TWENTY THIRD MEETING OF THE
ADVISORY COMMITTEE ON HEALTH RESEARCH

Washington, D.C.
4-7 September 1984

RESEARCH PRIORITIES
TROPICAL DISEASES PROGRAM

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INTRODUCTION

The general problems, regional goals and objectives related to tropical diseases were outlined in the Plan of Action for the Implementation of Regional Strategies approved by the Directing Council of the Pan American Health Organization at its XXVIII Meeting in October 1981, which represent the contribution of the Americas to the Seventh General Program of Work of WHO (1984-1989).

The purpose of the Tropical Disease Program is to provide technical cooperation for the development of national programs for the prevention and control of tropical diseases, and to promote applied field research aimed at solving problems that hinder the progress of the prevention and control activities.

SITUATION CONCERNING TROPICAL DISEASES IN THE REGION AND PROGRAM OBJECTIVES

The activities of the PAHO Tropical Diseases program are directly related to vector control as well as prevention and control of specific diseases such as malaria, American trypanosomiasis, schistosomiasis, filariasis, including onchocerciasis, leishmaniasis, leprosy and enteric parasitic diseases. They are either widely spread throughout the American Region or are present in foci within specific subregions or countries. Several million people are affected by these diseases.

The particular characteristics in the epidemiology of most of these diseases make them more prevalent in rural areas where high morbidity is common. Their evolution is usually chronic, with a debilitating and disabling effect, which is believed to result in lower productivity per worker causing great economic loss. The opening of new territories for agriculture, timber and mining exploitation has led to the appearance of epidemics of some of the diseases in several areas where they were already prevalent. This has not only increased the load on an already overburdened health care system, but has also limited the full utilization of potentially rich and newly developed areas. In the case of children, the epidemics may lead to malnutrition and increased susceptibility to diarrheal diseases and acute respiratory infections. In addition, migration of the infected population from the rural to the urban areas has put a new load on Institutions providing health care in the cities. In some circumstances, it has also given rise to cases of human infection through means of transmission other than by vectors (eg. transfusional Chagas' disease).

In general, the situation concerning malaria continues to worsen in the Region. The number of positive blood slides has steadily increased since 1974, despite the fact that the number of examined slides has been approximately the same. The slide positivity rate was 9.0% in 1983, the highest since 1958. In 1983, the incidence in the malarious areas was...
3.26 cases per 1000 habitants, the highest since the initiation of the malaria eradication program. The total number of reported cases in the Region for 1983 was 812,453. Moreover, vector resistance to insecticides and parasite resistance to anti-malarial drugs may frustrate the attempts to improved the activities of the prevention and control programs in the future.

The Pan American Health Organization estimates that from 10 to 20 million people are infected with *Trypanosoma cruzi* in the Americas. Furthermore, it is suspected that blood transfusion is responsible for thousands of new infections yearly. Argentina, Brazil, Chile, Uruguay and Venezuela are the countries where the disease has been more widely studied. In the remaining Latin American countries, efforts are still directed towards establishing the impact of the infection on the population's health. Programs for control of the triatomine vector are operating quite effectively in only four countries.

Cutaneous and mucocutaneous leishmaniasis are prevalent in sylvatic foci in the Hemisphere with the exception of Chile. Man is an accidental host who contracts the infection when colonizing new land for agriculture, participating in military training in the jungle or working in the development of projects in rural endemic areas. In addition, outbreaks of visceral leishmaniasis are occurring in several countries. The number of reported cases of the different forms of the disease varied from 120 to 4,000 cases in different countries of the Region such as Brazil, Costa Rica, Peru, Nicargua and Paraguay in 1980.

There is no precise information on the prevalence of schistosomiasis mansoni in the Hemisphere. However, approximate data from the countries points out to the existence of about 10 million cases in Brazil, mainly in the northeastern part of the country; about 10,000 infected people in Suriname, about the same number in Venezuela, and 3,000 cases in Dominican Republic.

