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# CONTENTS

**Introduction** vii

## I. GOVERNING BODIES

The Pan American Sanitary Conference 1
The Executive Committee 5

## II. GENERAL PROGRAM DEVELOPMENT

Technical cooperation among developing countries 10
Primary health care 11
Community participation 12
Appropriate technology 13

## III. DISEASE CONTROL

Communicable diseases 14
- Expanded Program on Immunization 14
- Tuberculosis 17
- Malaria 19
- Other parasitic diseases 23
  - Chagas' disease 23
  - Schistosomiasis 24
  - Filariasis 24
  - Leishmaniasis 25
- Dengue 25
- Yellow fever 26
- *Aedes aegypti* eradication and vector control 27
- Mycoses 30
- Cholera and enteric diseases 30
- Leprosy 32
- Sexually transmitted diseases 32
- Influenza 33
- Hepatitis and rotavirus 33
- Plague 33
- Meningococcal meningitis 34
- Typhoid fever 34

Noncommunicable diseases 34
- Cancer 34
- Other noncommunicable diseases 35

Zoonoses and animal health 35
- Foot-and-mouth disease and the Pan American Foot-and-Mouth Disease Center 36
- Zoonoses and the Pan American Zoonoses Center 39
- Anthrax 40
- Brucellosis 40
- Equine encephalitis 42
- Hydatidosis 42
- Leptospirosis 43
- Rabies 43
- Tuberculosis 43
Services related to disease control 44
  Epidemiologic surveillance and the Caribbean Epidemiology Center 44
  Laboratory services 45
  Quality control of drugs 46
  Production and control of biologicals 47
  Hospital infections control 48
  Food protection 49
  Control of toxic substances 49
  Emergency preparedness and disaster relief coordination 50

IV. ENVIRONMENTAL HEALTH 51
  Water supply and basic sanitation 53
  Solid wastes 56
  Institutional development program 57
  Pan American Center for Human Ecology and Health 57
  Pan American Center for Sanitary Engineering and Environmental Sciences 59
  Radiation and isotopes 63

V. HEALTH SERVICE SYSTEMS 64
  Health care services 64
    Training 68
    Primary health care and community participation 69
    Health planning 71
  Nursing services 71
  Rehabilitation services 73
  Maintenance of health facilities 73

VI. FAMILY HEALTH 75
  Maternal and child health and family planning 75
    Latin American Center for Perinatology and Human Development 77
  Nutrition 77
    Institute of Nutrition of Central America and Panama 79
    Caribbean Food and Nutrition Institute 82
  Mental health 82
  Dental health 83
  Prevention of traffic accidents 85

VII. HUMAN RESOURCES 86
  Manpower planning and administration 86
    Manpower planning 86
    Education and training in health care administration 86
    Continuing education 87
  Human resources development 87
    Institutional and program development 88
    Educational development for health 90
    Medical education 90
    Nursing education 92
    Education in engineering and environmental sciences 92
    Education in public health and social medicine 93
    Training intermediate-level health workers 94
Primary health care is essential health care based on practical, scientifically sound, and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination.

Declaration of Alma-Ata
September 1978
INTRODUCTION

In the last two years, the Governments of the Region have adopted resolutions of far-reaching importance in the health field. Especially significant are those relating to health services and the extension of coverage, as approved by the IV Special Meeting of Ministers of Health of the Americas and the XXV Meeting of the Directing Council of the Pan American Health Organization, both of which were held in 1977. Subsequently, in 1978, the International Conference on Primary Health Care culminated in the Declaration of Alma-Ata with its recommendation for primary care and community participation.

The XX Pan American Sanitary Conference (Grenada, 1978) adopted a number of resolutions for the purpose of strengthening national health programs and related PAHO activities of technical cooperation with the countries.

Another major event during 1978 was the United Nations Conference on Technical Cooperation among Developing Countries (Buenos Aires), which approved a plan of action emphasizing the importance of such cooperation as a way to build national and collective self-confidence and self-sufficiency. PAHO was selected to serve as a focal point for the activities of the World Health Organization in this field.

The number of people living in the Americas has grown considerably in recent years. In 1975 it was estimated that there were approximately 325 million people in Latin America and the Caribbean area. That figure is expected to double by the end of this century. Moreover, there has been a radical shift in the urban-rural distribution of this population, with an increasingly heavy migration to urban centers, which requires an overhaul of systems for the delivery of health services that adequately responds to projected needs and demands.

In this general context, the Governments of the Americas have reaffirmed their commitment to increase health services delivery, particularly to the underserved segments of their societies. They have assigned priorities and set objectives for their national efforts in keeping with the social, political, and economic characteristics of their respective countries and have taken account of the stage of their national development and of the problems of the health sector itself.

The main concern of the Governments and of the Organization continues to be the extension of health services coverage, with particular emphasis on primary care. Greater community participation in this process has been considered a key to its success. The Governments have also
established priorities, goals, and strategies in the health field, with national programs that are often multisectoral in approach. PAHO, in turn, has refined its technical cooperation with the health authorities and improved its functional channels of communication with them.

This improvement has been achieved through a new methodology instituted in 1978 for programming and evaluation of the Organization's activities. That methodology has enabled the Governments to request collaboration that is better suited to their national programs—i.e., international technical cooperation in the health field is now flexible enough to be tailored to particular national needs and situations. Thus, the program and budget of the Organization now reflect more faithfully the requirements of the countries.

As the 1970s draw to a close, it is important to ascertain what have been the results of efforts made by the countries during this decade to attain the goals of the Ten-Year Health Plan for the Americas, and whether the plans and strategies have been appropriate to achieve the desired goals.

New strategies, policies, and mechanisms have undoubtedly been incorporated into some programs, while others have been adjusted as activities developed. Primary care, community participation, appropriate technology, intersectoral programming, and technical cooperation among developing countries—adapted to local conditions—are now accepted as effective mechanisms for improving health.

In recent years the subregional groups have refined the coordination of their efforts through intercountry programs. The Organization has recognized them as an important vehicle for technical cooperation, harmonizing its policies with those of the subregional groups and conducting joint activities.

The Organization's collaboration with the health programs of the countries has been carried out in the following areas: comprehensive health services, including the strengthening of health systems; administration, planning, and information; disease prevention and control; environmental protection and the control of environmental factors detrimental to health; multidisciplinary development of human resources at all levels, with emphasis on intermediate and auxiliary personnel; and promotion of biomedical and social research.

The chapters that follow describe the activities of the Pan American Health Organization during 1978 in its efforts to cooperate with the countries to achieve the greater well-being of all the peoples of the Region.

Héctor R. Acuña
Director
I. GOVERNING BODIES

THE PAN AMERICAN SANITARY CONFERENCE

The XX Pan American Sanitary Conference, which was also the XXX Meeting of the Regional Committee for the Americas of the World Health Organization, was held at St. George's, Grenada, from 25 September to 6 October. Taking part in the Conference were delegates from PAHO's 32 Member and Participating Governments: Argentina, Bahamas, Barbados, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, the Dominican Republic, Ecuador, El Salvador, France, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, the Netherlands, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad and Tobago, the United Kingdom, the United States of America, Uruguay, and Venezuela.

Also present were Mr. Kamaluddin Mohammed, President of the Thirty-first World Health Assembly and Minister of Health and Local Government of Trinidad and Tobago; Dr. David Tejada-de-Rivero, Assistant Director-General of WHO; and observers from 16 inter- and nongovernmental organizations. The Executive Committee was represented by its Chairman, Dr. Rubén M. Cáceres (Paraguay), and two of its members, Mr. Michel Careau (Canada) and Dr. Laurence J. Charles, Sr. (Bahamas).

The officers of the Conference were its President, Mr. Herbert J. Preudhomme (Grenada); its Vice-Presidents, Dr. Julius B. Richmond (United States of America) and Dr. Paulo de Almeida Machado (Brazil); and its Rapporteur, Dr. Oscar González Carrizo (Argentina). Dr. Héctor R. Acúña, Director of the Pan American Sanitary Bureau, was Secretary ex officio.

The Conference, which consisted of an inaugural session, 14 plenary sessions, and a closing session, approved 34 resolutions.

The Conference reelected the Director, Dr. Acúña, to a new four-year term of office beginning 1 February 1979 and submitted his name to the Executive Board of WHO for appointment as Regional Director for the Americas.

As in previous Conferences, several of the plenary sessions were devoted to the presentation of reports by the countries on health conditions and progress achieved during the last four years. It was expected that these reports, which included information about the prevention and control of diseases, health promotion, and extension of health services to the countries' entire populations, would prove of great usefulness in planning future health activities in the Hemisphere.

PAHO submitted for consideration its principal statistical publication, Health Conditions in the Americas, 1973-1977, the seventh in a series prepared for successive Pan American Sanitary Conferences. Since the publication covered the middle period of the Ten-Year Health Plan for the Americas, it focused on the progress
achieved in attaining the goals established in the Plan.

Also submitted to the Conference was the Quadrennial Report, 1974–1977, and Annual Report, 1977, of the Director, which summarized PAHO's cooperation with the Member Governments over the period.

PAHO's Program and Budget. The Conference approved a budget for PAHO of $33,672,100 which, together with the WHO budget for the Region of the Americas and funds from other sources, created a total PAHO budget of $72,994,570 for fiscal year 1979. PAHO will use the funds for various regional public health programs in the fields of disease control, family health, environmental health, health systems, supporting services, human resource development, physical, financial, and technological resources, and research coordination.

The Conference decided to adopt a biennial program and budget for PAHO, starting with 1980–1981, which the Directing Council would examine and approve every two years.

Extension of Health Services. The Conference expressed its conviction that inequalities in the health of the peoples of the Americas are unacceptable and a matter of concern for all the countries.

It urged Governments that have not yet completed their plans for extending health services to their entire populations to give priority to that effort. It also recommended that plans for achieving complete coverage be hastened and that primary health care be developed as part of general health services.

The Conference also requested the Director to give priority to establishing and disseminating the definitions and criteria that all countries should use in evaluating the extension of services and to facilitate the exchange of experiences, technical knowledge, teaching materials, and information about appropriate tech-
It also asked the Governments to recognize the historic importance of the International Conference on Primary Health Care held at Alma-Ata, U.S.S.R., in September, to adhere to its declaration, and to put the Conference's recommendations into practice.

Both PAHO and WHO accord highest priority to extending health services, and the Governments have set themselves the goal of "health for all by the year 2000."

**Technical Cooperation among Developing Countries.** The Conference took note of the report on "Technical Cooperation among Developing Countries" (TCDC) setting forth the activities in which PAHO has collaborated with the countries. As the resolutions approved by their Governing Bodies show, both PAHO and WHO attach great importance to TCDC. Intercountry or subregional cooperation in the health sector has taken various forms in the Hemisphere. Bilateral cooperation has been a common practice, as various agreements on nutrition, communicable disease, zoonoses, and environmental sanitation programs demonstrate.

The Conference asked PAHO to continue its cooperation in strengthening TCDC among countries, subregionally, and regionally and requested that a high-level working group be organized to formulate strategies for stimulating the furtherance of TCDC in the Region. It also recommended that PAHO establish an information bank from which the countries could draw data about technical knowledge, training courses, equipment, and the like, in the health field.

**Malaria.** Because malaria has worsened in some of the countries, the Conference reiterated its previous policy that eradication continue to be the goal of malaria programs in the Americas. To intensify eradication activities, it declared 1980 to
be the "Year of Frontal Struggle with Malaria in the Americas."

It requested the Governments to conduct epidemiologic studies as a basis for adopting new eradication strategies and to appropriate the necessary funds for carrying forward the regional malaria program.

It also asked the Director to orient the III Meeting of Directors of Malaria Eradication Services, to be held in Mexico in 1979, toward formulating a regional action plan and to intensify PAHO's technical cooperation with the Governments in applied research and training activities.

**Dengue.** The Conference noted that a number of countries of the Americas have experienced *Aedes aegypti* reinfestations and that dengue epidemics occurred in the Caribbean in 1977 and 1978. It also expressed its concern about the presence of jungle yellow fever in parts of the Region adjacent to those with *A. aegypti* infestation.

It therefore resolved to maintain the present policy of *A. aegypti* eradication and to reaffirm the XVII Pan American Sanitary Conference's recommendation that still-infested countries adopt necessary measures to overcome eradication campaign problems and give utmost priority to providing funds, personnel, and supplies in order to complete such campaigns as soon as possible.

It also recommended that surveillance of dengue and yellow fever be strengthened and that national surveillance centers be designated in order to give warning of the imminence of epidemics.

In addition, it asked the Director to bring together a working group to draw up a regional plan for gradually eradicating *A. aegypti*, to prepare a vector control manual for emergencies to provide all necessary assistance to national *A. aegypti* eradication programs, and to promote the availability of enough good vaccines to deal with any emergency.

**Foot-and-Mouth Disease and the Zoonoses.** After noting the Final Report of the XI Inter-American Meeting, at the Ministerial Level, on Foot-and-Mouth Disease and Zoonoses Control, held at Washington, D.C., earlier in the year, the Conference called attention to the major technical cooperation PAHO provides the Governments' animal health programs through the Pan American Foot-and-Mouth Disease and Zoonoses Centers. It requested the Director to study the possibility of transferring the responsibilities PAHO now exercises through the Pan American Foot-and-Mouth Disease Center to another international agency more closely concerned with agriculture.

**Sociocultural Impediments to Health Care Delivery.** The Conference noted that the present health care system often encounters problems of a cultural nature because of the indiscriminate character of its infrastructure. Patients interpret care levels in their own ways and have superstitions or beliefs that may not coincide with the ways in which health care is provided.

It recommended that PAHO and the Governments intensify research in the sociocultural aspects of health in community life and the health care delivery system. It also asked the Director to support studies to discover and develop communications procedures in order to improve the health service system.

**Technical Discussions.** The subject of the Conference's Technical Discussions, in which distinguished experts participated, was "The Impact of Drugs on Health Costs: National and International Problems."

In the report of the Discussions, of which the Conference took note, several recommendations were put forward which would provide the countries guidelines for developing national drug policies and adopting pharmaceutical product supply systems to reduce the high cost of such agents.

The Conference requested the Director
to establish or strengthen relations with the pharmaceutical industry and recommended that the countries set up comprehensive national drug policies.

"Community Health Education: Evaluation of Present Programs, New Approaches, and Strategies" was chosen as the topic for the Technical Discussions to be held during the XXVII Meeting of the Directing Council in 1980.

WHO Special Program for Research and Training in Tropical Diseases. Brazil and Venezuela were chosen to represent the Region on the Joint Coordinating Board of the WHO Special Program for Research and Training in Tropical Diseases, whose purpose is to create better mechanisms for controlling six tropical diseases—malaria, schistosomiasis, filariasis, trypanosomiasis, leprosy, and leishmaniasis—and increase the capacity of affected countries for investigating them.

Cooperation with the Inter-American Association of Sanitary and Environmental Engineering (AIDIS). The Conference recommended that increased collaboration be sought with AIDIS, a nongovernmental organization that has cooperated with PAHO for almost 30 years in activities to improve the Hemisphere's environment.

Election of New Executive Committee Members. The periods of office of the Bahamas, Colombia, and Costa Rica having ended, Guatemala, Peru, and the United States of America were elected to membership of the Executive Committee for three-year terms. Presently, the Committee's other members are Brazil, Canada, Ecuador, Paraguay, Trinidad and Tobago, and Venezuela.

PAHO Award for Administration. Dr. Oswaldo Egas Cevallos of Ecuador received the 1978 Award for his work in the field of administration of health services.

THE EXECUTIVE COMMITTEE

The Executive Committee held its 80th Meeting at PAHO Headquarters, Washington, D.C., from 26 June to 6 July, and it was attended by representatives of its nine members—Bahamas, Brazil, Canada, Colombia, Costa Rica, Ecuador, Paraguay, Trinidad and Tobago, and Venezuela. Observers from Chile, Cuba, Jamaica, and the United States of America were also present.

The Committee's officers were its Chairman, Dr. Rubén M. Cáceres (Paraguay); Vice-Chairman, Mr. Michel Careau (Canada); Rapporteur, Dr. Jorge Arias Sobrado (Costa Rica); and Secretary ex officio, Dr. Acuna, Director of PASB.

The Committee held 16 plenary sessions, nine of which were devoted to a detailed review of PAHO's proposed program and budget estimates, and a closing session. It approved 28 resolutions on various subjects.

At the 81st Meeting of the Executive Committee, on 4 October at St. George's, three new members—Guatemala, Peru, and the United States of America—were instated. The Committee elected Mr. Michel Careau (Canada) as Chairman, Dr. José Manuel Padilla Lepage (Venezuela) as Vice-Chairman, and Dr. José Leonel Barrios (Guatemala) as Rapporteur.

The Committee noted the resolutions approved by the Pan American Sanitary Conference and elected Peru a member of the jury of the PAHO Award for Administration, after a vacancy occurred therein when the Bahamas' membership on the Committee ended. It also chose Ec-
Figure 1. Composition of the Executive Committee from 1960 to 1979.
uador, Trinidad and Tobago, and the United States of America as members of a working group to conduct an analysis of the WHO study of its own structures in the light of its functions, to be carried out with the assistance of the Director. Finally, the Committee approved PAHO's participation in an Inter-American Development Bank loan to finance a broadened textbook and educational materials program and authorized the Director to make the necessary commitment.
II. GENERAL PROGRAM DEVELOPMENT

As a result of policies established by its Governing Bodies in recent years, PAHO now operates according to a set of premises quite different from those that obtained a few years ago. Foremost among the policies that took shape during the mid-1970s is the concept of technical cooperation among developing countries.

Others, which pertain more specifically to health and the extension of health services to those who do not now have access to them, are primary health care, community participation in health activities, and the use of "appropriate health technologies."

None of these policies that today underlie PAHO's programs and activities belongs exclusively to it or even to the Western Hemisphere, for by now all of them are truly international in their application. They are commonly cited not merely in the publications and discussions of PAHO and the other WHO Regions as well as WHO itself, but also in the day-to-day discourse of the United Nations, U.N. specialized agencies, international organizations such as the World Bank and the Inter-American Development Bank, and the overseas development agencies of industrialized nations.

They are rooted in the new awareness of developing countries of their own resources, needs, and goals as well as the greater voice those countries have acquired in international forums over the past decade or two. Their tilt is away from the former "we know best what's good for you" attitude of the developed countries and often of international agencies toward less developed ones. These policies are in the direction of true collaboration between international agencies and the developing world and among more and less developed countries in promoting social and economic advance everywhere. Even more, they imply that developing nations and the international organizations serving them will rely less on the help of advanced countries and increasingly on their own mutual efforts in the years ahead.
Technical cooperation among developing countries or TCDC, as this new mode of collaboration between international agencies and developing countries and among those countries is commonly known, is predicated on the ability many such countries have demonstrated during the past decade to plot their own course and guide themselves along it with their own resources.

The United Nations General Assembly took cognizance of the TCDC concept as early as 1972, and in the mid-1970s adopted a series of resolutions further defining what TCDC meant and how it should be put into practice.

WHO was not far behind in adopting TCDC as a policy. As early as January 1976 the WHO Executive Board acknowledged the importance of TCDC as an integral part of overall cooperation for development in one of its resolutions (EB57.R50), and later meetings of WHO's various Governing Bodies approved resolutions specifying in greater detail the activities that could and should be undertaken within the framework of TCDC.

One of WHO's actions to promote TCDC was the Director-General's designation of PAHO as the focal point for WHO's TCDC activities throughout the world because of the experience PAHO had already acquired in technical cooperation programs in the Western Hemisphere. Under this mandate, PAHO reviews the application of TCDC principles and practices in WHO, serves as liaison with the U.N. Development Program (UNDP) Special Unit in New York, and provides necessary information about TCDC application and activities to other WHO Regional Offices. This responsibility also gives an added boost to WHO's work in promoting TCDC in the Americas.

Because of its special responsibility for TCDC within WHO, PAHO was one of the leading organizations at the U.N. Conference on Technical Cooperation Among Developing Countries (Buenos Aires, 30 August-12 September). Many of the proposals put forward at the Conference were controversial, and as might be expected there was general agreement about only a few. Out of the meeting, however, came a broader consensus of what TCDC means and what activities could be carried out within its context. Portions of the Conference's report help explain TCDC:

This form of cooperation is not new. A large number of cooperative activities have been carried out among developing countries over the years, and many are now in progress. What is new, however, is that cooperation among developing countries is now perceived by those countries to be increasingly important in promoting sound development in the present world context. Furthermore, the difficulties currently encountered by the world economy make it even more necessary for the developing countries to evolve strategies based on greater national and collective self-reliance, for which TCDC is an important instrument. This in no way reduces the responsibility of developed countries to undertake the necessary policy measures—in particular, the increase of development assistance for accelerated development of developing countries.

TCDC is a multidimensional process. It can be bilateral or multilateral in scope, and subregional, regional, or interregional in character. It should be organized by, between, and among Governments which can promote, for this purpose, the participation of public organizations and, within the framework of the policies laid down by Governments, that of private organizations and individuals. It may rely on innovative approaches, methods, and techniques particularly adapted to local needs...
II. GENERAL PROGRAM DEVELOPMENT

and, at the same time, use existing modalities of technical cooperation to the extent that these are useful. While the main flows of technical cooperation visualized would be between two or more developing countries, the support of developed countries and of regional and interregional institutions may be necessary.

TCDC is neither an end in itself nor a substitute for technical cooperation with developed countries. Increased technical cooperation of the developed countries is required for the transfer of appropriate technologies and also for the transfer of advanced technologies and other expertise in which they have manifest advantages. Further contributions from the developed countries are required for the enhancement of technological capabilities of developing countries through support to relevant institutions in those countries. TCDC can serve the purpose of increasing the capacity of developing countries to adapt and absorb appropriate inputs from developed countries.

PAHO and the countries can now point to many concrete examples of TCDC in promoting health in the Americas. All 10 of PAHO's Pan American Centers practice TCDC daily in their respective fields, among them environmental sanitation, health education technology, animal health, and disease control. All subregional conferences of health ministers have agreed to a greater or lesser extent to pool their efforts in certain areas, such as the establishment of a network of health laboratories in the Caribbean or incipient joint efforts to prevent traffic accidents in the Andean Pact countries. Individual countries are also aiding their neighbors in specific health activities: an example is Venezuela's willingness to train nationals from other Andean Pact countries in various health equipment maintenance specialties.

Finally, it should be noted that one of WHO's TCDC activities is of particularly great relevance to the Americas, the Special Program for Research and Training in Tropical Diseases. This two-year-old program, which is cosponsored by the UNDP and World Bank, focuses on six of the world's major tropical diseases—malaria, schistosomiasis, leprosy, leishmaniasis, trypanosomiasis, and filariasis. It has two interlocking goals, the promotion of self-reliance in biomedical research in tropical countries and the development of improved tools for controlling disease. Its policy makers are almost all from developing countries, and it is there that the research activities it sponsors largely take place.

PRIMARY HEALTH CARE

Primary health care (PHC) is, as WHO defines it, basic care provided by community health workers. It is useful to note that this definition differs from that in some industrialized countries where PHC means initial medical care by general physicians—family practitioners, internists, pediatricians, and sometimes obstetrician-gynecologists. The WHO definition also includes more emphasis on the promotional, preventive, and rehabilitative as well as curative aspects of health care than is common in northern American and European countries.

WHO and PAHO, together with individual developing countries, now stress PHC as a health promotion strategy for two fundamental reasons: there are not and will not be enough health care professionals in the developing countries to provide adequate care to all their peoples for many years to come, and community-based care—even if at times rudimentary—is feasible and better than no care.
By definition, PHC has certain structural characteristics. The community workers who are its front-line fighters against disease are trained to deal only with common health problems such as the lack of good basic environmental sanitation; those beyond their competence to handle are referred upward through successively more qualified levels of a health care pyramid until they can be solved. This implies the need for good communication between the health workers at different levels of the pyramid and adequate management of lower levels by those above. Community health workers are often also generalists, for within the space of a day one may be called on to treat a cut, give a class on good eating habits, solve a basic sanitation problem, guide community activities, and take part in an epidemiologic survey. One of the most important attributes of such health workers is that they be able to communicate with and enjoy the confidence of fellow community members. For this reason, community workers are sometimes recruits to scientific medicine from the traditional health practices with which their urban districts or rural villages are familiar.

For the past several years PAHO has vigorously promoted the development of PHC as the bedrock of national health systems. It does this in many ways, such as through system design and management consultation, cooperation in formulating proposals to international finance agencies for grants or loans to put PHC programs into effect, and workshops and courses for community health worker trainers.

PAHO representatives also participate in meetings on PHC, the largest to date being the International Conference on Primary Health Care (Alma-Ata, U.S.S.R., 6–12 September 1978), sponsored by WHO and U.N. Children's Fund.

COMMUNITY PARTICIPATION

Just as developing countries are increasing their cooperation under TCDC, so the residents of communities in developing countries are cooperating ever more in solving their own problems.

The goals of community participation in health programs are two: to win the acceptance and interest of health care consumers in health activities affecting them and to enlist their direct support of and involvement in those activities.

The consensual quality of community participation is important because it can enhance health care. In the past, many of the Region's peoples often did not understand the reasons for and had little say about care activities. Now, however, the health ministries are making greater efforts to explain their programs and are often letting communities decide their own health priorities.

The participative nature of this concept is equally important since first-level PHC workers are recruited from their own communities. Much of their success—whether in arranging the construction of a water supply system or persuading fellow residents to take part in an immunization campaign—depends on the willingness of the rest of the community to contribute money, labor, or both to their efforts.
Community participation supports and promotes health care and contributes to social and economic development.

APPROPRIATE TECHNOLOGY

Another strategy that most developing countries have adopted to further their health care goals is “appropriate technology.” As now commonly used by international health agencies, “technology” means an association of methods, techniques, and equipment which, together with the people using them, can contribute significantly to solving a health problem. “Appropriate” means that besides being scientifically sound, the technology is also acceptable to those who apply it and to those for whom it is intended. This implies that technology should be in keeping with or adaptable to the local culture and that community health workers must be able to understand and use it without difficulty.

All too often in the past developed countries have urged less developed nations to use health care methods, materials, and techniques to which they are accustomed and can afford but which are ill-suited to and beyond the means of less sophisticated and less privileged societies. In Latin America and the Caribbean, this situation has been fast changing as simpler, more effective, and less costly health care methods, medicines, and equipment have been developed and adopted.
III. DISEASE CONTROL

COMMUNICABLE DISEASES

Expanded Program on Immunization

Progress in the control of disease has historically started with the subjugation of communicable diseases and particularly those preventable through immunization, for they are the easiest to overcome.

Even when effective vaccines exist, the advance toward the ultimate goal of eradicating a disease is often agonizingly slow. Well managed and financed organizations must be developed to conduct immunization campaigns, staff must be recruited and trained, vaccines must be properly produced and distributed, public acceptance must be won, and adequate epidemiologic surveillance must be undertaken to ensure that the disease under attack is indeed retreating. Like any fine mechanism, a good immunization program takes time and skill to construct and once built can break down if the least of its parts falters.

Despite occasionally serious scientific, technologic, and administrative problems, concerted immunization against some of the most important communicable diseases can succeed brilliantly.

The best known case in point of recent times is the global campaign the World Health Organization undertook in 1967 against smallpox. Most public health authorities agree that smallpox is theoretically the easiest of the major communicable diseases to eradicate because its causative virus is short-lived, transmitted only between humans, and does not exist in animal reservoirs. Notwithstanding, many formidable difficulties in vaccine production had to be overcome before the disease was eradicated in the Americas in 1971 and the world’s last known case occurred near Mogadishu, Somalia, in October 1977.

In the mid-1970s the already apparent success of the global smallpox eradication campaign and other factors led WHO to adopt its current Expanded Program on Immunization (EPI), an intensified attack through increased immunization on diphtheria, tetanus, whooping cough, poliomyelitis, measles, and tuberculosis. This program was formally inaugurated in the Americas when PAHO’s Directing Council approved a resolution (CD25.27) enabling it in October 1977.

As with the smallpox campaign in its early stages, EPI faced major problems as it began to take shape in the Region during 1978, and undoubtedly it will require some time to resolve them. Although every one of the countries carried on immunization activities, the traditional programs suffered from many handicaps: management was often deficient, especially in assessment, evaluation, and
The recently established Expanded Program on Immunization contributes toward the strengthening of national vaccination campaigns against childhood diseases, improvements in equipment for preservation of vaccines, and new research activities. (Photos: Governments of the Dominican Republic and El Salvador)
vaccine preservation in the field; few vaccines were produced in Latin America and the Caribbean area; they were not always purchased in an orderly manner and at the lowest possible cost; and almost no models existed for conducting EPI activities within integrated health services. Equally as serious, the morbidity and death rates caused by the six EPI diseases were hard to determine because reporting of cases and deaths was irregular, unreliable, or nonexistent. This made formulating precise attack strategies difficult.

Yet the situation in the Hemisphere appeared to be serious, for the limited reasonably trustworthy data available from recent years indicated that poliomyelitis morbidity was several times greater and measles, whooping cough, and tetanus mortality as much as 400 times higher in some developing nations than in the industrialized countries. The latter, though less affected by the six diseases, stood in danger of their re-crudesence because immunization efforts had been allowed to lag through apathy.

The EPI action plan that PAHO developed during the year in collaboration with the countries called for four major thrusts: strengthened management, supervision, and evaluation of field operations; improved equipment to preserve vaccines, particularly in rural areas where refrigeration facilities were not routinely available; applied research to develop models for providing immunization through integrated health services; and the establishment of a revolving fund for vaccine purchases.

In the first area, PAHO prepared and conducted several training courses of two kinds. The first dealt with program planning, management, and evaluation; the second with distribution and preservation of vaccines in the field (the "cold chain" of distribution, involving refrigeration of vaccines during transport to final, often remote destinations). More than 140 specialists in immunization, maternal and child health, and vaccine distribution from all the Latin American countries attended the courses, which were designed so that graduates could in turn give them nationally—as they were scheduled to do in 1979.

In the next area, three "cold chain" vaccine carriers were developed and put into wide use in several countries under PAHO auspices. The carriers, which hold 1.5 to 2.0 liters of vaccine, can keep it at the proper temperature for up to four days and three nights. Work was also begun to develop a low-cost, 22-liter refrigerator for stocking vaccine at health centers, and it was expected to enter production in many developing countries in 1979.

In the realm of applied research, several EPI demonstration areas were created in Ecuador. Health workers in fixed primary care services and mobile teams planned and carried out immunizations so that all target patients in the areas were reached. Periodic evaluations showed that EPI activities could be integrated with existing health services, and the program began to expand into other parts of the country. In Guatemala, a sociocultural analysis of the population's attitudes toward immunization was made in one province, and the results were used to draw up an action plan for 1979. To determine the optimal age for measles immunization, PAHO brought together five investigators from as many countries to prepare a protocol for a serologic study which was then begun.

In October the XX Pan American Sanitary Conference approved the establishment of a revolving fund for EPI with an initial capitalization of $1 million. By year's end 24 countries and territories had become members of the fund, and 20 had purchased their 1979 vaccine supplies
through it. The fund will eventually need a capitalization of $3 to $4 million for smooth operation, and PAHO began seeking the additional financing.

### Tuberculosis

Despite the efficacy of modern chemotherapy, tuberculosis continues to be a major public health problem in Latin America and the Caribbean and still occurs frequently in certain populations or areas in Canada and the United States of America.

As a result of intensive control efforts, morbidity and mortality caused by the disease have definitely declined in the last 20 years. Extent of the decline is, however, problematic because in many countries registration of new cases and reporting of active cases and deaths are incomplete.

The Region's health ministers marked out the main lines of attack and set the goals to be achieved in controlling tuberculosis during the 1970s at their III Special Meeting in Santiago, Chile, in 1972. They decided that three activities were essential to control: increasing biologic resistance to the disease in persons under 15 years of age through sustained and widespread BCG immunization, finding the main sources of infection through bacteriologic examination of sputum samples from patients with respiratory symptoms, and neutralizing newly discovered sources of infection through ambulatory chemotherapy.

These activities should be carried out continuously and cover the entire population. Because tuberculosis control must depend on available resources, almost all countries in the Region have decided that it is best accomplished through cost-effective integrated health services, a policy PAHO encourages. Most countries that have adopted integrated childhood immunization programs have managed to increase their BCG vaccination coverage, but integration is still incomplete in many countries and in a few is only beginning.

As in previous years, PAHO's tuberculosis control efforts during 1978 were chiefly devoted to helping organize and evaluate integrated national health services that include tuberculosis control among their activities. Priority was given to providing advice on how to develop bacteriologic diagnosis services and supervise ambulatory chemotherapy.

During the year specific tuberculosis programs continued in Argentina, Brazil, and Venezuela, and a new project was started in Mexico. In Belize, Colombia, Cuba, the Dominican Republic, Guatemala, and Peru, PAHO provided advice on communicable disease control and epidemiologic surveillance programs in which tuberculosis control was a distinct part. The following activities were carried out in individual countries:

### Argentina.
The National Tuberculosis Institute at Recreo continued to monitor the decline in tuberculosis incidence through its national tuberculin survey of first-grade schoolchildren and age-group analysis of new cases. A PAHO consultant visited the country's principal laboratories to advise on current diagnostic techniques and evaluate bacteriologic services in the more populous provinces.

### Belize.
After reviewing the tuberculosis situation, a PAHO consultant made recommendations for improving the efficiency of the national program, particularly inpatient treatment and diagnostic services.

### Brazil.
A major reform of the tuberculosis program took place in March when the National Tuberculosis Division became the Respiratory Disease Division of the National Secretariat of Special Programs, which deals with high-
priority national projects, and a full-time PAHO consultant was assigned. During the remainder of the year the division was reorganized to enable it to better meet its broadened responsibilities. Tuberculosis control planning for the country's general health services was upgraded, reporting of operational information and new cases was simplified, and quarterly divisional supervision visits to control programs in the states and territories were begun. Agreements for federal coordination of the tuberculosis program were signed with the health and social welfare ministries in several states. A national seminar to assess the year's progress was held at Porto Alegre in October.

**Chile.** A PAHO consultant advised the Bacteriologic Institute on current diagnostic and safety methods, took part in a national seminar for regional laboratory workers, and reviewed the tuberculosis control program's bacteriologic activities.

**Colombia.** PAHO continued to provide advice on operations research in the national control program. A study of tuberculosis prevalence among health service patients was completed, and the efficiency of case-finding was tested by analyzing delays in diagnosis attributable to patients and health services. A survey was begun of the incidence of hypertrophic and keloid scars after BCG vaccination.

**Cuba.** PAHO cooperated with national authorities in analyzing the efficacy and toxicity of the standard treatment regimen and in determining the effect of control activities on tuberculosis morbidity and mortality.

**Dominican Republic.** Advice was given on managing the combined tuberculosis-leprosy control project in the eastern part of the country.

**Guatemala.** Tuberculosis control as an integral part of the general health services was extended during the year to all health centers, 81 per cent of the health posts, and 74 per cent of the hospitals in the country. Two national seminars were held, one for laboratory workers and the other for nurses specializing in tuberculosis control.

**Mexico.** As a result of an agreement with national authorities, a full-time PAHO consultant was assigned to Mexico to help develop methods for evaluating the integrated tuberculosis control program. A newly designed planning model led to formulation of annual program objectives and changed case-reporting standards, a plan of operations for the period 1978-1981 was drawn up and approved, and a seminar was held to bring departmental chiefs and supervisors in the National Tuberculosis Control Directorate abreast of these developments. Research began in the Mexico City area on the prevalence of respiratory symptoms and tuberculosis among patients in general hospitals and on human tuberculosis of bovine origin, and in Veracruz State on reasons why patients discontinue treatment.

**Peru.** PAHO helped to develop a simplified method for planning control activities that was tested in the Cuzco and Puno health regions and to update the national program's standards manual. It also arranged for the International Union Against Tuberculosis to donate tuberculosis medicines to the national health authorities.

**Venezuela.** Organization and evaluation of the integrated tuberculosis program continued. On the basis of experience in three test areas, the program's national operational model was approved and extended throughout the country. A tuberculosis epidemiologic surveillance model was constructed, and a national technical and administrative seminar was held for state program officials. Operations research was continued to evaluate BCG vaccination coverage in school and community samples, the prevalence of tuberculosis among patients visiting general health services, the quality of bacteriologic examinations performed in peripheral laboratories, and the efficacy of short-term chemotherapy regimens.

At the end of the year, 10 countries were producing BCG vaccine: Brazil, Colombia, Cuba, Mexico, and Venezuela manufactured it in freeze-dried form, while the other five produced it as fluid. Argentina began to produce freeze-dried vaccine experimentally, and Ecuador decided to begin manufacturing it in 1979. PAHO provided all countries information about WHO's international BCG vaccine quality control system, and Chile, Mexico, and Uruguay sent samples of their vaccines to WHO's reference laboratory in Copenhagen for testing. The Pan American Zoonoses Center continued to act as the Region's BCG quality control laboratory.
and received periodic samples from Argentina, Chile, Colombia, and Venezuela for analysis. A consultant from the Center advised laboratories in Argentina and Mexico on quality control.

As it had done in previous years, PAHO gave or arranged the donation of vaccine, tuberculin purified protein derivative, microscopes, reagents, and spare parts for vaccine production equipment to five countries.

In the area of training, PAHO, in cooperation with Venezuela, organized a two-month regional tuberculosis control course at Caracas which was attended by 17 physicians, seven nurses, and six laboratory workers from 13 countries; fellowships were awarded to 18 of the participants. Classroom instruction was given in Caracas, while field observation and practice took place in the States of Cara­bobobo, Monagas, Sucre, Táchira, and Zulia.

In addition to the regional course, PAHO cooperated in training tuberculosis workers for the health services in Argentina, Brazil, Chile, Cuba, Guatemala, Honduras, Mexico, and Peru and provided financial and technical assistance for national seminars in Bolivia and Colombia. It awarded 11 fellowships for attendance at national epidemiology and control courses in Argentina, Chile, and Cuba and provided two travel grants to study integrated control programs and especially the organization of diagnostic laboratories.

Among its other activities in the field, PAHO finished analyzing data from a 1977 survey of tuberculosis instruction in 105 Latin American nursing schools and prepared a report for publication in its Nursing Reports Series. In addition, a Manual of Standards and Procedures for Integrated Tuberculosis Control Programs in Latin America was prepared which will be included in the PAHO Scientific Publication series. The quarterly tuberculosis bulletin in Spanish continued to appear.

Malaria

As in the last several years, malaria continued to worsen in the Region during 1978. The overall number of cases reported—409,322—was 14.8 per cent higher than in 1975. Although 13 of the 22 countries and territories with active malaria control programs reported a decrease in cases compared with 1977, eight reported an increase and one no change. Colombia, El Salvador, Guatemala, and Haiti showed the most serious deterioration, while Argentina, Brazil, French Guiana, Guyana, and Panama recorded the greatest gains. In the remaining countries and territories the situation remained almost the same as in the previous year.

Because of this worrisome trend, malaria was much discussed by the PAHO Executive Committee in Washington, D.C., in June and July and at the XX Pan American Sanitary Conference in September and October. Participants in the two meetings resolved that, with control as an intermediate objective, eradication should be the ultimate goal of malaria programs throughout the Hemisphere and urged Member Governments to make firm national commitments toward that end. The Director was requested to intensify PAHO's technical cooperation of applied research and training with assistance from the WHO Special Program for Research and Training in Tropical Diseases.

