photo: J. Vizcarra Brenner/PAHO)

Houses destroyed by a flood in central Peru.

One of PAHO's most important activities in disaster preparedness was to contract the University of the West Indies to prepare a simulation exercise to train disaster relief coordinators, for decision making under stress and in uncertainty cannot be taught in lectures or conferences. Tested during the Jamaica seminar, the day-long exercise reproduced the strain of postdisaster management.

After reading a brief profile of an imaginary country, participants were told that "Hurricane Goliath" had just struck "Cariba" and were assigned roles as members of its national emergency committee. In rapid fire,

the coordinator then fed the participants an unwieldy succession of reports on damage, medical and sanitation problems, and the status of food, transport, and communications. Much of the information was deliberately unreliable and contradictory so as to reproduce the rumors and confusion of an actual disaster. The exercise room was hot, telephones rang, communication lines went down, and no breaks to relieve the tension were allowed. At the end of the seven-hour simulation the participants agreed they knew far more about how to manage a crisis than before.

A similar exercise entitled "Earthquake in Tocuy" was written for Latin American conditions with the cooperation of PAHO's Latin American Health Education Technology Center in Rio de Janeiro. It will be tested in 1981.

Technical manuals also received priority attention. *Emergency Health Management After Natural Disasters* was edited, translated, and sent for publication. Drafts of postdisaster management manuals on communicable disease surveillance and control, emergency environmental health management, evaluation and control of vectors, rodents, and pests, and medical supply management were completed in English and will be translated and published in 1981 and 1982.

It also prepared eight instructional slide shows with English captions covering the major aspects of emergency health management. Initiated in 1979, the shows were tested at the Jamaica seminar and WHO's October course in Brussels on postdisaster health care and relief management, and revised in light of comments from other organizations such as UNDRO, UNICEF, and the League of Red Cross Societies. Spanish captions will be prepared in 1981.

Other PAHO activities were support of short-term travel fellowships for health officials from Barbados, Cuba, Ecuador, and Jamaica, and promotion, technical support, and funding of two research projects (a study of health problems caused by Hurricane David in Dominica in 1979 through a $10,000 grant to the University of the West Indies, and a morbidity and mortality survey following the 1979 earthquake in Tumaco, Colombia, through another $10,000 grant to that country's health ministry).

(Photo: J. Vizcarra Brenner/PAHO)

Adobe slum houses overlooking the Rimac River in Lima would topple in an earthquake.

The Directing Council reviewed the proposed medium-term plan for PAHO's disaster preparedness program. The plan includes strengthening PAHO's technical ability to help countries prepare for man-made disasters, which are an increasing threat to public health; increasing its cooperation in organizing multidisciplinary health ministry seminars and workshops as part of national emergency preparedness programs in the health sector;

including emergency preparedness in training meetings and materials organized by other PAHO technical units, as in a module on hospital disaster planning for health service management courses or postdisaster rehabilitation of water and sanitation systems during a regional sanitary engineering meeting; organizing short and refresher courses for disaster relief coordinators alternately in English and Spanish to transmit new research findings; and increasing PAHO support of scientific evaluations of postdisaster relief activities and epidemiologic surveys.

Experience from Hurricanes David (1979) and Allen (1980) in the Caribbean indicates the need for PAHO to have in reserve a self-sufficient and multidisciplinary team ready to help assess needs and coordinate international health assistance if asked for by a disaster-affected country. Countries vulnerable to disaster have been urged to facilitate the team's entry after a disaster by giving prior consent.

PAHO provided emergency medical supplies and equipment totaling $43,000 to Haiti, $10,000 to Jamaica, and $4,000 to Saint Lucia after Hurricane Allen. These donations resulted from reallocation of savings in country or regional programs.

The lack of contributions to PAHO's natural disaster relief fund prevented the shipment of additional relief supplies. Because PAHO is not as well equipped to buy and ship large amounts of medical supplies on short notice as specialized bilateral and international agencies, it concentrates on assessing needs and giving advice to the international community on the most effective health assistance.