In 1980, a new focus of onchocerciasis was discovered in Ecuador with an estimated 2,000 cases of infected people. The number of estimated cases in Brazil is 1,500 cases; in Colombia 1,000 cases; in Guatemala 35,000 cases; in Mexico 20,000 cases; and 47,000 cases in Venezuela. Lymphatic filariasis caused by *Wuchereria bancrofti* also exists in some areas of several Latin American and Caribbean countries but the exact prevalence is still unknown.

The intestinal helminthic and protozoal parasitic infections are also highly prevalent throughout the Region. They are commonly associated with malnutrition and other infectious diseases in children residing in areas with poor socio-economic conditions.

In the region there were 280,000 registered cases of leprosy in 1982 (a rate of 0.43 per 1,000 inhabitants) with an incidence of 21,842 (a rate of 4.5 per 100,000) for the same year. There is evidence that
the number of cases increases year after year, and that this is not necessarily the result of better detection. Multidrug treatment, which offers the hope of curing patients in relatively short period of time, is still not routinely used in many of the countries.

The overall objectives of the Tropical Diseases Program are: a) To eliminate mortality and reduce morbidity produced by tropical diseases to levels compatible with the socioeconomic development of the different countries of the region, b) To reduce the transmission in areas where epidemic outbreaks may occur especially in relation to malaria, dengue and visceral leishmaniasis, c) To prevent the spread of tropical diseases in areas free of transmission, d) To increase the technical capacity of the national health services for developing and executing effective actions directed towards the prevention and control of these diseases.

Historical review of research activities

Since its creation, PAHO has been involved in the promotion and sponsorship of research activities related to tropical diseases. Because of the insufficiency of resources in various countries where tropical diseases were prevalent, a substantial part of research on the subject was done by PAHO or under the PAHO aegis. Therefore, during many years the Organization was responsible for determining the epidemiological situation of most of the vector-borne diseases, object of the present program activities. PAHO personnel substantially increased knowledge on the vectors, tested better ways of diagnosis and assayed different treatment schedules as well as put into effect operational studies on the implementation of control programs, especially on dengue, malaria and American trypanosomiasis.

The fact that PAHO resources available for research are limited and that the countries' capacity for performing these activities has increased throughout the years have both contributed to the change in the direction of the research program's activities towards the promotion of coordination of the regional research efforts. Limited financial support is also provided to national institutions to implement projects considered of substantial importance, such as the monitoring of drug susceptibility and the existence of genetic differences in *Plasmodium falciparum*; the assay of methods for detecting malaria parasites in mosquitoes using monoclonal antibodies; the epidemiology of *T. cruzi* infection and of leishmaniasis; the epidemiology of intestinal parasites in rural and urban settings; drug testing on malaria; the effect of migration on the malaria problem; and the improvement of available methods for using probes in the diagnosis of cutaneous leishmaniasis. In addition, a particularly active group of national institutions that act as WHO collaborating Centers also collaborate with the research activities of the program. Despite this, PAHO still carries out studies on the vectors of malaria and dengue, and on epidemiology of tropical diseases through personnel stationed in Tapachula, Mexico, in Panama City, and in Maracay, Venezuela.
Research developments on tropical diseases since the sixties have been impressive. Until the economic situation began to deteriorate in the region in 1980, the amount of funds devoted to research on the subject was substantial. Several studies were conducted attempting to establish the influence of different factors, including the social and economic conditions that play an important role in the appearance, distribution and prevalence of the various tropical diseases in different geographical and ecological conditions. Although these studies allow for the identification of different intervention measures, methodologies for implementing the prevention and control programs at a cost that is not out of the reach of the countries where the problem exists, are still lacking.

Advances made on immunology have been impressive. A vaccine against malaria is envisioned for the future and one for leprosy is currently undergoing field trials. Diagnostic methods for malaria to be used either in the vertebrate host or in the vector have been developed. Unfortunately, there is a delay in the field assays and in the incorporation of the new tools in the program's operations. Experimental studies on the biology, physiology and biochemistry of the parasites and vectors, which attempt to establish targets for the action of drugs and pesticides in the vertebrate and the vector respectively, as well as studies on the host/parasite relationship have substantially increased the available knowledge on the subject. However, although these studies undoubtedly develop and strengthen the countries' research infrastructure, it is unlikely that they may offer viable solutions to existing problems, on a short or medium term basis. Different treatment schedules of drugs developed in industrialized countries either have been or are being tested in the region. However, even some of those that were proven to be effective are put to limited use because of economic or operational difficulties.