Grouped according to their progress, the Region's malaria programs could be categorized as follows in 1978:

Group I comprised 12 countries or territories in which the disease had been eradicated (Chile, Cuba, Dominica, Grenada and Carriacou, Guadeloupe, Jamaica, Martinique, St. Lucia, Trinidad and Tobago, and the United States of America, including Puerto Rico and the Virgin Islands). The group had a population of 71.6 million
Table 1. Reported cases of malaria, 1975-1978.

<table>
<thead>
<tr>
<th>Group</th>
<th>Population in originally malarious areas</th>
<th>Cases reported</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group I</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 countries or territories in which malaria eradication has been certified</td>
<td>71,631</td>
<td>435</td>
</tr>
<tr>
<td><strong>Group II</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Argentina</td>
<td>3,190</td>
<td>100</td>
</tr>
<tr>
<td>Belize</td>
<td>143</td>
<td>90</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>608</td>
<td>290</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>5,091</td>
<td>159</td>
</tr>
<tr>
<td>French Guiana</td>
<td>56</td>
<td>319</td>
</tr>
<tr>
<td>Guyana</td>
<td>877</td>
<td>1,116</td>
</tr>
<tr>
<td>Panama</td>
<td>1,758</td>
<td>666</td>
</tr>
<tr>
<td>Panama Canal Zone</td>
<td>38</td>
<td>11</td>
</tr>
<tr>
<td>Paraguay</td>
<td>2,415</td>
<td>217</td>
</tr>
<tr>
<td>Sub-total</td>
<td>14,176</td>
<td>2,968</td>
</tr>
<tr>
<td><strong>Group III</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td>46,891</td>
<td>88,630</td>
</tr>
<tr>
<td>Ecuador</td>
<td>4,559</td>
<td>6,555</td>
</tr>
<tr>
<td>Mexico</td>
<td>33,639</td>
<td>27,925</td>
</tr>
<tr>
<td>Suriname</td>
<td>276</td>
<td>2,741</td>
</tr>
<tr>
<td>Venezuela</td>
<td>9,789</td>
<td>5,952</td>
</tr>
<tr>
<td>Sub-total</td>
<td>95,154</td>
<td>131,803</td>
</tr>
<tr>
<td><strong>Group IV</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bolivia</td>
<td>1,923</td>
<td>6,615</td>
</tr>
<tr>
<td>Colombia</td>
<td>15,778</td>
<td>32,690</td>
</tr>
<tr>
<td>El Salvador</td>
<td>3,906</td>
<td>83,100</td>
</tr>
<tr>
<td>Guatemala</td>
<td>2,561</td>
<td>4,979</td>
</tr>
<tr>
<td>Haiti</td>
<td>4,271</td>
<td>24,733</td>
</tr>
<tr>
<td>Honduras</td>
<td>2,670</td>
<td>30,289</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>2,424</td>
<td>24,692</td>
</tr>
<tr>
<td>Peru</td>
<td>5,659</td>
<td>14,338</td>
</tr>
<tr>
<td>Sub-total</td>
<td>39,192</td>
<td>221,436</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>220,153</td>
<td>356,642</td>
</tr>
</tbody>
</table>

*a Up to 30 September.  
*b Up to 31 October.
in once malarious areas, or almost one-third of the total population of the originally malarious portion of the Americas. During the year 58 *Plasmodium malariae* cases occurred in Grenada, but this focal outbreak was eliminated with insecticides and antimalarial drugs. In addition to the cases there, five of the other countries or territories in the group reported 660 imported cases.

Group II consisted of nine countries or territories in which malaria transmission was almost interrupted but, because of continuing disease importation, certain costly preventive and surveillance activities had to be maintained (Argentina, Belize, Costa Rica, the Dominican Republic, French Guiana, Guyana, Panama, the Panama Canal Zone, and Paraguay). Together the group recorded 5,004 cases and had 14.2 million people in formerly malarious areas (6.4 per cent of the total population in the Region's originally malarious area). Disease transmission recurred in much of Belize and Guyana; attack measures which had been suspended for several years were reinitiated, and the epidemiologic situation again improved in the two countries—although in Belize the final number of cases reported was 13.5 times higher than it had been in 1975.

Group III comprised five countries or territories in which eradication was pursued with the same or intensified efforts using all available control methods (Brazil, Ecuador, Mexico, Suriname, and Venezuela). In 1978 this group had 116,357 malaria cases and its population in once malarious areas was 95.1 million, or 43.2 per cent of the total population in the Region's originally malarious area. Most of the countries experienced vector and parasite problems, and in a few labor problems among field workers occurred, but in general malaria programs were well managed and adequately financed.

Group IV embraced the remaining countries (Bolivia, Colombia, El Salvador, Guatemala, Haiti, Honduras, Nicaragua, and Peru), which together had 39.2 million people (17.8 per cent of the Hemisphere's total) in originally malarious areas. During the period 1976-1978 the malaria situation in these countries deteriorated badly because of acute technical, operational, administrative, and financial problems, and in 1978 they reported 287,243 cases or 70.2 per cent of the Region's total. In some malaria control was pursued as a separate program or as part of the general health services, while in others there was little or no vector control or case-finding and thus it was difficult to evaluate the malaria situation. Halting further deterioration is necessarily the immediate goal in these countries.

Of the 220,153,000 people living in the Region's originally malarious zones at the end of 1978, 105,611,000 (48.0 per cent) were in maintenance-phase areas where the disease had been eradicated, 59,734,000 (27.1 per cent) were in consolidation-phase areas where transmission had been interrupted, and 54,808,000 (24.9 per cent) were in attack-phase areas where transmission still occurred.

The impediments to progress in the Hemisphere's malaria programs are technical, social, and administrative in nature and are particularly serious in Group III and IV countries.

The Region's most serious technical problem, which is acute in El Salvador, Guatemala, Haiti, Honduras, and Nicaragua, is anopheline physiologic resistance to insecticides. Vector exophily is also a major concern in some areas such as western Venezuela and northeastern Colombia, where the vector is *Anopheles nuneztovari*. *P. falciparum* resistance to the 4-aminoquinolines occurs in certain parts of South America, but in most instances it is not a major obstacle to
Figure 2. Status of the malaria program in the Americas, 31 December 1978.

Including:
- Areas in which malaria has disappeared or never existed: Antigua, Bahamas, Barbados, Barbuda, Bermuda, St. Kitts-Nevis-Anguilla, St. Vincent, Turks and Caicos Islands, Virgin Islands (UK)
- Areas where malaria has been eradicated (Maintenance phase): Dominica, Grenada, Guadeloupe, Martinique, St. Lucia, Trinidad and Tobago, Virgin Islands (US)
- Areas in consolidation phase
- Areas in attack phase
eradication because other attack measures effectively interrupt transmission and alternative drugs are available for treatment.

Human behavior often creates greater problems than those caused by vectors and parasites. Factors that often promote malaria transmission include makeshift housing, customs and habits that increase contact with the vector, migration, water impoundment, irrigation systems, road construction, and government-sponsored or spontaneous colonization and settlement, combined with the relative inaccessibility of many communities and wide dispersal of dwellings.

Poor administration and funding have been the principal problems in several countries. Inadequate budgets, lack of technical staff, constantly changing field crews, labor problems, and shortages of vehicles, drugs, insecticides, and equipment frequently paralyze or delay field operations and set programs back. Some malaria programs have been integrated into general health services when specific attack measures are still required. Such integration, if not carefully planned and implemented, may cause discontinuity or deterioration in field operations leading to more malaria in attack areas and resurgent transmission in consolidation and maintenance areas.

Other Parasitic Diseases

Several parasitic diseases in addition to malaria are considered to be of significant public health importance in Latin America and the Caribbean area. It is difficult to quantify the morbidity, mortality, and economic loss they cause, however, because they are not reportable and the pertinent data available are often of questionable value.

Foremost among them are Chagas' disease, schistosomiasis, filariasis (including onchocerciasis), and leishmaniasis, which together have received special attention from PAHO's Governing Bodies in various resolutions in recent years.

Malaria and the other four parasitic diseases noted above can be grouped because they are vector-borne and occur predominantly in the tropics and so, together with leprosy, which is nonparasitic, are the subject of WHO's Special Program for Research and Training in Tropical Diseases.

Because relatively little is known about the epidemiology of these diseases as compared to the knowledge that exists about many other diseases, PAHO's major interest in this area is in increasing basic information about them as rapidly as possible as a basis for more effective control.

Chagas' Disease

For this disease, also known as American trypanosomiasis, reduviid bugs are the vectors and more than 150 species of animals, many living close to man, serve as reservoir hosts. Trypanosoma cruzi is believed to infect between 10 and 15 million people and to threaten millions more in South America and in Mexico, Central America, and Panama. Though seldom fatal, the infection can result in serious illness, permanent disability, and considerable economic loss.

During 1978 most countries affected by Chagas' disease showed some interest in developing programs to control it. Brazil and Venezuela, the two most affected, were also the most active in their control efforts.
In Brazil, where 4 million mostly asymptomatic people were thought to be infected, federal and state health authorities continued to collect blood samples on filter paper for immunofluorescence testing in strategically located laboratories. This was to improve their knowledge of the disease's epidemiology, map the distribution of vectors and their infectivity, and carry on limited housing improvement and household spraying projects to decrease vector density.

The Chagas' disease research center at Maracay, Venezuela, operated collaboratively by PAHO and that country's Government since 1976, began testing house construction materials for their vector and weather resistance and acceptability to occupants. This study, supported by a grant from the Edna McConnell Clark Foundation, was to continue for at least five years. In addition to its research, the center's staff also conferred with visitors from Brazil, Ecuador, Paraguay, and Peru about national control measures and sent consultants to Bolivia and Brazil.

Overall, noticeable progress was made during the year in characterizing T. cruzi strains, vector biology, and human pathology including cardiovascular involvement. On the minus side it must also be said that knowledge of the disease's epidemiology remained inadequate, development of suitable treatments continued to lag, and shortcomings in the use of available disease control methods persisted.

Schistosomiasis

In the Americas this disease results only from infections caused by Schistosoma mansoni flukes of which snails are intermediate hosts. It is endemic in more than half of Brazil's states and territories; parts of Caracas and Aragua, Carabobo, Guárico, and Miranda States in Venezuela; and the Commewijne, Saramacca, and Suriname Districts of Suriname. In the Caribbean area small foci also occur in the Dominican Republic, Guadeloupe, Martinique, Puerto Rico, St. Lucia, and St. Martin.

The countries in which the disease is endemic continued their control efforts in 1978 with one or all of the methods at hand—chemotherapy, environmental sanitation, and molluscaciding—with varying success.

Filariasis

Wuchereria bancrofti infections occur in limited coastal areas of Central and South America and particularly in the Caribbean area. The countries that had control programs continued them during 1978, though no new ones were established. A few reported marked success in controlling the periodic nocturnal filariasis caused by this organism through chemotherapy and abatement of Culex pipiens fatigans, the mosquito that is its primary vector.

Onchocerciasis, caused by Onchocerca volvulus, is an incapacitating and even blinding disease which attacks many people in Guatemala and Mexico and lesser numbers in Brazil, Colombia, and Venezuela. New foci were discovered during 1978 in the Amazon and Orinoco River basins of Brazil and Venezuela inhabited by Amerindians, and plans were laid for studying the disease's vectors and epidemiology in those areas.

Generally speaking, the study of these two filariases in the Americas is only in its infancy, and much needs to be done to determine their epidemiology and develop better drugs for use against them. Both diseases are among those covered by the WHO Special Program for Research and Training in Tropical Diseases, which is
likely to advance their control more rapidly than in the past.

Leishmaniasis

Several leishmaniases—visceral leishmaniasis or kala-azar, cutaneous leishmaniasis or chiclero's sore, uta, mucocutaneous leishmaniasis or espundia, and diffuse cutaneous leishmaniasis—exist in the Hemisphere and are caused by different species of the *Leishmania* genus of protozoa. All can cause destructive skin lesions that often result in facial disfiguration, and the visceral form is especially fatal in children.

In conjunction with the Gorgas Memorial Laboratory in Panama, PAHO began a program in 1978 to produce and distribute antigens and reagents to national laboratories and provide serodiagnosis and training in antigen production and laboratory procedures for health workers in affected countries.

Dengue

The introduction of dengue-1 into the Caribbean in 1977 produced the largest epidemic of the disease yet recorded in the Americas. In discussions of the XX Pan American Sanitary Conference in October 1978 it was estimated that 2.5 million cases had occurred in the Caribbean islands in 1977, causing losses totaling $75 million in medical care, vector control, research costs, and absences from work (but excluding diverted tourism).

In 1978 the Region’s dengue situation improved in that fewer cases were reported overall, but worsened in that the new serotype continued to spread and lodge in previously unaffected areas.

Cuba, which had almost a half-million cases of varying serotypes including dengue-1 in 1977, experienced almost no dengue-1 in 1978 though serotypes 2 and 3 continued to be present. Despite a large outbreak of dengue-2 and -3 in Puerto Rico in 1977,
the island experienced an even larger epidemic of dengue-1 in 1978. A very careful search for the dengue hemorrhagic fever and dengue shock syndrome seen in Southeast Asia was conducted in Puerto Rico, but no cases were detected. Several scattered cases of dengue occurred in Barbados, though Aedes aegypti infestation on that island is low. Other Caribbean countries or territories that reported more than a handful of dengue cases in 1978 were Haiti (545 through June), Trinidad and Tobago (373), and the U.S. Virgin Islands (237).

In Venezuela, which had not reported any dengue since 1967, the disease broke out in the east at the beginning of 1978 and by mid-year had spread along the entire coast. During the second half of the year it appeared in Colombia, where it was particularly serious in Barranquilla, Cartagena, and Santa Marta. Guyana and Suriname reported 51 and 60 cases, respectively, during the year, and the disease was believed to have entered French Guiana.

Dengue appeared in Central America for the first time in 40 years in 1978. The first cases occurred on the Caribbean coast of Honduras and especially in the port of San Pedro Sula, but the epidemic spread rapidly through the rest of that country, El Salvador, and Guatemala, until it reached the Pacific coast of Central America. Costa Rica and Nicaragua maintained adequate control in areas of limited infestation, but only Panama escaped the disease due to its successful vector eradication activities. By the end of the year the wave had engulfed Belize and the Mexican states bordering Guatemala and was threatening northern Mexico and the A. aegypti-infested portions of southern United States of America.

Dengue-1 was either confirmed or strongly suspected to exist in each of the affected Middle American countries, all of which had community attack rates of between 10 and 30 per cent. Despite systematic searching, no shock syndrome or hemorrhagic fever was detected, though between 6 and 9 per cent of the cases in the area had minor hemorrhagic abnormalities.

In addition to the consultation on control provided and the various research activities supported, PAHO organized the meeting of a working group on dengue in the Caribbean held at Montego Bay, Jamaica, in May. Fifty-seven representatives from 15 Caribbean countries and territories attended, along with scientists from PAHO Headquarters, WHO, and WHO's Regional Office for Southeast Asia. Papers presented at the meeting were to be published as PAHO Scientific Publication No. 375.

**Yellow Fever**

The highest number of cases of jungle yellow fever in 10 years — 216 — was reported in Bolivia, Brazil, Colombia, Ecuador, Peru, and Venezuela during 1978. No cases of urban yellow fever were recorded.

The outbreak in Colombia, which occurred in the Catatumbo River area along the Venezuelan border, was the most significant of those in the several countries because of its size (89 cases) and the danger it posed of taking root in A. aegypti-infested urban areas. Fortunately, opportune insecticiding around the epidemic area may have prevented the urban cycle of the disease from establishing itself.

Yellow fever immunization continued in risk areas, though as in earlier years vaccine demand exceeded supply. It became ever more apparent in 1978 that the opening of new areas in South America to colonization and geophysical exploration was rapidly increasing the number of people in need of systematic immunization.
**Aedes aegypti Eradication and Vector Control**

Because of the serious dengue situation and the increasing incidence of yellow fever, countries such as Brazil, Colombia, Honduras, Jamaica, and Mexico radically increased their efforts in 1978 to eradicate or control *Aedes aegypti*, the vector of both diseases. Countries with little or no infestation took lesser precautionary measures. Reliance was increasingly placed on ultralow volume (ULV) insecticiding from the air or on the ground because with scarce labor it is the quickest and most effective way of controlling adult mosquitoes as well as on use of temephos as a larvicide in drinking water.

PAHO staff helped plan operations, train personnel, and supply equipment to control dengue outbreaks in Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Trinidad and Tobago and took part in emergency control activities in infected areas adjacent to the jungle yellow fever area in Norte de Santander Department, Colombia.

Under an agreement with the Colombian Ministry of Health, studies of *A. aegypti* biology and control were started in conjunction with the Ministry's National Health Institute and Malaria Eradication Service. To strengthen dengue epidemiologic surveillance, a course on the serologic diagnosis of dengue was held for laboratory technicians from Central America and some of the South American countries at Colombia's National Health Institute. With the help of a short-term consultant, PAHO drafted an *A. aegypti* emergency control manual, which was to be distributed in 1979.

After studying the recommendations from the May meeting of the working group on dengue in the Caribbean, delegates to the XX Pan American Sanitary Conference approved a resolution in September reiterating PAHO's policy that *A. aegypti* must be eradicated rather than merely controlled and urging the countries to act accordingly. The resolution also asked the Director to prepare a regional plan for gradually eradicating *A. aegypti* and to increase PAHO's efforts toward that end.

At the end of the year the *A. aegypti* situation in the Americas was as follows:

- **Bahamas.** Having experienced a dengue epidemic in 1977, the country intensified its *A. aegypti* control program by starting monthly inspections and treatments in four areas.
- **Barbados.** The entire country was being covered in regular inspection and treatment cycles, and the index of infested houses varied from less than 1 per cent during the dry season to a little more than 1 per cent during the rainy season.
- **Belize.** Most of the country was infested.
- **Brazil.** Eradication efforts to eliminate the reinfestation discovered in Salvador in 1976 continued in the States of Bahia and Guanabara, though infestation in the latter remained heavy and affected densely populated districts. Surveillance at ports, airports, and other vulnerable areas increased.
- **Colombia.** Early in the year an epidemic of jungle yellow fever occurred in an enzootic area of Norte de Santander Department where no cases had been reported for 25 years, and in September dengue attacked the Caribbean coast and particularly the cities of Barranquilla, Cartagena, and Santa Marta. Though no disease resulted, a new reinfestation of *A. aegypti* was discovered in parts of the Cauca River valley including Cali, the country's second largest city. Consequently, Colombia went to great lengths to strengthen its *A. aegypti* control, relying chiefly on ULV malathion and focal temephos insecticiding.
- **Costa Rica.** The reinfestation discovered in 1977 in Puntarenas Province continued to be attacked systematically, and the mosquito was kept in check.
Figure 3. Status of the *Aedes aegypti* eradication campaign in the Americas, December 1978.

- **Countries which have completed *Aedes aegypti* eradication**: Including: Aruba, Bermuda, Bonaire, Cayman Islands
- **Areas in which *Aedes aegypti* is no longer found**: Including: Anguilla, Antigua and Barbuda, Bahamas, Barbados, Curacao, Dominica, Grenada, Grenadines, Guadeloupe, Martinique, Montserrat, St. Kitts-Nevis, St. Lucia, St. Vincent, Virgin Islands (UK), Virgin Islands (USA)
- **Areas reinfested (after completion of eradication)**: 
- **Areas still infested or not yet inspected**: 
- **Areas presumably not infested**: 

*Eradiation carried out according to the standards established by the Pan American Health Organization.*
Cuba. The 1977 dengue epidemic made generalized A. aegypti infestation apparent, and efforts to control the mosquito were improved. These included aerial and ground spraying with ULV malathion, temephos larviciding, and health education.

Dominican Republic. Because of limited resources, control activities were being carried out chiefly around Santo Domingo, the capital.

El Salvador. Control activities were under way in the several most heavily infested cities, including San Salvador.

French territories. Focal and perifocal treatments and ground ULV insecticiding were being carried out in French Guiana and the French part of St. Martin. No information was available about the situation in Guadeloupe and Martinique.

Grenada. A new control campaign consisting of ULV malathion applications and perifocal treatments was begun, but had to be interrupted because the limited resources were diverted to combating a malaria epidemic.

Guatemala. Emergency control measures were in effect along the Caribbean coast and particularly in Coatepeque and the dengue-affected Departments of Escuintla, Retalhuleu, and Suchitepéquez.

Guyana. Control activities continued to be limited to Georgetown, the capital, and seven towns between the Berbice and Courantyne Rivers in the east. A field test was made to determine the acceptability, efficacy, and feasibility of ground ULV insecticiding.

Haiti. No control efforts had been made since 1973.

Honduras. Vigorous control efforts were being carried out in most of the country.

Jamaica. Infestation continued, and the control program was impeded by labor problems. A pilot project requiring little manpower was being tested as an alternative to more labor-intensive methods and, if successful, was to be extended nationally.

Mexico. The most intensive control efforts were being carried out in the heavily infested southeastern states, where a major dengue outbreak was also in progress.

Netherlands Antilles. Curaçao's health authorities had still not decided whether to undertake A. aegypti control, while in the Dutch part of St. Martin it was necessary to halt control efforts because of administrative, financial, and operational problems.

Nicaragua. No new reinfestations were discovered, but an intensive sanitation and insecticiding program was under way in Managua to eliminate sporadic localized infestations.

Suriname. Though 18.6 per cent of surveyed houses were found to be infested, no decision has been taken to commence control measures. A pilot ground ULV insecticiding project was being carried out.

Trinidad and Tobago. A. aegypti control was intensified after yellow fever was discovered in local monkeys, and the entire country was being insecticided focally and perifocally in eight-week cycles.

United States of America. ULV insecticides were being applied in both Puerto Rico and the Virgin Islands, but the Government had taken no measures to combat A. aegypti in the southern part of the country since 1968.

Venezuela. Very limited operations, including periodic aerosol insecticiding, were being carried out in Caribbean ports and the western part of the country.

PAHO's interest in vector control extends well beyond A. aegypti. Other major responsibilities in this area are the vectors of malaria and Chagas' disease, as well as those of schistosomiasis, the filariases, leishmaniasis, and the arboviruses.

During the year support and coordination of basic research in vector biology continued by, among other things, the arrangement of a grant of almost $20,000 from the WHO Special Program for Research and Training in Tropical Diseases to finance a workshop on the taxonomy of South American simuliiids of medical importance. In the area of control it maintained its normal contact with WHO, various governmental laboratories, specific vector control programs, and insecticide and equipment companies in order to promote the flow of information about new and alternative control techniques. Several biologic and chemical vector control agents were tested against important vectors in tropical areas of the Region, and new insecticiding equipment was given trials. These tests enabled PAHO to make recommendations to the countries about their insecticide and equipment purchases.
Training was another important part of PAHO’s vector control activities. Two courses in Spanish and one in English were given in Venezuela on maintenance and use of control equipment; with the assistance of the WHO Special Program and the U.S. Department of Agriculture’s Laboratory on Insects Affecting Man, a course was held in Colombia on the identification and study of vector pathogens; a seminar on the safe use of insecticides was held in Central America; and a course was given at the National Health Institute of Colombia on the serologic diagnosis of dengue.

Mycoses

Fungal infections are a major part of human pathology in both the temperate and tropical areas of the Region, but since they are not reported, no information exists about their real prevalence.

Some mycoses such as the cutaneous ones are extremely common. Among the subcutaneous mycoses, chromoblastomycosis is of particular significance in Central America and sporotrichosis in Brazil and Mexico. The most serious mycoses are those that are deep or systemic, and they are generally contracted through inhalation of air-borne fungal spores. In this group, coccidioidomycosis is endemic in the Region’s dry and desert areas and histoplasmosis in most of the Americas, including the Caribbean countries, while paracoccidioidomycosis, an infection that occurs exclusively in Latin America, is found from Argentina to Mexico.

In 1976 the Twenty-ninth World Health Assembly reviewed the global mycosis situation and called attention to the importance of mycotic infections by recommending that PAHO cooperate with the countries in training, epidemiologic evaluation, and research activities.

PAHO then began increasing its mycosis activities. In 1978, to test a mycosis program with quantitative activity goals, it cooperated with Colombia in creating a demonstration project area in Magdalena Department. The first phase consisted of organizing and combining systemic mycosis diagnosis and treatment with tuberculosis activities as an integral part of the area’s general health services. Plans were made to extend the project to the superficial and subcutaneous mycoses during its second phase, in combination with leprosy activities. For the first time in Latin America, this project offers the opportunity to prepare and carry out all activities to control simultaneously three diseases—the mycoses, tuberculosis, and leprosy. In addition to technical help in designing the project, PAHO provided material and equipment for mycology laboratory activities and two consultants to advise on immunologic techniques for diagnosing mycotic infections at the National Health Institute in Bogotá.

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Cholera and Enteric Diseases

Cholera became a matter of concern to public health officials in the Americas for the first time in years during 1978. The
fitful westward march of the disease is thought to have originated in a 1958 resurgence in the Celebes Islands of Indonesia, whence it moved slowly across the southern part of Asia to the eastern Mediterranean and East Africa. Acute local outbreaks were reported in West Africa in 1977.

As a result of surveillance activities, *Vibrio cholerae* was isolated from sewage samples at the major port city of Santos, São Paulo State, Brazil, in April and May and from two sewage samples at Rio de Janeiro in October. With PAHO's aid, the samples were subjected to more careful analysis, and it was determined that all four isolates were *V. cholerae* O1 biotype El Tor (atyypical). All strains were weakly toxigenic or nontoxigenic and agglutinated strongly in Inaba antisera. Stepped-up case-finding in Brazil failed to detect any human infections.

A small indigenous outbreak of cholera occurred in August and September in two parishes in the State of Louisiana, U.S.A. The eight clinical and three subclinical or asymptomatic infections resulted from eating cholera-infected crabs taken from local waters. Prompt identification and later public health measures probably prevented the occurrence of additional cases.

During the year PAHO developed a laboratory kit to simplify the identification and characterization of cholera vibrios. It distributed the kits, with detailed guidelines for use, to the 14 countries that requested them to aid in monitoring cholera. As might be expected in view of the West African situation and the discovery of the vibrio in Brazil and the United States of America, PAHO relied heavily on constant surveillance with prompt contingency control measures to prevent cholera from establishing a foothold in the Region.

Because so little reliable information is available about the incidence of lesser infectious diarrheal diseases and the mortality associated with them, a PAHO Headquarters task force continued the analysis it had begun in 1977 of impediments to effective enteric disease control in the Region.

Realizing that diarrheal disease can only be reduced through long-term efforts requiring large amounts of money, the task force developed an intermediate control program based on oral rehydration, a therapy of recent origin which auxiliary health workers and mothers can undertake. When coupled with sound hygienic and nutritional advice, this treatment should reduce not only hospital admissions and deaths in all age-groups, but also, and perhaps more significantly, should result in a major decrease in infant diarrhea.

During the year PAHO consultants gave specialized oral rehydration training in hospitals in five countries, three of which then adopted the technique as a substitute for older intravenous treatment in their large pediatric hospitals. An international oral rehydration seminar with participants from six countries was held in Panama, and national seminars were held in the Dominican Republic and Honduras.

A consultant in pharmaceutical production was hired to survey the interest and ability of 11 countries to manufacture oral rehydration salts locally. On the basis of the findings, PAHO began helping some of the countries surveyed draw up requests to UNICEF and other agencies for funds to begin large-scale production of salts for domestic use and possible exportation.

Because considerable clinical and operations research was necessary to develop the oral rehydration program, PAHO awarded small study grants to three countries during the year. Three clinical investigation reports resulted from these grants and were to be published together with the findings from the operations research.
Leprosy

Leprosy control activities are expanding rapidly because of the Governments' increasing interest in the disease as a public health problem and the availability of extrabudgetary funds from the Japanese Shipbuilding Industry Foundation and other agencies belonging to the International Federation of Antileprosy Associations. These factors resulted in a substantial increase in national leprosy control projects and the incorporation of additional leprosy control activities into general health services in various parts of the Region in 1978.

The emphasis in PAHO's cooperation with the Governments is on early case detection, effective treatment to reduce sources of infection, and systematic inclusion in patient care of measures to prevent disability. Other forms of cooperation include advice on administrative measures such as integration or coordination of leprosy control activities with general health services.

PAHO encourages and supports training and research activities at several institutions in the Americas and elsewhere in the world. The Pan American Center for Research and Training in Leprosy and Tropical Diseases (CEPIALET) at Caracas, a Venezuelan institute which was associated with PAHO by a Directing Council resolution in 1976, is in the forefront of these activities. PAHO's regional leprosy adviser is based at the Center and, among other duties, coordinates its international activities.

The inclusion of leprosy in the WHO Special Program for Research and Training in Tropical Diseases has created a need for PAHO to help national institutions prepare proposals for institutional strengthening, training courses and fellowships, epidemiologic surveillance, and leprosy immunology and therapy studies.

The English-speaking Caribbean has a subregional leprosy control program which receives technical support from the regional leprosy adviser in Caracas and the Caribbean Epidemiology Center in Port-of-Spain, Trinidad. There were indications in 1978 that the Central American and Andean Pact countries might develop similar subregional programs.

An effort was initiated to combine leprosy and tuberculosis control activities in the English-speaking Caribbean countries, Colombia, the Dominican Republic, and Venezuela. If this approach proves successful, it will undoubtedly be adopted by other countries whose health policies and administrative structures make it feasible.

Sexually Transmitted Diseases

1978 was a significant year for PAHO's efforts to control sexually transmitted diseases (STDs): it moved from promoting control to helping the countries plan and carry out control programs.

The Organization supported planning meetings to establish or reinforce STD control programs in Colombia, Cuba, Ecuador, Jamaica, Panama, and Trinidad and Tobago. The Governments of these and other countries that are developing active programs gave increasing priority to diagnosing, preventing, and controlling syphilis and gonorrhea, and several countries also showed interest in epidemiologic studies of Chlamydia, Mycoplasma, and herpes virus infections to determine their real importance.

Some of the countries advised PAHO that their major efforts in STD control might be through maternal and child health and family planning programs, particularly those projects financed by the U.N. Fund for Population Activities.

In the area of training, PAHO organized its IX International Course on the Epidemiology and Control of Venereal Diseases
at Santiago, Chile, and assisted national training programs in Brazil and Guatemala.

Influenza

Influenza outbreaks due to Russian flu (A/USSR/77) were first detected in Córdoba, Argentina, in April and not long thereafter in Buenos Aires, Chile, and Rio de Janeiro, Brazil. Isolations of influenza virus in South America during the year revealed an antigenic drift toward a strain found in Brazil (A/Brazil/11/78), though the differences between this and the Russian strain were quite small. Late in the year the Brazilian strain was the one most commonly found in the United States of America. The PAHO-sponsored influenza surveillance system promptly and accurately detected this slight antigenic drift, thus once again demonstrating its sensitivity and efficiency.

Hepatitis and Rotavirus

In October, PAHO held a workshop at the Institute of Nutrition of Central America and Panama (INCAP) in Guatemala City to teach new procedures for identifying hepatitis, rotaviruses, and enteroviruses. Faculty from INCAP and the U.S. National Institutes of Health and Center for Disease Control instructed 19 students from 17 countries in the principles of enzyme immunoassay and the technical skills needed to perform tests for hepatitis B surface antigen, Escherichia coli enterotoxins, rotavirus antigen from stool extracts, and rotavirus antibodies. Procedures for isolating enteroviruses, with special emphasis on poliovirus and its identification through cell culture neutralization, were also taught.

Argentine hemorrhagic fever has gradually spread during the past quarter-century from its original endemic area of 18,000 km$^2$ to embrace 100,000 km$^2$ in Argentina's rich agricultural Provinces of Buenos Aires, Córdoba, and Santa Fe. During the same period the population at risk increased from 260,000 to 1.2 million, and every year between 300 and 3,000 epidemic cases were reported.

In 1978 the Government of Argentina created the National Institute for Studies of Viral Hemorrhagic Diseases at Pergamino, Buenos Aires Province, the center of the hemorrhagic fever area. At the end of the year the U.N. Development Program awarded Argentina a three-year, $488,000 grant to develop an attenuated live virus vaccine and conduct initial field trials with it against the disease. PAHO, which provided assistance in virology training and consultation in the design and construction of the new institute's facilities, was appointed the executive agency for the grant.

Plague

Plague is today a relatively unimportant disease in the Americas, but its potential for spreading to large urban areas from the sylvatic foci where it now exists is great. In recent years human cases have occurred in Bolivia, Brazil, Ecuador, Peru, and the United States of America.

As it had in earlier years, PAHO in 1978 continued helping the countries maintain and improve their surveillance activities and stood ready to provide epidemiologic consultation and supplies and equipment for laboratory diagnosis should outbreaks occur.
Meningococcal Meningitis

No major outbreaks of meningococcal meningitis were reported during the year in the Americas, in some parts of which the disease is endemic. A catastrophe was averted in Chile when, after 49 cases and 12 deaths had occurred in Santiago, public health officials began emergency mass immunization. With PAHO assistance in procuring a large amount of vaccine, supplying immunization equipment, and providing consultants, the national authorities immunized 196,349 high-risk children and adolescents in two days and 1,417,728 in less than a month.

Typhoid Fever

Typhoid fever is a major public health problem in the Americas because it is so endemic. Although it can be quickly and easily controlled once it breaks out, the number of cases appears to be increasing, as does resistance of recently identified strains to previously effective doses of antibiotics. During the year there were two significant outbreaks, one among tourists returning to the United States of America from Mexico (307 cases, 22 of which were laboratory-confirmed) and the other in a village of 800 inhabitants on Dominica (23 cases).

NONCOMMUNICABLE DISEASES

Diseases that are noncommunicable or chronic in nature are becoming ever more important in Latin America and the Caribbean area as the gradual control of communicable diseases results in longer life expectancies. The prevalence of noncommunicable diseases, which varies greatly from country to country, is undoubtedly increased in some places by the cultural stresses and environmental contamination that accompany rapid urbanization and industrialization.

That portion of PAHO’s disease control efforts devoted to noncommunicable diseases has grown steadily in recent years because of the interest shown in them by its Governing Bodies. The diseases receiving most attention have been cancer, arterial hypertension and rheumatic fever, chronic rheumatic diseases, and diabetes mellitus.

Cancer

Effective cervical cancer control programs and cancer registries have become the principal focus of national cancer projects in which PAHO collaborates. PAHO continued offering the Governments information about cancer, as provided for in previous recommendations of the PAHO and WHO Governing Bodies.

In the Latin American Cancer Research Information Project, which is based in a terminal at Headquarters connected with the computerized CANCERLINE data bank at the U.S. National Library of Medicine, 1,046 individual requests for information from oncologists throughout the Region were answered in 1978. The Regional Library of Medicine and the Health Sciences at Sao Paulo sent updated monthly information about 15 cancer topics to 2,500 users in the Americas. Both of these services were provided in collaboration with the U.S. National Cancer Institute.

The Collaborative Cancer Treatment Research Program, begun in 1977 with nine centers in Latin America and six in the United States of America, grew by two more during 1978. The countries participating in the program are Argentina, Brazil,
Chile, Colombia, Peru, the United States of America, and Uruguay. By December, a total of 25 protocols for chemotherapy of patients with breast cancer, head and neck tumors, leukemia and lymphoma, gastrointestinal cancer, malignant melanoma cervical carcinoma, and osteogenic sarcoma were being carried out at the participating centers. The program comprises technical advice, provision of drugs, training, and other cooperative activities.

During the year the Spanish and Portuguese editions of the *International Classification of Diseases for Oncology*, which PAHO had prepared, were distributed. In addition, the International Union Against Cancer published the second edition of its *Directory of Oncologic Institutions*, which includes 62 Latin American and Caribbean cancer centers identified by PAHO.

**Other Noncommunicable Diseases**

Cardiovascular disease (especially hypertension, rheumatic heart disease, and coronary heart disease), diabetes mellitus, and chronic rheumatic diseases are being given high priority by the Governments. At its 80th meeting in June, PAHO’s Executive Committee approved a resolution calling the countries’ attention to the growing importance of arterial hypertension. The PAHO working group on hypertension control, which is composed of representatives from Argentina, Bolivia, Brazil, Chile, Colombia, Cuba, Ecuador, Mexico, Peru, and Venezuela, met at Washington, D.C., to discuss the results of the first two years of collaborative hypertension studies and to plan future activities.

Representatives of the countries taking part in PAHO’s program to prevent rheumatic fever and rheumatic heart disease (Argentina, Bolivia, Brazil, Chile, Ecuador, Peru, and Venezuela) met at Quito in November to discuss a draft of the operational standards for community prevention and control activities which PAHO was to propose to the countries in 1979.

A third project was started in 1978 on the disability caused by chronic rheumatic diseases and the burden they place on health services, in which Argentina, Brazil, Chile, Mexico, and Uruguay were participating.

**Zoonoses and Animal Health**

To the one-third of a billion people living in Latin America and the Caribbean, the zoonoses and animal health are matters of crucial concern. This is so of the zoonoses—animal diseases that can be transmitted to man—because more than half of the area’s population is rural and lives in close contact with domestic animals and often not far from wild ones. Of animal health it is true because the area depends heavily on livestock raising both to feed itself and to earn foreign exchange through meat and other animal product exports.

PAHO has long recognized these concerns and for many years has worked to control the zoonoses and improve animal health.
health through its Headquarters and field staffs and two specialized research, training, and consultation institutions, the Pan American Foot-and-Mouth Disease Center (PANAFTOSA) at Rio de Janeiro, Brazil, and the Pan American Zoonoses Center (CEPANZO) at Ramos Mejía, Argentina. In doing so it maintains ongoing close contact with WHO and the Food and Agriculture Organization (FAO), specialized bodies such as the Regional International Organization for Plant and Animal Health (OIRSA) and the South American Foot-and-Mouth Disease Control Commission (COSALFA), national health and agriculture ministries, and individual programs and laboratories throughout the Region.

Illustrative of the many national zoonosis control and animal health programs PAHO supported in one way or another during 1978 are those in Brazil, Central America, and Ecuador.

Toward the beginning of the year, São Paulo started the Region's first systematic program to control zoonoses in a major metropolitan area. Like many Latin American cities, it had suffered human and canine rabies and from disease vectors such as flies, mosquitoes, and rodents, all of which became subject to intensified control and surveillance under the new program. With assistance from CEPANZO, São Paulo's program made such great progress by the end of the year that health authorities in other Brazilian cities contemplated setting up similar programs.

Elsewhere in Brazil, work went forward rapidly on building new facilities for the National Institute of Animal Health. Architectural plans which PAHO advisers reviewed and commented on were completed, infrastructural works such as access roads and water and sewage mains were finished, and construction was begun on buildings to house the institute. The entire center was to be inaugurated in 1979.

In Central America, professional and auxiliary workers for Costa Rica's new animal health program were recruited and trained; Honduras built a new central office, maintenance shop, and seven diagnostic laboratories for its program; and El Salvador, Nicaragua, and Panama completed requirements for signing loan agreements for animal health projects with the IDB. The project to educate the public about animal health, in which all the Central American countries and Panama were participating, completed 80 per cent of its activities during the year.

Ecuador, with assistance from PANAFTOSA, concluded an epidemiologic study, formulated an animal health information system, and defined a new strategy for controlling animal diseases within the country.