Statistical Services

To monitor health conditions in the Americas, PAHO collects data from the countries and processes, analyzes, and disseminates them. The information collected will be used to determine the potential impact of the health improvement measures and strategies PAHO and the governments are adopting to bring about universal health and gauge the effectiveness of programs to carry out those measures and strategies.

The first priority of PAHO's statistical service during the year was to design a computerized data base to allow wide flexibility in accessing information and analyzing various types of data. A consulting firm was hired to do so and is expected to submit its final design report in early 1981.

Discussions were also initiated within PAHO to ascertain information requirements for monitoring and evaluating different programs. This led to the design of new forms for collecting data on vaccinations, epidemiologic surveillance, leprosy, and mortality. Discussions of forms for gathering information on human resources, hospitals, and health service use are underway, as are methods and procedures for collecting data on health expenditures and health service coverage.

Data on mortality, communicable diseases, human resources, and hospitals were updated for internal use and in reports and specific publications, including *Health Conditions in the Americas*, to be published in 1982.

PAHO supplied mortality statistics to WHO and the United Nations Statistics Office, and statistics on communicable diseases, hospitals, and human resources to WHO.

As the focal point for information on health in the hemisphere, PAHO receives and answers numerous queries from governments and training and research centers in the Americas and other WHO regions and from international organizations.

Much of the information PAHO collects and publishes is not internationally comparable. A priority activity in 1981 will be to identify variant areas and promote the development of more uniform international data collection, processing, and dissemination standards.

To promote use of the *International*

Classification of Diseases (*ICD*), PAHO retained two consultants to support the Venezuelan Classification Center (CEVECE) in Caracas in its activities as WHO's Spanish-language classification center.

CEVECE is preparing the Spanish translation of the *International Classification of Procedures in Medicine*, which is to be published in 1981, and issued its first quarterly newsletter to apprise national disease classification officials of problems and possible solutions in applying the *Classification* and of relevant publications, and to answer queries it receives. The first international course on disease classification for producing morbidity and mortality statistics was held in July and August. Nineteen students from nine Latin American countries attended.

CEVECE's highest priority in 1981 and 1982 will be to support the countries in extending health service coverage through primary care by helping them develop classifications of symptoms or health problems suitable for treatment by nonmedical personnel. Such classifications will aid in designing information systems for programming, controlling, and evaluating primary care programs.

The Brazilian Center for Disease Classification published and distributed the revised version of volumes 1 and 2 of the *Classificação Internacional de Doenças* after testing and correcting a trial edition published in 1979. The Portuguese translation of volume 1 of the *International Classification of Procedures in Medicine* was finished, and the work will be distributed in 1981. The center also decided to publish a thrice-yearly newsletter. Its first issue included explanations of coding and other aspects of *ICD*'s ninth revision and information on *ICD* courses.

Publications

Through its publications program PAHO disseminates scientific and technical information of international interest on health promotion, disease prevention, and allied subjects.

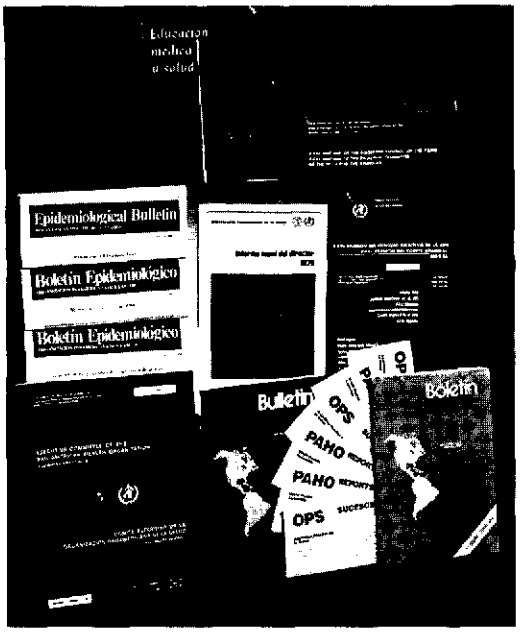
The PAHO/WHO publications coordination working group held its sixth annual meeting in November to discuss mutual policy, planning, and communications problems. The presence of a representative from WHO's European regional office added a new viewpoint to the discussions, especially in the areas of interregional cooperation and possible copublishing.