Research priorities

Taking into account that the overall objective of the tropical disease program is to prevent or decrease transmission of these diseases, reversing the trends now occurring in the region, the program should offer viable solutions to national authorities through research and by making full use of the available resources.

The program has information concerning research activities being carried out in the region in addition to knowledge on the different problems that impede or hamper the efficiency and efficacy of prevention and control programs. One universal problem is the lack of methodologies for the implementation of comprehensive prevention and control programs within the PHC system. Other areas of concern are the incomplete knowledge of the different socioepidemiological variables that influence the distribution and prevalence of tropical diseases, the lack of rapid and simple techniques for diagnosis and epidemiological surveillance that are practical and effective, and the absence of drugs treatment schemes that are feasible to implement. Priority research activities will be those
directed toward finding solutions to the already mentioned problems on specific diseases which have been chosen because of the following: 1) actual public health importance, as shown by the prevalence of these diseases and the burden they impose on health services; 2) the future trend that is envisaged; 3) the existence of technologies or the possibility of the adaptation of the available ones for implementing program activities; 4) the existence in the countries of human and financial resources available for carrying out the proposed research and the possibility that personnel could be trained while the studies are performed; 5) the existence in the countries of the interest and political commitment for solving the problem. Therefore, knowledge and experience gained through research can be implemented.

Emphasis will be placed on applied field research, the following being the topics that have been identified as research priorities: 1) Development and testing of methodologies for the implementation of integrated disease control programs within the PHC system; the focus will be on a) vector control in actual or potential areas of high transmission of dengue, malaria and Chagas' disease, b) Enteric parasitic diseases, c) and leprosy. 2) Studies on the different socioepidemiological variables that influence transmission and affect control of malaria, Chagas, schistosomiasis and enteric parasitic diseases. 3) Development and testing of practical techniques for the diagnosis and epidemiological surveillance of malaria, Chagas, schistosomiasis, enteric parasitic diseases and leprosy, and 4) The evaluation of effective, and easily implemented drug treatment schemes for malaria, Chagas, schistosomiasis, cutaneous leishmaniasis, filariasis, enteric parasitic diseases and leprosy.

Targets and activities

The program's activities will aim at strengthening national and international action so that:

1) By 1989 at least 50% of the countries in the Region will have organized relevant programmes for the prevention and control of tropical diseases within the general health services and in support of the strategy of primary health care.

2) By 1987 all countries in the Region will have developed measures to eliminate the mortality caused by the tropical diseases and to reduce their morbidity in areas under severe risk of transmission, and

3) By 1987 all countries will have developed technical and managerial capacity to prevent epidemic outbreaks of malaria, dengue, urban yellow fever and visceral leishmaniasis.
The purpose of this program is to provide technical cooperation to
develop the capability and promote the national and international action
required for the better knowledge, prevention, control and monitoring of
tropical diseases with a major impact on public health in the Americas.

To fulfill this objective, maximum use will be made of the
resources of social and economic development programs in support of the
strategy for primary health care, promoting the self-sufficiency of the
countries in order to achieve the goal of Health for All by the Year
2000, by meeting the basic objectives of the Plan of Action for the
Implementation of Regional Strategies.

In support of the national goals stated in the Seventh General
Programme of Work of WHO, covering the period 1984-1989, emphasis will be
given to program development, technical cooperation, training, research,
exchange of information and dissemination of technical and operational
data.

The programming of activities will be geared to national and
subregional conditions, identifying problems common to several countries
in order to facilitate joint analyses, foster the regular exchange of
information, and make better use of human and financial resources.

