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RESEARCH POLICY - DISEASE CONTROL DIVISION

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## RESEARCH POLICY - DISEASE CONTROL DIVISION\*

Health problems in the Americas vary as widely as socioeconomic development and climate.

Some areas still have high morbidity and mortality from diphtheria, tetanus, poliomyelitis, measles, and other diseases for which there are preventive methods of proven effectiveness. In such cases, the anthropological and sociological problems that have prevented the use of these methods must be investigated.

Other areas have a high incidence of diseases--like malaria--that are preventable but do not respond easily to standard preventive methods, and therefore, modifications or combinations of those methods must be investigated, based on better information about local conditions and resources. In these areas, it would also be advantageous to have new methods that are more effective and more easily applied.

For the large numbers of people caught in the vicious circle of poverty-ignorance-sickness-poverty, such illnesses as Chagas' disease, schistosomiasis, gastroenteritis, etc., could be controlled using the same mechanisms that have been employed in areas with greater resources if the socioeconomic situation can be improved, but where that cannot be done, new control methods must be developed.

Furthermore, there are no effective control methods for the varied epidemiology of such major endemic illnesses as Chagas' disease, schistosomiasis, leishmaniasis, and onchocerciasis, and control campaigns are not yet being carried out on a wide enough scale.

In the more advanced areas of the Hemisphere, the spectacular development of the biomedical sciences and their effective application in the control of disease over the last 50 years have contributed to population growth and, as a consequence, to an increase in the older population groups. Solutions to the multiple problems thus generated also depend on new research.

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Although these examples are not intended to cover the entire gamut of existing problems, they give an idea of how varied the problems and the research programs seeking to solve them are.

Public health research has been defined as an activity whose objectives are attained by the application of methods carried out under controlled conditions, to obtain and confirm data on community health, demonstrate the feasibility of utilizing new information, and evaluate the effectiveness of additional data for the promotion of health, prolongation of life, and reduction of diseases and their threats.

The general goals of the Division's programs are:

1. To identify problems that impede better knowledge of regional pathology;
2. To study the distribution and causal factors of diseases, with basic supplementary research for developing effective control standards;
3. To promote, coordinate, assist and evaluate the work performed in individual countries;
4. To conduct studies to develop methodologies for the provision of preventive care through primary health services.
5. To stimulate and motivate researchers working on communicable and noncommunicable diseases;
6. To attract, train, and retain the staff needed at all levels;
7. To do everything possible to promote technical cooperation between the developing countries in the Region and those of other regions, for example the Portuguese- and Spanish-speaking countries in Africa.

Research is a collective enterprise that must have public funds, and it must therefore be planned within an overall context, setting priorities relevant to the community problems. Research projects must relate to the public health field and must at the same time provide benefits in terms of new knowledge and its significance, thus making it possible to improve community health. Preference should therefore be given to programs that have a special impact on a country or on some areas of the country and to

regional cooperative programs that combine the efforts of the individual countries so as to make greater human resources available.

Within this framework, PAHO should (a) coordinate and exchange information among the various institutions conducting research on these problems; (b) establish liaison between research institutions and the disease-control programs in the field; (c) identify unknowns in our basic knowledge and in our control methods, where more intensive research should be promoted; (d) promote and assist in training physical and human research resources in the countries, with programs geared to solving their problems; and (e) establish inter-country or regional research resources to solve more effectively problems of collective interest.

Below are the research programs in which the Division participates.

1. Malaria

The success attained by malaria programs in the early years with the application of two uniform and effective measures, DDT and drugs, have relegated research to a secondary level. The predominance of a single technique resulted in little importance being attached to biological, ecological, and genetic studies. Later, technical, operational, and administrative problems emerged that caused the epidemiologic situation to worsen.

It has become evident that malaria cannot be eradicated over a short period of time in a number of malarious areas in several countries of the Region.

These problems heighten the need to expand research on the application of a more flexible strategy and on immunology, seroepidemiology, and clinical field tests with new anti-malarial drugs.