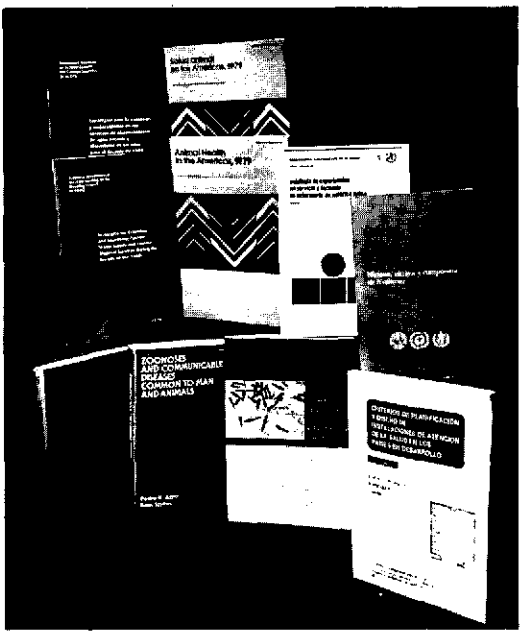
Periodical publications

The monthly *Boletín de la Oficina Sanitaria Panamericana* entered its 58th year of publication as PAHO's main Spanish-language scientific and technical periodical. It featured 77 original articles on public health, health care research, disease control, animal health, health manpower, health administration, environmental health, and many other subjects by authors from the Americas as well as other parts of the world. A new quarterly section in special format entitled "Information on Pharmacology" began to appear in the July issue.

The quarterly *Bulletin of PAHO* entered its 14th year and included 34 original articles and news on such subjects as rural health, primary health care, ambulatory care, nutrition, family health, maternal and child health, immunology, microbiology and virology, mental health, cancer, and environmental health.

Educación Médica y Salud, also a quarterly in its 14th year, devoted its first issue of 1980 wholly to nursing, as had its last issue of 1979. The two nursing issues later appeared together in Spanish as Scientific Publication 393. The other three 1980 issues included articles and abstracts on varied manpower topics such as university medical tutoring, technology evaluation, curricular reforms, research in hospitals, teaching through simulation, medical specialization trends, and





(Photos: J. Vizcarra Brenner/PAHO)

teaching in nutrition and health administration.

The bimonthly *Epidemiological Bulletin*, which appeared for the first time in 1980, promotes the exchange of epidemiologic information among the Americas. It periodically publishes short accounts of and comments on the epidemiologic activity of important communicable and noncommunicable diseases as well as information from the countries and PAHO field research activities and technical aspects of disease surveillance, prevention, and control programs. Each issue also includes a section on diseases subject to international health regulation and a calendar of courses and meetings. The newsletter's pressrun was 3,000 copies in Spanish and 2,000 in English.

Scientific publications and official documents

The selections approved for the 1980 special publications program, comprising scientific publications and official and other documents, were edited and produced by the staff at headquarters and at the PAHO/WHO publications and documentation service in Mexico. These comprised 27 titles totaling 5,081 printed pages and 61,160 copies.

The most important volume published during the year was *Zoonoses and Communicable Diseases Common to Man and Animals* (Scientific Publication 354) by Pedro Acha and Boris Szyfres, originally issued in Spanish in 1977. It contains detailed descriptions of diseases transmitted from vertebrate animals to man and those common to man and animals. The book, of special interest to students, technical staff, and professionals in the human and animal health sciences, combines up-to-date information in a single volume on both the medical and veterinary aspects of diseases that have traditionally been dealt with in different texts.

The proceedings of the XII Inter-American Meeting, at the Ministerial Level, on Foot-and-Mouth Disease and Zoonoses Control were published as *Animal Health in the Americas, 1979* (Scientific Publication 391).

Table 7. PAHO Special Publications, 1980.