The teams responsible for providing technical cooperation to the
countries should identify precisely the elements required for analysis of
the situation and development of training activities, reorganization of
national programs, adaptation of structures, and orientation of research.

Mechanisms should be devised for the coordination of national
capabilities, external technical cooperation, and the integration and
dovetailing of activities, having regard to the units responsible for
cooperation. Activities will be institutionalized through the Ministries
of Health, as well as other institutions in the health sector and in other
sectors, strengthening links with teaching institutions and institutional
and socioeconomic development programs.

The programs will assist in the development of infrastructure for
the establishment of training centers.

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WHO Collaborating Centers in the Americas

related
to the
Activities
of the

PAHO Tropical Diseases Program

PAN AMERICAN HEALTH ORGANIZATION
Pan American Sanitary Bureau, Regional Office of the
WORLD HEALTH ORGANIZATION
WHO COLLABORATING CENTERS IN THE AMERICAS
RELATED TO THE ACTIVITIES
OF THE
TROPICAL DISEASES PROGRAM

PAN AMERICAN HEALTH ORGANIZATION
WHO Collaborating Centers are national institutions that cooperate with ongoing WHO programs at the national, regional and global levels. The purpose of this document is to provide information on the WHO Collaborating Centers whose activities are related to those of the Tropical Diseases Program of the Pan American Health Organization. Most of the Centers offer reference services, training, research, and research training. Government agencies, institutions and researchers are encouraged to contact the Centers and make use of their facilities as centers of excellence in their areas of expertise.

For more information please contact the Centers themselves or the office of the Tropical Diseases Program at the Pan American Health Organization, 525 23rd. Street, N.W., Washington, D.C. 20037.
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WHO COLLABORATING CENTER FOR DIAGNOSIS AND RESEARCH
ON CHAGAS' DISEASE

Argentina

PAHO reference number: HCI/AMR/8900/28/ARG-4
Director of the institution: Dr. Elsa Leonor Segura
Director of the WHO collaborating center: Same as above
Other senior staff:
Dr. Juan José Cazzulo, Chief, Research Department; Dr. Gladys J. Wynne de Martini, Chief, Production Department; Dr. Manuel Alvarez, Chief, Diagnosis Department.
Address: Instituto Fatale Chaben
Av. Paseo Colón 568
Buenos Aires 1063, Argentina
Telephones: 33-7732; 33-2330; 30-5622

Terms of reference (activities performed as WHO Collaborating Center):

1. Standardization of methods used in the diagnosis of Chagas' disease.
3. Delivery of courses on serological diagnosis of Chagas' disease.
4. Provision of Argentinian strains of Trypanosoma cruzi to other researchers in the American Region as well as other WHO Regions.
5. Characterization of strains of Trypanosoma cruzi and performance of studies on the metabolism of Trypanosoma cruzi, with special reference to those metabolic aspects apt to be used as targets for trypanocidal drugs.
6. Development of studies on animal models resembling man in relation to the pathology characterizing the chronic Chagasic infection.

Other ongoing research:

Studies on antigens of Trypanosoma cruzi and their role in immunoprotection and immunoaggression.
Training and research training offered:

An annual two-week theoretical and practical course on Chagas' Disease and Leishmaniasis. This course is usually given in October.

On-the-job training on culture methods and serological diagnosis of *Trypanosoma cruzi* and Leishmania and on maintenance and development of a triatome colony.

Research training as per terms of reference.

**Publications, 1981 and 1982:**


WHO COLLABORATING CENTER FOR RESEARCH AND TRAINING IN THE
IMMUNOLOGY OF PARASITIC DISEASES

Brazil

PAHO reference number: HCl/AMR/8900/28/BRA-4

Director of the institution: Dr. José Rodrigues Coura

Director of the WHO collaborating center: Dr. Bernardo Galvao Castro

Chief, Department of Immunology

Other senior staff:

Dr. Akira Homma, Chief, Biological Products, Production Unit; Dr. Cláudio Daniel Ribeiro, Department of Immunology; Dr. Gabriel Grimaldi Filho, Chief, Electron Microscopy Center; Dr. Lain Carlos Pontes de Carvalho, Department of Immunology; Dr. Maria Deane, Chief, Department of Protozoology; Dr. Maria Nazaré Meirelles, Electron Microscopy Center; Dr. Mauro Marzochi, Associate Researcher, Department of Protozoology; Dr. Pamela Morearty Grimaldi, Assistant Researcher, Department of Protozoology; Dr. Sérgio Gomes Coutinho, Researcher, Department of Protozoology; Dr. Vera Bangertz, Department of Immunology.