Foot-and-Mouth Disease and the Pan American Foot-and-Mouth Disease Center

Foot-and-mouth disease (FMD) severely damages livestock raising by markedly reducing the production of meat and milk, a major source of food and foreign exchange for the Region's countries. While it occurs only in South America, it threatens the other countries because their animals are susceptible to the disease. In the United States of America, for example, the value of livestock now free of FMD is estimated at more than $20 billion, and were the disease to enter that country the cost of vaccination—which would not eradicate FMD but merely slow its spread—would exceed $100 million.

PANAFTOSA, which is operated in cooperation with the Government of Brazil, is PAHO's principal instrument for carrying out FMD research and promoting, coordinating, and supporting national control
The Pan American Foot-and-Mouth Disease Center carries out epidemiologic surveillance activities of vesicular diseases in animals in the Americas. (Photo: PAHO/PANAFTOSA)

programs. Founded in 1951 and fully integrated with the programs of PAHO and WHO since 1968, it is supported by quotas collected from Member Governments of PAHO in accordance with the resolutions of its Governing Bodies.

The Center’s chief interest is in FMD owing to the wide prevalence of that disease in South America, but it has for some time also been responsible for PAHO’s efforts to control vesicular stomatitis, a disease which may affect the same livestock as FMD. On occasion it is assigned responsibility for still other animal diseases, as it was in 1978 when African swine fever entered the Americas.

The Center carries out three main activities—technical services, training and information, and research (which is discussed in Chapter VIII).

In the realm of technical services, PANAF-TOSA staff and consultants permanently stationed in various countries provide technical advice on planning, organizing, executing, and evaluating national programs and maintain liaison among international organizations, the Center, and national animal health authorities. The locations of the Center’s permanent field consultants and the countries and other political units they cover are: Panama City (Mexico, Central America, and Panama), Bogotá (Colombia, Venezuela, and the Netherlands Antilles), Quito (Ecuador and Peru), Santiago (Chile), Asunción (Paraguay), and Buenos Aires (Argentina and Uruguay). The Center provides assistance to Bolivia and Brazil directly, and when other countries request advice sends out temporary consultants, as it did to Cuba, the Dominican Republic, Guyana, and Jamaica during 1978.

In the area of training and information, the Center sponsored four international
seminars, at Rio de Janeiro, Buenos Aires, Panama City, and Kingston; collaborated in national seminars and courses in Argentina, Bolivia, Brazil, Cuba, Guatemala, Mexico, Peru, and Uruguay; and provided 20 fellowships to candidates from eight countries during the year. Generally speaking, its training program was smaller than in previous years because a training agreement with Brazil had ended in November 1977. In collaboration with COSALFA, whose ex officio secretariat it is, PANAF-TOSA continued to promote and advise on the development of national FMD and vesicular stomatitis information systems.

Among its activities other than technical services, training and information, and research, the Center devoted a great deal of time in 1978 to the Region's new African swine fever problem. This disease appeared in March in the municipality of Paracambi, Guanabara State, Brazil, and outbreaks of it later occurred in the Dominican Republic and Haiti. Center staff consulted with officials in those countries on programs to control the disease within their own borders and advised animal health authorities in countries free of African swine fever on ways to prevent its importation. At mid-year publication began of its African Swine Fever Newsletter for distribution throughout the Region.

The Center also continued several long-standing activities. Among them were staff participation in COSALFA's fifth ordinary meeting at Rio de Janeiro, the sixth meeting of OIRSA at Panama City, and 19 other international meetings on FMD and related animal diseases; production and distribution of vaccines for emergency use and demonstration projects, reference strains and reagents, and laboratory animals; and publication of its biweekly Epidemiologic Report and quarterly Bulletin as well as training manuals, monographs, and bibliographies.

The Region's FMD situation during 1978 was as follows:

**Nonendemic areas.** Canada, the United States of America, Mexico, Central America and Panama, the Caribbean, Suriname and French Guiana remained free of the disease, while in Guyana an October outbreak caused by type O virus was quickly controlled. The countries near South America remained in danger of the disease, however, because of their proximity to the endemic area and the fact that in several of them few measures to prevent the introduction of FMD were being taken.

The Center tested 487 vesicular samples from Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama for stomatitis. Two hundred six specimens were negative, but New Jersey virus was found in 242, Indiana virus in 25, and both types of virus in 14. Center staff visited the interior of Panama (especially the Darien area), the Central American countries, Mexico, and the Caribbean to promote and advise on national activities to prevent FMD and other animal diseases from entering those countries.

As has already been noted, FMD is confined to South America, which now contributes about 40 per cent of the world's export meat supply. Annual FMD losses amount to $500 million, mostly due to restrictions on diseased meat and other animal products imposed by importing countries to protect their own livestock industries. All the affected South American countries have active FMD control programs and together produce 600 million doses of FMD vaccine annually. Those programs began in Venezuela in 1956, Argentina in 1961, Paraguay and Uruguay in 1968, Brazil and Chile in 1970, Colombia in 1972, Ecuador and Peru in 1975, and Bolivia in 1976. Their result has been the disappearance of the disease in Chile and quite significant reductions in its incidence in Paraguay, Peru, and Uruguay, while elsewhere on the continent it is still quite prevalent.

**Argentina.** A dramatic improvement in the quality of Argentina's FMD vaccines and more intensive control measures during the year were accompanied by a lessening in the disease's incidence. Through November, only 830 (0.25 per cent) of the 335,000 cattle registered in the program were found to be infected. In February the National Animal Health Service ordered the regular cleaning and disinfection of livestock-hauling vehicles, and in May it increased its
inspection staff, established six inspection posts at strategic crossroads, and began requiring that cattle at risk be suitably immunized with the improved vaccine. The National Laboratory Service and National Animal Husbandry Institute, with PANAFTOSA advice, undertook studies of oil-adjuvant FMD vaccines.

**Bolivia.** Through agreements with PAHO and the Inter-American Development Bank, the National FMD, Rabies, and Brucellosis Control Service increased its organizational capabilities by retaining consultants in administration, epidemiology, information services, laboratory work, and statistics. Arrangements were concluded to buy 32 vehicles for field use; build and equip a central laboratory at Cochabamba, an administrative office at Santa Cruz, veterinary centers at Epizana, Okinawa, Punata, San Ignacio, and San Matías, and animal quarantine stations at Puerto Suárez and Yacuiba; and purchase 1 million doses of FMD vaccine a year. Meanwhile, the Government vaccinated 30,000 cattle in the Cochabamba area and 70,000 around Santa Cruz.

**Brazil.** The appearance of African swine fever in the State of Guanabara and its later spread to many of the other states generally upset the FMD control program's activities. Still, there was less disease than in previous years except in a few areas. Brazilian private industry expressed interest in manufacturing oil-adjuvant FMD vaccine with advice from the Center.

**Chile.** The FMD situation remained excellent inasmuch as only sporadic episodes of disease occurred in imported meat cattle. The area of these minor incidents was a handful of slaughterhouses at Antofagasta, Arica, and Iquique in the extreme northern, desert part of the country.

**Colombia.** The number of FMD-affected ranches increased in comparison with 1977, especially in the Departments of Antioquia, Caldas, Córdoba, Cundinamarca, Magdalena, Meta, Norte de Santander, and Santander. Examination of 268 vesicular samples at PANAFTOSA between January and August showed that 72 were negative, while 84 contained type A FMD virus; 69, type O FMD virus; 32, New Jersey vesicular stomatitis virus; and 11, Indiana vesicular stomatitis virus. The new building of the National Laboratory for Control of Veterinary Drugs and Biologicals was inaugurated in August, and between January and October the Colombian Veterinary Products Company produced 22 million doses of O-A bivalent FMD vaccine.

**Ecuador.** The National Animal Health Program continued to develop its technical and administrative infrastructure both centrally and peripherally and, in general, to carry out its control activities as planned.

**Paraguay.** Eight of the country's 18 departments—Alto Paraná, Boquerón, Caaguazú, Cacapá, Chaco, Misiones, Nueva Asunción, and Paraguái—remained free of FMD, while the other 10 were compromised to a generally slight degree. A total of 866 cattle and 45 hogs on 18 ranches were found to be infected through October. In January the Congress approved legislation to convert the National FMD Control Service into the National Animal Health Service with broadened responsibility for brucellosis, rabies, and tuberculosis as well as FMD control. The new agency was reorganized and its budget increased to enable it to fulfill its added duties.

**Peru.** Seven diagnoses of FMD virus A and five of Indiana vesicular stomatitis virus were made in samples from 28 ranches near Lima and in the north-central part of the country.

**Uruguay.** Only small, sporadic foci were found during the year.

**Venezuela.** The situation was better than in 1977. During the first nine months of the year, type O FMD virus was identified 28 times, type A FMD virus 13 times, and New Jersey vesicular stomatitis virus 11 times. Vesicular samples from 30 ranches were negative.

### Zoonoses and the Pan American Zoonoses Center

The most serious zoonoses in the Americas are anthrax, brucellosis, equine encephalitis, hydatidosis, leptospirosis, rabies, and tuberculosis. Together they result in a considerable amount of human disease and cause great damage to the Region's livestock industry.

PAHO's principal component for combating the zoonoses is the Pan American Zoonoses Center (CEPANZO). It is run in cooperation with the Government of Argentina and, like PANAFTOSA, provides services to PAHO Member Governments in three basic areas—technical services, training and information, and research (which is dealt with in Chapter VIII).
CEPANZO continued to provide advice during 1978 to national animal health authorities on preventing and controlling or eradicating the major zoonoses and also consulted on ways to prevent hospital infections and improve food protection. One of its specific activities in this area was to act as a catalyst in intercountry agreements to coordinate border control of trade in animals, foodstuffs of animal origin, and biologicals.

In the area of training and information services, CEPANZO offered a wide range of workshops, seminars, and courses. The longest was its eighth animal health planning course, which had 10 students and lasted seven months. The number of students in the course was smaller than in previous years because experience had shown that too many students lessened the individual attention each needed from the faculty.

Other courses during 1978 included: production and control of rabies vaccine, which had six participants and lasted two months; food hygiene for veterinarians, with 25 participants and lasting two weeks; parasitology, which had six participants and lasted two months; brucellosis, with three participants and lasting two months; methods of diagnosing tuberculosis and producing tuberculin, which had seven participants and lasted two months; and two pathology workshops, each with 10 participants and lasting two days. CEPANZO's professional staff also acted as instructors in 31 zoonoses courses in the following countries: Argentina (19 courses), Belgium (1), Brazil (4), Chile (1), Egypt (1), Guatemala (1), and Mexico (4).

To promote the exchange of information, CEPANZO continued to publish its quarterly journal *Zoonosis*, monthly epidemiologic surveillance newsletters dealing with rabies and equine encephalitis in the Americas, and several monographs and technical notes.

The situation with respect to the various zoonoses in the Region during the year was as follows:

**Anthrax**

The only significant outbreak of this disease occurred in the Cayes coastal area of southern Haiti, which has customarily seen much anthrax because only half of the 65,000 cattle there have been vaccinated against it since 1969. Although no information was available about the prevalence of the disease in the area’s animals, *Bacillus anthracis* was isolated from humans, cattle, and goat skins. During the year 315 human cases of anthrax were reported.

**Brucellosis**

This disease continues to be one of the Region’s most prevalent zoonoses, and few of the countries have managed to control it. In some countries, up to a quarter of the cattle in dairy herds are infected. It should be noted that goat brucellosis is the principal source of infection where human brucellosis rates are highest (Argentina, Mexico, Peru, and to a lesser extent Chile). According to reports from veterinarians, hog brucellosis is probably more prevalent than bovine brucellosis in Argentina, and the same may be true in a few other countries.

Most diagnoses of bovine brucellosis in the Americas are made with the rapid plate agglutination test, a simple and inexpensive procedure that allows quick examination of large numbers of specimens. The test is an effective weapon in bovine brucellosis control campaigns provided it is used by trained workers employing standard antigens. Countries using it rely on CEPANZO’s reference antigen to prepare their own antigens and ask the Center to test the
Preparation of liquid medium for cultivation of mycobacteria at the laboratories of the Pan American Zoonoses Center. (Photo: PAHO/CEPANZO)

quality of the reagents they produce locally or buy abroad.

During the year CEPANZO cooperated with several Buenos Aires hospitals, the University of Bahía Blanca, and the National Atomic Energy Center in Argentina to develop new methods for diagnosing human and animal brucellosis. It also helped the country design a feasibility study for a pilot goat brucellosis eradication project in the Province of San Luis.

Bovine brucellosis control was carried out in 11 Brazilian states, but its impact seemed slight except in Rio Grande do Sul and São Paulo. In Colombia, where tests showed that brucellosis infected 3.9 per cent of the country’s cattle, the combined bovine brucellosis and FMD control program continued energetically with funds from an IDB loan. The program’s antigens and vaccines were manufactured by the Colombian Veterinary Products Company, checked for efficacy by CEPANZO, and tested for quality by the Colombian Animal Husbandry Institute.
CEPANZO also cooperated with the Dominican Republic and Mexico in evaluating the production of biologicals for brucellosis diagnosis and control, and with Chile in defining different strategies for controlling bovine brucellosis in high- and low-prevalence areas.

Equine Encephalitis

Venezuelan encephalitis is a widespread zoonosis in some Latin American countries, where it may decimate horse herds and cause alarming epidemics in humans. Previously confined to the northern South American countries, the disease began to spread epidemically through Central and North America in 1971, though no cases have been seen in the latter area since 1972. Several Central and South American countries have programs to vaccinate horses against the disease, including Colombia, where three-quarters of the 1.2 million horses in the country's lowlands were immunized during 1978.

At the beginning of the year an outbreak of eastern equine encephalitis occurred in the Dominican Republic in the northern Provinces of Duarte, María Trinidad Sánchez, and Samaná. Of the three provinces' 15,860 horses, 84 died and 50 were slaughtered. Through its Emergency Revolving Fund, PAHO provided bivalent vaccines against eastern and western equine encephalitis for mass immunization of the susceptible animal population. Within four weeks of the start of the project, 10,270 horses (64.8 per cent of the total number) had been vaccinated, and mortality had declined sharply.

Hydatidosis

Of the four recognized Echinococcus species, the widest spread, *E. granulosus*, continues to be of global importance. Although the four species—*E. granulosus*, *E. multilocularis*, *E. oligarthrus*, and *E. vogeli*—are found in the Americas, the first is the most important from the viewpoint of public health and animal production, especially in sheep-raising areas. The dog-sheep cycle of *E. granulosus* predominates in the endemic countries of Argentina, Brazil (Rio Grande do Sul), Chile, Peru (the Central Sierra), and Uruguay, where the irresponsible practice of feeding dogs raw sheep viscera maintains it. Another *E. granulosus* strain may predominate in Ecuador and Guatemala, where there appears to be a dog-hog rather than a dog-sheep cycle.

*E. oligarthrus* has been reported in Central America and the northern part of South America, and *E. vogeli* in Ecuador. *E. multilocularis* is the cause of alveolar hydatidosis in the arctic region of North America.

With direct support from CEPANZO, Argentina, Peru, and Uruguay continued to develop their pilot hydatidosis control programs and Brazil initiated a pilot control project in Rio Grande do Sul State. Another of CEPANZO's activities during the year was to promote the establishment of central national laboratories responsible for producing and standardizing reagents for hospital laboratories. To achieve this goal, CEPANZO provided instruction to laboratory technicians from the following institutions: the Department of Rural Zoonoses, Azul, Buenos Aires Province; National Parasitology Center, Faculty of Medicine, National University of Northeastern Argentina; department of pharmacology and public health, provincial social welfare ministry, San Luis Province, Argentina; Carlos A. Malbrán National Institute of Microbiology, Buenos Aires; Central Public Health Laboratory, Pórtio Alegre, Brazil; Bacteriologic Institute of Chile; and the Daniel A. Carrión Institute of Tropical Medicine, San Marcos University, Lima, Peru.
Leptospirosis

Of the 18 leptospirosis serologic groups so far described, 15 have been reported in Latin America and the Caribbean and, though available data do not reflect it, the disease is undoubtedly widespread. Little is being done to control it, largely because of inadequate laboratory diagnostic services. The Hemisphere’s most promising leptospirosis control effort in 1978 was in São Paulo, where massive rodenticiding against rats known to be infected was carried out in the new metropolitan zoonosis control program.

Rabies

Canine rabies is an important public health problem throughout the Region. Except in Canada and the United States of America, where sylvatic rabies is a threat to human health, dogs are both the principal carrier and transmitter of rabies virus. The seriousness of the rabies problem is reflected in the need to provide antirabies treatment to the thousands of persons attacked by rabid animals or homeless street dogs, and in Latin America this is exacerbated by the enormous mortality in cattle caused by vampire bat-transmitted rabies.

When they are carried out systematically, dog vaccination programs reduce the number of urban human rabies cases, but the disease nonetheless remains widespread in some countries because vaccination campaigns are limited in scope and sporadic in nature. CEPANZO collaborates with the countries in monitoring the potency of rabies vaccines, and in 1978 it advised Argentina, El Salvador, Guatemala, Trinidad and Tobago, Uruguay, and Venezuela on various aspects of their control programs.

Brazil’s National Rabies Control Commission continued its active campaign against canine rabies with PAHO consultation. During the first six months of 1978 rabies was clinically diagnosed in 387 cattle and 2,756 horses, and 300,000 cattle were vaccinated in focal areas in eight states. In the first quarter of the year, 4.2 million dogs were vaccinated, and during the last nine months a rabies epidemiologic surveillance system was established throughout the country. Rabies control was particularly effective in São Paulo because of the new metropolitan zoonosis control program.

In Central America, Honduras and Nicaragua finished formulating urban rabies control projects to present to the U.N. Development Program for financial assistance. Costa Rica and Panama succeeded in controlling urban rabies, though bat-transmitted cattle rabies continued to occur epizootically.

In Colombia 10 human rabies cases occurred during the first nine months of the year in the Departments of Atlántico, Boyacá, Córdoba, Cundinamarca, Magdalena, and Santander; the patients had all been bitten by dogs, and none had been previously vaccinated. Isolated cases of bovine rabies without epidemics occurred in the Guajira, Cundinamarca, Magdalena, Nariño, Sucre, and Urabá districts. The country produced 364,000 doses of suckling mouse-brain vaccine for human use and 1,460,000 doses of the same vaccine for canine use, some of which it exported to several countries.

Haiti continued its rabies vaccination campaign. Although 37,000 dogs were immunized during the year, coverage remained inadequate since 40 percent of the dog population is renewed every year.

Tuberculosis

Bovine tuberculosis is widespread in
Latin America, with the highest incidence occurring in South American dairy cattle. Several countries continued their eradication efforts based on tuberculin testing and the slaughter of reactive animals.

In Brazil, tuberculin-tested animals on 36 of 400 ranches were found to be positive for tuberculosis. Herd infection rates ranged from 0.20 to 5.11 per cent in the 16,000 animals tested. Six of 233 animals tuberculin-tested in Colombia's Boyacá Department and one in eight tested in Antioquia Department were found to be positive.

SERVICES RELATED TO DISEASE CONTROL

Epidemiologic Surveillance and the Caribbean Epidemiology Center

Among the diseases subject to international regulation or surveillance, yellow fever showed an increase in its usual activity in 1978 which resulted in heightened surveillance and control measures. The recognition of nine patients with *Vibrio cholerae* in the State of Louisiana, U.S.A., and the isolation of non-toxin producing *V. cholerae* from sewage in Brazil caused the watch on that disease to be intensified. Poliomyelitis was the subject of a September regional workshop in Mexico City, at which its endemicity and epidemicity in the Hemisphere's tropical countries was stressed, in order to update information about the disease's control and surveillance.

Special attention was paid during the year to carrying out the epidemiologic surveillance component of the Expanded Program on Immunization (EPI). Various technical materials were prepared and disseminated at the First Regional Course on Planning, Administration, and Evaluation of the EPI at San José, Costa Rica.

The VII Regional Course on Epidemiologic Surveillance and Communicable Diseases was held at Caracas under the sponsorship of PAHO and the Venezuelan Ministry of Health and Social Welfare and the School of Public Health. Fifteen fellowship holders from Latin America attended the five-month session.

Awareness increased during 1978 that there would have to be closer liaison between national epidemiologic surveillance systems and programs to extend health service coverage if the latter are to succeed. Taking part in this rationalization process are PAHO epidemiologists in Argentina, Brazil, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Panama, and Peru, as well as PAHO's Caribbean Epidemiology Center (CAREC) in Port-of-Spain, Trinidad.

CAREC was established on 1 January 1975 after having been operated by the Rockefeller Foundation and the University of the West Indies as the Trinidad Regional Virus Laboratory. The countries and territories that sponsor and contribute to CAREC's budget are Antigua, Barbados, Belize, Cayman Islands, Dominica, Grenada, Guyana, Jamaica, Montserrat, St. Kitts-Nevis-Anguilla, St. Lucia, St. Vincent, Suriname, Trinidad and Tobago, Turks and Caicos Islands, the United Kingdom through its Overseas Development Ministry, and the Virgin Islands (UK).

During 1978, a time in which CAREC consolidated its activities after the rapid growth of its first three years, three events
occurred that are likely to change its scope of activities and financing. First, France and the Netherlands Antilles applied for full membership. Second, CAREC developed still closer relations with the Spanish-speaking Caribbean. Preliminary arrangements are now under way to develop an extrabudgetary project to strengthen epidemiologic surveillance in Central America in coordination with CAREC. And third, a grant from the U.S. Center for Disease Control (CDC) through the Caribbean Community (CARICOM) Secretariat ended, and application was to be made to the U.S. Agency for International Development for a replacement grant with which to conduct further surveillance and epidemiology training activities in the Caribbean.

CAREC continued one of its main tasks—fostering the development of national surveillance units—and by the end of 1978 had noted considerable progress in the ability of several to carry on independently. There was also general improvement in the reporting of communicable disease cases to CAREC itself. The circulation of the monthly CAREC Surveillance Report stood at 2,300 copies at the year’s close.

The year was a busy one for CAREC in disease surveillance and investigation. Among the many field activities conducted were an assessment of typhoid fever risk in Belize following Hurricane Greta; typhoid fever investigations in Dominica and Jamaica; a rabies survey and an investigation of 58 cases of *Plasmodium malariae* in Grenada; serologic surveys for encephalitis and entomologic studies of anopheline mosquitoes and the Kabowra fly in Guyana; a typhoid fever investigation in Jamaica; studies of leptospirosis and suspected whooping cough in St. Vincent; and a poliomyelitis serologic survey, an examination of the risk factors in myocardial ischemia, and surveillance of dengue, filariasis, gastroenteritis, hepatitis, intestinal parasites, and leptospirosis in Trinidad and Tobago.

An outbreak of paralytic poliomyelitis in the Dominican Republic and widespread measles epidemics and the persistence of diphtheria, whooping cough, and tetanus showed the need to strengthen the Caribbean’s immunization programs.

Five hundred forty-three persons attended courses or workshops sponsored by CAREC at the center or elsewhere. To meet the demand in the Caribbean for deputy epidemiologists (usually public health nurses and inspectors), CAREC offered its annual five-week training course in the early fall; nine students attended—three were from Trinidad and Tobago, two each from Dominica and Jamaica, and one each from Guyana and Montserrat. Among the many other courses and workshops which CAREC sponsored or in which it collaborated were workshops for public health nurses and inspectors in the Bahamas, Barbados, Dominica, and Montserrat; two laboratory courses on hematology and anaerobic bacteriology; and leprosy control and gastroenteritis workshops.

### Laboratory Services

The increasing reliance the countries are placing on primary care to extend their health service coverage has awakened new interest in improving health laboratory services. Progress has naturally varied from country to country.

In one of the year’s most significant activities in this field, PAHO and the Netherlands helped establish a Caribbean network of immunology laboratories in Cuba, Jamaica, and Suriname which was later to be extended to Trinidad and Tobago. These laboratories will provide diagnostic services
for and training opportunities in communicable and noncommunicable diseases and conduct research in Caribbean pathology.

Lack of financing has been an impediment to expanding adequate national laboratory services. To help overcome this problem, PAHO helped Chile, Cuba, and Mexico obtain foreign funds for their laboratory networks and aided Peru and several Caribbean countries to draw up proposals for securing such funds during 1978.

Providing the technicians who work in them adequate training is obviously crucial if the Region’s health laboratories are to be effective.

In cooperation with CDC, PAHO organized and financed a Caribbean course on hematology attended by 16 participants from the Bahamas, Barbados, Cuba, Dominica, Grenada, Guyana, Jamaica, St. Kitts, St. Lucia, Suriname, and Trinidad and Tobago. With CDC and the U.S. National Institutes of Health, it presented a course in Guatemala City on ELISA techniques and enterovirus isolation and identification attended by 21 participants from Argentina, Bolivia, Brazil, Chile, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guatemala, Jamaica, Mexico, Panama, Peru, Trinidad and Tobago, Uruguay, and Venezuela. Other courses that PAHO organized in conjunction with WHO were one on mycology at the University of the West Indies, Kingston, for 11 participants from Barbados, Dominica, Guyana, Jamaica, Suriname, and Trinidad and Tobago, and another at the Adolfo Lutz Institute, São Paulo, on the laboratory diagnosis of sexually transmitted diseases for 14 participants from 11 Brazilian states in which laboratory and epidemiologic workers were taught together for the first time in the Region.

To improve the efficiency and effectiveness of the services provided by national laboratory networks, PAHO continued evaluating syphilis serology methods, hepatitis B diagnosis, and enterovirus and Streptococcus pyogenes identification.

Among the research activities applicable to health programs, it cooperated in a regional study to determine the prevalence of Diplococcus pneumoniae antigens in order to include the most commonly occurring pneumococci in a polyvalent vaccine.

Quality Control of Drugs

During the year PAHO staff prepared a comprehensive report on “The Impact of Drugs on Health Costs: National and International Problems” as background information for the technical discussions on this subject at the XX Pan American Sanitary Conference. The participants in the discussions stressed the need for the Governments to develop realistic policies to provide their peoples enough effective, reasonably priced drugs and to ensure that they are used properly.

In response to a Conference resolution, representatives of the Latin American pharmaceutical industry were invited to meet with PAHO to discuss better liaison with the Region’s public health authorities and particularly those responsible for expanding health care coverage and primary health care.

The drug manufacturing and quality control practices WHO recommends were promoted at a PAHO seminar at Guatemala City for drug regulatory officials from Central America and Panama. Later in the year the U.S. Food and Drug Administration and PAHO approved the agenda and funding for a jointly sponsored 1979 regional drug control workshop at Washington, D.C., which will stress drug information and registration criteria.
PAHO helped Guatemala develop a drug control program as part of its Unified Food Control Laboratory. It evaluated the drug quality control programs in Costa Rica, El Salvador, and Paraguay and presented recommendations for strengthening regulatory activities to the respective Governments. It assisted Guyana in starting the second edition of its national formulary.

During the year Jamaica all but finished building the Caribbean Regional Drug Testing Laboratory (CRDTL), a joint venture of CARICOM, the Caribbean Governments, PAHO, and the Canadian International Development Agency (CIDA). When CRDTL begins operations it will be able to undertake microbiologic and pharmacologic analyses of pharmaceutical products in the Caribbean.

The Drug Quality Institute at São Paulo continued to give courses for drug analysts and inspectors in Brazil and, with the cooperation of specialized laboratories abroad, advanced training in developing pharmaceutical reference standards. The Institute also collaborated in reorganizing Brazil's drug control laboratory at the Oswaldo Cruz Institute in Rio de Janeiro and provided technical advice on the construction of modern drug analysis facilities there.

Production and Control of Biologicals

PAHO's biologicals procurement program continued to meet the Region's needs for these vital products during 1978. It was able to fulfill almost all requests for cholera and yellow fever vaccines, although to satisfy urgent requests for the latter from Trinidad and Tobago it had to purchase supplies outside the Region.

Except for Canada and the United States
of America, the Hemisphere's countries continued to depend on imports to meet their vaccine needs; at the same time, they made slow yet steady progress in increasing and improving their own production of biologicals.

As of the end of the year, the only country in Latin America producing poliomyelitis and measles vaccines was Mexico, whose production capacity was constantly increasing. WHO approval of the Mexican products is subject to the results of testing by a WHO reference laboratory. A step forward in the potential production of biologicals was taken as a result of an Andean Pact meeting at which representatives adopted a resolution to combine their countries' resources to develop central production and control laboratories with PAHO technical and financial assistance.

Perhaps the greatest shortcoming in the Region is the lack of satisfactory governmental controls over production. In this regard, it is useful to note that Mexico opened a viral vaccine control laboratory, which makes that country the first in Latin America to have efficient and effective national control facilities for all biologicals. Argentina's progress in bettering its facilities for controlling biologicals should also be noted, as should plans to improve laboratory facilities in Chile, Costa Rica, Cuba, Ecuador, and Venezuela.

As part of PAHO's program to improve biologicals control, two three-week courses were organized in Mexico. The first, on the production and control of biologicals, was held in October and attended by 20 persons from Argentina, Bolivia, Brazil, Chile, Cuba, Dominican Republic, Ecuador, Mexico, Peru, and Venezuela. The second, on measles, poliomyelitis, and yellow fever vaccine tissue culturing, was sponsored by PAHO, the UNDP, and Mexico and was given in November-December and attended by 21 persons from Algeria, Argentina, Brazil, Cuba, Curaçao, Jamaica, Mexico, Trinidad and Tobago, Uruguay, and Venezuela.

In the realm of blood transfusion, PAHO continued urging the countries to develop national policies of nonprofit, volunteer blood donation. Eight thousand copies of 14 publications dealing with various aspects of blood transfusion were received from the American Association of Blood Banks and distributed throughout the Region.

Hospital Infections Control

Efforts were made during the year to identify, observe, and evaluate hospital infection control activities in the countries, very few of which have organized programs to control such infections. PAHO staff visited the Central American countries and Panama, Barbados, Ecuador, Colombia, Peru, Trinidad and Tobago, and Venezuela in 1978 to determine the extent of the problem and promote the development of hospital infection control programs.

With a few exceptions, data about hospital infections in the Americas were found to be nonexistent or almost so. What data may exist are often gathered without using infection criteria or may cover incidence rather than prevalence. Prevalence studies would provide a far quicker perception of the situation and yield experience from which preliminary control measures could be constructed.

In areas about which reasonably reliable information exists, the incidence or prevalence of surgical infections varies from 5 to upwards of 50 per cent, depending on the service. All countries have reported problems with cesarean sections. Prevalence studies in 10 Central American hospitals based on acceptable criteria showed infection rates as high as 70 per cent in some surgical services and diarrheal infec-
tion among 50 to 100 per cent of susceptible patients in a pediatric unit. CAREC has found high transmission rates in diarrhea units, the second infection in the same patient often being far more serious because of lowered resistance.

Plans have been made for a study group to review and discuss available information on hospital infection in Latin America and the Caribbean in 1979 in order to develop suitable control strategies and techniques for the developing countries in the Region.

Food Protection

PAHO distributed copies of the first Regional Food Protection Program and the Guidelines for Developing an Effective National Food Control System to Member Governments during 1978. These documents are designed to help develop or improve effective national food protection programs and services based on up-to-date legislation. In addition, books, reference documents, technical notes, and pamphlets about food protection were distributed to the countries.

An advisory study group met in Washington, D.C., from 13-17 February to review PAHO's present food standards and made several recommendations for updating and publishing them for distribution throughout Latin America.

Among training activities in this area, the National School of Public Health at Medellín, Colombia, which participates in PAHO's regional food protection education program, graduated its first class of 28 well-qualified food inspectors representing five countries. Three other international courses were given under the program — on the quality control of infant formulas in hospital nurseries for 19 students, chemical food contamination for 15 participants, and sea-

food quality control for 16 students. Headquarters and field staff participated in the VI Seminar on Meat Hygiene in Central America and Panama held at San Salvador in July.

PAHO staff and consultants advised several countries on their food inspection activities during the year. In Barbados, a Headquarters staff member appraised the operation and inspection services of a meat processing plant; in Colombia, a consultant analyzed the national quality control services; and in Guatemala three consultants helped assess food inspection services and offered recommendations for a national food protection program.

Control of Toxic Substances

An advisory study group of health administrators, toxicologists, regulatory officials, public health academicians, and epidemiologists finished designing the Region's first program for controlling toxic substances during 1978. Their overview report on the situation in Latin America, the Caribbean, and the United States of America discussed toxic chemicals in general, identified the major problems in the Region, and made recommendations about national policies and programs—including training—for controlling toxic substances.

Technical consultation was provided to several countries during episodes of intoxication. Health authorities in Brazil and Venezuela received technical advice from Headquarters staff after toxic dinoflagellates—the "red tide"—washed up on their shores. PAHO supplied diagnostic reagents and procedures to the Adolfo Lutz Institute at São Paulo in the Brazilian incident, which established the first diagnostic capability for this type of problem.
Emergency Preparedness and Disaster Relief Coordination

PAHO's emergency preparedness and disaster relief coordination program was established in 1977 in compliance with a Directing Council resolution (CD24.10) of the previous October. During 1978 there was considerable administrative and technical progress in this area both regionally and nationally. PAHO itself drew up disaster procedures for dealing with emergency situations efficiently. Its roster of experts in various areas of disaster relief was enlarged, although because of the wide variety of skills required and the limited opportunity of health workers to acquire extensive disaster management experience it is still not as complete as it should be.

Most disaster-prone countries have increased their readiness to deal with disasters because of the training many of their health workers have received in special seminars, courses, and conferences organized or sponsored by PAHO. But more substantial achievements and, in particular, the organization of an international Spanish-language course on disaster management initially planned for 1978 were delayed because extrabudgetary funds were not available during the year.

The preparation of PAHO's disaster management guidelines and manuals progressed satisfactorily. A Guide to Health Management After Natural Disaster was prepared in 1978 and was proposed for publication.

Coordination with the U.N. Office of the Disaster Relief Coordinator, the U.N. High Commissioner for Refugees' office, the Red Cross, and other agencies improved considerably during the year. Joint missions and projects such as the organization of donor fact-finding visits to Costa Rica, Guatemala, and Peru, joint PAHO-Red Cross advisory services in Costa Rica, and a seminar in Mexico were carried out with encouraging results.

PAHO provided emergency assistance during the year to Belize (floods caused by Hurricane Greta), Costa Rica (Nicaraguan refugees), Honduras (Hurricane Greta and Nicaraguan refugees), and Peru (floods in Cuzco). Fortunately, no major natural disasters resulting in severe health problems occurred in the Americas during 1978.
IV. ENVIRONMENTAL HEALTH

The environment in which the peoples of Latin America and the Caribbean live is today seriously threatened by increasing industrialization and urbanization. These are some of the basic facts:

- In 1978 it was estimated that only 61 per cent of the Region's total population received water through house connections or had easy access to it. Seventy-eight per cent of the urban and 34 per cent of the rural population were reported to have adequate service. This represents little change from the previous year.
- The proportions of urban and rural residents with sanitary sewerage did not improve during the year (42 per cent for urban and 26 per cent for rural residents).
- Solid waste is still disposed of in open dumps as often as not in the Region's developing countries. It is estimated that throughout the Hemisphere 150,000 tons of urban garbage are so discarded daily.
- Though governmental controls over air and water pollution exist in many Latin American and Caribbean countries, they are often not enforced.
- Work-related diseases and accidents in the Region's developing countries are estimated to occur at 6 to 10 times the rate they do in developed countries.
- Most people in Latin America and the Caribbean do not have access to diagnostic or therapeutic X-ray services, largely because the trained personnel and equipment such services require do not exist. Where they do, radiologic workers are often inadequately trained and equipment is outmoded and poorly maintained.

To help the Governments respond to these problems and so meet the rising expectations of their peoples for a better environment in which to live, PAHO has an active environmental health program embracing such fields as potable drinking water supply, sewerage technology, solid waste management, air and water pollution control, occupational health, and radiologic services.

Two specialized service, research, training, and information institutions are part of this program: the Pan American Center for Human Ecology and Health (ECO) in Mexico City and the Pan American Center for Sanitary Engineering and Environmental Sciences (CEPIS) in Lima.

Because the resources it can devote to advancing the Region's environmental health are limited, PAHO is seeking to develop a network of collaborative national centers to aid in fulfilling its responsibilities in this field. These centers, an outgrowth of a network of cooperative institutions WHO began to form in February 1974 which up to now have been largely research-oriented, would cooperate with PAHO not only in environmental research but also in technical consultation, training, and information collection and dissemination. While the activities of such centers would complement PAHO's in environmental health, they also have their own national missions to fulfill. During 1978 PAHO staff identified a dozen institutions in various countries in the Region which meet the criteria established for becoming collaborative centers, and it was anticipated that the first would be designated in 1979.

Realizing that proper project preparation greatly enhances the possibility of more external financing and to help the
Basic activities in environmental sanitation are related to construction of sewerage systems; disposal of growing amounts of domestic and industrial wastes; and provision of adequate water supplies.
countries include in their proposals the "social" aspects of environmental services that multi- and bilateral lending agencies are increasingly taking into consideration. PAHO and the World Bank agreed in June that PAHO would undertake a cooperative project identification and appraisal program, which had begun informally in 1977. During the year PAHO participation in this program involved 14 man-months (a figure expected to double in 1979) and aided Argentina, Bolivia, Ecuador, and Mexico in carrying out sector studies that tentatively identified and appraised a large number of water supply, sanitation, and other environmental projects which financial agencies abroad could support. Those the World Bank does not underwrite itself would be referred to other financing agencies for consideration.

Some of PAHO's environmental health efforts during 1978 spanned all the areas that make up that field and involved cooperation with other international agencies. An extensive study was carried out to develop broad environmental health strategies for 10 countries and territories in the English-speaking Caribbean. Working with Caribbean Community (CARICOM) and national officials, PAHO staff and consultants prepared background papers on water supply, sewage disposal, solid waste management, beach pollution, and industrial refuse control for an environmental health planning meeting held in Grenada in October. Participants in the meeting included: representatives of the Canadian International Development Agency (CIDA), which has financed and may continue to support environmental planning in the Caribbean, the U.N. Environment Program (UNEP), the U.N. Economic Commission for Latin America (ECLA), and the Caribbean Development Bank, as well as PAHO, CARICOM, and national delegates.

WATER SUPPLY AND BASIC SANITATION

The Region's drinking water supplies continue to concern health authorities since in large parts of many major cities current supplies do not meet even minimal quantity, quality, and continuity standards. The same may be said of many urban sewerage systems. Further, the rapidly growing populations of many cities are threatening to swamp existing services.

All available statistics show that in rural areas the water supply and basic sanitation situation is far worse than in the cities.

During 1978, as it had in earlier years, PAHO sought to help the countries develop water and basic sanitation programs consonant with their human, technical, and financial resources. The year saw a change in emphases in that PAHO gave increased attention to the special needs of rural and periurban areas and began stressing the importance of better water quality, long-term operation and maintenance of water and sewerage systems, and training of enough manpower to run current and future systems.

One of PAHO's important activities during the year was helping the Governments prepare for the United Nations International Drinking Water and Sanitation Decade (1981-1990), whose goal is to provide acceptable service to as many people as possible by 1990. PAHO representatives
took part in a Latin American regional meeting sponsored by ECLA on the U.N. Water Conference Action Plan developed at Mar del Plata, Argentina, in March 1977. A resolution was approved requesting governments and international agencies to give full support to the Decade and to set up the technical, economic, and legal mechanisms for carrying out projects needed.