Serial No.	Title	Printed pages	Pressrun
	Scientific Publications		
354	Zoonoses and Communicable Diseases Common to Man and Animals, P. N. Acha and B. Szyfres	714	2,000
373	Orientations pour la chimiothérapie du paludisme humain	26	1,000
373	Orientaciones sobre quimioterapia de la malaria humana (*Second printing*)	26	1,000
391	Animal Health in the Americas, 1979—Proceedings of the XII Inter-American Meeting, at the Ministerial Level, on Foot-and-Mouth Disease and Zoonoses Control	136	1,000
391	Salud animal en las Américas, 1979—Documentos de la XII Reunión Interamericana, a Nivel Ministerial, sobre el Control de la Fiebre Aftosa y Otras Zoonosis	144	1,950
392	Tuberculosis—Detección de casos y quimioterapia: Preguntas y respuestas, K. Toman	280	3,000
393	Antología de experiencias en servicio y docencia en enfermería en América Latina	225	3,000
394	Nitratos, nitritos y compuestos de N-nitroso, Criterios de Salud Ambiental No. 5	119	3,000
395	Regionalización de los servicios de salud—La experiencia de Puerto Rico, G. Arbona and Annette B. Ramírez de Arellano	92	3,000
396	Proceedings, V International Conference on the Mycoses—Superficial, Cutaneous, and Subcutaneous Infections	400	1,500
397	Criterios de planificación y diseño de instalaciones de atención de la salud en los países en desarrollo, Vol. 3, B. M. Kleczkowski and R. Pibouleau (eds.)	175	3,000
398	Procedimientos para la investigación de enfermedades transmitidas por el agua	84	2,000
399	Prevención y control de la fiebre reumática en la comunidad—Normas operativas para un programa de extensión de la cobertura a los diferentes niveles de atención	132	5,000
400	Trastornos mentales: Glosario y guía para su clasificación según la Novena Revisión de la Clasificación Internacional de Enfermedades	114	3,000
401	Manual de calidad del aire en el medio urbano	240	2,000
402	Principios y métodos para evaluar la toxicidad de sustancias químicas, Parte I. Criterios de Salud Ambiental No. 6	306	3,000
403	Oxidantes fotoquímicos. Criterios de Salud Ambiental No. 7	122	3,000
	Official Documents		
167	Final Report, XXVI Meeting of the Directing Council of PAHO, XXXI Meeting of the Regional Committee of WHO for the Americas (bilingual edition)	105	1,500
168	Financial Report of the Director and Report of the External Auditor for 1979	135	330
168	Informe Financiero del Director e Informe del Auditor Externo correspondiente a 1979	135	380
169	(*To be published in 1981*)		
170	Proceedings, XXVI Meeting of the Directing Council of PAHO, XXXI Meeting of the Regional Committee of WHO for the Americas (multilingual edition)	309	1,000

Table 7. PAHO Special Publications, 1980 (cont.).

Serial No.	Title	Printed pages	Pressrun
171	Annual Report of the Director, 1979	196	2,000
171	Informe Anual del Director, 1979	215	2,000
172	Proceedings, 83rd and 84th Meetings of the Executive Committee of PAHO	222	500
	Other Publications		
Enseñanza de la Medicina Veterinaria No. 4	Enseñanza de la epidemiología en la educación en medicina veterinaria en América Latina	48	2,000
	Oral Rehydration Therapy: An Annotated Bibliography	123	5,000
	(*Second printing*)	123	3,000
	Terapia de rehidratación oral: Una bibliografía anotada	135	4,000

In addition to the meeting's final report, the work contains papers presented on African swine fever and the support animal health diagnostic laboratories can provide rural medical care programs.

Three additional *Environmental Health Criteria* guides were published in Spanish (Nos. 5, 6, and 7) as part of the WHO program established in 1973 to assess environmental conditions and compile, review, and evaluate available information on the human health effects of pollutants and other environmental factors.

The Spanish edition of K. Toman's book, *Tuberculosis Case-Finding and Chemotherapy: Questions and Answers*, was issued as Scientific Publication 392. It is addressed to tuberculosis program organizers and administrators, and professors who teach tuberculosis control in medical, public health, and other health science schools.