Address: Instituto Oswaldo Cruz
Av. Brasil 4365
Manguinhos, CEP 21040
Rio de Janeiro, Brasil

Telephone: 280-1589

Terms of reference (activities performed as WHO Collaborating Center):

1. To perform studies on the humoral and cell-mediated immune responses in man and animals infected with Trypanosoma cruzi and different species of Leishmania.

2. To produce monoclonal antibodies against Trypanosoma cruzi and to provide small quantities of these antibodies to other researchers when requested by WHO.

3. To provide for immunological studies of different strains of Trypanosoma cruzi and to provide small quantities of these antibodies to other researchers when requested by WHO.

4. To train personnel in immunological techniques that can be applied to studies on protozoal diseases.
5. To collect and disseminate information within the Region concerning immunological aspects of protozoal diseases, with special emphasis on Chagas' disease and leishmaniasis.

Training and research training offered:

A one-year postgraduate course in Parasite Biology followed by two years of research training in one of the institution's departments, concluded by a M.Sc. degree.

A one-year course on general laboratory practices in parasitic diseases research for laboratory technicians, offered yearly in March. At the end, the trainees may join the department for further training.

Short and long-term research training as per the terms of reference.

Publications, 1981 and 1982


WHO COLLABORATING CENTRE. FOR PESTICIDE TOXICOLOGY

Brazil

PAHO reference number: HCI/AMR/8900/28/BRA-6

Director of the institution: Dr. Joao Adelino Martinez

Director of the WHO collaborating center: Dr. Flavio Rodrigues Puga

Other senior staff: Dr. Rosa Gaeta and Dr. Renata de Oliveira Salvatore

Address: Secao de Toxicologia e Higiene Comparada
Instituto Biológico
Av. Cons. Rodrigues Alves, 1252
C. P. 7119
01000 Sao Paulo, SP, Brasil

Telephones: 570-0300; 572-9822

Terms of Reference (Activities Performed as WHO Collaborating Center):

1. To conduct epidemiological studies on exposure to pesticides in people working on the land in adverse climatic conditions and in workers in the pesticides industry.

2. To determine the toxicity of new pesticide compounds in laboratory animals, with special emphasis on their possible toxic effect on the skin.

3. To provide training courses related to the safe use of pesticides.

Other ongoing research:

The influence of solvents affecting the acute toxicity of pesticides to mammals.

The influence of formulation on the behavior of the pesticide related to the toxicity and residues.

Therapeutic activities of new oximes.

Cholinesterase monitoring in workers exposed to organophosphorus insecticides.
Training and research training offered:

A two-week theoretical and practical graduate course on toxicology of pesticides including the toxicity of pesticides in mammals, toxicity evaluation and pesticide residues in food. To begin in June 1984.

Research training as per the terms of reference and determination of pesticide residues in animals and foods.

Publications, 1981 and 1982


De Cassia Stocco, Rita; Beçak, Willy; Gaeta, Rosa; Rabello, Gay, and Nazareth, M. Cytogenetic study of workers exposed to methyl-parathion. Mutation Research, 103:71, 1982.