To assist the countries in preparing for this increased effort, PAHO's environmental health staff spent much of 1978 quickly assessing national resources and problems, identifying constraints to sector development, and determining each country's preparedness for the Decade. By the end of the year, nine countries had completed the assessment, and 13 others were in its final stages.

The assessment information was to be used as part of a second-stage effort to compile pertinent global data for country planning, to be presented to the U.N. General Assembly by the U.N. Economic and Social Council in 1980. International lending and donor agencies would also use these documents to determine the external support that might be required.

In support of the Decade's goals and objectives, the Federal Republic of Germany through its overseas development agency concluded an agreement with WHO in December to finance the identification and formulation of high-priority water supply and sanitation projects in 20 of the world's countries, including five in Latin America—Bolivia, El Salvador, Haiti, Honduras, and Paraguay; this work was expected to be completed in early 1979.

Another major effort in which PAHO was involved through CEPIS during 1978 was the design of a large project in Peru to improve the operation and maintenance of that country's water and sanitation systems. CEPIS was to train professionals and technicians in such areas as leakage control, low-cost design criteria, water distribution techniques, water standards adapted to developing countries, and simplified water analysis. The objective would be to develop training materials and 18 courses, an information system, and a research program with emphasis on the operation and maintenance of water supply and waste water treatment facilities. The project, consisting of 10 separate subprojects, was to begin in February 1979 and last three years and its cost—more than $1.3 million—was to be financed by Peru and the IDB. The materials, concepts, and strategies developed would be used throughout the Region.

Present technologies are often oversophisticated and misapplied, and as a result there is considerable interest in developing technology that takes into account a country's economic, social, and cultural conditions. Thus, during the year, CEPIS carried out operations research to examine simplified low-cost water treatment plant designs in Costa Rica, Honduras, and Peru, and oxidation lagoons in Peru.

To ensure the integration of water supply and sanitation activities into national environmental health programs, PAHO aided in developing comprehensive plans of action in Bolivia, all the Central American countries, Colombia, Ecuador, and Peru. Costa Rica supported environmental health activities by providing extrabudgetary financing for three elements of its plan.

PAHO acted as executive agency in 1978 for several projects financed with extrabudgetary funds in which the countries explored new areas. In Nicaragua and Paraguay, the World Bank financed projects that sought to provide safe water, improve basic sanitation, and upgrade housing for people living in small villages and semi-concentrated rural areas. In Honduras, PAHO continued to help the national water authority revise its operation and maintenance strategies. In Bolivia, the Caribbean, Chile, and Guatemala, a variety of projects
Figure 4. Urban and rural population and number and percentage served by water supply and sewerage systems in Latin America, 1961, 1970, 1974, and 1978.
continued to be carried out in such areas as manpower development, low-cost sewerage technology, and institutional development for rural water programs.

As the more social aspects of the programs are elaborated, increasing attention has been given to developing links between water and sanitation activities and primary health care. To this end, detailed joint studies by the countries, PAHO, and UNICEF were explored in Bolivia and Colombia. The reports resulting from these studies were the basis for PAHO's participation in preparing recommendations for the WHO/UNICEF Joint Committee on Health Policies. In addition, assistance was given to Ecuador and Honduras in developing audiovisual materials and manuals for village water system operators.

SOLID WASTES

The steadily mounting volume of solid wastes resulting from rapid urbanization and the increasing amount produced per capita per day is a growing problem in most of Latin America's large and medium-sized cities. It is estimated that each person produced 0.5 kg of solid waste per day in 1978 and that in 1985 the amount would be double what it was in 1970. The need for good solid waste management was particularly noticeable in metropolitan areas and large cities whose traditional collection and disposal systems were seriously strained because of ever-increasing loads and distances from collection to disposal sites. A major difficulty was the limited number of acceptable disposal sites.

PAHO continued its cooperation with the countries in finding solutions to prevent or reduce the adverse effects of unsanitary solid waste disposal. Activities were focused on the collection and disposal of solid wastes in metropolitan areas and on formulating national programs through the creation and operation of national planning and technical support agencies which identify, formulate, and submit projects to international lending agencies for financing.

PAHO helped Colombia prepare a $4.5 million proposal for CIDA financing of urban sanitation services in 13 Colombian towns with a combined population of one million inhabitants. Proposals have been submitted to the World Bank for loans to finance similar projects in 11 Colombian cities, including Medellín.

Ecuador, Guatemala, Panama, and Peru began drawing up national solid waste management plans. The OAS referred to PAHO a request from Venezuela to collaborate in a national study to define solid waste management needs in 51 towns of more than 20,000 inhabitants each and to recommend solutions. A PAHO expert visited Venezuela on two occasions during 1978 in connection with this project.

PAHO convened a regional solid waste management symposium at Santo Domingo, Dominican Republic, in February at which there were 138 participants; the proceedings were published as document Nos. 21 and 22 in the Division of Environmental Health's Technical Series. A regional course on solid waste management with 30 participants from several countries was held in Buenos Aires in September and October.
INSTITUTIONAL DEVELOPMENT PROGRAM

To help create the infrastructure necessary for providing adequate water supply, sanitation, and other environmental services, PAHO advised 13 Governments on institutional development during the year.

PAHO provided 255 man-months of consultation in the following areas: organizational planning and evaluation; manpower development; accounting, internal controls, and budgeting; rates, billing, and collections; operation and maintenance; water quality control; water meters; detection and control of leaks; hydrology; well drilling and maintenance; personnel management; supply administration; paperwork management and data processing; legal matters; construction of rural water systems; and promotion of community participation.

The institutional development projects were financed by the environmental sanitation agencies themselves, sometimes with contributions from international and foreign organizations such as the CIDA, IDB, UNDP, and the World Bank.

PAN AMERICAN CENTER FOR HUMAN ECOLOGY AND HEALTH

The Pan American Center for Human Ecology and Health (ECO) was established at Mexico City in 1975 under an agreement between PAHO and the Government of Mexico, which provides an annual contribution to cover part of its operating expenses. Plans were made for completion of ECO’s new center at Toluca in 1979.

The creation of ECO, which at year’s end was staffed by five professionals, was a response to the need for an additional intersectoral and multidisciplinary focus on human ecology in the health sector. The broad and integrative viewpoint of human ecology is the basis for studying man’s interactions with his physical and social environment, and ECO’s technical program concentrates on the effects of such interactions on health.

Multidisciplinary teams formed by ECO help the countries develop and use their own resources to conduct holistic ecologic assessments of health problems. One of its principal duties is to aid the Governments in determining the environmental impact of large development projects on human health. Information and technical advice are also provided to countries that have established environmental quality agencies. While ECO is not expected to have an internal research or training program in the foreseeable future, its staff cooperates with Governments and academic institutions in designing and conducting courses and research projects related to human ecology and environmental health.

One of the Center’s major objectives is to aid the countries in preventing or ameliorating adverse effects on human health that may result from environmental pollution and changes accompanying economic development and industrialization. Since its founding, ECO has cooperated in regional environmental health studies with UNEP’s regional office in Mexico City.
Together the two agencies sponsored two conferences on human ecology assessment of development projects in June, which marked the beginning of the program on methodologies for environmental and health impact assessment in development projects.

The latter area was the subject of a series of guidelines and manuals which ECO staff began writing with assistance from UNEP and other international agencies. The first publication in the series was to be a guide for use by decision- and policy-makers describing the needs, importance, and value of assessing development projects in order to avoid serious environmental health problems. A manual was also started to present procedures for assessing the effects of dam construction on environmental and human health; it was to provide examples of how to minimize adverse effects while enhancing the environment, health, and social well-being of the affected population, and was to suggest alternative assessment methods. ECO began a second manual on the evaluation, planning, and design of human settlements resulting from immigration or colonization in areas where natural resources are being newly exploited. Later manuals will cover other development, industrialization, and environmental modification topics.

ECO and UNEP jointly planned the establishment of a network of associated regional and national institutions interested in human ecology and environmental health. The goal was to support and strengthen national institutions and to develop personnel who could effectively introduce health and environmental improvement goals into development programs. The institutions, both academic and governmental, would be able to undertake multidisciplinary training and research programs to improve the health status, living standards, and environmental conditions in developing regions.

Mexico, Peru, and the United States of America are participating in the WHO/UNEP biologic monitoring project, and preparatory arrangements for starting activities were completed during 1978. The main objective was to develop national institutional capacity, collect information, and assist the countries in the solution of specific problems. Selected heavy metals and organic compounds would be monitored. Assistance in this area was provided to Peru for a preliminary study of Mantaro River. A joint ECO/UNEP mission visited Panama to conduct a survey of the environmental health situation and to prepare recommendations for institutional development.

ECO continuously received requests for cooperation with the countries in designing methodologies for conducting and helping to conduct environmental, social well-being, and health impact assessment—usually of large regional resource development projects. During 1978 its staff prepared and presented numerous lectures, seminars, and short courses on human ecology, impact assessment, and environmental health at the invitation of governmental, professional, and academic organizations in 18 Latin American and Caribbean countries.

ECO's information service collected, processed, and evaluated information needed by the countries on health problems associated with environmental modification and change. The information consisted of current publications, journals, and unpublished documents and reports. The service also maintained and continually updated a roster of expert consultants in environmental change related to health, identifying them by general professional skills, specific areas of expertise, and regional field experience. A full-time environmental scientist managed the ECO information service, and the professional staff contributed to its operation.
PAN AMERICAN CENTER FOR SANITARY ENGINEERING AND ENVIRONMENTAL SCIENCES

The Pan American Center for Sanitary Engineering and Environmental Sciences (CEPIS) at Lima was founded in 1967. During the years since then it has provided technical cooperation, chiefly in the areas of air and water pollution control, industrial hygiene and occupational health, drinking and waste water treatment, water quality and laboratories, systems analysis and computing sciences, and technical information.

During 1978, CEPIS’s orientation began to shift from technical assistance to education, research, and information exchange because of the changing nature and intensity of the Region’s environmental problems and the increasing ability of the countries to deal with their own problems.

Under the guidance of PAHO Headquarters and with the close collaboration of PAHO’s Area and Country Representatives, CEPIS conducted support activities in four basic areas: technical cooperation, research, training, and information collection and dissemination.

In the first area, CEPIS coordinates the regional activities of the Global Environmental Monitoring System (GEMS, which is financed by UNEP and UNESCO and consists of the Global Air Pollution and Water Pollution Monitoring Networks), the Pan American Air Sampling Network (REDPANAIRE), and the Regional Program for Analytical Control of Water and Waste Water Laboratories (PRELAB). It also collaborates in subregional occupational health programs and coordinates the development of the Pan American Sanitary Engineering and Environmental Sciences Information and Documentation Network (REPIDISCA).

The research conducted by CEPIS in 1978 included studies to determine the characteristics of stone/gravel water treatment flocculators; the development of analysis procedures for starting stabilization pond operation; development of simple equipment to determine residual chlorine and the measurement of low turbidities; planning of two modular water treatment plants (with the support of WHO); and laboratory testing of a locally built turbidimeter, about which a report for publication was prepared.

In Argentina, CEPIS advised the National Institute of Water Sciences and Technology and the Center for Environmental Engineering on their liquid waste research. In Brazil its staff cooperated in studies of the experimental biologic treatment lagoons at Campina Grande and Recife. In Chile it helped the National Sanitary Works Service operate the Melipilla Treatment Plant southeast of Santiago and the University of Chile’s sanitary engineering section in its research on oxidation ditches. In Ecuador it assisted the Polytechnic School build model research laboratories, and in Mexico it aided Monterrey in evaluating that city’s water treatment plants. In Peru, CEPIS coordinated the research activities sponsored by the International Development Research Center of Canada (IDRC) to evaluate new treatment methods at the El Imperial Water Treatment Plant at Cañete, near Lima, and continued studying the efficiency and possible use of effluents from the San Juan Stabilization Ponds at Lima.

CEPIS conducted its education and training activities at the Center and in the countries. Fifteen fellows from different countries were trained at CEPIS, and experts from several countries visited it to discuss cooperation needs and specific problems.
Detection of pulmonary conditions, as part of the development of a long-term occupational health program in Chile. (Photo: WHO/P. Larsen)

Air samples taken at nose level during the industrial work process in which insufficient protection exposes workers to inhalation of health-hazardous vapors. (Photo: WHO/P. Larsen)
or to be briefed on program activities. In addition, it conducted a regional course on water quality monitoring as part of GEMS.

As Regional Information and Reference Center in Sanitary Engineering and Environmental Sciences, CEPIS facilitated the timely and low-cost flow of technical and scientific information among the countries. To achieve this objective, it strengthened its permanent relationship with sources and users. At the end of the year its library contained 18,500 titles and had designed and put into operation a classification system to speed information retrieval by subject.

As part of its information program, CEPIS published the following documents, some of which it had translated into Spanish: the Guide for Laboratories Performing Physical and Chemical Analyses of Water in English and Spanish; Hand Pumps; 14 issues of the monthly newsletter of the WHO International Reference Center for Water Supply at The Hague in Spanish; and three issues of its own in Spanish. CEPIS also translated into Spanish Simplified Methods for the Analysis of Water, Manual M-12 of the American Water Works Association, which PAHO later published.

The project being carried out with the support of IDRC was of special importance in the area of information and included the design of REPIDISCA, the preparation of a Microthesaurus in Sanitary Engineering and Environmental Sciences (MISCA), and an inventory of sources and users of information.

The following are some of the activities that CEPIS carried out in specific fields during 1978:

**General Pollution Control.** In cooperation with the World Bank, CEPIS helped Brazil's quasi-governmental Basic Sanitation Technology Company (CETESB) identify and appraise a project to provide funds for industrial pollution control in metropolitan São Paulo. A similar effort was undertaken in formulating a project to finance industrial pollution control in greater Rio de Janeiro.

An important development during the year was the new interest of international lending agencies in supporting environmental pollution control programs.

**Air Pollution.** The Pan American Air Sampling Network (REDPANAIRE), which was organized in 1967, continued its regular collection of information on air quality in the Region's principal cities. The network consists of about 100 semi-automatic and relatively inexpensive stations in 25 cities in 15 countries which monitor SO₂, suspended particles, and other air contaminants. Information from the stations is analyzed at CEPIS and reported back to the countries. To systematize the processing of REDPANAIRE information and make it more rapidly available to participating countries, a mathematical model was developed during the year.

CEPIS also collaborated with WHO and UNEP in organizing the new and technically more sophisticated Global Air Pollution Monitoring Network. Preparation of a course on air monitoring quality assurance was begun.

In Argentina, CEPIS participated in that country's first meeting to plan the improvement and conservation of its air resources, and in Uruguay it cooperated with the Ministry of Health and the Municipality of Montevideo in revising the Uruguayan air pollution control program.

**Water Pollution.** CEPIS manages the regional program for analytic quality control of drinking and waste water analysis laboratories, which involves 50 laboratories in 20 countries. The program includes selection and application of analytic methods, training, calibration of equipment and instruments, and internal quality assurance.

During 1978, CEPIS collaborated in and coordinated regional efforts to establish
the Global Water Pollution Monitoring Network sponsored by WHO and UNEP. It promoted the designation of stations in participating countries, trained personnel, and provided information on methodology and processes. One of its most important activities was evaluating the analytic cali-
ber of the laboratories to be involved. Interlaboratory assessments for quality assurance, in which 59 laboratories participated, were completed by PRELAB for physical parameters. The objective was to obtain comparable results within the net-
work.

In Colombia, CEPIS helped the Ministry of Health draw up a preliminary proposal for foreign financial assistance to assess the contamination of Cartagena Bay and aided the Cauca Valley Corporation con-
tinue its studies of the Cauca River basin. In Costa Rica, it assisted the National Water Supply and Sewerage Service in studying water pollution around Puntarenas, and in Ecuador it aided in a study of the Esmeraldas River basin.

**OCCUPATIONAL HEALTH.** Industrialization and technification of both industry and agri-
culture, without corresponding improvements in the work environment, have re-
sulted in ever more industrial accidents and occupational diseases among the 100 million working men and women of Latin America and the Caribbean. Experts often estimate that there are six to 10 times as many work accidents and illnesses in develop-
ing countries as in developed ones.

Incorporation of preventive and curative activities in primary health care programs and the basic sanitation programs of the working environment, and the develop-
ment of adequate preventive techniques and control activities in small industry, could significantly diminish the present high incidence of work-related disability. Attention should also be paid to cancer-producing substances in the working en-
vironment which could result in serious long-range health problems. Epidemiologic studies that would show the importance of such substances should be undertaken in some Latin American countries.

The V Meeting of the Ministers of Health of the Andean Pact, held at Santa Cruz, Bolivia, approved the Andean Occupational Health Program. PAHO coopered first in preparing the program and later in planning and carrying out the II Meeting of the Advisory Commission on Occupa-
tional Health of the Andean Pact and the First Andean Seminar on Occupational Health, both in Lima in November. The meeting of the Advisory Commission pro-
posed the activities to be carried out by the member countries during the period 1979-1981. The recommendations of the seminar were approved at the VIII Meeting of the Coordination Committee of the Andean Pact at Bogotá in December.

CEPIS also participated in the Sixth Inter-
American Conference of Ministers of Labor under the auspices of the OAS. Analysis of the occupational health situation in Latin America and the Caribbean and the conclu-
sions staff members presented contributed greatly to forming the basis for the meet-
ing’s recommendations.

CEPIS also participated in occupational health meetings, courses, and program planning in Costa Rica, Ecuador, Mexico, Panama, Paraguay, Peru, Trinidad and Tobago, and Venezuela during the year.
RADIATION AND ISOTOPES

Most people in Latin America and the Caribbean, especially in rural areas, do not have access to radiodiagnostic services, while in developed countries it is estimated that between one-third and one-half of all crucial medical decisions depend on radiologic information. Adequately trained professionals and technicians to man X-ray services are wanting: there are too few schools for X-ray technicians, and the quality of instruction and teaching materials varies greatly among those there are. When it is not lacking, radiologic equipment is often old and prone to breakdown: studies have shown that almost one-third of X-ray equipment in Latin America and the Caribbean is not operational at any given time.

Much the same can be said about radiotherapy in the Region's developing countries. As an example, it is generally agreed that tumor doses must have an accuracy of about 7 per cent for treatment to be effective, yet in many countries not a single medical radiation physicist is available to assist with dosage calculations and treatment planning.

During 1978, PAHO continued to cooperate with the countries in securing the optimal use of radiation in medicine and in maintaining radiation exposure of patients, workers, and the public at reasonably acceptable levels.

In the area of basic radiodiagnostic services, PAHO continued to promote and develop a simplified X-ray system, including a clinical field trial in at least one country. Guidance in evaluating radiologic risks and organizing and developing national radiation protection services was provided to Costa Rica, Guatemala, Mexico, and Peru. A seven-country cooperative program to measure environmental radiation exposure was organized in collaboration with the University of Texas (U.S.A.) using mailed thermoluminescent dosimeters, and the cooperative program for measuring radionuclides in milk was continued in collaboration with the U.S. Environmental Protection Agency.

A monthly bibliography of recent publications containing titles abstracted from 16 journals was distributed to radiology workers throughout the Region, as was the monthly newsletter of the Latin American Association of Nuclear Biology and Medicine Societies.

Contact was maintained with various standards-setting organizations, such as the International Commission on Radiological Protection and the International Commission on Radiation Units and Measurements, in order to assure relevance and uniformity in efforts to promote the use of international radiologic standards throughout the Region.
V. HEALTH SERVICE SYSTEMS

PAHO cooperated with the countries in improving their national health systems and services. Staff members from a variety of disciplines worked together during 1978 to carry out these activities.

The extension of health care coverage to all who do not now have it in the Americas—the goal of the Region’s countries during this decade—implies the need for major changes in the organization of present health services and in traditional care patterns. The magnitude of this task and the variety of activities required to complete it demand that PAHO’s and the countries’ efforts to improve health services be ranked by priority to achieve concrete results as quickly as possible.

The Governing Bodies of PAHO and subregional health ministers’ conferences have established those priorities, a review of which is reflected in the discussion that follows.

HEALTH CARE SERVICES

The central purpose of this program was to help develop national health systems as well as institutional and community health services. This was done through direct cooperation with the Governments which emphasized the extension of health services to under- or unserved groups and systematic analysis and dissemination of knowledge about the evolution of such extension and the techniques, procedures, and strategies underlying it. The goal was to increase knowledge about problems and possible solutions in extending service and to exchange such knowledge among countries. Special importance was attached to planning, organizing, and administering institutional and community health systems in order to increase their operative capacity, efficiency, and usefulness.

Against this background, the program’s major strategies during 1978 were oriented toward achieving greater efficiency in the use of resources through:

- Improved planning, organization, and management of health service systems, including community subsystems, with priority given to determining the content and designing the most basic and next higher, or first and second, levels of care. In this respect, the relationship between the content of care levels and choosing and using appropriate technologies and their efficiency and effectiveness in extending service coverage was crucial.
PUESTO DE SALUD
SAN MIGUEL SIGUILA
Better coordination among health institutions as well as the various models developed to provide health services to individuals. In this regard, special attention was paid to collaborating with social security agencies since their health services were acquiring ever greater significance in the Region.

- Application of new forms and models of service organization and provision through promotion and stimulation of health services research.
- Search for greater rationalization in planning and carrying out investments in health facilities in order to extend service coverage.
- Strengthened training programs according to national priorities and needs.

PAHO's activities in carrying out these strategies occurred regionally and in specific countries. Regionally, special importance was attached to disseminating information about the different national health systems and health care delivery models, especially for primary health care.

Programs to broaden health care coverage created a need for management and planning based on more detailed knowledge of the population groups for which services were organized, the operational characteristics of such services, and their efficiency and true impact on improving the health status of the population.

Extending services implied the need to increase the number of health facilities of various kinds as well as their outputs, which in turn implied an increase in system operational capacity and substantial financial investment. To rationalize such investment, the Region's countries made great efforts to improve their functional planning, architectural design, construction, equipping, and maintenance of health facilities. To cooperate in these activities, PAHO prepared and presented to UNDP a regional action plan for developing technical health facilities design, construction, and equipment standards based on individual countries' socioeconomic characteristics and availability of trained personnel in relevant disciplines.

In the area of social security health care, PAHO took part in the Seventh Meeting of the Regional Committee of Actuaries and Statisticians (La Paz, June); the Fifth Inter-American Congress on Prevention of Work Hazards (Jalapa, Mexico, October); and the Sixth Inter-American Congress of Social Security Medicine (San José). At the last meeting a staff member presented a paper on extension of health services and social security coverage in Latin America. PAHO also cosponsored the health services administration course offered to participants from the Region with the Inter-American Center for Social Security Research in Mexico.

PAHO cooperated with individual countries in improving their health care systems.

In the field of planning and carrying out investments in health facilities, the organization and opening of new hospitals was an important area of technical cooperation. Collaboration given in this regard, especially in the Dominican Republic, Ecuador, and Nicaragua, enabled innovative models to be introduced which tended to systematize this process and modernize conventional hospital administration. In carrying out these activities, strong emphasis was placed on the link between the hospital and the network of peripheral services, the community, and internal departmental coordination. The design and startup of patient referral and flow systems, which were incorporated in the organizational plans of the new units, warranted special attention.

The foregoing experiences, together with specific requests for cooperation from various countries, channeled greater cooperation efforts into the area of organization and operation of ambulatory and emergency care services, as evidenced in
the study of the ambulatory services of Managua and the investigation being conducted in this field in Bogotá.

Cooperation was provided through one regional, two area, and 19 country projects, which benefited from the services of 19 full-time advisers and 102 short-term consultant months.

In the English-speaking Caribbean, PAHO cooperated with Antigua in improving its supply procedures and the administration of its maternal and child health program. In the Bahamas, a cost control system was developed and inventory procedures were bettered through computerization and purchasing by designing new procedures and improving storage and distribution. In Dominica, the administrative offices of the Princess Margaret Hospital were redesigned for greater efficiency, and drug purchasing and distribution procedures were improved. In Jamaica, PAHO helped organize workshops to improve the Ministry of Health's organization, budget, personnel, and supply procedures. A senior-level seminar was organized for Health and Environmental Control Ministry officials in St. Lucia at which administration, supply, and maternal and child health program manuals were developed. In Trinidad and Tobago, PAHO helped organize a health systems training program.

PAHO collaborated with Costa Rica, El Salvador, Guatemala, and Honduras in administration development efforts.

Exemplifying the role of health education in raising health care standards, an auxiliary nurse instructs mothers and children on nutrition as they wait to receive treatment. (Photo: Government of Haiti)
Costa Rica significantly improved the organization of its Health Ministry, El Salvador its finance and purchasing procedures, Guatemala the administration of its Public Health and Social Welfare Ministry, and Honduras its supply procedures.

In Uruguay, cooperation continued to be given to bettering the Ministry of Public Health's administrative procedures in the fields of supply, personnel, and budget.

Training

During the year PAHO organized the Second Regional Course on Health Services Administration, which had 32 participants, with the University of the Andes in Colombia. The XVI Regional Seminar on Health Services Administration on structures of administrative development for coverage extension (Cartagena, Colombia, December) enabled its 75 participants to exchange information about experiments under way in health systems development; the seminar's report, containing major recommendations about the development of service extension programs, was in its final editing stage.

The new Center for Education in Health Administration at Cali, Colombia, began to carry out a project to train large num-
bers of intermediate-level and junior health managers with unconventional methods. The directors of this and the two new advanced programs in health administration education in Rio de Janeiro and São Paulo were beginning to coordinate their activities at various levels and were planning joint short courses and seminars, continuing education, publications, research, and consultation.

In Costa Rica, PAHO cosponsored three seminars for executives of the national social security agency.

In Mexico the First International Course on the Development of Health Service Systems had 34 participants. The course replaced the administration and planning courses which the School of Public Health of Mexico formerly held separately.

Through its new Human Resources Institute, Nicaragua began offering an especially innovative continuing education program to prepare and train health executives. The methods used in this program, which contained much self-instruction and field work, enabled the 45 participants to continue their regular duties during the course.

Primary Health Care and Community Participation

PAHO aided the Governments in applying the strategies of primary health care and community participation to hasten the extension of health services to medically unserved populations.

Based on national analyses of this extension process, special emphasis was put on disseminating the conceptual bases of primary health care regionally and sub-regionally and their inclusion in the plans and programs of the countries.

PAHO staff took part during the year in the following meetings dealing with one or both subjects: the International Conference on Primary Health Care at Halifax, Nova Scotia, Canada, under the sponsorship of the World Federation of Public Health Associations, at which more than 40 countries were represented; an international meeting to draw up the Five-Year Work Plan of the Inter-American Indigenist Institute at Pátzcuaro, Michoacán, Mexico; the International Conference on Primary Health Care at Alma-Ata, U.S.S.R.; a meeting at Washington, D.C., to prepare experimental primary health care and community participation projects in Colombia, Cuba, Guatemala, and Peru being supported by the Netherlands; an international course on development and population at Washington, D.C., organized by the World Bank; and an international course on quantitative methodology in health planning organized by the University of Texas, Austin, U.S.A.

In the area of primary care, PAHO staff inspected primary health care programs in the rural part of Loja Province, Ecuador; provided technical and financial cooperation to Jamaica for training personnel assigned to primary health care programs; promoted primary health care in Paraguay as a strategy for extending coverage and took part in the discussions of public health administrators from various parts of the country at Asunción; and helped analyze and revise Peru's programs for extending coverage through primary health care in the Puno highlands area.

Since not much was as yet known about the community as a system or about the sociocultural and psychologic factors that influenced community participation in health programs, PAHO concentrated its efforts in this area on preparing a simplified model for operational studies of the traditional community and institutional
health systems in order to develop techniques for promoting community participation in extending coverage. An interdisciplinary working group on relevant research methods met at Washington, D.C. from 24 April to 4 May. The methodologic model it constructed was being tested in some of the countries to adapt it to local conditions. The result was to be guidelines for increasing community participation in health services coverage.

PAHO also cooperated in planning and carrying out an interdisciplinary working group meeting on sociocultural impediments to health activities for the Andean Pact countries (Bogotá, 11–14 September). Among the group’s recommendations was one requesting PAHO’s cooperation in disseminating experiences in community participation in the Region and another urging that multidisciplinary national workshops on this subject be held to exchange experiences, working methods, and service delivery models among the Andean countries.

PAHO cooperated with individual countries in developing community participation programs in various ways.

In the English-speaking Caribbean, the Governments redoubled efforts to bring about community participation as a strategy for developing their health services. Significant efforts were made in health education and in training health personnel. Montserrat and the British Virgin Islands created their first health educator positions, and Antigua appointed its second specialist. In Jamaica, community participation was made the principal strategy in extending primary health care. Sixty-two local health committees were infusing new vitality into the health care system. In Drewsland, a poor district of Kingston with a population of 6,000, for example, residents contributed funds to establish a dental clinic at the local elementary school.

The committee at rural Windsor Castle took the lead in building the community’s first health center.

In Costa Rica, a national health education seminar was held from 27 to 30 July in which 65 representatives from various national institutions took part. The meeting was organized by the Costa Rican Social Security Agency, and its objective was to lay the foundation for a national health education policy.

In Ecuador, PAHO helped revise the community participation program of the Ministry of Health’s department of health
education and develop another to increase health education in rural primary schools.

As a result of Panama’s lively interest in promoting community participation in the development of health services, more than 3,000 families in 144 communities were cultivating community gardens to produce staple foods. An experimental social communication plan was also being carried out to help prevent foot-and-mouth disease and the financial losses it caused.

Health Planning

PAHO continued its cooperation during 1978 in the health planning efforts of various countries. At the close of the year, 10 countries were conducting coverage extension programs, six were starting them, and six more had formulated programs with PAHO advice and IDB financing.

Among the planning activities in which PAHO assisted were: adjustment of investment and service in light of budget cuts in Ecuador; preparation of the 1978–1982 national health plan in Guatemala; evaluation of coverage extension and preparation of the health portion of the 1978–1982 national development plan in Honduras; and preparation of a national health plan including the social security and Canal Zone health services in Panama.

NURSING SERVICES

PAHO’s nursing effort was directed toward developing strategies to strengthen and restructure nursing systems so they could provide the nursing required to extend health services. Most of the Region’s countries were encouraging nurses to increase their participation in national health planning and policy formulation and to assume a more active role in determining nursing activities.

An important part of PAHO’s work during the year was to provide information to field staff on new nursing concepts and encourage their inclusion in national programs. Several of these concepts dealt with primary health care.

Among PAHO’s nursing activities during the year were:

- A seminar on nursing issues held at Washington, D.C., in July, attended by 16 leaders in nursing and related disciplines, at which regional nursing policy on primary health care and extension of health care coverage was formulated.
- A course on community health nursing with special emphasis on extending health care coverage held at Guatemala City in July and August for 22 nurses from El Salvador, Guatemala, Honduras, Nicaragua, and Panama. A learning model was developed to strengthen program planning as it related to community needs and the knowledge required by and use made of nurses in expanded roles.
- Cooperation with several countries in their efforts to improve nursing quality and coverage extension, primarily through the formulation and adoption of hospital nursing standards. PAHO helped organize nursing standards planning workshops at Brasilia and Santiago, Chile. Standards were instituted for the first time in Colombia, the Dominican Republic, and Venezuela. Workshops were held in Colombia and Peru to develop care quality indicators with which to evaluate the nursing care received by medical, surgical, obstetric, and pediatric patients. More precise assessment factors were also developed to determine how well community nursing standards in maternal and child
health and communicable disease programs were being met.

In Mexico, projects were developed by the health services and state universities in Guanajuato and Nuevo León to define the role and functions of nurses in extending coverage. In Monterrey, nurses at the Nuevo León University Hospital formulated and initiated eight standards of direct patient care, while in San Luis Potosí 42 nurses from the nursing school and several health institutions drew up six health care standards.

Activities in Central America focused on the role of nursing in extending care and improving its quality through standards development. Costa Rica, El Salvador, Nicaragua, and Panama organized working groups to help put nursing standards into practice and conduct studies to assess the validity of instruments for measuring the quality of care. Panama undertook an inventory of present nursing personnel to determine the number and kinds needed to extend coverage.

A nursing personnel study in Guatemala showed that the country lacked 921 nurses and 3,084 nursing auxiliaries who would have to be found if coverage was to be
satisfactorily extended. Other studies in Guatemala indicated a discrepancy between nursing job descriptions and actual duties. The Ministry of Public Health’s department of nursing later organized a committee to identify all nursing activities at the first and second levels of care.

The principal activity in nursing in Chile, Colombia, Peru, and Uruguay was the development of standards and care quality measurements.

In summary, nursing activities in the Region during 1978 were aimed largely at restructuring and redefining nursing roles in relation to other members of the health team in order to achieve extended coverage and primary health care.

**REHABILITATION SERVICES**

Experiments were begun in various countries to promote effective community measures to prevent disability and provide simple community rehabilitation services.

Mexico’s health authorities agreed that a field study would be started in a suitable area of that country, and as a result the duty station of PAHO’s regional rehabilitation adviser was transferred to Mexico City. At Mexico’s request, the study was established in and around Toluca in the State of Mexico because that state had the necessary health services, including a rehabilitation center, and community health workers.

During the latter half of the year, health workers were taught how to identify disabled persons in their communities and, after having done so, evaluate their disabilities and prescribe simple but suitable rehabilitative activities.

Since this “simplified rehabilitation” program required that any country adopting it have a nucleus of rehabilitation professionals who could train and supervise community workers and since there would continue to be many disabled requiring more advanced services than communities could offer, PAHO aided in training rehabilitation physicians and therapists. This was carried out in ongoing country rehabilitation projects (Argentina, Brazil, Chile, Colombia, El Salvador, Guyana, Mexico, and Venezuela) and under PAHO’s regional rehabilitation training project in Bolivia, Jamaica, and Peru.

A meeting of therapists involved in training programs in the English-speaking Caribbean was held in October at Nassau, Bahamas. The participants recommended that a field study similar to that in Mexico be established on one of the English-speaking Caribbean islands.

**MAINTENANCE OF HEALTH FACILITIES**

Many of the Region’s countries were rapidly expanding their health facilities with extrabudgetary funds, and the logical corollary was that they needed to pay increased attention to maintaining such health facilities.
The following were a few of the activities in national programs to improve health facilities maintenance in which PAHO provided advice.

Colombia, which so far has trained only medical equipment maintenance technicians, plans to expand its training into the entire area of health facilities maintenance by using the Ministry of Education and Labor's vocational education program.

In Costa Rica the social security system took over responsibility for maintaining the country's hospitals from the Ministry of Health. The social security system's engineering director immediately assigned engineers to hospitals for whose maintenance he became responsible.

The Dominican Republic appointed an engineering director in its Health Ministry and sent him abroad for graduate training; on his return, he was to draw up a national health facilities maintenance program.

Taking advantage of a successful existing organization, Ecuador assigned the development of its national maintenance system to the Sanitary Works Institute, which assumed responsibility for designing, building, and maintaining new health facilities.

El Salvador's Ministry of Health planning team and National Planning Council drew up a countrywide health facilities maintenance plan that included a central maintenance center. The five-year plan was to cover the country's 14 major hospitals, eight health centers, and numerous health posts. It was particularly noteworthy that the Health Ministry began emphasizing supervisor and instructor training as well as its present courses on electric motors, electrical installation, laboratory equipment, sterilizers, surgical apparatus, and kitchen and laundry equipment—to name a few of the 32 offered.

Guatemala was planning a national maintenance system based on a health sector assessment by the U.S. AID, which recommended that coverage be extended throughout the country. PAHO outlined the system and support required to meet the time schedule the IDB stipulated.

In Honduras a survey of health facilities showed that in earthquake-prone countries, buildings should not be built of prestressed concrete and that additional engineering specialists were needed before and during hospital construction, especially to review design drawings to ensure that they complied with specifications.

In Jamaica, a national health care facilities maintenance program was begun with assistance from UNDP and PAHO, which assigned a technical adviser to the program. Working together, the Government and University of Panama completed the first phase of that country's new health facilities program—the design of a new children's hospital. The project team worked with the University's various departments and laboratories, thus giving graduate and undergraduate students useful training and experience in health facilities construction.

The Venezuelan Ministry of Health continued to open its maintenance center, which was able to train more than 2,000 technicians annually in all specialties, to nationals from other American countries. The technical manuals developed at the center were distributed to all Spanish-speaking countries in the Region.

There is a cooperative program to train students from abroad in health facilities maintenance in Mexico, where the social security system welcomed many students from other countries. One likewise exists in the United States of America, where the Veterans Administration taught doctors, nurses, engineers, and architects from Colombia, Ecuador, and El Salvador how to form and use doctor-nurse-engineer planning teams in their own countries.
VI. FAMILY HEALTH

MATERNAL AND CHILD HEALTH
AND FAMILY PLANNING

PAHO’s program during 1978 in the field of maternal and child health and family planning (MCH/FP) was varied. In collaboration with the W. K. Kellogg Foundation, numerous activities were carried out to improve MCH projects in 10 medically underserved marginal urban or rural areas. These projects were characterized by their preventive emphasis, efforts to improve the accessibility of care by reducing economic and geographic barriers, and integration of health services and training by promoting the delegation of duties and positive attitudes of health workers toward service extension and teamwork. Together the projects have benefited almost 1 million people in Brazil and Colombia by giving them greater access to basic health services and 4,000 health service workers and students through continuing education and in-service training. Two meetings were held in which health workers from the different areas exchanged experiences. An overall evaluation of the program was to be made in the first half of 1979.

PAHO also helped several countries prepare requests to the U.N. Fund for Population Activities (UNFPA) for financial assistance in carrying out MCH/FP projects, advised national health authorities on projects already under way, organized training workshops and courses for MCH/FP workers subregionally and in several countries, and furthered its efforts to improve nursing-midwifery.

To provide assistance in drawing up UNFPA grant requests, PAHO helped Chile formulate a detailed plan of operations for a 1978–1980 MCH rural health project, Honduras draw up specifications for a six-month MCH/FP project which was approved and put into operation, and Nicaragua and Panama prepare MCH/FP projects with the advice of short-term consultants.

Staff from PAHO’s divisions of family health and supporting services worked together in assessing the pilot service statistics system for integrated MCH/FP care in Jamaica. A draft proposal to evaluate the family planning program in Trinidad and Tobago was prepared.

As part of PAHO’s regional programs of continuing education in family planning program administration, a meeting was held at the University of the West Indies in Kingston to review progress and prepare a 1978 work plan for the Caribbean activities, and a workshop on the MCH services was held in St. Lucia in June. The Fifth Regional Course in Family Planning Administration was held at the School of Public Health of Mexico in September, and regional workshops on appropriate MCH/FP technology were held in Colombia, Costa
Rica, and Uruguay. A subregional seminar to evaluate MCH training in rural areas of Central America and Panama was held in El Salvador in May.

In the area of nursing-midwifery, PAHO staff evaluated three Brazilian programs to train traditional birth attendants in delivering primary health care to determine the practicality and acceptability of using such health workers in family planning and other MCH-related areas.

A collaborative research project with WHO was initiated in Ecuador and Honduras to train and supervise traditional birth attendants in communities where untrained midwives attend more than half of all deliveries.

Elsewhere, PAHO helped two Colombian universities field-test standards for normal deliveries by nurse-midwives and later distributed them throughout the Region. Training was provided to 25 nurses in Honduras on the expanded role of nurse-midwives in an eight-month modularized course on primary family health care that began in June. In Panama, discussions were held with teachers on the curricula for the postbasic MCH/FP nursing course with emphasis on primary health and its integration into the national MCH program. A workshop on modularized teaching and learning in MCH and midwifery was held at Washington, D.C., in October.