Comprehensive controlled field tests are now in preparation based on local and multidisciplinary epidemiologic studies. It is hoped that this operational research will have a major impact on future malaria programs. Studies have recently begun on the value of nonhuman primates as models for the production of human plasmodium antigens, and seroepidemiologic surveys are being conducted in several countries. A hemisphere-wide survey has been

planned on the susceptibility of Plasmodium falciparum to chloroquine, and research is in preparation to study the effectiveness of the new drug Mefloquine in treating infections of P. falciparum that are resistant to the 4-aminoquinolines.

The feasibility of including some of these major studies in the WHO Special Program on Research and Training in Tropical Diseases is being studied.

## 2. Biology and Control of Vectors

The growing extension of problems in the control and eradication of diseases transmitted by vectors has shown the need to organize a research program with the following objectives:

- a) To study the biology and ecology of the vectors and reservoir hosts of the major diseases, to orient the planning of control programs with a better definition of the vulnerability in time and space of the vector populations to particular control measures. These studies include the dynamics of vector populations, productivity of breeding areas, importance of animal reservoir hosts, contacts between the various cycles of wild, peridomestic, and domestic transmission, etc.
- b) To develop new control methods through the use of chemical or biological agents, the introduction of genetic manipulation, or modification of the environment, test and evaluate their effectiveness in the field, and determine the conditions of their applicability, restrictions on their use, and precautions required in their application.
- c) To study, in various ecological and epidemiological situations, various combinations of selected control measures, to obtain guides for choosing control methods and evaluating them in the field.
- d) To study the problems that hamper, modify, or render ineffective attack measures, such as the resistance of vectors or reservoir hosts to pesticides, and changes in behavior to avoid the action of control measures.

3. Diseases Preventable by Vaccination

In this field, assistance is being provided in the study of operational methods in the logistics, administration, and evaluation of immunization services, particularly with respect to the preservation of vaccines in the field and research on simultaneous inoculation of several antigens in order to confirm their applicability in Latin America and the Caribbean.

Special attention will be given to developing model vaccination projects to provide pilot areas to study and demonstrate the provision of immunization services through comprehensive programs.

4. Virus Infections

Studies to determine the extent of infections caused by viruses transmitted by anthropoids are of special interest in programs for colonizing new territories. The development of new areas of the Hemisphere without a prior study of their ecology has resulted in catastrophes in the past, as illustrated by Mayaro virus infections in Japanese colonists brought to Bolivia and in more recent cases where the development of rich agricultural areas in Argentina and Bolivia has been threatened by the agents of hemorrhagic fever.

The importance of the ravages caused in man and livestock by the equine encephalitis virus has caused the Organization to initiate negotiations to establish a regional center for the study of the ecology of these agents.

5. Zoonoses

Studies of diseases transmitted from animals to man have always received attention in the Organization.

Research projects in the field of zoonoses are designed to solve or prevent problems from occurring in animal health and veterinary public health programs carried out by the countries of the Region and to improve available resources for implementing those programs.

These projects are conducted through the Pan American Zoonoses and Foot-and-Mouth Disease Centers (some in cooperation with the countries) aimed at the following major objectives:

- a) Improvement of methods for the diagnosis of foot-and-mouth disease and the primary zoonoses.
- b) Improvement of existing vaccines and development of new vaccines and effective control methods for them.
- c) Epidemiologic information on foot-and-mouth disease and existing zoonoses in the various countries.

A more detailed description of this research will be given at this meeting by the directors of the Pan American Zoonoses and Foot-and-Mouth Disease Centers.

#### 6. Chagas' Disease

This topic, which is of great importance for the Region, has been studied by numerous groups in various countries. Coordination of this work and the establishment of a hemisphere-wide program will make it possible to determine host-parasite relationships that will lead to knowledge of the factors governing the virulence of the strains of Trypanosoma cruzi, the resistance of the host, the susceptibility of vectors, the effectiveness of drugs, etc.