WHO COLLABORATING CENTER FOR THE SEROLOGY OF CHAGAS' DISEASE, LEISHMANIASIS, AND TOXOPLASMOsis

Brazil

PAHO reference number: HCl/AMR/8900/28/BRA-8

Director of the institution: Dr. Carlos da Silva Lacaz

Director of the WHO collaborating center: Dr. Mario E. Camargo

Other senior staff:

Dr. Maria Carolina Soares Guimaraes, Assistant Professor, Department of Preventive Medicine; Dr. Sumie Hoshino-Shimizu, Assistant Professor, Department of Preventive Medicine; Dr. Antonio Walter Ferreira, Assistant Professor, Department of Tropical Medicine; Dr. Benedito Anselmo Peres, Assistant Professor, Department of Tropical Medicine; Dr. Anna Maria Simonsen Stolf, Assistant Professor, Department of Pathology; Dr. Eufrosina Setsu Umezawa, Laboratory of Protozoology.

Address: Laboratório de Imunologia
Instituto de Medicina Tropical de Sao Paulo
Av. Dr. Enéas de Carvalho Aguiar, 470
05403 Sao Paulo, Brasil

Telephones: 852-3622; 883-3233; 883-3441

Terms of Reference (Activities Performed as WHO Collaborating Center):

1. To develop and standardize new serological tests that could be applied to diagnosis.

2. To standardize serological diagnostic methods currently available.

3. To train personnel on serological diagnoses.

4. To provide standard references when requested.

5. To serve as a bank for samples of serum with positive serology and to distribute these samples when requested.
Training and research training offered:

An annual postgraduate course on serological techniques, given in March.

A biannual two-month intensive course on serological diagnosis of parasitic diseases, including training in the theory and practice of laboratory testing techniques, given through August and September.

Research training as per the terms of reference.

Publications, 1981 and 1982


WHO COLLABORATING CENTER FOR THE CRYOPRESERVATION OF STRAINS OF 
AMERICAN TRYPANOSOMA 

Brazil

PAHO reference number: HCI/AMR/8900/28/BRA-10

Director of the institution: Dr. Zigman Brener

Director of the WHO collaborating center: Same as above

Other senior staff:

Dr. L. Filardi, Associate Professor, Department of Zoology, Federal University, Minas Gerais.

Address: Centro de Pesquisas René Rachou FIOCRUZ
Av. Augusto de Lima, 1715
Belo Horizonte, Minas Gerais, Brazil

Telephone: (031) 335-3866

Terms of reference (activities performed as WHO Collaborating Center):

1. To isolate, study and store in liquid nitrogen, strains of Trypanosoma cruzi from different clinical forms of Chagas' disease and from different geographical regions.

2. To provide strains on demand.

Other ongoing research:

Susceptibility of different Trypanosoma cruzi strains to active chemotherapeutic agents.

Humoral immunity in Trypanosoma cruzi.

Role of macrophage in Trypanosoma cruzi resistance.

Development of chronic models for Chagas' disease.

Training and research training offered:

Research training on biology, chemotherapy, and immunological aspects of Trypanosoma cruzi and Chagas' disease.
Publications, 1981 and 1982:


WHO COLLABORATING CENTER FOR THE TRAINING OF PERSONNEL IN THE CONTROL OF LEPROSY, MAINLY FOR PORTUGUESE-SPEAKING COUNTRIES

Brazil

PAHO reference number: HCI/AMR/8900/28/BRA-23

Director of the institution: Dr. Oswaldo Cruz

Director of the WHO collaborating center: Dr. Diltor Vladmir Araújo

Other senior staff:

Dr. Claudio Joaquim Sampaio Tonello, Hansenologist - Dermatologist; Dr. Ivander Bastazini, Hansenologist - Dermatologist; Dr. Somei Ura, Hansenologist - Dermatologist; Dr. Frank Duerksen (F.R.C.S.[E]), Consultant in Rehabilitation to American Leprosy Mission; Dr. Marcos Virmond, Consultant in Reconstructive Surgery; Dr. Thomas Ferran Frist, Consultant in Rehabilitation to American Leprosy Mission; Dr. José Carlos de Almeida Pernambuco, Rheumatologist; Dr. José Antonio Garbino, Physiatrist; Dr. Raul Negrao Fleury, Pathologist; Olavo Speranza de Arruda, Cell Biologist; Sueli Farreira de Arruda, Cell Biologist.