Funds were obtained to begin translation into Spanish of the publication Modular Teaching Resources in MCH in 1979. Three documents on the expanded role of the nurse were distributed to nursing-midwifery personnel throughout the Region. A publication entitled Labor and Delivery of Nursing-Midwifery Care Standards was likewise distributed.

A meeting of a PAHO working group was coordinated by nursing-midwifery staff to formulate appropriate technologies in maternal and child primary health care and was held at the Latin American Center for Perinatology and Human Development; 36 health professionals from Brazil, Colombia, Costa Rica, Guatemala, Peru, and Uruguay participated.
VI. FAMILY HEALTH

Latin American Center for Perinatology and Human Development

This internationally known perinatology institute at Montevideo, Uruguay, which joined PAHO’s family of research centers in 1970, continued the investigative, training, and advisory activities that have made it so influential in pre-, peri-, and postnatal care in Latin America and elsewhere. The main purposes of its research activities are the simplification, cost reduction, and quality improvement of perinatal care. Toward the end of the year the Center and Uruguayan health and university authorities signed a new agreement for continuation of operations under PAHO auspices during the period 1979-1982.

The Center’s project to standardize obstetric diagnosis and therapy in Latin America continued. The program embraced 32 institutions in 12 countries, and as the year ended two more countries (El Salvador and Guatemala) were about to join it. Through February the project’s staff had gathered data on the diagnostic phase of almost 39,000 births in six of the countries and information about more than 6,000 premature births. During the first half of the year visits were made to Brazil, Mexico, Panama, and Venezuela to introduce the project to new institutions.

In the training area, the Center offered its usual year-long course on the scientific fundamentals of integrated care of the mother, fetus, and newborn for fellowship holders from Argentina (2), Brazil (3), Chile (1), Colombia (2), Guatemala (3), Spain (1), and Uruguay (4). It also offered short courses for physicians on perinatal risk and electronic and biochemical monitoring techniques.

During the year Center staff spent 595 days as consultants in 17 countries in the Region and two in Europe.

NUTRITION

PAHO cooperated with the Governments during 1978 in carrying out national programs and projects in intersectoral food and nutrition planning, nutritional surveillance, nutrition in health services with emphasis on primary health care, prevention and control of nutritional deficiencies, nutrition education and training of personnel, and nutrition research.

Progress was made in formulating and carrying out national food and nutrition policies and programs in several countries with the assistance of INCAP (Central America), CFNI (the English-speaking Caribbean), and the Inter-Agency Project for the Promotion of National Food and Nutrition Policies (Bolivia, Chile, the Dominican Republic, and Haiti). A technical group meeting was held (Guatemala, November) to review food and nutrition planning methods.

Nutritional surveillance was strengthened through greater coordination and increased exchange of information with UNICEF, the U.S. Center for Disease Control, the U.S. National Academy of Sciences, and various academic institutions. Models for national nutrition information systems were developed and tested in Colombia, Costa Rica, Honduras, St. Kitts-Nevis, and Venezuela. PAHO staff helped organize a plenary session on nutritional surveillance at the XI International Congress of Nutrition and a joint session with the Latin
American Nutrition Society (Rio de Janeiro, August) to discuss formulation of a regional nutrition surveillance project.

PAHO continued to advise on an experimental project to provide integrated nutrition services in Colombia's regionalized health system. Assistance was given to Chile, Ecuador, Haiti, Jamaica, and Mexico in carrying out and evaluating supplementary feeding programs for vulnerable groups and hospitalized patients receiving World Food Program (WFP) aid.

With the assistance of national health authorities, PAHO updated statistical information on the prevalence of endemic goiter and energy-protein malnutrition. PAHO staff participated in meetings of the International Vitamin A Consultative Group (Campinas, Brazil, September) and the International Nutritional Anemias Consultative Group (Rio de Janeiro, September).

The IDB approved a feasibility study of the industrial production of a highly nutritious food mix (Acamil) in Haiti, a project for which INCAP was to provide assistance in establishing quality control standards.

A workshop on breast-feeding and infant nutrition (Brasilia, September) included representatives from Argentina, Brazil, Chile, Colombia, Costa Rica, Guatemala, Mexico, PAHO/WHO, and UNICEF. The final report was to be circulated to the Governments, research and academic groups, and appropriate international agencies.

Assistance was provided to several countries in making inventories of nutrition manpower and in reviewing under- and postgraduate training programs for nutritionist-dietitians and other health professionals. An international workshop (Guadalajara, Mexico, at mid-year) reviewed the integration of nutrition into health sciences curricula. A technical group meeting (Washington, D.C.) recommended educational materials in nutrition for the PAHO medical textbook program, including books for translation into Spanish.

Following the recommendations of PAHO's Advisory Committee on Medical Research, high priority was being given to research projects on nutrition and food sciences at INCAP and CFNI with the support of the Governments, international and bilateral agencies, and private foundations and institutions.

Institute of Nutrition of Central America and Panama

INCAP, at Guatemala City, continued to carry out its research, teaching, and technical consultation responsibilities, receiving substantial financial support from U.S. AID, the W. K. Kellogg Foundation, and PAHO.

Among the research projects carried out during the year were the following: that of basic foods investigated effects of environmental, agricultural, and genetic factors on the chemical composition and nutritive value of cereals and legumes; that of nutrient sources evaluated potential materials for human and animal nutrition and for the food industry; that of food technology studied development of food use processes that preserve nutritive quality and control

Many Latin American children suffer from malnutrition despite the market availability of basic staple foods. (Photo: WHO/P. Almasy)
the physical, organoleptic, and biologic deterioration of foods; and nutrition and infection studies aimed at elucidating the epidemiology of infectious diseases prevalent in Central America and Panama, determining the injury they cause, and identifying ways to increase host defense mechanisms.

Another activity was the attempt to characterize the gastrointestinal etiology of persons whose environmental sanitation and diet were poor, studying the prevalence and nature of malabsorption in such groups, developing methods for diagnosing digestive and malabsorption diseases, and cooperating with health ministries in solving poverty-related nutritional problems.

Other projects worth mentioning were those of clinical physiology and nutrition project; of control of vitamin A deficiency in Central America and Panama; of metabolism and nutritional requirements, which proposed to investigate metabolic changes resulting from malnutrition by identifying their causes and relationships with multiple deficiencies; of research in nutritional status and work productivity, including studies of the relationship between physical efficiency and modified diets; and of human growth investigations to examine the relationship between nutrition and various environmental factors in order to promote biologic, psychologic, and social growth.

The rural development project aimed at achieving better understanding of the effects of social variables on health and nutrition and prepared socioeconomic indicators to identify high-risk groups as well as evaluational methods and strategies.

In food and nutrition planning, the countries' institutional capacity was promoted and developed to identify and describe nutritional problems and their causes, formulate multisectoral plans for solving them, carry out specific interventions, train and advise responsible personnel, evaluate their interventions, and integrate relevant institutions.

Food and nutrition surveillance activities focused on stimulating multisectoral systems in this field and cooperated with the countries in designing, creating, and improving them; educating national authorities about the international surveillance system; and advising countries on system organization and operation.

Several training programs were carried out. The School of Nutrition and Dietetics whose students come from Central America and Panama, graduated 12 nutritionists, making for a total of 97 graduates since the School's founding.

INCAP's postgraduate course in public health, with a concentration on nutrition and maternal and child health, trained nine professionals who work in public health services or teach health or nutrition in Central America and Panama.

Its postgraduate courses in food science and technology and animal food science and technology, with a total of 24 Latin American graduates thus far, trained highly qualified personnel to work with governmental, academic, and industrial organizations.

The postgraduate course in human biochemistry and nutrition, which prepares health care practitioners and investigators to become instructors in health sciences schools, was attended by two students in 1978.

Tutorial instruction and research work in nutrition and food science was offered 84 advanced students, including 14 professionals. The United Nations University/INCAP advanced tutorial trained seven professionals—six from the Americas and one from Asia—in areas considered of high priority by the University's World Program Against Hunger to prepare them for teaching, research, or service activities.
Metabolic research and studies related to nutritional status of children and adults are carried out at the INCAP Clinical Center. (Photo: INCAP)

INCAP's biochemical laboratories assist in diagnosis and prevention of nutritional problems of the population. (Photo: INCAP)
Caribbean Food and Nutrition Institute

The main thrusts during 1978 in the activities of CFNI, located at Kingston and associated with PAHO since 1967, were collaborating with the Caribbean's less developed countries in establishing their food and nutrition policies, helping to restructure national nutrition advisory councils, and gathering preparatory data and working out methods for a food and nutrition plan to be applicable throughout the Caribbean Community.

CFNI's educational efforts increased when a nutrition educator joined the staff and greater emphasis began to be put on national seminars and workshops. During the year the Institute also began sending national health authorities monthly packets of nutrition information for distribution to newspapers in their countries.

Information dissemination continued, notably through publication of the quarterly *Cajanus* and of the deliberations of two technical group meetings, one of which produced *Guidelines for the Development of Food and Nutrition Councils in the Caribbean* and the other *Guidelines for Feeding the Weaning Age Group* (to be published in 1979).

CFNI placed greater emphasis than in earlier years on direct cooperation with individual countries through seminars and workshops, evaluation of school feeding programs, help in formulating requests to WFP for assistance in feeding programs for supplementary groups, and similar activities.

The St. Kitts-Nevis-Anguilla research project on food and nutrition surveillance continued, and by the end of the year data were being collected; findings from the project were to be available by 1980.

Anemia and suitable methods for screening people with it were studied.

The U.S. AID awarded CFNI a major grant to carry out activities in three areas: intermediate-level training, food and nutrition policy development, and production of educational materials. A grant was also received from the Ford Foundation for research associates, fellowships, and training workshops, seminars, and technical group meetings.

MENTAL HEALTH

PAHO continued to help the countries develop both general and specialized mental health programs.

The regional mental health adviser and two consultants visited Bolivia, Ecuador, and El Salvador to discuss the creation of mental health programs with senior health ministry officials. A draft plan was prepared for Bolivia and submitted to national authorities; written recommendations were presented to the other two countries.

Cooperation was provided to national mental health projects in Jamaica, Peru, Uruguay, and Venezuela and to other activities in the mental health field in Colombia, Costa Rica, the Dominican Republic, Ecuador, Honduras, and Trinidad and Tobago.

A workshop was held in August in Jamaica to evaluate mental health activities during the past 10 years. PAHO's input was analyzed, and priorities, particularly in manpower development, were established.

Assistance was given to the mental health section of the Peruvian Ministry of Health in organizing three training courses
on family therapy, psychiatry for general practitioners, and child psychiatry. The Fifth Peruvian Congress of Psychiatry examined and made recommendations on the national mental health program. Six fellows were trained in epidemiology, treatment methods, and the organization of drug abuse services in Peru.

A consultative group on strategies for mental health program development in Latin America met in Cali, Colombia, in April to inaugurate the WHO Collaborating Center in Mental Health there. In Washington, D.C., the U.S. National Institute of Drug Abuse was designated a WHO Collaborating Center in Drug Dependence Research and Training.

In specialized areas of mental health, PAHO collaborated with Argentina, Costa Rica, Ecuador, Honduras, Mexico, and Peru in developing drug and alcohol abuse control programs. Final reports from the alcoholism study being conducted in five Latin American cities—São Paulo, Bogotá, San José, Santo Domingo, and Caracas—were completed. The PAHO drug abuse adviser and a consultant visited Argentina, Mexico, and Peru to develop bases for a drug abuse monitoring and surveillance system.

A PAHO consultant visited Argentina to advise the Directorate of Mental Health on organizing services for the mentally retarded, and in Colombia PAHO helped the Ministry of Health's mental health unit review standards for occupational therapy and psychiatric services in general hospitals.

DENTAL HEALTH

PAHO staff consulted on national dental health programs with health ministry officials in Colombia, the Dominican Republic, Guyana, Mexico, Panama, and Trinidad and Tobago. Technical collaboration was provided to Mexico State and to western Venezuela in developing dental service extension programs and in providing administrative structures for such services.

Staff members visited Costa Rica and Panama to assist in extending rural dental programs. In the Dominican Republic they helped start a project to provide dental care to rural populations. A preventive program for children was initiated in Bermuda, and assistance was provided to children's dental programs throughout the Caribbean.

A study of dental caries in two towns and an investigation of plaque in communities with high and low caries incidence were carried out in Colombia.

DENTAL HEALTH STATUS. A new system for evaluating dental health status, particularly caries, was initiated. The Application of the International Classification of Diseases to Dentistry and Stomatology was translated into Spanish and began to be field-tested, and local meetings were held in Colombia and Peru to discuss the application. Meetings were held with dental advisers at the Johns Hopkins University and the University of Maryland's School of Dentistry (USA) on new methods of evaluating dental health status.

FLUORIDATION. Short courses and seminars on fluoridation were held in Lima in August, and in La Paz and Arequipa, Peru, in September. Articles on fluoridation, particularly of salt, were distributed throughout the Region. A draft document for a fluoridation program in Brazil was prepared and reviewed, and tests of simplified equip-
Dental education. Courses on the use of audiovisual materials in training dentists were conducted at CLATES, Mexico, and the Federal University of Rio Grande do Sul, Porto Alegre, Brazil. A small assistance grant was provided to the School of Public Health at Monterrey, Mexico, for the Master's degree program in dentistry being conducted there. The annual meeting on innovations in dental education was held at Lima in October with 85 representatives from Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Guatemala, Mexico, Panama, Paraguay, and Venezuela. Additional activities in dental education included preparation of an index to dental literature in Spanish and dissemination of selected experiences of recent years in dental education and service in Latin America published in Educación médica y salud.

Auxiliaries. A proposal for assistance to countries with auxiliaries in training at the Dental Nurses School in Trinidad was prepared and submitted to UNDP. Technical cooperation was also provided to dental auxiliary training programs in Guyana, Jamaica, and Suriname.

Equipment. Discussions related to new dental equipment were held with the U.S. National Aeronautics and Space Administration and the Red Cross in Milwaukee, Wisconsin. New generator compressors for rural use were sent to Panama for field-testing. Discussions about the development of simplified dental equipment were held in Costa Rica and Guatemala and with a major equipment manufacturer in the United States of America. Cuba and Mexico expressed interest in the development and use of simplified equipment.

Many of the countries have emphasized integration of dental health in family health programs. (Photo: Metropolitan Autonomous University of Mexico, Xochimilco Campus)
PAHO participated in the second Andean Pact meeting on traffic accident prevention (Guayaquil, Ecuador, 4-7 December), with participants from the health, education, and transportation sectors of Bolivia, Chile, Colombia, Ecuador, Peru, and Venezuela.

Technical assistance was provided to Argentina in carrying out its traffic accident prevention project.

At the request of its European Region office, which WHO has designated the focal point for a global program to prevent traffic accidents, PAHO undertook to coordinate accident prevention efforts in the Americas with other WHO Regions. PAHO staff prepared a questionnaire for a study of traffic accidents in developing countries to be conducted in 1979 before an international traffic accident prevention conference scheduled for 1980.
VII. HUMAN RESOURCES

MANPOWER PLANNING AND ADMINISTRATION

Manpower Planning

Complying with recommendations of its Governing Bodies and of the Special Meetings of Ministers of Health of Central America and Panama and of the Andean Pact, PAHO cooperated with the Colombian Ministry of Health in preparing and holding at Bogotá the First International Course on Human Health Resources Planning. The manpower units in the health ministries of Colombia, the Dominican Republic, Ecuador, Honduras, Nicaragua, Paraguay, and Peru helped organize the course. Twenty-five officials of various national health manpower units and instructors in public health attended. The course enabled the theoretical and practical relationships between socioeconomic, health, education, and health manpower planning to be clarified.

PAHO collaborated with the secretariat of the Andean Pact and the Ministries of Health of Bolivia, Costa Rica, Ecuador, Peru, and Venezuela in preparing and holding the meeting of the Pact's Advisory Committee on the Development of Human Resources. The meeting approved a program of joint activities by the member countries for developing national health manpower statistical systems, manpower research and information exchange, and personnel training. Venezuela took charge of coordinating activities during 1978–1979. Special stress was put on training intermediate-level technical workers.

As its contribution, PAHO began consultations with the health ministries of Colombia, Ecuador, and Peru to establish the technical bases for a common system of statistical information about the training and use of health workers. The participating countries were to design and begin testing the system in 1979.

Education and Training in Health Care Administration

In Latin America and the Caribbean, the unceasing demand for health care, the varied complexity of its levels and procedures, and its increasing cost collide with the reality of too few and inadequately trained professional and intermediate-level health administrators.

PAHO cooperated with Argentina, Brazil, Chile, Colombia, Costa Rica, Cuba, Jamaica, Mexico, Peru, Puerto Rico, the United States of America, and Venezuela in strengthening the Region's present 45 health administration training programs and courses, which produced 1,650 graduates during the year. Technical cooperation focused on activities to form a critical
mass of 350 full-time and 1,000 part-time professors. Among these activities was the Regional Didactic Seminar for Professors in Advanced Health Administration Programs at CLATES, Rio de Janeiro.

PAHO also cooperated with 14 other countries without regular programs for training in health administration by providing more fellowships and organizing and developing intensive, large-scale, and progressive courses on administration for senior and middle-level executives.

Continuing education in this specialty was given particular attention. A regional seminar on continuing education in health administration in Latin America and the Caribbean was held at Santiago, Chile, with the financial support of the W. K. Kellogg Foundation.

Continuing Education

As directed by the XIX Pan American Sanitary Conference (CPS19.23), PAHO continued to support various continuing education programs for health workers in order to improve their training, broaden their horizons, ensure their permanence, and orient them toward extended health services coverage.

With the financial assistance of the Canadian International Development Agency, PAHO initiated a regional program to strengthen the administrative, teaching, and operational infrastructures necessary to develop permanent continuing education systems for all health workers. With PAHO's collaboration and as the project's first, 1979-1982 phase, activities were begun in Bolivia, Colombia, Cuba, the Dominican Republic, Ecuador, Guatemala, and Honduras.

Although each country adopted the methods best suited to it, all the projects without exception focused their health workers' continuing education on the extension or strengthening of health services coverage by giving priority to primary health care through regionalization of services.

Special importance was attached to the comparative nature of this technical cooperation among the participating countries, and it was expected that the experiences and advances it would generate will be analyzed, systematized, and placed at the disposal of other countries.

As part of this project, PAHO prepared for dissemination a Guide for the Organization of Continuing Education Programs for Health Workers which, through discussions with national groups, was adapted to Latin America and the Caribbean.

HUMAN RESOURCES DEVELOPMENT

The countries have increasingly emphasized activities to improve both the amount and quality of training available in various health disciplines in order for their health services to broaden the coverage they offer their peoples. To achieve these goals, PAHO has cooperated in developing programs geared to specific national needs.
Institutional and Program Development

PAHO worked with the countries during 1978 to integrate the development of their health education institutions through three- and four-year programs which include construction or modernization of facilities, purchase of equipment, reorganization of administrative and academic structures, and training of professional, technical, and auxiliary personnel.

PAHO's policy is to advise that training activities take place as closely as possible to health care services in order to bring about greater integration of learning and service. During 1978 such training activities were almost always carried out as part of projects financed by institutions such as IDB, UNDP, or foundations that supported the health sector and in which PAHO served as the executive agency.

In Bolivia, assistance to the programs of the Faculties of Health Sciences at Cochabamba, La Paz, and Sucre continued. The First National Workshop on Education in the Health Sciences was held at Coroico in December.

In Central America and Panama, activities to integrate health education and care provision, including obligatory rural service for newly graduated physicians, received significant help from PAHO.

At the request of the Dominican Republic's Secretariat of Public Health and Social Welfare and the Catholic University of Santiago de los Caballeros, PAHO provided advice on first-phase activities in an IDB-financed project to complete the administrative, teaching, and service structure of the Faculty of Health Sciences and the Biomedical and Operations Research Center in Santiago.

The Ministry of Public Health of Ecuador received assistance in preparing the basic document needed for requesting an IDB loan to finish organizing its network of health services and training of technical and auxiliary personnel. In Honduras, advisory assistance was completed to the Tegucigalpa Teaching Hospital and the Health Sciences School of the National University. The project was financed with nonreimbursable IDB technical assistance funds.

Several national and local meetings were held in Mexico to discuss various aspects of the educational process, and advice was provided to teaching institutions such as the Metropolitan Autonomous University and the Faculty of Medicine of the Autonomous University of Guadalajara.

In Nicaragua, PAHO acted as IDB's executive agency in a project to modernize the Medical Campus of León and the structure of the National University's Faculties of Medicine, Dentistry, Pharmacy, and Medical Technology. IDB authorized a one-year extension for the project in order to complete its activities.

The integration of teaching and care in Peru was furthered with PAHO assistance by the inauguration of a special civil service corps in which new graduates in medicine, nursing, dentistry, pharmacy, and obstetrics must spend a year in rural practice to be awarded their degrees. This program is under university supervision and receives PAHO's financial and technical support.

PAHO provided technical cooperation in carrying out the health sciences plans and programs of the Universities of the West and Midwest in Venezuela and, within the Andean Pact, to programs to train medical technicians in Bolivia, Chile, Colombia, Ecuador, Peru, and Venezuela. PAHO-assisted workshops on teaching and care integration were held in Argentina and Chile, where PAHO cooperated in organizing programs and committees to plan curricular and organizational changes in health sciences schools.
PAHO cooperates with the Governments in the education and training of professional, technical, and auxiliary personnel. (Photos: WHO/O Globo Photos, WHO/J. Littlewood)
Educational Development for Health

With the support of a grant from the W. K. Kellogg Foundation to the Pan American Health and Education Foundation, PAHO began the Latin American Program for Educational Development for Health (PLADES) in 1976 by creating Nuclei of Research and Development in Education and Health (NIDES). This Program brings together people from teaching and service institutions and conducts activities to achieve better coordination between health and educational systems.

At the same time new models for improving the extension of coverage were tested, and improvement of programs to train personnel at all levels was promoted in several countries. In Brazil, the Ministry of Health, through the Program of Strategic Preparation of Health Personnel (PPREPS), made major efforts along these lines. The existence of regionalized health systems in Chile and Cuba facilitated the execution of such programs in those countries.

By the end of 1978 help had been given to 12 NIDES in Bolivia, Brazil, Costa Rica, the Dominican Republic, Honduras, Mexico (3), Nicaragua, Paraguay, and Venezuela (2).

PLADES continued to be a prime example of PAHO’s technical cooperation strategies. Also in preparation was a mechanism for continuing exchange and consultation among the various Nuclei and studies of the countries’ needs in technical and auxiliary personnel and rural internship programs. The health and education authorities of the Americas have shown interest in the methods used in this project, and several Nuclei were converted into broader community health and learning-service programs.

Medical Education

In the field of medical education, PAHO’s cooperation with the countries was mostly in helping develop specific instructional areas and providing support to individual medical schools in advancing their academic programs. The former area of cooperation covered the basic medical sciences and their coordination with the clinical and social sciences, epidemiology, and maternal and child health. The activities ranged from participation in reforming curricula to the design of interdisciplinary studies—as in the case of maternal and child health, a field in which eight studies were carried out and five new projects prepared.

Technical cooperation, equipment, and educational materials were provided to individual medical schools in Bolivia, Chile, Costa Rica, Cuba, the Dominican Republic, Honduras, Jamaica, Mexico, Nicaragua, Paraguay, Peru, and Uruguay. PAHO continued its consultation on integrated teaching and care programs at the Universities of Guadalajara, Hidalgo, Coahuila, and Yucatán, Mexico; National Autonomous of Nicaragua; Autonomous of Santo Domingo, Dominican Republic; Central of Ecuador; San Marcos and Cayetano Heredia of Peru; San Francisco Xavier, Sucre, and San Simón, Cochabamba, Bolivia; and National of Asunción, Paraguay.

PAHO’s Basic Principles for the Development of Medical Education in Latin America and the Caribbean Area (PAHO Scientific Publication No. 341) was widely distributed and continued to be a basis for discussion of this subject at national meetings.

PAHO continued cooperating with the University of the West Indies, Kingston, in carrying out the policies laid down by the committee on medical education for the
Figure 5. Physicians, nurses, and other nursing personnel per 10,000 population in countries of the Americas, 1977 or latest year.

<table>
<thead>
<tr>
<th>Country</th>
<th>Ratio per 10,000 population (a)</th>
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<tbody>
<tr>
<td>Argentina 73</td>
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<td>Guatemala 76</td>
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(a) Data for some countries may refer only to personnel working for the government.
English-speaking countries of the Caribbean, which proposed bases for reforming the teaching of medicine and better relating it to the health programs of those countries.

A seminar cosponsored by the World Medical Education Federation and the Pan American Federation of Medical School Associations was held at Caracas. Representatives from health services, social security agencies, universities, and medical schools from all the countries attended. The meeting dealt with the relationships between medical education and health services, and its report was being widely distributed.

Nursing Education

The countries were trying to assign nursing personnel increasing responsibility in providing primary care services and in training and supervising community health workers, whose participation is essential to solving the urgent problems of coverage extension and primary care. They were also attempting to bring nursing resources in line with the present and future requirements of their health services. PAHO's cooperation was requested to accomplish both of these goals.

PAHO assisted the Region's nursing schools in creating strategies that include instruction close to the service system to coordinate teaching and care activities; revision and reorganization of curricula to introduce the community health and primary care concepts; creation of short and refresher courses according to the priorities of the services; training of new auxiliary health workers for both the traditional and community care systems, and development and initiation of new educational technologies.

In some countries the rapid increase in the production of nursing personnel exceeded the ability to absorb them. During the year an incipient trend toward under- or unemployment of nurses and nursing auxiliaries was perceived that indicated shortcomings in manpower planning and warrants joint action by the educational and service delivery systems.

The broadening of nursing's role, as one means of extending coverage, requires better use of nursing personnel in primary health care and means a change in their duties from an administrative focus to one that is primarily clinical. Upgrading the clinical competence of nurses would allow them to assume greater responsibilities in dealing with common health problems and would include diagnostic and therapeutic decision-making in nursing practice.

Some countries gave official support to such projects (Costa Rica, Guatemala, Jamaica, Nicaragua, and Trinidad and Tobago), and many incorporated instruction in these new functions in the basic curriculum of their nursing schools.

As part of the technical cooperation PAHO provided in 1978, a series of short courses, workshops, and seminars on curriculum revision in Latin America and the Caribbean was held.

The training of teaching personnel for the various educational programs was conducted chiefly through short courses, in-service education, and academic fellowships.

Education in Engineering and Environmental Sciences

PAHO's program of continuing education in sanitary engineering went on throughout the year. Intensive short courses and seminars on sanitary engineering and environmental sciences subjects, organized jointly by PAHO and the countries, were given in all six of the Organization's Areas. Ex-
Examples of such educational activities were courses on water and wastewater treatment plant operations (Jamaica); ecology, engineering, and environmental protection (Venezuela); collection, transport, and disposal of solid wastes (Mexico); and monitoring drinking water quality (Costa Rica). Others were the Andean subregional seminar on environmental health (Peru); the Third Latin American Course on Urban Sanitation (Argentina); a chlorination seminar (Chile), and a course on special solid wastes (Uruguay).

CEPIS at Lima continued to have an active training role that included organization of seminars, dissemination of technical and scientific information, and planning and execution of educational activities.

Basic information was collected through a systematic inventory of human and physical resources to facilitate the formulation of a $1.3 million water supply and sanitation project in Peru to be financed by that country's Government and IDB.

Several activities were begun to reorient PAHO's training activities in environmental engineering toward the broader concept of human resources development. Principal among such activities were consultation meetings to lay the groundwork for a 1979 symposium on environmental manpower development and especially the promotion of basic sanitation. The overall goal of the symposium is to provide practical working guidelines incorporating all the elements of a comprehensive manpower development program.

Education in Public Health and Social Medicine

The exchange of experiences and the opportunity to discuss topics of common interest among public health teaching institutions was achieved through activities in collaboration with the Latin American Association of Public Health Schools (ALAEPS). In conjunction with this association, a subregional meeting dealing with health services research was held in Brazil. Plans were made for the X Conference of Public Health Schools to be held in 1979.

Greater coordination in ongoing research and the exchange of professors and teaching experiences were promoted.

Training in public health was strengthened through postgraduate programs in public health and social medicine in several of the Region's universities which have been conducting scientific investigations in public health and preventive medicine. PAHO stimulated such programs as well as the development or consolidation of preventive and social medicine departments which, in addition to their undergraduate activities, extended their radius of activity into postgraduate training and health research. Cooperation continued in the exchanges among the 25 postgraduate programs offering Master's degrees in public health and preventive and social medicine.

Encouraging undergraduate instruction in the preventive and social aspects of medicine has been one of PAHO's important endeavors and produced curricular changes and the introduction of extramural teaching models in medical schools and in many health faculties. The resulting experience was made known through a volume on teaching preventive and social medicine, a recounting of 20 years of experience in Latin America (PAHO Scientific Publication No. 324), which was distributed and used as a basic document at national meetings for reforms in this area.

Special attention was also given to training in public health, health administration, and epidemiology. Direct assistance was provided to the public health schools in Argentina, Bolivia, Brazil, Chile, Mexico, Peru, and Venezuela.
Training Intermediate-level Health Workers

Health services wishing to extend their activities and achieve universal coverage, as called for in the Ten-Year Health Plan for the Americas, need to rely on a new type of intermediate-level technician trained to carry out innovations in health practices, institutional work, and activities in marginal urban and rural areas.

PAHO cooperated with the countries in two activities in this sphere. The first was obtaining a wider perspective of the problems in training such workers, training centers, their working conditions, legal status, and occupational levels, and the nature of the centers that train them. The other was defining criteria and alternatives for carrying out regional, intercountry, and national programs.

PPREPS, a major effort of the Ministry of Health in conjunction with the Ministry of Education and Culture and support from PAHO, promoted up-to-date training of intermediate-level and basic health personnel according to the needs of Brazil's services. The program is based on health teaching and care regions as a strategy for extending coverage, and the integration of health manpower with state sectorial planning systems.

In collaboration with the Governments of the English-speaking Caribbean countries and with UNDP funds, PAHO participated in the second phase of the auxiliary personnel training project in that area. The project, which is based on a network of educational institutions in the Caribbean, aims at training necessary workers in accordance with previous studies of manpower requirements. A contribution from Canada for second-phase activities allowed scholarships to be offered to train 75 more candidates from the Caribbean area's less developed countries.

PAHO continued to cooperate with the National Directorate of Intermediate Medical Instruction of the Ministry of Public Health in Cuba in preparing a retrospective study of changes in that field, in formulating bases for a national system of intermediate medical teaching for 1976–1980, and in the year's execution of the 1976–1980 plan.

A study was conducted in Costa Rica and Honduras of intermediate-level technician training in order to analyze the nature of such workers’ training, practice, and technical and social relationships, identify workers in this category who perform health duties by investigating their practices, training, and relationships with health teams, and retrospectively evaluate the origin, development, and relationship of such workers to the labor system.

In the Dominican Republic’s health regions 2 and 3, PAHO took part in the first year of a project to train professional, technical, and auxiliary health workers together.

In Mexico, assistance was given to the Secretariat of Public Education and the Subsecretariat of Planning in the Secretariat of Health and Welfare in drawing up a national project for training intermediate health technicians. The project’s fundamental goal is to help raise health levels in the country’s critical areas. As a preliminary to this activity, a study was carried out in Greater Mexico City of the characteristics of intermediate technician training centers at 11 institutions.

Training in Supervision and Consultation in Local Health Units

In 1977 the Directing Council approved a project to train local health unit supervisors as part of the WHO Director-General's Development Program.
This regional project is carried out nationally since it attempts to develop the countries' existing capacity to carry out such training. Its objectives are to train or reorient needed local health unit supervisors and consultants for each of the participating countries.

The first six countries to be included in the project—Costa Rica, the Dominican Republic, El Salvador, Guatemala, Honduras, and Nicaragua—were chosen on the basis of their health coverage extension programs, training needs, and ability to form a subregional network of national projects to allow for the exchange of experiences.

They began their participation in the project by undertaking a study to define the objectives of supervision, the functions and activities the personnel to be supervised carry out, standards governing the number of persons to be supervised, the situation in the local units, means of communication, and the numerical relationships between supervisors and supervised which each country wants to achieve—in other words, everything involved in planning supervisory manpower. At the same time, detailed descriptions of the supervisory and consulting activities to be conducted in the primary care area were prepared for each country. It was also suggested that the participating countries' investigate the possibility of producing instructional materials for the program locally.

Each of the countries began this investigation during the second quarter of 1978. The first coordinating meeting of national representatives was held at Guatemala City in August in conjunction with PAHO's continuing education project in order to determine the points of contact between the two programs and undertake joint planning. The purpose of the meeting was to test criteria, analyze methods, and coordinate tasks among the participating countries. Each of them reported on progress achieved in the investigation.

General and country agreements were later made for continuing the program and completing the investigation. It was also decided which national representatives would attend a workshop (CLATES, Rio de Janeiro, 30 October-22 November) for training in the educational methods needed to plan, carry out, and evaluate the training of supervisors. Costa Rica sent five representatives; the Dominican Republic, six; El Salvador, five; Guatemala, six; Honduras, five; and Nicaragua, four; seven representatives of the Secretariats of Health of Pernambuco, Bahia, and Minas Gerais States, Brazil, also attended as special guests. The supervisor training projects to be conducted in the six countries in 1979 were designed at the workshop.

TECHNOLOGIC RESOURCES

The purpose of PAHO's technologic resources program is to support the other manpower programs and in general all the educational activities that PAHO conducts in the countries. During 1978 special emphasis was placed on methodologic support of various educational projects rather than direct activity in this area.

Both the Regional Library of Medicine and Health Sciences (RLM) in the information and documentation area and the Latin American Centers for Educational Tech-
Access to scientific and technologic information benefits the development of adequate human resources and teaching-service activities. (Photo: F. Escobar, University of the Conception, Chile)

technology in Health (CLATES) in the educational technology area have developed technical cooperation programs so that countries requesting their help can develop their own teaching-learning projects according to their own needs and realities.

IDB approved a new loan to PAHEF which would allow the PAHO Textbook Program to expand to cover all the health professions, and manuals, teaching modules, and other audiovisual materials to be prepared for technical- and auxiliary-level students and for communities themselves. This area also saw a change in orientation toward trying to promote the local production of these instructional materials.

The quarterly PAHO periodical Educación médica y salud was important in disseminating the thinking of Latin American and Caribbean authors about health worker training.
Regional Library of Medicine and the Health Sciences

RLM at São Paulo continued carrying out the policy adopted at the end of 1976 of becoming an information and documentation center to support health programs in Brazil and other countries in the Region. The strategy was along two basic lines: the development of an efficient basic infrastructure to enable RLM to fulfill its responsibilities as the principal library in the Latin American and Brazilian information network and the undertaking of new programs.

RLM's 1978 activities included:

- The MEDLINE computerized bibliography system was expanded through installation of terminals in Bahia and Belo Horizonte under agreements with the universities there.
- Indexing began in January of 300 Latin American journals as the first step toward regular publication starting in 1979 of a Latin American Index Medicus.
- Publications continued to be issued. No. 1, Maternal and Child Health, was reissued, and 1,500 copies each of Nos. 2, Rural Health; 3, Traditional Medicine; and 4, Primary Care, were published and distributed largely through PAHO's country representatives. The Spanish and Portuguese versions of the publication Standards for Hospital Libraries in Latin America were reissued in printings of 1,000 copies each.
- At the request of the Brazilian Ministry of Education and Culture, new RLM subcenters were created at Natal, Paraíba, Espírito Santo, and Piauí.
- RLM continued its cooperation with countries in Latin America through teaching, advice, provision of bibliographic material, and visits. A seminar on health information at Lima, at which 70 participants attended, analyzed experiences and evolution of national health-information centers.
- The dissemination of selected information about cancer and nutrition was emphasized. At its request, proposals for other selected information dissemination programs about maternal and child health, public health dermatology, mental health, and neonatology were sent to the Brazilian Ministry of Health.
- The installation of the Digital PDP 11 enabled routine work in certain specific programs and RLM's administration to be automated and experience to be acquired for more ambitious projects such as the Latin American Index Medicus and the nonperiodic information program.

During 1978 RLM served 164,100 users, provided 1,418 requested bibliographies (1,186 through MEDLINE and 232 manually), and received 47,128 requests for photocopies of articles, of which it processed 39,100 itself (the U.S. National Library of Medicine at Bethesda, Maryland, and other libraries in the network provided the rest).

RLM's Scientific Advisory Committee met for the 10th time. Among its agreements and recommendations, it requested RLM and PAHO to make a new survey of national health information needs and of the possibility of their being solved by the countries themselves with RLM cooperation. Financial assistance for the survey was requested from UNDP.

Educational Technology

Educational technology is the basic responsibility of PAHO's Latin American Centers for Educational Technology in Health at Rio de Janeiro (CLATES-Rio) and Mexico City (CLATES-Mexico). The nursing technical education program at CLATES-Rio is complementary to and more specialized than the two CLATES programs. P克莱, with its Nuclei of Research and Development in Education and Health, and the dentistry innovations program are also part of this effort to disseminate modern teaching methods in the health field.
Latin American Center for Educational Technology in Health, Rio de Janeiro

During the year the various sectors covered by CLATES-Rio fulfilled different goals.

The teaching improvement sector was responsible for planning and providing courses, seminars, symposia, advice, and other activities related to instructor training. Sixteen regular courses attended by 290 instructors were given. These courses covered the strategy of large-scale training, teaching of upper-level work, educational evaluation, educational group dynamics, modularized teaching, basic audiovisual methods in education, simulations in education, curricular organization, and the use of computers as an instructional tool. In addition to courses held at CLATES, five others for a total of 138 instructors were given elsewhere in Brazil, six elsewhere in Latin America (Colombia, 2; Ecuador, 1; and Peru, 3) and one at PAHO Headquarters—for a total of 266 instructors.

Two seminars were also held: one was a three-week workshop in November to train instructors of local health unit supervisors, and the other was a seminar for instructors in advanced centers of health administration which had 21 Latin American participants.

The sector is also responsible for activities pertaining to the Master's degree program in education with concentration on educational technology, which the Nucleus of Educational Technology for Health and the Federal University of Rio de Janeiro's School of Education began in August with 13 students. This program is open to instructors from Brazil and other Latin American countries.

Advice was provided to training programs and institutions in Brazil, Chile, Colombia, the Dominican Republic, Ecuador, Honduras, Peru, and Venezuela.

The educational research sector continued with various projects, including an analysis of the use of educational technology at the Federal University of Rio de Janeiro.

In the audiovisual aids sector, 37 students (23 from Brazil and 14 from other Latin American countries) in two specialty courses produced eight educational programs (four filmstrips with sound and four videotape programs) as the final product of their apprenticeship. These were part of the Center's total production of 83 educational programs, of which 19 were videotape and 15 were filmstrips with sound. CLATES-Rio's instructional material was requested by 9,015 persons during the year.

The educational resources sector, which is part of the Library of Educational Resources of the Federal University of Rio de Janeiro's Faculty of Medical Sciences received requests for borrowings at an average monthly rate of 484 for videotapes, 110 for audiotapes, and 176 for filmstrips with sound.

Latin American Center for Educational Technology in Health, Mexico City

During the year CLATES-Mexico devoted itself mostly to an internal reorganization which would better enable it to deal with the educational problems of the other countries in the Region.