Scientific Publication 395 was the Spanish translation of *Regionalization of Health Services—The Puerto Rican Experience*, by G. Arbona and A. Ramírez de Arellano, a case history deserving an important place in health care literature. Scientific Publication 400 was the Spanish edition of *Mental Disorders: Glossary and Guide to Their Classification in Accordance with the Ninth Revision of the International Classification of Diseases*.

Seven official documents and three nonserial publications were also issued during the year.

The headquarters publications staff also took part in editing and producing all PAHO periodicals except the *Boletín de la Oficina Sanitaria Panamericana*, a total of 1,104 printed pages and 73,200 copies. The editorial time it spent on periodicals was much greater than in previous years.

SEPU, in addition to the *Boletín de la Oficina Sanitaria Panamericana*, produced six PAHO scientific publications, with a total of 1,242 printed pages and 17,000 copies printed. It also translated 10 titles in WHO's technical report series, four offset publications, and three nonserial publications.

Distribution and sales

To promote PAHO and WHO publications, PAHO exhibited selections of them at the International Book Fair in Mexico City, the Na-

tional Council for International Health conference in Washington, and the annual meetings of the American Veterinary Medical Association in Washington and the American Public Health Association in Detroit, Michigan.

Emphasis throughout the year was on increasing the paid distribution of PAHO publications, as a result of which $77,444 was invoiced, an increase of 41 percent over 1979. The amount collected was $72,624. A new system for maintaining and updating PAHO's several mailing lists by computer was also designed and put into effect, and the necessary computer terminal was installed in the distribution and sales unit.

The numbers of publications distributed during the year were: periodicals, 217,637; scientific publications, 72,203; official documents and other publications, 37,943, and WHO publications, 6,558. The grand total was 334,341.

Filmstrips

In the filmstrip program, 82 titles have been completed to date on a variety of subjects including environmental sanitation, nutrition, maternal and child care, food hygiene, laboratory procedures, community health, slaughterhouse hygiene, and eye care. A total of 4,573 filmstrip copies were distributed, 2,958 gratis to educational institutions and 1,615 sold to individuals. In addition, 1,037 sets of the printed materials on primary eye care were distributed.

Textbook and instructional materials program

In 1979 PAHO expanded its textbook program to provide high quality textbooks and other instructional materials to all fields and levels of study in the health sciences. The expansion was financed by a $5 million IDB loan to the Pan American Health and Education Foundation and a $1.5 million PAHO contribution. PAHO acts as the project's loan guarantor and executing agency.

The program's principal emphasis is on training primary health workers in accordance with PAHO and WHO priorities for extending basic health services to the urban and rural poor. In August, in compliance with a request from the health ministers of Central America and Panama, PAHO brought together staff from the ministries at San José to review each country's nursing auxiliary priorities and needs and make recommendations regarding the preparation of manuals and instructional modules for training auxiliaries.

After the meeting, three short-term consultants were retained to begin preparation of the first manual, on maternal and child care, and by December a pilot version was ready for review by the ministerial working group. It is expected that this and other manuals and audiovisual materials will be completed in 1981.

PAHO financed the production of a set of instructional modules for training health workers in various aspects of communicable disease and immunization strategies and procedures. These materials are now available through PAHO's expanded immunization program office, and distribution through textbook program channels is expected to begin in 1981.

By the end of the year, the program included five professional-level textbooks in the basic sciences, five in dentistry, four in nutrition, three in nursing, and two each in veterinary medicine and environmental health. Seventeen of the 19 Spanish- and Portuguese-speaking countries in the hemisphere had signed basic agreements permitting purchase and sale of materials.

Total sales of medical textbooks were about the same volume as in the previous two years, with considerable gains in several countries being partially offset by losses in

others due to strikes and university closures. No new titles were added, though the Portuguese version of Sabiston's surgery textbook became available to participating schools in Brazil for the first time. Manuals in certain medical specialties will be considered for inclusion in 1981.