Address: Hospital Lauro de Souza Lima
Rodovia Comandante João Ribeiro de Barros
Km. 115, Caixa Postal 62
17,100 Bauru, Sao Paulo, Brazil

Telephone: 235922

Terms of reference (activities performed as WHO Collaborating Center):

1. Training of personnel in the control and research of leprosy, mainly for Portuguese-speaking countries.

Other ongoing research:

Procreation of armadillos (Mammalia endendata) in captivity.

To carry out experimental transmission of Mycobacterium leprae, particularly in the armadillo.

To perform studies on the development of cell-mediated response of man infected with Mycobacterium leprae.
To establish therapeutic schemes for the control of Hansen's disease.

To develop new surgical techniques for the treatment of Hansen's disease patients with physical deformities.

**Training and research training offered:**

One-week theoretical and practical courses in leprology to be held in January, March, September, and November.

Two-week theoretical and practical courses in physical rehabilitation for patients with Hansen's disease, that will be held in February, May, August, and October.

One-week theoretical and practical courses for the prevention of incapacities in patients with Hansen's disease, for auxiliary personnel and professionals to be held in April, June, September, and December.

**Research training on the clinical, therapeutic, and histopathologic aspects of leprosy.**

**Publications, 1981 and 1982:**


WHO COLLABORATING CENTER ON PESTICIDE APPLICATION TESTING
AND DEVELOPMENT

Colombia

PAHO reference number: HCI/AMR/8900/28/COL-4

Director of the institution: Dr. Osvaldo Caliz Peña

Director of the WHO collaborating center: Ing. Víctor E. Velandia B. Chief, Aedes and Vaccination Section

Address: Dirección de Campañas Directas Sección Aedes-Vacunación Avenida Caracas No. 1-91 Sur Bogotá, Colombia

Telephone: 2-463-009

Terms of reference (activities performed as WHO Collaborating Center)

1. Evaluation of new pesticides, pesticide formulation, and pesticide applications equipment.
WHO COLLABORATING CENTER FOR ONCHOCERCIASIS

Mexico

PAHO reference number: HCI/AMR/8900/28/MEX-7

Director of the institution: Dr. Raúl N. Ondarza

Director of the WHO collaborating center: Same as above

Other senior staff:

Dr. Alberto Gómez-Priego, Immunologist; Dr. Mauricio Ortég-Gutiérrez, Entomologist; Dr. Roberto Rivas Alcalá, Immunologist; Dr. Lauren G. Zárate, Entomologist; Dr. Renato Zárate-Castañeda, Parasitologist; Dr. Alfredo Domínguez-Vázquez, Clinician.

Address: Centro de Investigaciones Ecológicas del Sureste (CIES) Carretera Panamericana y Periférico Sur, Código Postal 29290 San Cristóbal de las Casas Chiapas, México

Telephones: 8-18-83; 8-18-84

Terms of reference (activities performed as WHO collaborating center)

1. To undertake clinical drug trials for use in the treatment of onchocerciasis.

2. To develop simple, reliable serodiagnostic tests for onchocerciasis.

3. To conduct research on the transmission and development of methods for the control of onchocerciasis in Mexico, as well as study the epidemiology and socioeconomic importance of this disease.

Other ongoing research:

Develop simple, reliable serodiagnostic test for Chagas' Disease and research on the epidemiology of the disease.

Training and research training offered:

Continuous education and training for technicians in medical parasitology, basic immunology, and medical entomology.

Courses offered on the same topics on request.
Publications, 1981 and 1982:


Zárate, R.J. and Zárate, L.G. Vigilancia Epidemiológica de la Enfermedad de Chagas. En Memorias de Mesa Redonda sobre la Vigilancia Epidemiológica de las Enfermedades Parasitarias, Documento publicado por el Centro de Investigaciones Ecológicas del Sureste, p. 9, 1981.