The Center provided advice on specific educational topics to the National Autonomous University of Mexico, the Mexican Ministry of Public Education, and other state universities and service institutions. It also provided advice to training institutions in Argentina, Chile, Peru, Uruguay, and Venezuela.

CLATES-Mexico continued to prepare
VII. HUMAN RESOURCES

and distribute learning and reference materials adapted to local conditions and the requirements of basic and continuing education. It also continued developing computer-based methods and systems to evaluate the teaching material used in several universities.

Finally, it kept up to date its bibliographic collection, which includes microfiche documentation for answering requests for printed material and specialized bibliographies on education produced by various training institutions in Mexico and other Latin American countries. The department of educational information also distributed bibliographic newsletters, self-instruction materials, and abstracts from journals on educational topics to health sciences schools and hospitals in Mexico and other countries.

Educational Technology in Nursing

This program is a network of national centers supported by the W. K. Kellogg Foundation. Its purpose is to train instructors in Latin American nursing schools in educational technology by holding courses, seminars, and workshops to produce instructional materials basically through the modular system with the direct technical cooperation of project personnel. Nine courses or working meetings were held with the national centers composing the network; 268 persons attended these courses or meetings, which were held at the nursing educational technology centers at Bahia and Belo Horizonte, Santiago, Bogotá and Cali (2), San José, and Quito (2). A total of 74 days of technical cooperation were provided to the centers.

 Provision of Instructional Materials

This technologic resources program area consists of the textbook programs for students of medicine and nursing and the basic clinical diagnosis equipment program for medical and nursing students. Following the approval in November of a new $5 million IDB loan to PAHEF, the program was to be extended to cover all undergraduate students in the health sciences (dentistry, veterinary medicine, sanitary engineering, health administration, nutrition, and obstetrics) and students in intermediate-level and auxiliary health worker training programs. Special emphasis has been given in this broadened program to the last two categories by promoting local production of manuals, modules, and other instructional materials such as audiovisual aids.

One of the objectives of the expanded program is to get communities themselves to prepare instructional materials for training local health workers.

Medical Textbook Program. During 1978 the program offered 18 titles in Spanish only, two in Portuguese only, and five in both languages. The books were available through 156 participating schools, as opposed to 150 in 1977. Textbook sales totaled 90,000—about the same as in 1977.

On the basis of student enrollment in each country, the program’s greatest success appeared to be in Central America, Colombia, and Venezuela. Sales were somewhat disappointing in the largest countries—Argentina, Brazil, and Mexico—though these results were in part understandable because of administrative problems in the first two countries and the relative scarcity of books in Portuguese for Brazil. Although the textbooks continued to be available in Peru at about half the commercial price, the devaluation of that country’s currency put the program’s books out of reach of many of its medical students. Long-standing administrative difficulties in Ecuador persisted, but at year’s end it seemed that their solution was finally in the offing.

Two new titles were added to the pro-
gram's list during the year, *Pediatria básica* by Alcântara and Marcondes and *Prioridades en salud infantil* by Morley. The former, by Brazilians, was included to better meet the needs of Brazilian students. The latter was included to give advanced clinical students an introduction to the special pediatric needs of developing nations.

Most of the program's textbooks continued to be widely accepted, and for the first time there were some indications that certain schools were beginning to use the textbook by Passmore and Robson presenting an integrated view of medical specialties.

**Nursing Textbook Program.** Preliminary results showed that about 10,500 textbooks were sold through 137 participating schools during the year, somewhat fewer than in 1977. No new titles were added because of production delays, but translation and preliminary processing was completed on three new textbooks, Fitzpatrick-Reeder's *Enfermería maternoinfantil*, Travelbee's *Intervención en enfermería psiquiátrica*, and Morgan and Moreno's *La práctica de enfermería en salud mental*.

As in the case of the medical textbook program, the nursing program appeared to excite the greatest student and teacher interest in Colombia and parts of Central America, with lesser acceptance in Argentina and Mexico. The lack of Portuguese titles continued to hurt sales in Brazil. The transfer of the secondary-level nursing program in Venezuela from the old national schools to the technical high school system forced a temporary suspension of sales in that country (except at the universities), but contacts were made with governmental authorities to enable the technical schools to take part in the textbook program.

**Medical Instrument Program.** The number of stethoscopes, aneroid sphygmomanometers, and otoophthalmoscope diagnostic kits distributed was about the same as in 1977 except in Ecuador and Mexico, where administrative problems resulted in complete suspension of the program. New financing from IDB was expected to improve earlier distribution problems and enable the program to be resumed in Mexico, but no immediate solution seems likely in Ecuador. The additional funding was expected to also allow other basic instruments such as dissection kits to be distributed.

**Fellowships**

The combined fellowship activities for the Americas and for other WHO Regions in this Hemisphere rose 7.5 per cent over the previous year. AMRO awards from all sources of funds increased from 1,191 in 1977 to 1,249 in 1978. The number of fellows from other Regions who were placed for study and observation in this Region rose from 203 to 250, making a total of 1,499 fellowships processed during the year. The actual number of fellows who were in active status under the administrative and technical supervision of PAHO increased from 1,837 to 1,956.

The 1,249 fellowships awarded in the Americas respond to the priorities expressed by the Governments. Thus, 24 per cent were in public health administration, 19 per cent in communicable diseases, 19 per cent in other health services, 12 per cent in medical education and related sciences, 10 per cent in sanitation,
Table 2. Fellowships awarded in the Americas, by country of origin and type of training, 1978.

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Total 329 321 599 1,249

8 per cent in nursing, and the remaining 8 per cent in clinical medicine and maternal and child health.

PAHO continued its policy of placing fellows in areas where environment, language, and health conditions were similar to those of their home countries. Accordingly, 67 per cent of all fellowships were granted for study in Latin American countries; 16 per cent in the United States of America, Puerto Rico, or Canada; 9 per cent in the English-speaking Caribbean countries, and 8 per cent in other regions of the world. The latter were mostly for international courses organized or aided by PAHO.

Inflation continued to be reflected in the overall cost of fellowships, with partic-
ular effect on long- and short-term fellowships for study in Latin America and the United States of America. The average cost of a long-term award in the United States of America or Canada rose from $8,486 in 1977 to $8,905 in 1978 and in Latin America from $5,033 to $5,276. Short-term awards for study in the United States of America or Canada rose from $2,155 to $2,572 and in Latin America from $1,619 to $1,859.

The largest percentage of fellowship grants was in the category of short-term awards of less than six months' duration (48 per cent), followed by long-term awards averaging 10.7 months in the United States of America and 11.3 months in Latin America (16 per cent). Group courses organized or assisted by PAHO also represented 26 per cent of all awards made.

There was a 7 per cent increase in the number of requests for fellowships—1,683 as compared with 1,583 in 1977. Of the former, 77 per cent were satisfied as compared with 75 per cent in 1977, for a total cost of $3,947,048 from all sources of funds as follows: 591 fellowships from PAHO funds in the amount of $2,143,403; 535 from WHO funds for $1,422,300, and 123 from technical assistance funds for $381,345. The 1,249 fellowships granted totalled 5,365 fellowship-months as compared with 4,926 in the previous year, at an average cost of $736 per fellowship-month for all categories of study combined.

The expansion of PAHO's computer capacity considerably improved the retrieval of fellowship statistical data. Although the data required for the Directory of Training Programs in Latin America and the Caribbean were collected, final computerization was delayed because of organizational and screening difficulties.
PAHO's research program, which completed its 17th year of operation in 1978, spans all fields of human and animal health. Its basic purpose is naturally the betterment of health in the Western Hemisphere, which implies special attention to those conditions that adversely affect health in Latin America and the Caribbean. Moreover, many of the advances resulting from the investigations in which PAHO participates as grantor, grantee, or collaborator have benefited other parts of the world as well.

During 1978 the research program, which has its own budget and also relies on extra-budgetary funds, was fortified by the inflow of funds from WHO's Special Programs. In particular, the Special Program for Training and Research in Tropical Diseases was extended to the Americas, and some of the working groups it organized—such as the one studying American trypanosomiasis (Chagas' disease)—consisted almost entirely of investigators in the Hemisphere. The Region's research institutions and investigators also contributed significantly to the Special Program on Human Reproduction.

An activity which began to be planned in 1978 was the creation of regional collaborative research centers. PAHO had earlier helped organize immunology collaborative research and teaching centers at São Paulo and Mexico City at which advanced research is carried on and specialized courses are offered. Several additional centers were proposed during the year: a pediatric pathology center at Rio de Janeiro and an insecticide toxicology center at São Paulo; a radiation toxicology center in Canada; and two mycology centers at San José, Costa Rica, and the U.S. Center for Disease Control at Atlanta, Georgia.

PAHO continued its study of the impact of research on health conditions in the Americas, which was begun in late 1977. After a preliminary testing period, the project's data-gathering instruments and general design were reformulated. Information began to be collected on research institutes, investigators, and projects in Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Panama. The Smithsonian Institution Science Information Exchange started analyzing and making various tests of the comparability of the data obtained. Collection of information about the history of research institutions in Argentina, Colombia, Costa Rica, Ecuador, Guatemala, Honduras, Panama, Peru, and Uruguay also continued.

Two subregional meetings were held to discuss national health research policies: the first at Sucre, Bolivia, for the Andean countries, and the second at Tres Ríos, Costa Rica, for Central America and Panama.
RESEARCH GRANTS PROGRAM

As a matter of policy, PAHO prefers to support projects proposed by investigators in Latin America and the Caribbean in order to stimulate research in those areas. Of the 18 grants it approved in 1978, 16 went to investigators in Argentina, Bolivia, Chile, Costa Rica, Cuba, Guatemala, Mexico, Peru, and Venezuela. The two other grants approved were: a U.S.-Brazilian cooperative study of cell-mediated immunity in Chagas' disease and another on viral gastroenteritis in tropical American countries between the University of Toronto and various institutions in the Caribbean and Central America.

PAHO continued to support collaborative research between institutions in different countries such as the University of Bahia-PAHO-Harvard University tropical disease study and investigations being conducted by Cornell University and several Central American health agencies.

Part of PAHO's research funds were used to finance the National Council for Science and Technology in Mexico and the National Research Council in Peru in carrying out a survey of research resources in those countries in order to complete information required for the above-mentioned study of the impact of research on health conditions in the Americas.

ADVISORY COMMITTEE ON MEDICAL RESEARCH

The Advisory Committee on Medical Research (ACMR), which is also the Regional Committee of its WHO namesake, held its annual meeting at CEPIS in Lima. The meeting's central theme was health services research, and reports were presented on studies in that field in Argentina, Brazil, Colombia, Costa Rica, Honduras, Mexico, and the United States of America. Several distinguished investigators and PAHO staff members discussed such basic problems as investigator training, methods of evaluating and providing health services, and the role of information systems in health care. The ACMR became familiar with some of PAHO's research programs such as the one at CEPIS, the Collaborative Program on Cancer Treatment, and RLM's program for selective information dissemination.

The ACMR chairman took part in the meeting of the WHO Advisory Committee on Medical Research at Geneva, where he presented a report from the Regional Committee and its suggestions and initiatives for participation in worldwide programs. The vice-chairman delivered a report on PAHO's current research activities and the ACMR meeting to the XX Pan American Sanitary Conference.
FIELDS OF RESEARCH

Malaria

Vector resistance to insecticides and parasite resistance to drugs continued to be the main obstacles in the Region’s malaria eradication or control programs, and the search for possible solutions to these problems went forward.

Studies on Malaria Immunology. A research project was initiated in Colombia in 1977 at the National Institute of Health under an agreement signed by representatives of Colombia, the University of New Mexico (USA), and PAHO, with financial support from the U.S. AID. Its objectives included: to study the model value of Colombian simians for producing human plasmodial antigens; to investigate factors that affect the production of gametocytes in primates and their mosquito infectivity; to perfect techniques for collecting, isolating, and preserving human plasmodia; to study the possible pathologic and toxicologic effects of immunizing agents on primates as well as to evaluate the effectiveness of possible immunization methods (doses, routes, adjuvants, boosters) in the species.

The project’s laboratory and animal quarters were completed, and the personnel needed for immunology, hematology, and susceptibility testing were adequately trained by September. During the year, continuous in vitro Plasmodium falciparum cultivation and anopheline colonization were started. Aotus karyotyping and human malaria infection susceptibility studies were to be started in 1979, and agreement was reached to extend the project for three more years.

Studies of P. falciparum Susceptibility to Antimalarial Drugs. This project was initiated in 1978 under an agreement between the Gorgas Memorial Laboratory in Panama, PAHO, and the WHO Special Program for Research and Training in Tropical Diseases, with the following objectives: to assess the in-vitro response of P. falciparum to chloroquine, mefloquine, and other antimalarial drugs; to field-test WHO’s standard in-vitro macrotechniques and suitable microtechniques as they become available; and to obtain isolates from different parts of the Hemisphere where P. falciparum infections persist, reproduce them in suitable monkey models and in-vitro culture systems, and freeze them for further biochemical and immunologic studies.

As the first step in the study, 33 laboratory technicians from 18 countries received instruction in in-vitro susceptibility testing techniques in four 10-day courses.

Mefloquine Clinical Trials in Brazil. Representatives of Brazil, PAHO, and the WHO Special Program signed an agreement in September to carry out a clinical trial with mefloquine at the Barros Barreto Hospital in Belém, Pará. Necessary equipment and supplies were ordered for the trial, which was to start at the beginning of 1979.

Malaria Seroepidemiology. Malaria serologic surveys were being carried out in Panama using filter paper blood samples. Indirect fluorescent antibody testing was used to determine the antibody profiles of the population sample, and antigen slides were prepared with P. falciparum and P. vivax schizonts from experimental animals. The resulting information was to be of great value in confirming the absence of malaria transmission in areas where parasitologic information is scarce or in deter-
mining endemicity in surveyed localities for better control planning.

Other countries besides Panama showed interest in developing similar studies for their malaria programs. During the year, one physician from Mexico and two technicians from Costa Rica and Nicaragua were trained in the methods used in the Panama investigation.

**Evaluation of Insecticides.** Experimental residual house spraying against anophelines with chlorphoxim was planned in Nicaragua, but could not be carried out in regular cycles. Labor problems at the beginning of the year and political disturbances in the third quarter led to temporary suspensions of field and particularly entomologic studies. The project's field laboratory and insectarium were destroyed, and for security reasons it became impossible to do night work and anopheline research inside houses.

Nicaraguan field tests of powdered fenithion used as a larvicide and of larvivorous fish, local field tests of permethrin, and tests of decametrin on panels and in experimental houses were also temporarily discontinued. Training nevertheless continued to be given to Nicaraguan National Malaria Eradication Service workers, and the in-service training in medical entomology was given to four entomologists (two from Guyana and one each from Mexico and Nicaragua).

In Ecuador, Guatemala, and Haiti, residual house spraying field trials were carried out with fenitrothion. This insecticide did not show promise in Guatemala against multiresistant *Anopheles albimanus*, and findings about its efficacy were inconclusive in Ecuador and Haiti.

**Anopheles Nuneztovari.** In Venezuela the Government and PAHO began a study of *A. nuneztovari*, an important vector of malaria in northern South America. As part of this project, two research institutions in the United States of America—the University of Illinois and the State of Florida's Vero Beach Laboratory—drew up plans for a 1979 investigation with the Venezuelan Ministry of Health's division of rural endemic diseases of the isoenzymes and cytogentic of anopheline mosquito. Assistance was requested from the WHO Special Program for Research and Training in Tropical Diseases.

**Anopheine Biologic Control.** Preliminary field trials were carried out in Nicaragua with *Bacillus sphaericus* to control *A. albimanus*. These small-scale trials produced encouraging preliminary results, but it was not possible to confirm them or to expand the experiment because of the suspension of all entomologic activities in the third quarter of the year. A larvivorous fish, *Poecilia reticulata*, was being used widely in the Dominican Republic, and the same species was being tested in Ecuador and Haiti.

**Vector Biology and Control**

PAHO's Vector Biology and Control Research and Reference Center at Maracay, Venezuela, continued to expand its investigative and training activities in 1978—the natural history and control of Chagas' disease being the most important part of the Center's work. A number of countries in South America are just beginning to organize Chagas' disease surveys and vector control projects, and the Center provided individual training for scientists and control workers from six countries. In addition, staff members visited two countries for brief consultations. The Center responded to requests for information about Chagas' disease by producing and distributing a guide to planning epidemiologic surveys and control operations.
Chagas' Disease

Epidemiologic surveys were started in four Venezuelan states as part of a study to determine the incidence of Chagas' disease. Earlier work done by the Center had shown higher antibody rates in persons living in mountainous areas than in those living in the plains. The study combined serologic surveying with electrocardiographic studies and was to try to relate certain cardiographic abnormalities in rural populations to seropositivity.

A strain bank of Trypanosoma cruzi from humans with and without cardiopathy and from sylvatic and domestic vectors and reservoirs was established during the year. Although most specimens came from Venezuela, some strains in culture from El Salvador, Colombia, Panama, and Peru were included, and contacts were made with laboratories in Belgium, Brazil, and Germany to send specimens for special studies. In addition, biochemical, physiologic, and immunologic studies began at laboratories in Venezuela cooperating with the Center.

An evaluation of the epidemiologic and socioeconomic effects of house modification on T. cruzi transmission financed by a grant from the Edna McConnell Clark Foundation began in a rural part of Trujillo State, Venezuela, where Chagas' disease is endemic. The study is to continue for five years.

A field study began of the life table of Rhodnius prolixus. The results were to be used to develop a computer model of Chagas' disease epidemiology.

The Center's staff helped Venezuela's Ministry for Environmental Affairs and Renewable Natural Resources conduct biologic surveys for two months in the State of Apure. Specimens of Proechimys semispinosus, a reservoir of Chagas' disease, were collected for special genetic taxonomic studies conducted at the Simón Bolívar University, Caracas.

A study of the incidence of and damage done by domestic rodents was started, and a laboratory to test rodenticides was established. It was expected that these new projects would help define warfarin resistance and screen new rodenticides. This aspect of the Center's work may eventually lead to training programs for persons from countries in South and Central America.

In cooperation with Venezuela, the Center has developed standardized procedures for WHO stages 2, 3, and 4 testing of insecticides against the vectors of Chagas' disease. New insecticides, synthetic pyrethrum-like compounds, growth regulators, and new slow-release formulations of standard public health insecticides were being screened against dieldrin-resistant and susceptible R. prolixus and Triatoma maculata. The results of these tests provided a number of alternative insecticides useful in areas where there was dieldrin resistance.

In 1978 the Center and the Venezuelan Ministry of Health's division of rural endemic diseases began field-testing new vector control equipment under tropical conditions. Emphasis was placed on vehicle-mounted, ultra-low volume spraying equipment and motorized portable aerosol mist blowers. This testing was to be expanded and to become a valuable service to Governments seeking advice in choosing modern control equipment.

Aedes aegypti

In response to the upsurge of A. aegypti vectored dengue in 1977 and 1978 as well as the steady increase in jungle yellow fever in the Region, the Center gave three short courses on the use and maintenance of vector control equipment for 50 par-
Participants from 14 countries, sent staff members to seven countries as control consultants, and began ecologic and biologic studies of *Aedes aegypti* in Colombia. Though only thermal foggers were tested during 1978, plans were made to test still newer *Aedes aegypti* emergency control methods.

**Other Vectors**

Small mammal collections were made in cooperation with the University of Carabobo, Venezuela, to find possible reservoirs of *Leishmania* in Cojedes State and *Schistosoma* in Portuguesa State. Mammals were also collected with the National Veterinary Research Institute in Zulia State to attempt to isolate arboviruses or show serologic evidence of arbovirus infections. During these collections, Center staff also aided in a mosquito survey of the same areas.

*Streptococcus pneumoniae*

Despite antibiotics, pneumonia is one of the world's leading causes of morbidity and mortality.

An effective polyvalent polysaccharide pneumococcal vaccine, which can greatly reduce the rate of illness and death in groups exposed to infection, has been developed in the United States of America. But since it is "type specific," PAHO deemed it necessary to establish the antigenic composition of the most prevalent pneumococcal strains in other parts of the world before such a vaccine could effectively be used elsewhere.

It was to adapt such a vaccine to the specific needs of the Region's countries that PAHO undertook a study to establish the most prevalent types of *Streptococcus pneumoniae* in the Hemisphere. The collaborative research program, coordinated by PAHO and centered at a WHO Reference Laboratory at the University of Pennsylvania, involved institutions in Argentina, Brazil, Chile, Colombia, Jamaica, Mexico, Panama, Peru, and Uruguay as well as CAREC.

With material and financial support from the Merck Institute, all 10 participating laboratories have received media, typing antisera, and equipment for lyophilizing *S. pneumoniae* isolates. The reference laboratory has provided protocols for the methods used in isolation as well as other relevant documents. So far, 65 strains of *S. pneumoniae* have been typed. The initial results have justified undertaking the study since they have revealed marked antigenic differences between the streptococci provided by the collaborating laboratories and the antigens in currently available vaccines.

**Enteric Diseases**

The strategies of PAHO's short-term program for controlling diarrheal disease are based in large part on the recently developed technique of oral rehydration. Therapeutic studies in Southeast Asia have clearly shown that most hospitalized patients with cholera and other forms of diarrhea can be rehydrated with a specific, orally administered fluid composed of electrolytes and glucose, thus obviating the need for intravenous fluid replacement.

In the Americas, most diarrheal disease occurs in children, and much of it is caused by the recently identified rotaviruses or enterotoxigenic *Escherichia coli*. It was therefore important to deter-
mine if the glucose-electrolyte formula used elsewhere in oral therapy could be successfully employed in conditions that prevail in the Americas.

A study of rehydration with an oral glucose-electrolyte solution was undertaken in a Costa Rican hospital during the year to determine whether oral therapy success rates differed in infants and young children with rotavirus vis-à-vis bacterial diarrheas. The subjects were 62 children with 5 to 10 per cent dehydration due to acute watery diarrhea. Balance data and serial monitoring of weights, hematocrits, and plasma specific gravity measurements showed that the simple oral therapy regimen promptly corrected electrolyte abnormalities and dehydration in 94 per cent of the patients. Except for a slight increase in glucose excretion in the stools of rotavirus patients, the results were almost the same in rotaviral and bacterial diarrheas. Children with or without malnutrition and those with a variety of serum electrolyte abnormalities on admission responded equally well. Since children with dehydration of the same range traditionally receive intravenous therapy, the elimination of all need for intravenous fluids in 94 per cent of the study patients demonstrated the value of oral rehydration in reducing costs and patient trauma in the treatment of infant and childhood diarrheas.

In addition, it was important to determine if sucrose—which is more readily available than glucose—could replace the more expensive glucose in the currently recommended WHO oral formula. If so, this might allow home formulation of a simple and less expensive fluid that could be administered by mothers in peripheral areas where distribution of prepackaged electrolyte-glucose preparations might be difficult.

In a random, double-blind trial at the same Costa Rican hospital, 51 children suffering 5 to 10 per cent dehydration were rehydrated with oral electrolyte solutions containing either sucrose or glucose. Most children in both groups were successfully rehydrated, but patients receiving the sucrose solution experienced slower correction of electrolyte abnormalities, and a higher proportion of them required more than 24 hours of therapy. It was thus concluded that when adequate knowledge of the oral therapy method existed, sucrose could substitute for glucose in many cases; when a choice existed, glucose was recommended.

**Typhoid Fever**

PAHO supported research to identify the mechanisms of endemic typhoid fever transmission. A cooperative study with El Salvador begun in 1977 was completed in late 1978. Preliminary analysis of the data indicated that there was no single readily available control intervention that would immediately decrease typhoid fever endemicity.

Further typhoid fever studies were set in motion in Chile. The University of Maryland (U.S.A.), together with Chile's Ministry of Health and PAHO, prepared a proposal for extrabudgetary funding to support extensive investigations, which would include studies of the role of carriers, simple methods of identifying and treating them, further evaluation of the efficacy of a new vaccine, and an attempt to identify risk factors.

**Zoonoses and Animal Health**

The research PAHO conducted or supported in the field of zoonoses and ani-
mal health was extensive. Most of it dealt with diagnostic techniques, production and control of biologicals, administration of animal disease control campaigns, surveillance, and program evaluation. Much of it was carried on at two of PAHO's Centers, PANAFTOSA and CEPANZO.

During 1978, studies using mathematical models were conducted to evaluate various strategies for controlling domestic animal diseases and to determine the economic loss caused by brucellosis, bovine tuberculosis, hydatidosis, and tick infestation.

Special attention was paid at PANAFTOSA to typing and characterizing new strains of foot-and-mouth disease (FMD) virus; serologic testing and isolation of the virus to support epidemiologic surveillance programs; production of vaccines with new viral strains that might put livestock at risk; development of oil-adjuvant vaccines for cattle and hogs; development of methods to control the potency of oil-adjuvant vaccines; and study of the relationship between tests in cattle and small laboratory animals.

**Brucellosis**

PAHO continued to give special attention to studies of the factors that affect preservation of the *Brucella abortus* strain 19 as well as the use of the *B. melitensis* Rev. 1 vaccine in cattle and sheep. It also continued its evaluation of different serologic tests for diagnosing human brucellosis, investigations related to a large cattle ranch brucellosis eradication model, and studies to determine the presence of *B. canis* in Argentina and other countries.

Studies of simultaneous vaccination against brucellosis and FMD showed that such treatment interfered with the immunity against brucellosis conferred by strain 19. In *Brucella* strain studies, *B. canis* was isolated for the first time in Argentina and Peru, while *B. abortus* biotype 2 was isolated for the first time in a human patient in Latin America. The following *Brucella* strains have so far been typed in Latin America: *B. abortus* biotypes 1, 2, 3, 4, and 6; *B. melitensis* biotypes 1, 2, and 3; *B. suis* biotype 1 and atypical strains; *B. ovis*, and *B. canis.*

**Hydatidosis**

Since patients from whom hydatid cysts are removed surgically continue reacting positively to present immunodiagnostic tests for a year, PAHO continued its efforts to improve available diagnostic methods. A double-diffusion test was developed to diagnose hydatidosis using the appearance of arc 5 as its positivity criterion. The test's great simplicity and precision make it one that can be recommended for use in endemic areas and in surveys to detect persons with hydatid cysts.

PAHO also continued a postoperative serologic study of patients from whom hydatid cysts had been removed as well as studies to evaluate immunodiagnosis in patients with onchocerciasis, trichinosis, cysticercosis, and distomatiasis.

**Rabies**

Experiments continued to determine the duration of bovine immunity conferred by the PV-BHK-BEI rabies vaccine prepared in tissue culture. Serologic findings six months after vaccination were encouraging. It was anticipated that, because it is easy to prepare and economical, once the vaccine's potency had been confirmed after a longer period it would greatly aid the countries in controlling bovine rabies.

Also continued were studies to type the rabies virus through immunofiltration,
evaluate immunofiltration for rabies serology, determine the stability of the suckling mouse brain vaccine, and verify the neutralization of this vaccine's antigen in bovines.

Studies of the immunity conferred on dogs by an inactivated tissue culture rabies vaccine developed at CEPANZO showed that the dogs had a high antibody level three years after vaccination. When challenged by a virulent rabies virus, the dogs showed complete protection two and three years later.

Bovine Tuberculosis

Significant progress was made in a project to design methods of controlling bovine tuberculosis in large dairy cattle herds and in evaluating the caudal fold and neck tests in naturally infected cattle. Further progress was made in an immunoelectrophoretic study of antigenic components of PPD tuberculins and in determining the sensitivity of Mycobacterium tuberculosis to streptomycin.

In studies of the tuberculin test in cattle following vaccination against rabies and FMD, it was found that vaccination apparently does not interfere with tuberculin testing. In guinea pig studies, however, a marked decrease in the reaction to the tuberculin test was observed following vaccination against FMD and in some cases after inoculation with fixed rabies virus.

Other Diseases

Research to determine the ovicidal and scolicidal properties of various drugs against Echinococcus granulosus and their use in treating echinococcosis in dogs continued, as did ultramicroscopic studies of the biology of E. granulosus.

In the field of leptospirosis, a simplified method was developed to classify leptospiras, and an evaluation was made of the antigen of the external capsule of Fort Bragg serotype leptospiras as a hamster vaccine. The seroepidemiologic survey of leptospirosis in rural populations in Argentina and El Salvador also continued.

CEPANZO continued its development of microbiologic criteria for monitoring foodstuffs of animal origin. New demonstration techniques were developed for area microorganism control through studies of critical points in industrial food plants, several methods of investigating salmonella in dehydrated foods, and Staphylococcus aureus in processed foods.

The techniques developed for area microorganism control proved quite effective in investigations conducted of hospital and hospital kitchen infections. Salmonella, enteropathogenic Escherichia coli, Pseudomonas, and S. aureus were isolated from places where they could not be isolated with traditional methods.

Studies continued on the pathology of laboratory animals, including armadillos (Dasypus hybridus). A fatal outbreak of focal hepatitis without the presence of intranuclear inclusion bodies in the hepatic cells occurred during the year in armadillos in the CEPANZO colony. Studies to determine the etiology of this process were under way.

Primate Production

PAHO has agreements with Brazil, Colombia, and Peru to help develop their programs to reproduce the American primates most used in biomedical research. These projects are financed under a contract between PAHO and the U.S. National Institutes of Health.

Brazil was to begin building a reproduction station at Belém in 1979, and at year's end Colombia was completing the design
of a primate center to be located in the Magdalena River valley.

The Peruvian primate center at Iquitos expanded to four large monkey shelters for its more than 500 Aotus trivirgatus, Saginus mystax, and Saimiri sciureus monkeys. A dry diet has been developed, and 60 per cent of the S. sciureus have reproduced. The center's laboratory was completed in December, and various investigations began as soon as it was fully equipped.

Health Services Research

Until quite recently, health services research was almost nonexistent in the Region, yet it was clearly needed to achieve many of the goals in the Ten-Year Health Plan for the Americas. In the past two or three years the situation has begun to change.

To promote such research during 1978, PAHO staff presented papers on the subject at the annual meeting of PAHO's Advisory Committee on Medical Research and visited the industrial and systems engineering programs at the Federal University of Rio de Janeiro, the University of Chile, the National University of Engineering, in Lima, and the Technologic Institute of Monterrey, Mexico.

PAHO's promotional visits were favorably received in several countries. Chiefly in Brazil, Colombia, Costa Rica, and Mexico, research groups related to advanced health administration programs were formed to undertake specialized studies of different areas of health service operations. A bibliography of textbooks and articles in the field of health services research was prepared, and specific publications in this area were distributed to interested persons and institutions.

The following were some of the health services research activities PAHO aided in one way or another in various countries:

- In Colombia, a comparative study of sterilization and supply units and laundries was carried out in 25 hospitals.
- In Cuba, PAHO advised the Health Development Institute at Havana on the curriculum of its postgraduate programs in operations research and systems analysis and helped the Institute's research division identify possible future areas of investigation.
- In Ecuador, operations research produced a model of service geographic accessibility which became the basis for locating new units within the general program of services extension being undertaken by that country.
- In Nicaragua, evaluation research was incorporated in the ambulatory services improvement project in Managua, and PAHO cooperated with the Ministry of Health in developing a model for evaluating the patient referral system.
IX. SUPPORTING SERVICES

DEVELOPING NATIONAL HEALTH INFORMATION SYSTEMS

As part of its technical cooperation program, PAHO helps interested Governments design, organize, and operate the health information systems and subsystems and the health manpower information subsystems they need to extend their health care coverage.

During 1978, it provided advice on health information systems to Antigua, Argentina, Bolivia, Chile, Colombia, Costa Rica, Cuba, the Dominican Republic, El Salvador, Guyana, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, St. Kitts, and Trinidad and Tobago.

In Chile, it became apparent that the information system needed redesigning to abate the flood of documents reaching national offices in Santiago, and the result was formulation of a system for auditing activities performed. Since the program was put into effect before a complete system was available for monitoring it, Chile asked PAHO to help develop the indicators to be used in monitoring and to design the control system of which the indicators would be a part.

Costa Rica changed its health information systems policy during the year. The Government sought to unify the operations of various health agencies and asked PAHO to help bring this about in rural, periurban, and nutrition health programs and to redesign health statistics services and personnel training. PAHO responded by providing seven man-weeks of consultation. The result was an overhaul and later evaluation of the rural health program's information system, a new information subsystem for the periurban area, and unification of nutrition information systems. PAHO also helped reorganize the medical records departments of hospitals that had been shifted from the Ministry of Health to the Costa Rican Social Security Institute and strengthen the Institute's central medical records office. Finally, it collaborated in a cancer medical records seminar held at San José in June.

In the Dominican Republic, PAHO helped organize and put into operation the medical records and statistics department of the regional hospital at Santiago de los Caballeros, the country's second largest city. Subsequently, the national health authorities wanted to extend this system to the rest of their hospitals. This project also included preparation of a training program for the hospital's staff, which may later be extended to other hospitals.

In Nicaragua, where health care functions were split among the Ministry of Health, the National Social Welfare Board,
Governments assign high priority to the design, organization, and operation of health information systems and subsystems, in support of local and national health programs. (Photo: Government of Venezuela)

Medical record librarians are trained in accordance with the needs of the countries. (Photo: Children's Hospital, Costa Rica)
and local social welfare boards throughout the country, the Government concluded that greater unification was necessary. At its request, PAHO sent a specialist in health information systems to Managua for 10 days to help begin designing a unified health system and its related information subsystem. A group of Ministry, National Board, and PAHO representatives was formed to lay the groundwork for putting the new system into operation in 1979. PAHO also helped design a medical records department system for Nicaragua's new hospitals.

Paraguay obtained a loan from IDB to restructure its program for extending health care coverage. To accomplish this it asked PAHO's cooperation in improving its health statistics systems and putting the extension program's information system into effect. During 1978 a program was designed and begun to improve community volunteer work and rural health posts. At the same time, PAHO recommended that the country’s health centers and hospitals be reorganized—a suggestion that was accepted.

PAHO has for several years aided Peru in redesigning its health information system by providing complete printing equipment with which to produce questionnaires and manuals, helping design courses for health statisticians in its various regions, and providing calculating equipment to speed statistics gathering and record keeping. The overall design of the information system, which has been approved, was analyzed in January at a workshop sponsored by the Ministry of Health.

STATISTICAL METHODOLOGY

In addition to its activities related to overall development of national health information systems, PAHO provided statistical methodology support to specific national and multinational projects during 1978.

In response to the needs of diarrheal disease control programs in individual countries and the multinational program in the English-speaking Caribbean, PAHO helped develop a sampling model to assess the feasibility of community-based oral rehydration and the benefits which might be expected from this new therapy were it to be extended to entire national populations.

In response to a 1975 Directing Council resolution (CD23.24), a collaborative study of chronic rheumatic heart disease in the Americas was begun in October of that year and has continued since. During 1978, 489 initial and annual follow-up registry forms were processed and analyzed; the results were presented at the fourth meeting of PAHO's chronic rheumatic heart disease working group in November. Similarly, 2,721 registry forms in the regional arterial hypertension study, which was begun in 1976, were processed and analyzed during 1978; the results were presented to the third meeting of the hypertension working group in August.

In Costa Rica, whose government PAHO was advising on expanded immunization, a consultant helped prepare a module for giving instruction on designing the samples to be used in collecting data with which to evaluate immunization activities. This module was also included in the country's immunization program planning and management course.

PAHO also assisted Costa Rica in processing data collected in its national nutrition survey by analyzing them statistically
and providing tables and graphs based on its analysis. In this project it recommended techniques for constructing a Costa Rican nutritional model based in part on the results of the survey. This involved reviewing the sampling plan followed, establishing weights for variables before they were analyzed, and estimating the sampling errors for the most important variables.

## TRAINING HEALTH INFORMATION WORKERS

During the year PAHO cooperated with many of the countries in training workers—particularly health records librarians—for health information systems.

The curriculum of the health statistics courses at the Universities of Buenos Aires, Córdoba, and La Plata in Argentina was reviewed, and a national seminar was conducted to discuss and approve the revised course. In Bolivia, a technical-level course on medical records keeping and hospital statistics was organized and conducted for 32 students with PAHO cooperation.

In Costa Rica, the three-month course for health statistics and medical records auxiliaries was reviewed with a group of supervisors. The course was to be conducted in each of the country’s regions in order to train assistants near their places of work. PAHO also helped conduct a technical-level course on the same topics.

At Santiago de los Caballeros, Dominican Republic, a course was designed to meet the needs of auxiliaries in the regional hospital’s medical records department.

A PAHO medical records consultant reviewed courses for auxiliary workers in El Salvador and Honduras, and in the former country she also helped teach the medical records portion of the course and aided initial planning of a six-month intermediate-level medical records course needed by records librarians at higher-level institutions.

In Jamaica, a PAHO statistician and a health records administrator served for two weeks each as tutors in the Level I health statistics course given by the College of Arts, Science, and Technology (CAST) at Kingston; 14 students attended—13 from Jamaica and one from St. Kitts. The second stage of the Level II medical records and health statistics course was completed at CAST with the assistance of a PAHO short-term consultant in medical records keeping; 12 students—nine from Jamaica and one each from Antigua, Guyana, and Trinidad and Tobago—graduated from the course.

A Regional Meeting on Education and Training in Health Records and Statistics was also held in Jamaica in December. It was sponsored by the regional project for education and training of allied health personnel and was attended by CAST and Barbados Community College instructors, representatives of the health ministries of Antigua, Bahamas, Barbados, Guyana, Jamaica, and Trinidad and Tobago, and PAHO staff from Headquarters and CAREC. The recommendations made at the meeting were to be presented for approval at the Conference of Ministers Responsible for Health in the Caribbean in 1979.

One month of consultation was given to Peru’s School of Public Health, a part of that country’s health ministry, in organizing and conducting a refresher course on health statistics and medical records keeping for 35 students, all of whom had graduated from basic courses between 1964 and 1971.
INFORMATION COLLECTION AND DISSEMINATION

Collecting and disseminating vital and health statistics are activities mandated by the Pan American Sanitary Code. Data are regularly gathered through PAHO/WHO questionnaires to the Region's national health authorities, who in turn provide weekly, monthly, or annual statistics on mortality, communicable diseases, vaccinations, health care institutions, health manpower, and other subjects related to health. Information is also obtained from publications of other United Nations agencies and the Governments.

Routine data gathering, which is vital to maintaining a data bank with which to serve all information requesters, continued throughout 1978. Most of the countries readily provided information requested, thus helping to ensure the eventual completeness of PAHO's information about the Region's health.

The information collected is usually disseminated through regularly prepared publications.

The quadrennial Health Conditions in the Americas, 1973-1976 was prepared during the year and, as is traditional, presented to the XX Pan American Sanitary Conference. This publication, the seventh in a series, presented data provided by the countries and included other available information. Since the midpoint of the Ten-Year Health Plan for the Americas fell within the quadrennium the publication covered, it focused wherever possible on the progress achieved in reaching the Plan's goals. The data presented in Health Conditions was to be used by PAHO's Governing Bodies in deciding priorities among technical cooperation activities, by the Region's health ministries in evaluating their activities, and by students, scholars, and researchers.

PAHO's Weekly Epidemiological Report continued to be published throughout the year, but it was decided to discontinue it as of January 1979 because the threat from diseases subject to International Health Regulations (smallpox, cholera, plague, and yellow fever) was greater when
the publication was originally launched than it had now become. It was felt that the publication should be substituted by another that would be adjusted to today's changed epidemiologic conditions in order to fulfill its goal of exchanging epidemiologic information among the Region's countries.