This disease should be given special priority because of its high morbidity, because it is a disease found only in the Americas, and because trypanosomiasis is of major epidemiologic importance. For these reasons it will be given special attention by the WHO Special Program on Research and Training in Tropical Diseases

#### 7. Gastrointestinal Infections

Sanitation of the environment, purity of food, and an abundance of good-quality water are essential factors in reducing the incidence of gastrointestinal infections, which constitute the primary cause of general morbidity and infant mortality in most countries.

Research on these diseases will stress:

- a) Determination of the epidemiology and relative importance of enterotoxigenic E. coli and rotavirus as causes of gastroenteritis in infants in Latin America and the Caribbean.
- b) Evaluation of the responses of various etiological agents to oral rehydration.
- c) Improvement of means and development of methodologies for providing oral rehydration through primary health services.
- d) Development of simplified laboratory techniques for identifying etiological agents.
- e) Promotion of research on immunizing agents against the various causes of diarrheic diseases.

The presentations of Drs. Quadros, Rust, and Western will give more details on this research.

#### 8. Tuberculosis

For a number of years, special importance has been attached to the search for new drugs, the use of different therapeutic procedures, widespread immunization of exposed groups by BCG, and methods to simplify the techniques used to search for Mycobacterium tuberculosis in diagnosing the disease.

#### 9. Leprosy

Recent discoveries on the susceptibility of the armadillo (Dasipus novemcinctus, D. sabanicola) to the leprosy agent has constituted the basis for new studies on the host-parasite relationship in determining the host's defense mechanisms, testing of new drugs, and obtaining antigens. The Organization supports studies being conducted in this area at the Centro Colaborador de Estudios de Lepra y Otras Enfermedades de Tipo Tropical.

#### 10. Congenital Malformations

The growing importance of several infectious agents (rubella virus, herpesvirus, and cytomegalovirus, Toxoplasma gondii, Trypanosoma cruzi,



etc.) in causing fetus malformations stimulated the Organization's interest in supporting a hemisphere-wide study on the prevalence of these agents in pregnant women.

#### 11. Serum Banks

The importance of determining the prevalence and activities of certain agents in a particular community justifies the Organization's support of the establishment of serum banks for future determination of the activity of agents as yet unknown.

#### 12. Plague

Fortunately, only a few countries of the Hemisphere still have jungle foci of plague. Priority should be given to ecological studies, the development of an effective immunizing agent for rural populations exposed to infection, etc.

#### 13. Noncommunicable Chronic Disease

In a number of countries of the Region, this group of diseases is of growing importance. The Organization is assisting them directly or through inter-country studies in pilot-type epidemiological and operational studies to determine the actual magnitude of the problem and the feasibility of preventive and therapeutic measures. Priority in this research is being given to the prevention of rheumatic fever, the control of arterial hypertension, and diabetes mellitus.

PAHO maintains an active information network on research published or underway on cancer, in cooperation with the U.S. National Cancer Institute. Recently the Organization and that Institute have initiated cooperative research on cancer chemotherapy among seven oncological centers in Latin America and seven in the United States, based on protocols jointly designed by the participating centers.

Some of these programs, which have been undertaken by various countries with the Organization's support, have contributed extensive data that have been utilized to solve problems of unquestionable importance. This work has not

always been easy, and obstacles in the way of its progress have been overcome at a rate that is disproportionate to the effort contributed. Factors preventing better development of research programs are as follows:

1. Human factors
2. Lack of planning
3. Political and administrative instability
4. Educational deficiencies
5. Insufficient financing

These factors cannot be analyzed individually in this brief space. It should, however, be pointed out that, as our countries solidify their health structures and provide more opportunity to younger age groups, there is greater likelihood that basic and applied research programs will be initiated or expanded and that the societies in the countries sponsoring them will obtain the same benefits that have been achieved in the more advanced countries.