A number of administrative changes were made in medical textbook distribution, including consolidation of export shipments from different Mexican publishers. It is hoped that by anticipating medical school requirements throughout the hemisphere and making consolidated sea shipments, stockouts can be avoided and sales increased.

The interest of nursing schools participating in the program grew in 1980. Sales were significantly higher in most countries, and over 19,000 books were sold by the end of the year. Three titles are now available in Portuguese to Brazilian students. The second Spanish editions of several books whose translations PAHO commissioned for exclusive sale in the Americas will appear in 1981. A series of self-instructional perinatal care modules for university nursing students is also planned.

Considerable progress was made in bringing other health science schools into the program. About 40 percent of eligible dental schools had signed memoranda of understanding, and the conclusion of a basic agreement with Brazil toward the end of the year promised to double the number of dental schools participating in the first few months of 1981. In nutrition, most students now have access to books through the program, either directly or through participating medical schools. Less progress was made in veterinary medicine and sanitary engineering, mainly because unforeseen delays in negotiating textbook purchases from publishers made it difficult to give potential participants a clear idea of what materials would be available. It is expected that negotiations for several additional books in these areas will be completed in early 1981 and that most veterinary and sanitary engineering schools will be participating by the end of the year.

The sale of stethoscopes, sphygmomanometers, and diagnostic sets continued at about the same rate as in the previous two years. The chance of a significant increase in sales in 1981 seems good, since several schools in Brazil and Mexico plan to order instruments for the first time. Sales were extended to include nursing schools, and it appears that a number of dental schools will also be able to make use of the materials offered.

Index

A

B

E

F

G

H

I

J

K

L

M

N

O

P

R

S

T

U

V

W

X, Y, Z

ACRONYMS AND CORRESPONDING AGENCIES OR PROGRAMS

ACMR	PAHO Advisory Committee on Medical Research
AMPES	American Region Programming and Evaluation System
CAREC	Caribbean Epidemiology Center
CARICOM	Caribbean Community
CDC	Centers for Disease Control (USA)
CEPANZO	Pan American Zoonosis Center
CEPIALET	Pan American Center for Research and Training in Leprosy and Tropical Diseases
CEPIS	Pan American Center for Sanitary Engineering and Environmental Sciences
CFNI	Caribbean Food and Nutrition Institute
CIDA	Canadian International Development Agency
CLAP	Latin American Center for Perinatology and Human Development
CLATES	Latin American Center for Educational Technology in Health
COSALFA	South American Foot-and-Mouth Disease Control Commission
ECLA	Economic Commission for Latin America (UN)
ECO	Pan American Center for Human Ecology and Health
EEC	European Economic Community
EPI	Expanded Program on Immunization
FAO	Food and Agriculture Organization (UN)
IAEA	International Atomic Energy Agency
IBRD	International Bank for Reconstruction and Development (World Bank)
IDB	Inter-American Development Bank
IDRC	International Development Research Center (Canada)
IICA	Inter-American Institute for Cooperation on Agriculture
ILO	International Labor Organization
INCAP	Institute of Nutrition of Central America and Panama
LACRIP	Latin American Cancer Research Information Project
NIH	National Institutes of Health (USA)
OAS	Organization of American States
OIRSA	International Regional Organization for Health in Agriculture and Livestock
PADEF	Pan American Development Foundation
PAHEF	Pan American Health and Education Foundation
PAHO	Pan American Health Organization
PANAFTOSA	Pan American Foot-and-Mouth Disease Center
PASB	Pan American Sanitary Bureau
PASSCAP	Program on Health Training of the Community of Central America and Panama
PLADES	Latin American Program for Educational Development in Health
RLM	Regional Library of Medicine and the Health Sciences
UN	United Nations
UNDP	United Nations Development Program
UNDRO	United Nations Office of the Disaster Relief Coordinator
UNEP	United Nations Environment Program
UNFDAC	United Nations Fund for Drug Abuse Control
UNFPA	United Nations Fund for Population Activities
UNICEF	United Nations Children's Fund
UNU	United Nations University
USAID	U.S. Agency for International Development
WFP	World Food Program
WHO	World Health Organization