A large number of information requests were received during the year, mostly from outside PAHO. Every attempt was made to satisfy them, especially if the information needed was available in PAHO/WHO publications or could be obtained from PAHO's vital and health statistics system. The very volume of such requests well shows that PAHO is recognized as a central repository of health data for the Region.

INTERNATIONAL CLASSIFICATION OF DISEASES

The Twenty-ninth World Health Assembly agreed that the ninth revision of the International Classification of Diseases (ICD) would become effective on 1 January 1979.

There are three centers in the Americas for disease classification: the Latin American Disease Classification Center (CLACE) at Caracas, Venezuela, for the Spanish language; the Brazilian Disease Classification Center at São Paulo for the Portuguese language; and the U.S. National Center for Health Statistics at Washington, D.C., the WHO reference center in this field for North America.

Fulfilling an agreement with WHO, PAHO finished a task begun in 1975—translating the ICD into Spanish—with CLACE assistance during the year. Volume 1 was published and distributed to national health authorities as 1978 drew to a close. The two organizations also translated the first section of Volume 2, or the alphabetic index, into Spanish and translated and published three papers containing the notes of participants in the courses held to introduce the ninth revision of the ICD.

To make that introduction, two Spanish-language courses were given with CLACE's collaboration, one at Mexico City and the other at Lima.

Thirty participants from Central American countries, Cuba, the Dominican Republic, Haiti, Mexico, and Panama attended the course at Mexico City, and 22 representatives from the Spanish-speaking countries of South America attended that at Lima; among the participants were internationally recognized professors of public health specializing in disease classification.

An English-language course was given at Bridgetown, Barbados, with cooperation from the U.S. Government; 23 participants from the English-speaking Caribbean attended the course. Two Portuguese-language courses for cause-of-death coders and one for morbidity coders were given at the São Paulo center. A total of 83 Brazilian cause-of-death coders attended the São Paulo courses in their field, and 20 participants from the State of São Paulo attended the course on disease classification.

Argentina and Mexico held their own national courses, which were taught by persons who had attended PAHO's Spanish-language courses and for which PAHO and WHO provided part of the necessary teaching materials.

For use in teaching death certification procedures, PAHO and CLACE updated a series of slides and an accompanying guide which the United States of America had prepared and CLACE had translated into Spanish several years ago.
X. ADMINISTRATION

Several major developments took place in 1978 in PAHO's internal administration. Perhaps the most important was the decision to shift from an annual to a biennial program and budget cycle, starting with the period 1980-1981. This new cycle will allow compatibility with WHO and coincides with that of other international agencies.

Other significant administrative activities during the year were:

* Development of a new personnel classification system for general service staff.
* Installation of new and improved computer (IBM 370/138) and word-processing (Wang) equipment at Headquarters to improve administrative support and management information systems.
* A management study of PAHO's 10 Pan American Centers by a team of outside experts with international experience. The result was a series of recommendations and plans for evaluating the programs and reviewing the activities of these Centers over the next five years.
* Establishment of the Office of the Caribbean Program Coordinator at Bridgetown, Barbados, to integrate and coordinate PAHO's activities throughout the Caribbean, and the selection of a Coordinator.
* The shift of some of PAHO's Spanish-language publishing activities from PAHO Headquarters to Mexico City.
* The development of a comprehensive safety and protection program for PAHO buildings, facilities, and laboratories.

BUDGET AND FINANCE

The Governing Bodies adopted a biennial program and budget cycle beginning with the period 1980-1981 that coincides with that of WHO and other international agencies. The Governing Bodies approved necessary revisions in the PAHO Constitution and Financial Regulations.

New computer methods were devised to consolidate and analyze all program-budget proposal data for the period 1979-1983 by budget element, project number, country of origin, and regional program. In consequence, printouts of pertinent information—e.g., about supplies, short-term consultancies, fellowships, and personnel—were available when area and country representatives, center directors, and chiefs of Headquarters divisions met at Washington, D.C., in November to deliberate future program and budget matters.

Considerable effort was devoted to improving the management of extrabudgetary funds and formulating program support cost policies and rates. The XX Pan American Sanitary Conference approved the general policy of charging for program support costs to reimburse PAHO for administering such funds.

As noted in the Proposed Program and Budget Estimates, (PAHO Official Document No. 154), the 1978 budget from all
sources amounted to $76,007,718. This was an increase of $5,605,668, or 8 per cent, over 1977. Comparative budget data for 1977 and 1978 are shown in Table 3.

As the Directing Council instructed (CD25.27) in 1977, the Director established a revolving fund for the Expanded Program on Immunization (EPI). The XX Pan American Sanitary Conference authorized an initial capitalization of $1,000,000 (CPS20.16), i.e., the Director was authorized to use the 1978 approved budgetary increase of $500,000 in the Working Capital Fund and an additional $500,000 from the Working Capital Fund.


Remittances and the collection of quota contributions improved, and the largest contributor's revised method of forwarding quarterly installments had a favorable

Table 3. PAHO/WHO funds: amounts budgeted.

<table>
<thead>
<tr>
<th>Source of funds</th>
<th>PAHO/WHO funds budgeted</th>
<th>Percentage change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1977</td>
<td>1978</td>
</tr>
<tr>
<td><strong>Pan American Health Organization</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular Budget (parts I through VI)</td>
<td>28,868,415</td>
<td>31,177,900</td>
</tr>
<tr>
<td>Community Water Supply Fund</td>
<td>1,498,025</td>
<td>1,730,110</td>
</tr>
<tr>
<td>Grants and Other Contributions</td>
<td>9,119,233</td>
<td>9,844,750</td>
</tr>
<tr>
<td>INCAP(^a) Regular Budget and Grants</td>
<td>2,682,595</td>
<td>2,733,400</td>
</tr>
<tr>
<td>CFNI(^b)</td>
<td>280,256</td>
<td>286,644</td>
</tr>
<tr>
<td>CAREC(^c)</td>
<td>903,771</td>
<td>549,150</td>
</tr>
<tr>
<td>Natural Disaster Relief Voluntary Fund</td>
<td>100,000</td>
<td>100,000</td>
</tr>
<tr>
<td><strong>PAHO Subtotal</strong></td>
<td>43,452,295</td>
<td>46,421,954</td>
</tr>
<tr>
<td><strong>Pan American Health and Education Foundation(^d)</strong></td>
<td>3,851,368</td>
<td>3,684,100</td>
</tr>
<tr>
<td><strong>World Health Organization</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular Budget</td>
<td>12,814,000</td>
<td>14,535,000</td>
</tr>
<tr>
<td>United Nations Development Program</td>
<td>3,760,287</td>
<td>3,233,100</td>
</tr>
<tr>
<td>United Nations Fund for Population Activities</td>
<td>6,508,463</td>
<td>7,738,528</td>
</tr>
<tr>
<td>Other</td>
<td>15,637</td>
<td>395,036</td>
</tr>
<tr>
<td><strong>WHO Subtotal</strong></td>
<td>23,098,387</td>
<td>25,901,664</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>70,402,050</td>
<td>76,007,718</td>
</tr>
</tbody>
</table>

\(^a\) Institute of Nutrition of Central America and Panama.
\(^b\) Caribbean Food and Nutrition Institute.
\(^c\) Caribbean Epidemiology Center.
\(^d\) Represents joint projects with PAHO, not including the Textbook Program.
effect on PAHO's financial operations. Extrabudgetary expenditures amounted to $23,505,684, an increase of 12.6 per cent over 1977 expenditures of $20,884,582. Amounts collected for associated program support costs helped to defray the costs of administering these funds. Miscellaneous income in 1978 of $1,323,576, including interest on investments of $1,039,402, increased from $824,071 in 1977.

PROCUREMENT

The Procurement Office purchases a wide range of commodities and services for PAHO and the Governments from a worldwide market. During 1978 the office issued 3,853 purchase orders and contracts valued at $10.9 million, an all-time high. (For comparison, PAHO's purchases— in millions of dollars—during the past decade were: 1969, $3.2; 1970, $3.7; 1971, $4.5; 1972, $5.4; 1973, $6.1; 1974, $7.5; 1975, $8.2; 1976, $10.3; and 1977, $10.6). Included were 291 reimbursable purchases for the Governments valued at $3 million. A significant development during the year was the start of a program to enter into long-term contracts with selected vaccine suppliers to provide the vaccines needed for the EPI, which was to begin in 1979.

PERSONNEL

General Services Post Classification System

Perhaps the single most important development in PAHO's personnel management was its classification and reclassification of general services positions after a model for evaluating and classifying such positions had been developed.

Performance Evaluation System

A new personnel appraisal system was put into use on a trial basis in 21 countries and nine multinational centers, and a working group was organized to analyze the feedback from the pilot program. The group's report, an empirical study of the data obtained and an assessment of the system's effectiveness, was under consideration. It became evident, however, that the success of any appraisal system would depend to a large extent on the attitudes of supervisory personnel toward it.

Staff Training and Development

In accordance with the objectives and guidelines laid down in the "Policy Statement on Staff Development and Training," training courses, seminars, and work-
shops on a variety of subjects were organized for Headquarters and field staff members. Three advanced management seminars were held at Buenos Aires, Bridgetown, and Mexico City. Staff members that participated in the various courses and seminars numbered 319.

The first step in a new management trainee program was taken. Several college graduates were to be hired for junior management positions and then given career development guidance.

The first group of residents working under the international public health residency program—which provides a year’s experience in international public health, preventive medicine, social medicine, or all three—ended the tour of duty in the field.

**Conditions of Service and Other Staff-related Matters**

In collaboration with WHO, the first major review since 1954 of the Staff Rules was carried out, and they were updated in their entirety. At its 80th Meeting the Executive Committee confirmed these changes, which would become effective on 1 January 1979.

Following similar United Nations and WHO decisions, the Executive Committee made certain changes in the post adjustment system. As of 1 July, changes in post adjustment classes became based on cost-of-living index movements of 5 per cent in relation to the preceding class rather than the previous movements of 5 points in relation to a base of 100 (New York in November 1973 equalled 100).

The International Civil Service Commission approved a revised system of housing subsidies, and it was put into effect for the field staff on a trial basis for one year, beginning 1 July. The subsidies provide relief for staff members who were obliged to pay high rents at certain official stations where housing was in short supply.

**CONFERENCE SERVICES**

During 1978 the Conference Services participated in or advised on 262 meetings convened by PAHO or the Governments held at Headquarters or elsewhere in the Hemisphere.

A major effort was the organization and direction of all secretariat services of the XX Pan American Sanitary Conference. Since the Conference was held away from Headquarters, its logistic demands were greater than usual.

Complete staffing and documentation services were also provided for the 80th and 81st Meetings of the Executive Committee as well as for the XI Inter-American Meeting on Foot-and-Mouth Disease and Zoonoses Control.

Advisory or staffing assistance was supplied to a number of meetings sponsored by PAHO or the Governments. These included the: XXVI Meeting of the United States/Mexico Border Public Health Association at Reynosa, Mexico; Fifth Meeting of Ministers of Health of the Andean Region and the Coordinating Committee of the Andean Pact at Santa Cruz, Bolivia; Regional Symposium on Solid Waste Management at Santo Domingo, Dominican Republic; XVII Meeting of the PAHO Advisory Committee on Medical Research at
Lima; XV Regional Seminar on Administration of Health Services at Cartagena, Colombia; advanced management seminars at Buenos Aires and Mexico City; Conference of Ministers of Health of the Caribbean in St. Lucia; International Seminar on Primatology at Belém, Brazil; Environmental Health Strategy Workshop at St. George’s, Grenada; and Rural Water Seminar at Port-au-Prince, Haiti.

The following numbers of man-days had to be contracted for in each of the specialties indicated to meet the needs of the various meetings: interpretation, 727; translation, 64; editing, 45; and précis-writing, 340.

MANAGEMENT AND COMPUTER SERVICES

Management workshops were conducted in Areas III and VI to: orient field staff on PAHO’s policies, systems, and procedures; provide field staff the necessary administrative tools to perform their duties more efficiently; identify problems in field office administration and provide spot guidance and solutions; increase communication between Headquarters and the field; and introduce systems analysis at CEPANZO and other Pan American Centers.

Other activities in the management area were: a continuing review of activities at Headquarters and all field offices to ensure good management; administrative workshops to train Headquarters and field personnel in problem-solving techniques, clerical skills, and organization and methods; and an updating of the PAHO/WHO Manual and provisions of the Manual for Field Operations.

The year’s major acquisition in PAHO computer equipment was the purchase of an IBM 370/138, which was expected to result in savings that would be used to strengthen data processing throughout the Region.

Because of transfers and departures, only six of the computer science office’s 11 professional positions were filled during most of the year, though the volume of computer operations was 25 per cent greater than in 1977. A project control system was introduced that for the first time allowed the office to program and schedule the services requested by Headquarters and field offices, permitting active communication and interaction with different users. This system helped identify requests forwarded by different users and at the same time allowed them to establish their own priorities.

Many software enhancements and updates were made, and a new video system was incorporated to support the seven new terminals installed in the computer room. The installation of new software systems would help increase the productivity of the programmer analysts. In addition, a special statistical package for the social sciences (SPSS) was incorporated to respond to the technical needs of the divisions, and special functions for better job descriptions and management were incorporated into the system.
INTERNAL PROGRAMMING AND EVALUATION OF PAHO TECHNICAL COOPERATION

One of PAHO's most important internal developments during 1978 was to improve its ways of formulating, carrying out, and evaluating all phases of its technical cooperation with Governments.

These mechanisms, which were proposed in 1976 and began to be designed in 1977, are known as the AMRO Programming and Evaluation System (AMPES) and the AMPES information system (AMPESIS), whose products are those AMPES users generate and employ.

AMPES structures and organizes the various phases and subjects of the constant dialogue between PAHO and the Governments about PAHO's technical cooperation programs. AMPESIS contributes reliable, well-analyzed, and up-to-date information to this dialogue, thus facilitating decisions by PAHO and its Governments about the activities PAHO will undertake.

AMPES

Two 1978 events are noteworthy. The first was the publication of the Description of PAHO Regional Technical Cooperation Programs for the Period 1979–1985, a reference work presenting synopses of PAHO's 43 major areas of cooperation with the Governments. Each synopsis contains information about the constitutional or resolution bases for the area of cooperation; the problems confronting it; its main objectives, activities, and resources; the agencies, groups, or persons cooperating in it; and documents about each program including monitoring as well as evaluation criteria.

The second important event was the changed emphasis in the analysis and discussion of PAHO's program and budget for 1979 and proposals for 1980–1981 and 1982–1983 at the November meetings of PAHO's area and country representatives, multinational center directors, and Headquarters administrative and division chiefs. The discussions were primarily a detailed analysis of the Governments' needs and their expectations of PAHO. Each division presented a general picture of its participation and that of the multinational centers for which it is responsible in planning and carrying out a major group of activities to fulfill the constitutional or resolution mandates of PAHO's Governing Bodies.

AMPESIS

At mid-year a Headquarters unit was organized to design and put AMPESIS into operation. System objectives, including extensive use of word and data processing equipment and their telecommunication link, were specified, design criteria were established, and preliminary operational specifications were developed.

A comprehensive technical review of word-processing systems was made at the same time, after which a number of computer programs were successfully developed and tested for an initial pilot study. Advanced computer programs
were developed and successfully tested for narrative data entry, internal text organization, simplified updating procedures, and retrieval schemes.

As a test, beginning in 1978, semi-annual reports and annual reports replaced the quarterly internal reporting system from the field. These reports analyzed the progress of PAHO's activities, possible reasons for any failure to carry them out, and delivery of the resources programmed by PAHO. They are a means of overseeing the execution of PAHO's cooperation in each national and regional program.

A schedule for making AMPESIS fully operational was completed. It included: creation of a word-processing electronic memory for all AMPES narrative documents such as regional programs, country descriptions, and national technical cooperation programs; design and implementation of a telecommunications link between the word processing and the electronic data processing computer systems; and collaboration with field offices and multinational centers in establishing local word or electronic processing, storage, and communication capabilities to facilitate AMPES.

**DOCUMENTATION AND HEALTH INFORMATION OFFICE**

This office, formerly the PAHO library, continued to provide scientific information in health care, research, and continuing education in the health sciences to PAHO staff through interlibrary loans and bibliographic services.

A series of workshops was designed for two regional documentation centers, the first of which was held at Guatemala City and attended by representatives from the Dominican Republic, El Salvador, Haiti, Honduras, Nicaragua, and Panama.

A scientific information retrieval system employing PAHO's new IBM 370/138 computer was developed for PAHO, WHO, and United Nations documents.

**PUBLICATIONS PROGRAM**

The reappraisal of the content and structure of PAHO's publications program, begun in 1977 in light of recent trends in the biomedical information field, continued during 1978.

As part of this review, the PAHO Publications Committee held a special meeting in March to assess past accomplishments and set new policies and guidelines for the future in order to fulfill the program's objectives, strengthen the technical orientation of its various components, and assign it the high priority it deserves within PAHO's overall activities. As a result of this meeting, renewed emphasis was placed on promoting and choosing material for publication that more fully reflects the present-day program priorities of PAHO and the Governments, particularly materials concerned with
extending health services coverage based on primary care and community participation.

Two major studies of the publications program were carried out during the year. One was a detailed working group analysis of the entire program and related activities to define their relationships with other activities at Headquarters and the regional and country levels and draw up concrete proposals for its future organization, structure, and operation. The other was a comprehensive review with a consultant from WHO, Geneva, of PAHO's distribution service. This resulted in plans that would lead to a more streamlined and effective operation.

In December the Working Party of the PAHO/WHO Publications Policy and Coordinating Committee met at Washington, D.C., to survey the work accomplished so far in coordinating PAHO and WHO publication activities. It made recommendations about publishing practices to be followed, terminology guidelines and manuals, classification criteria for PAHO publications, and a plan of activities for the PAHO/WHO Publications and Documentation Service (SEPU).

SEPU, a new component of the program, was established in Mexico City as of 1 January pursuant to a plan calling for decentralization of certain Headquarters activities. Its primary purpose would be to handle production of a portion of PAHO and WHO publications in Spanish, including translation and editorial review, typesetting and printing, and initial distribution. These publications include the monthly Boletín and some of PAHO's Scientific Publications as well as the Spanish editions of WHO's Technical Reports, Public Health Papers, and Monographs. SEPU functions under the administrative supervision of PAHO and the technical direction and supervision of the PAHO/WHO Publications Policy and Coordinating Committee.

During the year, SEPU laid the groundwork for its activities in Mexico City. It recruited and trained contract translators and editors, surveyed printing facilities, chose printers and local distribution services, and obtained special postal rates for mailing publications. These preparations enabled SEPU to begin translation and editorial work early in the year and gradually begin typesetting the month-
ly Boletín, so that as of January 1979 the
journal was to be printed and distrib-
uted from Mexico. In the next stage of
its activities, SEPU would progressively
increase its capacity to absorb the Spanish
publications selected by WHO for pro-
cessing in Mexico as well as those as-
signed by PAHO Headquarters.

Periodical Publications

With the assistance of the PAHO Pub-
lcations Committee’s subcommittee on
periodical publications, measures were
planned to adjust the content of PAHO
technical journals so as to reflect changing
conditions and program priorities in the
health field. Criteria and procedures for
reviewing and selecting articles were being
revised and steps taken to promote con-
tributions of technical articles and re-
ports on priority subjects by national ex-
erts in the various countries and PAHO
Headquarters and field staff.

The monthly Boletín de la Oficina Sanita-
taria Panamericana appeared regularly
in a 96-page format with a monthly cir-
culation of 13,100 copies. SEPU assumed
responsibility for editing and printing the
journal, while responsibility for policy,
technical orientation, and content eval-
uation and selection rested with PAHO
Headquarters and its Publications Com-
mittee and subcommittees.

The quarterly Bulletin of PAHO en-
tered its 12th year of publication. It con-
tinued to have a 96-page format, and its
pressrun averaged 5,400 copies. Promo-
tional efforts led to an increase in the
number of original articles received for
publication on subjects of special inter-
est in English-speaking countries, particu-
larly in the Caribbean. Production de-
lays of earlier years were corrected, and
by the end of 1978 the journal was ap-
pearing regularly.

PAHO's quarterly journal on health
and medical education, Educación médica
y salud, also celebrated its 12th anniver-
sary. Its circulation was about the same
as that of the Bulletin of PAHO, and its
average length was 112 pages. Among the
subjects dealt with were the teaching-
learning process in the health sciences,
continuing education, medical educa-
tion, planning of pediatrics teaching, and
training in psychiatric nursing. The last
issue of the year, 206 pages long, was
devoted entirely to dental education,
with emphasis on new kinds of teaching
and practice.

Special Publications

This component of the publications
program embraces PAHO's Scientific
Publications, Official Documents, and
miscellaneous publications. The year's
production was 46 volumes totaling 8,100
pages; 159,000 copies were printed. Ta-
ble 4 lists all titles published during the
year.

A special 1978 project was the publica-
tion of several manuscripts on subjects
related to community participation and
extension of health care coverage. This
was one of PAHO's contributions to the
International Conference on Primary
Health Care held at Alma-Ata, U.S.S.R.,
in September. Among these publications
were P.E.S. Palmer's Radiology and Primary
Care and the volume Utilization of Auxil-
ary Personnel and Community Leaders
in Rural Health Programs, in addition to two
which stemmed from the IV Special Meet-
ing of Ministers of Health of the Americas
in late 1977.

Other technical publications of note

The subcommittees on scientific publications and official documents actively provided technical and advisory assistance to better plan, screen, and select materials for publication and recommended measures to ensure the most effective use of resources for this activity.

Distribution Center

The distribution of PAHO's publications, an integral and essential part of its publications program, was revitalized during the year. Through reorganization, the Distribution Center was able to participate more effectively in publications program planning and to coordinate more closely with the technical divisions in decisions affecting distribution.

The chief of WHO's distribution and sales office in Geneva was assigned to Washington, D.C., for a month to carry out a study with PAHO's distribution officer of free and paid distribution patterns and policies, invoicing and inventory control, pricing policy, coordination and improvement of mailing lists, ISBN numbering, and guidelines for future SEPU journal and publication mailings. The report submitted outlined problems and priorities and recommended improved procedures in each of the areas studied. The Distribution Center established a timetable for putting these recommendations into effect. At the same time, an agenda of policy matters relating to the overall planning of publications distribution was prepared for the PAHO Publications Committee's consideration.

The numbers of publications distributed by PAHO during the year were: Scientific Publications and Official Documents, 47,535; periodicals, 254,307; miscellaneous dispatches, 80,887; and WHO publications, 2,009. The grand total was 384,738.

Filmstrips

PAHO has produced and distributed filmstrips on a wide range of topics for use in various health care teaching programs in Latin America and the Caribbean. A total of 4,192 filmstrip copies, 1,000 of which were sold, were distributed during the year.

Five more Spanish titles were added to the filmstrip series during the year on slaughterhouse sanitation, education in family planning programs, cause-of-death certification, and avoidable eye disorders in children.

PAHO area and country offices received copies of all initial distribution lists for comment to assist in the planning of filmstrip distribution. A short questionnaire was mailed to all filmstrip users to determine the response to filmstrips already distributed, future subjects of greatest training usefulness, and how distribution lists should be updated.
Table 4. PAHO Special Publications, 1978.

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>Title</th>
<th>Pages</th>
<th>Pressrun</th>
</tr>
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<tbody>
<tr>
<td>320</td>
<td>Detección precoz del cáncer y lesiones precancerosas de la cavidad oral <em>(2nd printing)</em></td>
<td>49</td>
<td>2,000</td>
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<tr>
<td>325</td>
<td>Maternal and Child Health Strategy in the Caribbean Community <em>(2nd printing)</em></td>
<td>48</td>
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<td>336</td>
<td>Tratamiento e prevención de la deshidratación nas diarreas <em>(2nd printing)</em></td>
<td>23</td>
<td>6,000</td>
</tr>
<tr>
<td>296</td>
<td>Utilization of Auxiliary Personnel and Community Leaders in Rural Health Programs</td>
<td>24</td>
<td>4,000</td>
</tr>
<tr>
<td>345</td>
<td>Classificação Internacional de Doenças para Oncologia</td>
<td>126</td>
<td>2,000</td>
</tr>
<tr>
<td>353</td>
<td>Clasificación Internacional de Enfermedades—Manual de la Clasificación Estadística Internacional de Enfermedades, Traumatismos y Causas de Defunción <em>(Vol. I)</em></td>
<td>871</td>
<td>7,000</td>
</tr>
<tr>
<td>356</td>
<td>The Black and White Yeasts. Proceedings of the IV International Conference on the Mycoses</td>
<td>343</td>
<td>2,000</td>
</tr>
<tr>
<td>357</td>
<td>La radiología y la atención primaria, por P.E.S. Palmer</td>
<td>63</td>
<td>5,000</td>
</tr>
<tr>
<td>357</td>
<td>Radiology and Primary Care, by P.E.S. Palmer</td>
<td>60</td>
<td>2,000</td>
</tr>
<tr>
<td>358</td>
<td>Control de enfermedades de los animales en las Américas, 1977. Documentos de la X Reunión Interamericana, a Nivel Ministerial, sobre el Control de la Fiebre Alta y Otras Zoonosis</td>
<td>174</td>
<td>2,000</td>
</tr>
<tr>
<td>358</td>
<td>Animal Disease Control in the Americas, 1977. Proceedings of the X Inter-American Meeting, at the Ministerial Level, on Foot-and-Mouth Disease and Zoonoses Control</td>
<td>178</td>
<td>1,000</td>
</tr>
<tr>
<td>359</td>
<td>Modern Medicine and Medical Anthropology in the United States-Mexico Border Population</td>
<td>240</td>
<td>2,000</td>
</tr>
<tr>
<td>359</td>
<td>La medicina moderna y la antropología médica en la población fronteriza mexicano-estadounidense</td>
<td>242</td>
<td>3,000</td>
</tr>
<tr>
<td>360</td>
<td>Educación para la salud. Discursos pronunciados en la IX Conferencia Internacional sobre Educación para la Salud</td>
<td>73</td>
<td>3,000</td>
</tr>
<tr>
<td>360</td>
<td>Health Education. Addresses Presented at the IX International Conference on Health Education</td>
<td>65</td>
<td>2,000</td>
</tr>
<tr>
<td>361</td>
<td>La salud del niño en los trópicos, 2ª ed., por D.B. Jelliffe</td>
<td>214</td>
<td>5,000</td>
</tr>
<tr>
<td>361</td>
<td>Criterios de salud ambiental 1—Mercurio</td>
<td>214</td>
<td>3,000</td>
</tr>
<tr>
<td>362</td>
<td>Informe del Comité del Programa de Libros de Texto de la OPS/OMS para la Enseñanza de Enfermería en Salud Mental y Psiquiatría</td>
<td>16</td>
<td>4,000</td>
</tr>
<tr>
<td>364</td>
<td>Las condiciones de salud en las Américas, 1973-1976</td>
<td>339</td>
<td>3,000</td>
</tr>
<tr>
<td>364</td>
<td>Health Conditions in the Americas, 1973-1976</td>
<td>335</td>
<td>3,000</td>
</tr>
<tr>
<td>365</td>
<td>Psychosocial Determinants of Fertility and Contraception in Venezuela</td>
<td>157</td>
<td>3,000</td>
</tr>
<tr>
<td>366</td>
<td>The Armadillo as an Experimental Model in Biomedical Research.</td>
<td>144</td>
<td>2,000</td>
</tr>
<tr>
<td>367</td>
<td>Procedimientos para la investigación de enfermedades transmitidas por alimentos, 2ª ed.</td>
<td>68</td>
<td>3,000</td>
</tr>
<tr>
<td>368</td>
<td>Normas e instrucciones para la obtención de material cervicouterino, por Mercéz Pontes Cunha</td>
<td>18</td>
<td>5,000</td>
</tr>
<tr>
<td>369</td>
<td>Procedimientos simplificados para el examen de aguas—Manual de laboratorio</td>
<td>145</td>
<td>3,000</td>
</tr>
<tr>
<td>370</td>
<td>Metodología para la planificación integral de departamentos de radiodiagnóstico, por A. Cordera</td>
<td>240</td>
<td>2,000</td>
</tr>
<tr>
<td>371</td>
<td>Diseño de programas de vigilancia del aire para zonas urbanas e industriales</td>
<td>68</td>
<td>3,000</td>
</tr>
<tr>
<td>372</td>
<td>El control de las enfermedades transmisibles en el hombre, 12ª ed., Abram S. Benenson(ed.)</td>
<td>435</td>
<td>50,000</td>
</tr>
</tbody>
</table>
### Table 4. PAHO Special Publications, 1978 (cont.).

<table>
<thead>
<tr>
<th>Serial No.</th>
<th>Title</th>
<th>Pages</th>
<th>Pressrun</th>
</tr>
</thead>
<tbody>
<tr>
<td>152</td>
<td>XXV Meeting of the Directing Council of PAHO, XXIX Meeting of the</td>
<td>101</td>
<td>1,500</td>
</tr>
<tr>
<td></td>
<td>Regional Committee of WHO for the Americas—Final Report (bilingual</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>edition)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>153</td>
<td>Informe Financiero del Director e Informe del Auditor Externo, 1977</td>
<td>124</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>for 1977</td>
<td></td>
<td></td>
</tr>
<tr>
<td>154</td>
<td>Proyecto de Programa y Presupuesto: OPS, 1979; OMS, 1980, y OPS,</td>
<td>506</td>
<td>450</td>
</tr>
<tr>
<td></td>
<td>Anteproyecto, 1980</td>
<td></td>
<td></td>
</tr>
<tr>
<td>154</td>
<td>Proposed Program and Budget Estimates: PAHO 1979; WHO, 1980, and</td>
<td>506</td>
<td>475</td>
</tr>
<tr>
<td></td>
<td>PAHO Provisional Draft, 1980</td>
<td></td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>IV Reunión Especial de Ministros de Salud de las Américas</td>
<td>58</td>
<td>5,000</td>
</tr>
<tr>
<td>155</td>
<td>IV Special Meeting of Ministers of Health of the Americas</td>
<td>58</td>
<td>2,000</td>
</tr>
<tr>
<td>156</td>
<td>Extensión de la cobertura de servicios de salud con las estrategias</td>
<td>74</td>
<td>5,000</td>
</tr>
<tr>
<td></td>
<td>de atención primaria y participación de la comunidad— Resumen de la</td>
<td></td>
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<tr>
<td></td>
<td>situación en la Región de las Américas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>156</td>
<td>Extension of Health Service Coverage Based on the Strategies of</td>
<td>74</td>
<td>2,000</td>
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<tr>
<td></td>
<td>Primary Care and Community Participation—Summary of the Situation</td>
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<td>in the Region of the Americas</td>
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<td>157</td>
<td>Proceedings of the XXV Meeting of the Directing Council of PAHO,</td>
<td>219</td>
<td>1,000</td>
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<td>XXIX Meeting of the Regional Committee of WHO for the Americas</td>
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<td>(multilingual edition)</td>
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</tr>
<tr>
<td>158</td>
<td>Informe Cuadrienal (1974–1977) y Anual (1977) del Director</td>
<td>238</td>
<td>2,000</td>
</tr>
<tr>
<td></td>
<td>the Director</td>
<td></td>
<td></td>
</tr>
<tr>
<td>159</td>
<td>Proceedings of the 79th and 80th Meetings of the Executive Committee</td>
<td>329</td>
<td>500</td>
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<td></td>
<td>of PAHO (multilingual edition)</td>
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#### Official Documents

#### Other Publications

- Newsletter on Dengue, Yellow Fever, and *Aedes aegypti* in the Americas (Vol. VII, No. 1) ........................................ 16  500
- Boletín Informativo sobre el Dengue, la Fiebre Amarilla y el *Aedes aegypti* en las Américas (Vol. VII, No. 1) .................. 16  500
- Serie de Informes de Enfermería No. 20—Normas de atención de enfermería-obstetricia en el parto normal y participación en el parto prematuro ........................................ 40  3,000
Visual Aids

PAHO’s visual aids unit produced 1,157 charts, maps, graphs, forms, and drawings; 1,046 photoprints and negatives; 1,730 slides and Vu-graphs; 179 color filmstrip frames; and 323 photographic reproduction frames. Also, 31 conferences and meetings were covered photographically during the year.

TRANSLATIONS

The translation services unit continued to supply translations of documents and other written materials in response to requests from PAHO’s Headquarters and field offices. Staff and contract translators produced 10,248 pages of translations in PAHO’s four working languages: Spanish (51.7 per cent of the total production), English (35.3 per cent), Portuguese (11.2 per cent), and French (1.8 per cent).

One-third of this output was for PAHO publications, especially the Program and Budget report, the Financial Report, and nonserial publications such as the EPI Guidelines on the Planning, Management, and Evaluation of Immunizations and Continuing Education. Almost another third was for the Governing Bodies and PAHO-sponsored technical conferences and seminars.

PUBLIC INFORMATION

During 1978 the public information office continued its liaison with the news media, responded to queries from the public, and produced nontechnical publications about PAHO’s work and health conditions in the Americas. The year’s highlights for the office were World Health Day and the XX Pan American Sanitary Conference.

Plans were also made to reorganize PAHO’s information activities. A number of alternatives were considered. It was expected that once the internal reorganization has been completed, the program would better address the information needs of PAHO, the Governments, and the public.
XI. EXTERNAL RELATIONS

In carrying out its mission to improve the health of the Americas, PAHO is in constant contact with United Nations, inter-American, and other governmental and private organizations which share its interests and concerns.

One way it does this is by sending representatives to international meetings. Two such meetings during 1978 were of special importance and received widespread press attention: the United Nations Conference on Technical Cooperation among Developing Countries (TCDC) sponsored by UNDP at Buenos Aires in August and September and the International Conference on Primary Health Care jointly sponsored by WHO and UNICEF at Alma-Ata, U.S.S.R., in September.

Some of PAHO's more important dealings with other international agencies, development banks, and nongovernmental organizations during the year are set out below.

PAHO AND THE UNITED NATIONS SYSTEM

United Nations Development Program

PAHO worked closely with UNDP and several other U.N. agencies to organize the above-mentioned Conference on TCDC. The action plan arising from the Conference was subsequently accepted as containing the essential principles of TCDC. (The Conference and TCDC are discussed in greater detail in Chapter II.)

In July senior representatives of PAHO and the UNDP Regional Office for Latin America met at Washington, D.C., to discuss UNDP-funded health programs in Latin America and the two agencies' joint projects in the Americas.

Though UNDP's financial assistance to country health projects declined still more in 1978 ($2.8 million), the agency continued to support health and health-related projects in 17 of the Region's countries as its contribution to extending health...
care coverage. It increasingly emphasized rural multisectoral development projects in which the principles of TCDC, primary health care, and community participation could be applied and the involvement of Governments in projects it supports in the countries.

UNDP also showed increasing interest in subregional projects. With PAHO advice, it made plans during the year to organize large hospital engineering and maintenance projects in the Andean Pact and Caribbean Community countries. In consultation with WHO, it drew up a pharmaceutical TCDC project to be coordinated by Guyana with the support of WHO and several other specialized agencies.

PAHO continued to collaborate with UNDP in various environmental health projects. One, dealing with occupational health in Bolivia's mining industry, was completed. The environmental pollution control research project in Guanabara State, Brazil, and the Lake Paranoa environmental study continued with substantial UNDP funding. A project in Trinidad and Tobago to strengthen the training unit in that country's water and sewerage authority was extended to December, and UNDP began considering a proposal to continue supporting the project into its second phase.

A final evaluation of the second phase of the Venezuelan Environmental Pollution Research Center's activities was made at the end of the year, and PAHO supported a recommendation for a third phase which UNDP later approved to the extent of $500,000.

United Nations Environment Program

Much of PAHO's cooperation with UNEP during 1978 was in the Caribbean. The two organizations aided CARICOM in developing an environmental health strategy for that area. UNEP took an active part in the environmental strategy conference (Grenada, October) and provided funds for the representatives of various Caribbean Governments to attend.

PAHO also participated in an interagency meeting in late August at Mexico City on the wider Caribbean environment study project jointly sponsored by UNEP and ECLA at which it was asked to prepare an overview of environmental health conditions in the Caribbean for presentation to a group of national experts in 1979 for developing the project's final action plan.

In the area of environmental health, UNEP financed the attendance of experts at the PAHO Regional Symposium on Solid Wastes (Santo Domingo, Dominican Republic, February). PAHO and UNEP jointly sponsored two conferences on human ecologic assessments of development projects at ECO in June to prepare guidelines for use by the Region's countries. A joint ECO/UNEP mission visited Panama to conduct a survey of the environmental health situation there and prepare recommendations for institutional development.

United Nations Children's Fund

During the year UNICEF provided funds for supplies and equipment for Cuba's maternal and child health and family planning (MCH/FP) program and supported the training of MCH workers in Central America and Panama to develop manpower for primary health care in rural areas.

The PAHO/UNICEF project to provide dental care in Cuba entered its first full year of clinical operation, and 200,000
restorations for rural schoolchildren were scheduled. Water fluoridation to prevent dental caries was also started in two Cuban cities. Ten other Latin American countries have become interested in and adopted the dental equipment developed by PAHO with UNICEF assistance for the Cuban project.

Food and Agriculture Organization of the United Nations

One of the major components of PAHO's food protection program is promoting the food standards published by the Joint FAO/WHO Codex Alimentarius Commission. The basic FAO/WHO standards have also served as references for developing subregional norms. During the year FAO provided and PAHO distributed 50 Spanish-language copies of FAO's Guidelines for Developing an Effective National Food Control System to national health authorities in the Region.

United Nations Fund for Population Activities

PAHO served during 1978 as executive agency for UNFPA-funded MCH/FP projects in 13 countries and territories (Brazil, Cayman Islands, Chile, Colombia, Cuba, Dominica, Ecuador, Haiti, Honduras, Mexico, Peru, St. Kitts-Nevis, and St. Vincent). New MCH/FP projects for Guatemala, Panama, and Uruguay were formulated, as was a regional program of continuing education in postbasic family health nursing for the Caribbean area. PAHO also served as executive agency for the regional program of continuing education in MCH/FP program administration.

United Nations Office of the Disaster Relief Coordinator

PAHO's participation in national relief activities was increasingly integrated in 1978 with U.N. disaster relief efforts directed by representatives of UNDRO and UNDP. Regionally, it collaborated with other agencies to organize missions and activities such as a three-week Swedish tour to three earthquake-prone countries to study relief operations after earthquakes. The Swedish visit was organized jointly by PAHO, UNDRO, and the League of Red Cross Societies to encourage Sweden's support of emergency preparedness activities and increased assistance after disasters.

PAHO WITHIN THE INTER-AMERICAN SYSTEM

Organization of American States

PAHO was represented at the Eighth Regular Session of the OAS General Assembly (Washington, D.C., June) and took part in the 1978 meetings of the OAS-affiliated Inter-American Children's Institute, Inter-American Commission of Women, Inter-American Indian Institute, and Inter-American Institute of Agricultural Sciences.
The Interagency Committee on Human Settlements (Latin America), of which an OAS representative is chairman, met three times during the year to exchange information among its member agencies (U.N., IDB, USAID, OAS, the World Bank, and PAHO) and to discuss projects and experiences in this field.

PAHO participated in the OAS-sponsored Sixth Inter-American Conference of Ministers of Labor. There it presented a report on regional occupational health and safety conditions and made recommendations for action, most of which were approved and incorporated in the report of the Conference.

PAHO cooperated closely with the OAS Emergency Fund in rehabilitation and reconstruction activities in Guatemala after the earthquake there. At the request of the OAS Secretary General, PAHO also assessed the health problems created by population movements in Central America.

Inter-American Development Bank

IDB was particularly active in providing financial support during the year in two health areas: environmental sanitation (discussed in Chapter IV) and animal health (described in Chapter III).
Conference of Ministers Responsible for Health in the Caribbean

PAHO sent representatives to the Fourth Meeting of the Conference (St. Lucia, July). The areas in which the delegates were most interested and asked PAHO to provide technical cooperation were dental health strategies, laboratory services for the Windward Islands, management development in the less developed countries, maintenance of health care equipment, environmental health manpower development, and ways to stimulate community participation. PAHO also worked with the CARICOM Secretariat in carrying out Resolution No. 11 of the Conference's Second Meeting, which calls for devising a strategy to improve environmental health in the Caribbean.

Ministers of Health of Central America and Panama

The XXIII Meeting of Ministers of Public Health and Social Welfare and the Eighth Meeting of the Directors-General of Health of Central America and Panama (Guatemala City, 14-17 August) discussed six principal subjects: the high cost of medicaments and the negative impact thereof on health programs; dental care programs and prevention of dental caries through the use of fluorides; improvements in health care administration and manpower planning to extend coverage; assessment of environmental health and adoption of a resolution urging that all countries in the area develop their own action plans; epidemiologic surveillance of malnutrition; and health services following natural disasters. PAHO representatives organized the presentations of material about environmental health and malnutrition epidemiology.

Ministers of Health of the Andean Pact

The Fifth Meeting of Ministers of Health of the Andean Pact (Santa Cruz, Bolivia, 6-7 April) was attended by the Health Ministers of Bolivia, Colombia, Ecuador, and Peru and a Venezuelan health ministry representative. The Director of PASB spoke on the subjects of TCDC and PAHO cooperation with the Andean Pact nations. The meeting adopted major resolutions on occupational health, high altitude biology, basic drugs for health services, the legal aspects of TCDC, technical cooperation in health, and a program of joint activities between PAHO and the Andean Pact in health matters of common interest.

PAHO cooperated in planning and holding the Second Meeting of the Advisory Committee on Occupational Health of the Andean Pact and the First Andean Seminar on Occupational Health (both at Lima, November). The recommendations of the Meeting and Seminar were approved at the Eighth Meeting of the Coordinating Committee of the Andean Pact (Bogotá, December).

PAHO collaborated in planning and holding a meeting of an interdisciplinary working group on sociocultural impediments in health services (Bogotá, 11-14 September) under Andean Pact auspices.

Conference of Foreign Ministers of the Countries of the River Plate Basin

The X Meeting of the Foreign Ministers of Argentina, Bolivia, Brazil, Paraguay,
and Uruguay (Punta del Este, Uruguay, 4-6 December) was devoted in great part to the resources of the River Plate basin. The Meeting’s resolutions in the field of health dealt with evaluating water quality control, control and evaluation of communicable diseases, extending health services to rural and periurban areas, malaria eradication, and programs to control and prevent human rabies.

**Economic Commission for Latin America**

ECLA sponsored a hemispheric meeting on the U.N. Water Conference Action Plan at Mar del Plata, Argentina, in March 1977 at which the regional version of the Plan was formulated. The meeting was to further the U.N. Water Conference’s goal of providing drinking water and basic sanitation services to as many people as possible during the United Nations International Drinking Water and Sanitation Decade (1981-1990). A resolution urged PAHO to intensify its programs and activities toward this end.

A report on PAHO activities related to the health of women was presented to ECLA to use in its evaluation of the status of women in Latin America and the Caribbean.

PAHO was represented at the third session of the Caribbean Development and Cooperation Committee (CDCC) (Belize, April). Among the seven priority areas discussed were the establishment of a statistical data bank, a network of health information units, and participation of Caribbean women in development.

CDCC’s main functions are to act as a coordinating body for whatever development and cooperation activities the Caribbean countries may agree on and to provide advice to the Executive Secretary of ECLA about Caribbean issues and circumstances. CDCC uses the staff of the ECLA office at Port-of-Spain, Trinidad, as its secretariat.

**PAHO AND OTHER ORGANIZATIONS**

**World Bank**

PAHO and the World Bank agreed in July to undertake a cooperative program to identify environmental sanitation projects that the Bank or other international lending agencies might finance. The program took effect on 1 September when a member of the WHO staff in Geneva who had been dealing with the Bank was transferred to PAHO Headquarters to continue his work there. (For further details of the PAHO/World Bank program, see Chapter IV.)

**World Food Program**

PAHO continued its support of health-related projects carried out by the Governments with assistance from WFP, a program with United Nations ties. WFP’s policymaking body since 1975 has been the Committee on Food Aid Policies and Programs, an intergovernmental organization which reports annually to the U.N. Economic and Social Council and the FAO Council.

The support PAHO provided WFP included help in preparing the Program’s aid
requests and participating in its evaluation missions. The total number of WFP development projects approved for 28 of the Region's countries as of November was 130 and their total cost was $375,732,600. Health-related projects were a substantial part of the total WFP budget for the Region: 21 projects for feeding mothers and preschool children, $84,476,000; 13 elementary school food projects, $135,427,000; and six hospital food assistance projects, $8,855,000.

At the fifth meeting of the Committee on Food Aid Policies and Programs in April, two health projects in El Salvador and Haiti were approved and existing projects in Cuba and Honduras were expanded at a cost of $30,286,500.

A revision was made in the PAHO/WHO guidelines for planning and evaluating WFP health-related projects. It is expected that these guidelines will be used in helping Governments draw up new WFP project proposals and in planning primary health care extension projects.

Canadian International Development Agency

CIDA approved the continuation through December of the Caribbean Basin Water Management Project it had been supporting financially and indicated that it might agree to a two-year extension (for further details of this project, see Chapter IV). The Agency also continued to support an allied health personnel training program in all parts of the English-speaking Caribbean and a mobile veterinary laboratory services program in the Windward and Leeward Islands.

Foundations

The Pan American Health and Education Foundation (PAHEF), a PAHO partner, received grants and donations to support 50 projects from 30 public and semi-public organizations, private foundations, corporations, and individuals totaling $1.6 million. Almost half of PAHEF's receipts were to support research projects at INCAP, and the remaining contributions were for medical, dental, and nursing education and hospital administration training, disease control, and family and environmental health activities.

The PAHO-PAHEF medical textbook program's budget increased by $5 million as the result of an IDB loan to PAHEF and by $1.5 million to be contributed by PAHO over the next five years. (This program is discussed in greater detail in Chapter VII.)

The W. K. Kellogg Foundation, Ford Foundation, Microbiology Foundation, Josiah Macy, Jr., Foundation, Nestlé Foundation, Research Corporation, and Rockefeller Foundation all made grants during the year to PAHEF, INCAP, or both. The largest amount of money to be contributed for health projects in Latin America—$3.8 million—was from the Kellogg Foundation; it included a $390,000 grant to PAHEF for programs under PAHO's technical and administrative supervision. The balance was in direct grants to 40 Latin American universities and other organizations for various health projects. The Foundation also committed $1.43 million to agricultural projects with health components in Latin America, including a $360,000 grant to PAHEF for INCAP projects.

The Pan American Development Foundation (PADEF) continued its interest in the Region's health. PADEF, a nongovernmental, nonprofit organization established in 1962,
mobilizes private resources in the United States of America to advance the economic, social, educational, and cultural development of the Americas. During 1978 PADEF strengthened its commitment to health by signing a memorandum of understanding with PAHO for cooperative activities in extending health services coverage through primary care and active community participation. As part of the agreement, PAHO will help countries use and maintain donated health care equipment. PADEF also shipped donations of used hospital and dental equipment and packaged emergency hospital equipment valued at $6.3 million to 12 countries.

The International Health Resources Consortium cooperated with PAHO in planning a trial of simplified X-ray equipment for radiodiagnosis in primary health care programs.

Meeting for the signing of the memorandum of understanding between the Government of Canada and PAHO, for the cooperation of the Canadian International Development Agency and the Organization in a continuing education project in the health sector in seven Latin American countries. (Photo: G. Rincón)
INDEX

A

Accidents, traffic, prevention of, 85
Adolfo Lutz Institute (Brazil), 46
Aedes aegypti, 27-30
control research, 108-109
reinfestations discussed at XX Pan American Sanitary Conference, 4
African swine fever, 38
Agency for International Development, U.S. (USAID),
(see United States of America, Agency for International Development)
Air pollution (see Pollution control, air)
Alcohol abuse, 83
American Association of Blood Banks, 48
Andean Pact
biologicals, production of, 48
health manpower, 86
Ministers of Health (Santa Cruz, Bolivia, April), V
Meeting of, 62
occupational health, 62
Occupational Health (Lima, November), First Andean Seminar on, 137
Occupational Health of the Andean Pact (Lima, November), II
Meeting of the Advisory Committee on, 62
sociocultural impediments to health care delivery, working group on, 70
traffic accident prevention, 85
Animal health, 35-44
research in, 110-113
Animals, laboratory, 112
Anopheles albimanus, 107
Anopheles nuneztovari, 21, 107
Anthrax, 40
Antigua
Health care administration, 67
Appropriate technology, 13
Argentina
air resources, planning of, 61
biologicals, progress in testing, 48
brucellosis, diagnosis of human and animal, 40
cancer treatment research, participates in, 35
environmental improvement projects identified, 53
foot-and-mouth disease, 38-39
hemorrhagic fever, Argentine, 33
influenza, 33
malaria, 19
traffic accident prevention, 85
tuberculosis, 17
Audiovisual aids, 132
Autonomous University of Guadalajara (Mexico), 88, 90
Auxiliaries, dental, 84
health, 94-95

B

Bahamas
Aedes aegypti, 27
health care administration, 67
membership on PAHO Executive Committee ends, 5
Barbados
Aedes aegypti, 27
dengue, 26
food inspection, 49
Basic Principles in the Development of Medical Education in Latin America and the Caribbean, 90
Belize
Aedes aegypti, 27
hurricane Greta, PAHO emergency assistance after, 50
malaria, 21
tuberculosis, 17
typhoid fever risk, 45
Biologicals, production and control of, 47-48
Biomedical and Operations Research Center (Dominican Republic), 88
Blood transfusion, 48
Boletin de la Oficina Sanitaria Panamericana (PAHO monthly), 128
Bolivia
environmental improvement projects, 53, 54-55
foot-and-mouth disease, 39
health manpower training, 88
water supply and sanitation, develops projects with German aid, 54
yellow fever, 26
Brazil
Aedes aegypti, 27
Basic Sanitation Technology Company (CETESB), 61
BCG vaccine, produces freeze-dried, 18
brucellosis, 41
cancer treatment research, participates in, 35
Chagas' disease, 23
cholera vibrios isolated, 31
dinoflagellates ('red tide') washed ashore, 49
drug quality control, 47
foot-and-mouth disease, 39
influenza, 33
Joint Coordinating Board, chosen to join WHO Special Program for Research and Training in Tropical Diseases, 5
leptospirosis control (São Paulo), 43
malaria, 19, 106–107
midwifery, 76
pollution control, general, 61
primate production, 112–113
Program of Strategic Preparation of Health Personnel (PPREPS), 90, 94
rabies control, 43
schistosomiasis, 24
scleroderma, 44
schistosomiasis, human, 17–18
yellow fever, 26
zoonoses control, 36
Brazilian Disease Classification Center (São Paulo), 118
Breastfeeding, 79
Brucellosis, 40–42, 111
Bulletin of PAHO (quarterly), 128
Cajanus (CFNI quarterly), 82
Canada
Canadian International Development Agency (CIDA)
Caribbean environmental planning, supports, 53
Caribbean Regional Drug Testing Laboratory, supports, 47
Colombian water supply and sanitation projects, supports, 56
Continuing education, supports regional, 87
International Development Research Center (IDRC), 59
Cancer, 34–35
CANCERLINE (computerized data bank), 34
Caribbean Community (CARICOM), 45, 82
Caribbean Regional Drug Testing Laboratory, supports, 47
environmental improvement, planning for, 53
Caribbean Development and Cooperation Committee (CDCC)
Caribbean Development Bank, 53
Caribbean Epidemiology Center (Port of Spain, Trinidad) (CAREC), 52, 44–45, 49
Caribbean Food and Nutrition Institute (CFNI) (Kingston, Jamaica), 77, 82
Catholic University of Santiago de los Caballeros (Dominican Republic), 88
Center for Environmental Engineering (Brazil), 59
CEPANZO (see Pan American Zoonoses Center)
CEPIS (see Pan American Center for Sanitary Engineering and Environmental Sciences)
CFNI (see Caribbean Food and Nutrition Institute)
Chagas' disease, 23–24, 103, 105, 108
Chile
brucellosis control, 42
foot-and-mouth disease, 39
health information systems, 114
influenza, 33
meningococcal meningitis, 34
Aedes aegypti, 27
BCG vaccine, produces freeze-dried, 18
brucellosis, 41
cancer treatment research, participates in, 35
dengue, 26
environmental improvement projects, 54–55
food protection, 49
foot-and-mouth disease, 39
health services research, 112
maintenance of health facilities, 74
malaria, 19, 21
membership on PAHO Executive Committee ends, 5
mental health, 82–83
midwifery, 76
mycosis demonstration project, 30
nutrition services, integrated, 79
rabies, 43
sexually transmitted diseases, control of, 32
Aedes aegypti, 27
BGC vaccine, produces freeze-dried, 18
dengue, 26
drug quality control, 47
environmental improvement program, 54
health care administration, 67–68
health education, 70
health information systems, 114
maintenance of health facilities, 74
membership on PAHO Executive Committee ends, 5
Nicaraguan refugees, PAHO assistance in dealing with, 50
oral rehydration in diarrheal disease, research in, 110
statistical methodology in immunization and nutrition programs, 116
Swedish disaster relief fact-finding visit to, 50
water pollution control, 62
Courses (see Training activities)

Cuba
- Aedes aegypti, 29
- auxiliaries, training of, 94
- BCG vaccine, produces freeze-dried, 18
- dengue, 25-26
- dental care, 134-135
- health services research, 113
- National Directorate of Intermediate Medical Instruction, 94
- sexually transmitted diseases, control of, 32
- tuberculosis, 18

D

Dengue, 25-26
- discussed at XX Pan American Sanitary Conference

Dental health, 83-84

Directing Council of PAHO (see Pan American Health Organization)

Directory of Oncologic Institutions, 35

Directory of Training Programs in Latin America and the Caribbean, 101

Disaster relief, 50

Disease, foot-and-mouth (see Foot-and-mouth disease)

Diseases, cardiovascular, 35, 116
- communicable, 14-34
- diarrheal, 31, 109-110
- noncommunicable, 34-35, 116-117
- sexually transmitted, 32-33

Dominica
- health care administration, 67
- typhoid fever, outbreak of, 34, 45

Dominican Republic
- Aedes aegypti, 29
- auxiliaries, training of, 94
- brucellosis control, 42
- equine encephalitis, 42
- health manpower training, 88
- health information systems, 114
- maintenance of health facilities, 74
- poliomyelitis, 45
- tuberculosis, 18

Drug abuse, 83

Drugs
- impact on health care costs discussed at XX Pan American Sanitary Conference, 4-5, 46
- quality control, 46-47

E

ECO (see Pan American Center for Human Ecology and Health)

Economic Commission for Latin America (United Nations) (ECLA), 53

Ecuador
- animal health information system, formulates, 36
- appointed to working group on WHO organization study, 5, 7
- community participation in health care, 70-71

environmental improvement projects identified, 95

Expanded Program on Immunization demonstration areas, 16
- foot-and-mouth disease, 39
- health manpower training, 88
- health planning, 71
- health services research, 113
- maintenance of health facilities, 74
- midwifery, 76
- primary health care programs, 69
- sexually transmitted diseases, control of, 32
- water pollution control, 62
- yellow fever, 26

Educación médica y salud (PAHO quarterly), 128

Education, engineering and environmental sciences, 92-93
- medical, 90-92
- nursing, 92
- public health and social medicine, 93

El Salvador
- Aedes aegypti, 29
- dengue, 26
- drug quality control, 47
- health care administration, 67-68
- maintenance of health facilities, 74
- malaria, 19, 21
- water supply and sanitation, develops projects with German aid, 54

Emergency preparedness, 50

Encephalitis, equine, 42

Engineering and environmental sciences education, 92-93

Enteric diseases, 30-31, 109-110

Environmental health, 51-63
- institutional development, 57
- Epidemiologic surveillance, 44-45
- Equine encephalitis, 42

Executive Committee of PAHO (see Pan American Health Organization)

Expanded Program on Immunization, 14-17
- research in preparation for, 16
- revolving vaccine purchase fund, 16-17, 121
- training activities in preparation for, 16, 44

Extension of health services, 2-3, 71

F

Family health, 75-85

Family planning, 75-77

Fellowships program, PAHO, 100-102

Filariasis, 24-25

Fluoridation (of water supplies), 83-84

Food and Agriculture Organization (United Nations), 36, 135

Food protection, 49, 112

Foot-and-mouth disease, 36-39
- discussed at XX Pan American Sanitary Conference, 4

Ford Foundation, 82

French Guiana
- dengue, suspected, 26
- malaria, 19
French Territories

- *Aedes aegypti*, 29
- apply for membership in Caribbean Epidemiology Center, 45

**G**

- Germany, Federal Republic of, 54
- Global Air Pollution Monitoring Network, 59, 61
- Global Environmental Monitoring System (GEMS), 59
- Global Water Pollution Monitoring Network, 59, 62
- Gorgas Memorial Laboratory (Panama), 25

Grenada

- *Aedes aegypti*, 29
- *Plasmodium malariae*, outbreak of, 21, 45
- rabies survey, 45
- site of XX Pan American Sanitary Conference, 1-5

Guatemala

- *Aedes aegypti*, 29
- dengue, 26
- drug regulation program developed, 46
- food protection, 49
- elected to PAHO Executive Committee, 5
- Expanded Program on Immunization research in, 16
- health care administration, 68
- health planning, 71
- maintenance of health facilities, 74
- malaria, 19, 21
- nursing services, 72-73
- Swedish disaster relief fact-finding visit to, 50
- tuberculosis, 18

Guide for Laboratories Performing Physical and Chemical Analyses of Water, 61

Guide for the Organization of Continuing Education Programs for Health Workers, 87

Guide to Health Management After Natural Disaster, A, 50

Guidelines for Developing an Effective National Food Control System, 49, 135

Guyana

- *Aedes aegypti*, 29
- Caribbean Epidemiology Center surveys in, 45
- dengue, 26
- drug formulary, prepares second edition of, 47
- malaria, 19, 21

**H**

Haiti

- *Aedes aegypti*, 29
- anthrax, 40
- dengue, 26
- malaria, 19, 21
- rabies control, 43
- water supply and sanitation, develops projects with German aid, 54

Hand Pumps, 61

Harvard University (USA), 105

Health, animal, 35-44
- dental, 83-84
- maternal and child, 75-77
- mental, 82-83
- occupational, 62

Health care administration, 64-74, 86-87


Health planning, 71

Health service systems, 64-74

research, 113

Hemorrhagic fever, Argentine, 33

Hepatitis, 33

Histoplasmosis, 30

Honduras

- *Aedes aegypti*, 27, 29
- auxiliaries, training of, 94
- dengue, 26
- health care administration, 68
- health manpower training, 88
- health planning, 71
- hurricane Greta and Nicaraguan refugees, PAHO assistance in dealing with, 50
- maintenance of health facilities, 74
- midwifery, 76
- water supply and sanitation, develops projects with German aid, 54

Hospitals

- administration, 66
- infections, control of, 48-49, 112

Hydatidosis, 42-43, 111

Immunization (see also Expanded Program on Immunization)

- need for in Caribbean, 45
- problems confronting Expanded Program on, 14-15

INCAP (see Institute of Nutrition of Central America and Panama)

Index Medicus (see Latin American Index Medicus)

Infection, hospital, control of, 48-49

Influenza, 33

Information systems, health, 114-116

Insecticides, 106, 107, 108

Institute of Nutrition of Central America and Panama (INCAP), 33, 77, 78, 78-79

Interagency Committee on Human Settlements (Latin America), 136

Interagency Project for the Promotion of National Food and Nutrition Policies (PIA/PNAN), 77

Inter-American Association of Sanitary Engineering (AIDIS), 5

Inter-American Center for Social Security Research, 66

Inter-American Development Bank, 136-137

ACAMIL (food mix), supports Haitian study of, 78

brucellosis control in Colombia, 41
health services extension, supports, 71, 116
PAHO medical instrument program, supports, 99
PAHO textbook program, lends money for, 7, 96, 99
training activities, supports, 88
water supply and sanitation project, aids Peru in, 54, 93, 99

Inter-American Indian Institute, 69, 135
Intermediate-level health workers (see Auxiliaries, health)
International Bank for Reconstruction and Development (World Bank), 138
Cooperative program with PAHO, 53
Development and population, sponsors Washington, D.C., course on, 69
Water supply and sanitation, aids Nicaraguan and Paraguayan projects to improve, 54
International Classification of Diseases, 35, 83, 119, 129
International Commission on Radiological Protection, 63
International Drinking Water and Sanitation Decade (1981-90), 53-54, 138
International Federation of Antileprosy Associations, 32
International Health Resources Consortium, 140
International Nutritional Anemias Consultative Group (INACG), 78
International Union Against Cancer, 35
International Vitamin A Consultative Group (IVACG), 78

J

Jamaica
Aedes aegypti, 27, 29
Caribbean Regional Drug Testing Laboratory (CRDTL), 47
community participation in health care, 70
health care administration, 67
histoplasmosis outbreak, 30
maintenance of health facilities, 74
mental health, 82
primary health care, training in, 70
sexually transmitted diseases, control of, 32
typhoid fever, 45
Japanese Shipbuilding Industry Foundation, 32
Johns Hopkins University (USA), 87

K

Kellogg, W. K., Foundation, 75, 78, 87, 90, 99, 139

L

Laboratory services, 45-46
Latin American Association of Nuclear Biology and Medicine Societies, 63
Latin American Association of Public Health Schools (ALAESPI), 93
Latin American Cancer Research Information Project, 34
Latin American Center for Educational Technology for Health, Mexico City (CLATES-Mexico), 97, 98-99
Latin American Center for Educational Technology for Health, Rio de Janeiro (CLATES-Rio), 87, 95, 97, 98
Latin American Center for Perinatology and Human Development (CLAP) (Montevideo), 77
Latin American Disease Classification Center (CLACE) (Caracas), 119
Latin American Index Medicus, 97
Latin American Nutrition Society, 77-78
Latin American Program for Educational Development for Health (PLADES), 90, 97
Leishmaniasis, 25, 109
Leprosy, 32
Leptospirosis, 43, 112

M

Macy, Jr., Josiah, Foundation, 139
Maintenance of health facilities, 73-74
Malaria, 19-23
Anopheles nuneztovari, 21
anopheline resistance to insecticides, 21-22, 106-107
discussed at XX Pan American Sanitary Conference, 3-4
research, 106-107
Manpower, health, 86-102
Manual of Standards and Procedures for Integrated Tuberculosis Control Programs in Latin America, 19
Maternal and child health, 75-77
Maternal and Child Health (RLM publication), 97
Medical education, 90-92
Medical records, training, 117
Medical Mycology Society of the Americas, 30
MEDLINE, 97
Meetings
Actuaries and Statisticians (La Paz, Bolivia, June), Seventh Meeting of the Regional Committee of, 66
Advisory Commission on Occupational Health of the Andean Pact (Lima, November), Second Meeting of the, 62
Dengue in the Caribbean (Montego Bay, Jamaica, May), PAHO Working Group on, 26, 27
Directors General of Health of Central America and Panama (Guatemala City, August), Eighth Meeting of
Panama (Guatemala City, August), Eighth Meeting of, 137
Directors of Malaria Eradication Services (Mexico, 1979), Third Meeting of, 4
Foot-and-Mouth Disease and Zoonoses Control (Washington, D.C., 1978), XI Inter-American Meeting on, 4, 123
Foreign Ministers of the Countries of the River Plate Basin (Punta del Este, Uruguay, December), X Meeting of, 137-138
Ministers of Health of the Americas, Third Special Meeting of the (Santiago, Chile, 1972), 17
Ministers of Health of the Andean Pact (Santa Cruz, Bolivia, April), Fifth Meeting of the, 62
Ministers of Labor, Sixth Inter-American Conference of, 62, 136
Ministers of Public Health and Social Welfare of Central America and Panama (Guatemala City, August), XXIII Meeting of, 137
Nutrition (Rio de Janeiro, August), XI International Congress of, 77-78
Occupational Health (Lima, November), First Andean Seminar on, 62, 137
Occupational Health of the Andean Pact (Lima, November), Second Meeting of the Advisory Committee on, 62, 137
Primary Health Care (Alma-Ata, U.S.S.R., September), International Conference on, 3, 133
Psychiatry, Fifth Peruvian Congress of, 83
Public Health Schools (1979), X Conference of, 93
Seminar on Occupational Health (Lima, November), First Andean, 62
Social Security Medicine (San José, Costa Rica), Sixth Inter-American Congress of, 66
Solid Waste Management (Santo Domingo, Dominican Republic, February), PAHO Regional Symposium on, 134
Technical Cooperation among Developing Countries (Buenos Aires, 30 August–12 September 1977), U.N. Conference on, 101, 133
United States/Mexico Border Public Health Association (Reynoso, Mexico), XXVI Meeting of, 123
Water Conference, United Nations (Mar del Plata, Argentina, March 1977), 54, 138
Work Hazards (Jalapa, Mexico, October), Fifth Inter-American Congress on Prevention of, 66

Meningitis, meningococcal, 34
Mental health, 82-83
Mental retardation, 83
Merck Institute, 109
Mexico
Aedes aegypti, 27, 29
auxiliaries, training of, 94
BCG vaccine, produces freeze-dried, 31
brucellosis control, 40, 42
environmental improvement projects identified, 53
health manpower training, 88
International Council for Science and Technology, 105
nursing services, 72
rehabilitation services, 73
tuberculosis, 18
vaccine production and testing, 48
Microbiology Foundation, 139
Microthesaurus In Sanitary Engineering and Environmental Sciences (MISCA), 61
Midwifery, 76
Ministers of Health of Central America and Panama, 137
Ministers Responsible for Health in the Caribbean, Conference of, 137
Montserrat
Appoints first health educator, 70
Mycoses, 30
mycology course held at Kingston, Jamaica, 30, 46

Narcotics (see Drug abuse)
Nestlé Foundation, 139
Netherlands
helps establish Caribbean laboratory network, 45-46
Netherlands Antilles
Aedes aegypti, 29
apply for membership in Caribbean Epidemiology Center, 45
Nicaragua
Aedes aegypti, 29
dengue, 26
health information systems, 114-115
health manpower training, 88
health services research, 113
Human Resources Institute, 69
Nuclei of Research and Development in Education and Health (NIDES), 90, 97
Nursing, 71-73
tuberculosis instruction in nursing schools, 19
Nursing education, 92
Nutrition, 77-82

Occupational health, 62, 66, 137
Onchocerciasis, 24
Organization of American States, 56, 62, 135-136

PAHEF (see Pan American Health and Education Foundation)
Pan American Air Sampling Network (REDPANAIRE), 59, 61
Pan American Center for Human Ecology and Health (ECO) (Mexico City), 57-58, 134
Pan American Center for Research and Training in Leprosy and Tropical Diseases (Caracas, Venezuela), 32

Pan American Center for Sanitary Engineering and Environmental Sciences (CEPIS)(Lima), 51, 59-62, 93

Advisory Committee on Medical Research (PAHO) meets at, 105

aids Peru in formulating large water supply and sanitation project, 54, 93

research, 54

Pan American Development Foundation (PADEF), 139-140

Pan American Federation of Medical School Associations, 92

Pan American Foot-and-Mouth Disease Center (PANAFTOSA), Rio de Janeiro, 4, 36, 36-39

Pan American Health and Education Foundation (PAHEF), 90, 96, 99-100, 139

Pan American Health Organization (PAHO)

Advisory Committee on Medical Research, 78, 105, 113

Award for Administration, 5

budget and finance, 120-122

conference services, 123-124

designated focus of WHO’s TCDC activities, 10

Directing Council

Emergency preparedness program, recommends establishment of at XXIV Meeting (October 1976), 50

Expanded Program on Immunization, approves at XXV Meeting (October 1977), 14, 121

rheumatic heart disease, recommends collaborative study of at XXIII Meeting (October 1975), 116

Technical Discussions at XXVII Meeting (1980), 5

Director, reelection of, 1

Documentation and Health Information Office, 126

Executive Committee

80th Meeting, Washington, D.C., 16 June-6 July, 123

arterial hypertension, resolution on, 35

malaria situation, discusses, 19

81st Meeting, St. George’s, Grenada, 4 October, 123

represented at XX Pan American Sanitary Conference, 1

fellowships program, 100-102

filmstrips, 129

hypertension control, working group on, 35

information collection and dissemination, 118-119

internal programming and evaluation of PAHO technical cooperation, 125-126

management and computer services, 120, 124

medical instrument program, 100

PAHO/WHO Publications and Documentation Service (SEPU), 127, 128

personnel, 120, 122-123

policies, basic, 9-3

procurement, 122

program and budget, 2

public information, 132

publications program, 120, 126-132

rheumatic fever and rheumatic heart disease, working group on, 35

textbook program, 7, 96, 99-100

translations, 132

visual aids, 132

Weekly Epidemiological Report, 118-119

Pan American Sanitary Code, 118

Pan American Sanitary Conference, XVII

Aedes aegypti eradication, 4

XIX

continuing education, resolution on, 87

XX, 1-7

Aedes aegypti eradication, 27

biennial program and budget cycle, 120

extrabudgetary funds, 120

malaria situation, discusses, 19

research, receives report on, 105

revolving vaccine purchase fund, 16-17

staffing support for, 123

Pan American Sanitary Engineering and Environmental Sciences Information and Documentation Network (REPIDISCA), 59

Pan American Zoonoses Center (CEPANZO), Ramos Mejia, Argentina, 4, 36, 39-44

BCG vaccine quality control laboratory, 18

PANAFTOSA (see Pan American Foot-and-Mouth Disease Center)

Panama

community participation in health care, 71

dengue, 26

environmental health, ECO/UNEP survey of, 58, 134

health planning, 71

maintenance of health facilities, 74

malaria, 21

sexually transmitted diseases, control of, 32

Paracoccidioidomycosis, 30

Paraguay

drug quality control, 47

foot-and-mouth disease, 39

health information systems, 116

primary health care, 69

water supply and sanitation, develops projects with German aid, 54

Peru

cancer treatment research, participates in, 35

elected to PAHO Executive Committee, 5

floods in Cuzco, PAHO assistance in dealing with, 50

foot-and-mouth disease, 39

health information systems, 114-116

health manpower training, 80

mental health, 82

National Research Council, 105

primary health care, 69

primate production, 112-113

tuberculosis, 18

water supply and sanitation, formulates large project for, 54

yellow fever, 26

PLADES (see Latin American Program for Educational Development for Health)

Plague, 33

Planning, family, 75-77
Planning, health, 71
Plasmodium falciparum, resistance to 4-aminoquinolines, 21-22, 106-107
Plasmodium malariae, outbreak of in Grenada, 21, 45
Pneumonia, 109
Poliomyelitis, 44-45
Pollution control, air, 61
general, 61
water, 61-62
Primary health care, 11-12, 69-71
International Conference on (Alma-Ata, U.S.S.R., September), 3, 12, 69
International Conference on (Halifax, Nova Scotia, Canada), 69
Program of Strategic Preparation of Health Personnel (PPRPS) (Brazil), 90, 94
Publication program (PAHO), 126-132
Public health and social medicine, education in, 93
Puerto Rico
Aedes aegypti, 29
dengue, 26


Rabies, 43, 111-112
Radiation and isotopes, 63
Regional Food Protection Program, 49
Regional International Organization for Plant and Animal Health (OIRSA), 36, 38
Regional Library of Medicine (São Paulo), 35, 97, 105
Regional Program for Analytical Control of Water and Waste Water Laboratories (PRELAB), 59, 62
Rehabilitation services, 73
Rehydration, oral, 109-110
Research, 103-113
Advisory Committee on Medical Research (PAHO), 78, 105, 113
Aedes aegypti, 108-109
enteric diseases, 109-110
environmental health, 56, 59
grants (PAHO), 105
health services, 113
malaria, 106-107
typhoid fever, 110
vector biology and control, 29, 107
zoonoses and animal health, 110-113
Research Corporation, 139
Retardation, mental, 83
RLM (see Regional Library of Medicine
Rockefeller Foundation, 48, 139
Rotavirus, 33
Rural Health (RLM publication), 97

S
St. Kitts-Nevis-Anguilla
nutrition, 77, 82
St. Lucia
health care administration, 67
St. Vincent
Caribbean Epidemiology Center surveys in, 45
Schistosomiasis, 24, 109
Seminar (see Training activities)
Sexually transmitted diseases, 32-33
course on laboratory diagnosis of (São Paulo), 46
Simplified Methods for the Analysis of Water, 61
Smallpox, 14
Smithsonian Science Information Exchange, 103
Sociocultural impediments to health care delivery, 4, 70
Solid wastes, 56
South American Foot-and-Mouth Disease Control Commission (COSALFA), 36, 38
Sporotrichosis, 30
Standards for Hospital Libraries in Latin America (RLM publication), 97
Statistical methodology, 116, 117
Stomatitis, vesicular, 36-39
Streptococcus pneumoniae, 109
Suriname
Aedes aegypti, 29
dengue, 26
schistosomiasis, 24
Swine fever, African, 38

T
Teaching Preventive and Social Medicine: Twenty Years of Experience in Latin America, 93
Technical Cooperation among Developing Countries (TCDC), 3, 10-11
U.N. Conference on (Buenos Aires, 30 August-12 September 1977), 10
Technicians, health (see Auxiliaries, health)
Ten-Year Health Plan for the Americas, 1, 94, 113
Toxic substances, control of, 49
Traditional Medicine (RLM publication), 97
Traffic accidents, prevention of, 85
Training activities
Development of Health Service Systems, First International Course on, 69
Epidemiologic Surveillance and Communicable Diseases (Caracas), Seventh Regional Course on, 44
Expanded Program on Immunization Planning, Administration, and Evaluation (San José, Costa Rica), First Regional Course on, 44
Family Planning Administration (Mexico, September), Fifth Regional Course in, 75
Health Administration Programs (Rio de Janeiro), Regional Didactic Seminar for Professors in Advanced, 87
Health Manpower Planning, First International Course on, 86
Health Records and Statistics (Kingston, Jamaica, December), Regional Meeting on Education and Training in, 117
Health Services Administration, Second Regional Course on, 68
Health Services Administration (Cartagena, Colombia, December), XVI Regional Seminar on, 68, 124
Meat Hygiene in Central America and Panama (San Salvador, July), Sixth Seminar on, 49
Urban Sanitation, Third Latin American Course on (Argentina), 93
Venereal Disease (Santiago, Chile), XI International Course on the Epidemiology and Control of, 32
Trinidad and Tobago
Aedes aegypti, 29
appointed to working group of WHO organization study, 7
Caribbean Epidemiology Center surveys in, 45
dengue, 26
health care administration, training in, 67
sexually transmitted diseases, control of, 32
Tuberculosis, animal, 43-44, 112
Tuberculosis, human, 17-19
Manual of Standards and Procedures for Integrated Tuberculosis Control Programs in Latin America, 19
training activities, 19
Tuberculosis Bulletin, 19
Typhoid fever, 34, 110

United Nations
Economic and Social Council (ECOSOC), 54
General Assembly, 10, 54
Children’s Fund (UNICEF), 31, 56, 134-135
International Conference on Primary Health Care, sponsors, 12
Development Program (UNDP), 133-134
Argentine hemorrhagic fever vaccine production, awards Argentina grant for, 33
auxiliaries, training of in the Caribbean, 94
dental nurses training in Trinidad, 84
health care maintenance program in Jamaica, supports, 74
regional health facilities program, 66
Technical Cooperation among Developing Countries, 10
training activities, supports, 88
vaccine tissue culturing, supports course on, 48
Economic Commission for Latin America (see Economic Commission for Latin America (United Nations))
Environment Program (UNEP), 53, 58, 61, 134
Fund for Population Activities (UNFPA), 32, 75, 135
High Commissioner for Refugees, 50
Office of the Disaster Relief Coordinator (UNDRO), 50, 135
University, 80
United States of America
Aedes aegypti, 29
Agency for International Development, 45, 74, 78, 82, 106
appointed to working group on WHO organization study, 7
cancer treatment research, participates in, 35
Center for Disease Control (Atlanta, Georgia), 33, 46, 77, 103
cholera outbreak in Louisiana, 31
elected to PAHO Executive Committee, 5
Food and Drug Administration, 46
influenza, 53
National Academy of Sciences, 77
National Aeronautics and Space Administration, 84
National Cancer Institute (Bethesda, Maryland), 35
National Center for Health Statistics (Rockville, Maryland), 119
National Institute of Drug Abuse (Rockville, Maryland), 83
National Institutes of Health (Bethesda, Maryland), 33, 46, 112
National Library of Medicine (Bethesda, Maryland), 34, 97
Typhoid fever outbreak, 34
Veterans Administration, 74
University of Rio de Janeiro, Federal, 113
University of Texas, Austin, U.S.A., 63
University of the West Indies (Kingston, Jamaica), 30, 44, 75
University of Toronto (Ontario, Canada), 105
Uruguay
air pollution control, 61
cancer treatment research, participates in, 35
foot-and-mouth disease, 39
health care administration, 68

Vaccines (see also Expanded Program on Immunization), 47-48
pneumonia, 109
Vector Biology and Control Research and Reference Center (Maracay, Venezuela), 107
Vector control, research in, 29, 107
Venezuela
Aedes aegypti, 29
BCG vaccine, produces freeze-dried, 18
Chagas’ disease, 23
dengue, 26
dinoflagellates (“red tide”) washed ashore, 49
foot-and-mouth disease, 39
Joint Coordinating Board, Chosen to join WHO Special Program for Research and Training in Tropical Diseases, 5
maintenance of health facilities, 74
schistosomiasis, 24
solid waste management, 56
yellow fever, 26
Vesicular stomatitis, 36–39
Virgin Islands (U.K.)
appoints first health educator, 70
Virgin Islands (U.S.)
Aedes aegypti, 29
dengue, 26

W

Wastes, solid, 56
Water pollution (see Pollution control, water)
Water supply, 53–56
Weekly Epidemiological Report (PAHO), 118–119
W. K. Kellogg Foundation (see Kellogg, W. K., Foundation)
Workshops (see Training activities)
World Bank (see International Bank for Reconstruction and Development)
World Federation of Public Health Associations, 69
World Food Program, 82
World Health Organization (WHO)
   Expanded Program on Immunization, adopts, 14
   International Conference on Primary Health Care, sponsors, 12
   Special Program on Human Reproduction, 103

Y

Yellow fever, 26
discussed at XX Pan American Sanitary Conference, 4

Z

Zoonoses, 35–44
research in, 110–113
Zoonosis (quarterly PAHO journal), 40
<table>
<thead>
<tr>
<th>Acronym</th>
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