WHO COLLABORATING CENTER FOR WORK ON INSECTICIDE RESISTANCE

United States of America

PAHO reference number: HCI/AMR/8900/28/USA-10

Director of the institution: Dr. Thomás Rivera, Chancellor

Director of the WHO collaborating center: Prof. George P. Georgiou, Department of Entomology

Other senior staff:

Prof. T.R. Fukuto, Prof. of Entomology and Chemistry; Prof. L.K. Gaston, Adjunct Lecturer and Chemist; Prof. S.S. Gil, Assistant Professor of Entomology; Prof. T. Imamura, Assistant Professor of Entomology; Prof. T.A. Miller, Professor of Entomology.

Address: Division of Toxicology and Physiology
University of California
P.O. Box 112
Riverside, CA. 92521

Telephone: (714) 787-5830

Terms of reference (activities performed as WHO Collaborating Center):

1. Testing of new insecticides for intrinsic activity, resistance, and cross resistance against Culicine and Anopheline mosquitoes as part of WHO's Pesticides Evaluation Scheme (WHOPES).


3. Consultation services in various countries, as needed.

Other ongoing research:

Investigations of the genetics and mechanisms of resistance to pyrethroid insecticides.

Studies of the potentiality of mosquitoes to develop resistance to Bacillus thuringiensis toxins.

Rotation and combination of insecticides as a resistance-delaying or avoiding tactic.
Training and research training offered:

Courses in Medical Entomology (Winter Quarter) and Insect Toxicology (Fall Quarter) are offered regularly as part of undergraduate and graduate degree programs.

A comprehensive course on insecticide resistance in relation to development, evolution, and dynamics of resistance and analysis of the physiological, behavioral and ecological correlates of resistance, and of measures designed for its avoidance or suppression, is offered every other year (Spring Quarter).

Publications, 1981


WHO COLLABORATING CENTER FOR THE EVALUATION EVALUATION AND TESTING OF NEW INSECTICIDES

United States of America

PAHO reference number: HCI/AMR/8900/28/USA-11

Director of the institution: Dr. Donald E. Weidhaas

Director of the WHO collaborating center: Same as above

Other senior staff: Dr. Clifford S. Lofgren; Dr. David A. Dame; Dr. Jack A. Seawright; Dr. Richard S. Patterson.

Address: Insects Affecting Man and Animals Research Laboratory Agricultural Research Southern Region U.S. Department of Agriculture 1600 S.W. 23rd Drive P.O. Box 14565 Gainesville, FL 32604

Telephone: (904) 373-6701

Terms of reference (activities performed as WHO Collaborating Center):

1. Evaluation and testing of new insecticides, Stages II and III, screening of new materials for contact and residual effectiveness on mosquitoes, body lice, rat fleas, bed bugs, ticks, and houseflies.

Other ongoing research:

Studies on biological control, genetics, insecticides, insect growth regulators, attractants and pheromones.

Training and research training offered

Research training on vector biology and control.

Publications, 1981 and 1982:


WHO COLLABORATING CENTER FOR REFERENCE AND RESEARCH ON MYCO LEPRAE

United States of Americas

PAHO reference number: HCI/AMR/8900/28/USA-13
Director of the institution: Dr. William H. Foege
Director of the WHO collaborating center: Dr. Charles C. Shepard
Other senior staff:
Address: Virology Division
          Bureau of Laboratories
          Center for Disease Control
          Atlanta, GA. 30333
Telephone: (404) 329-3601

Terms of reference (activities performed as WHO Collaborating Center):

1. To carry out investigations of experimental transmissions of M. leprae.
2. To study the action of drugs against M. leprae in animals as background for clinical trials in patients.
3. To test drugs sensitivity of strains of M. leprae in animals.
4. To supply designated strains of M. leprae in animals and to standardize methods for preserving M. leprae.
5. To provide training in specialized techniques.
6. Other studies may be added following mutual agreement.

Other ongoing research:

Studies in mice of vaccines against M. Leprae.
Maintenance of a colony of armadillos infected with M. Leprae.
Vaccination of armadillos with M. leprae.
Studies of drugs for their activity against M. leprae in mice.
Training and research training offered:

Training in specialized techniques in *M. leprae* research.

Research training on continuing projects.

Research training in relation to the terms of reference.

Publications, 1981 and 1982:


WHO COLLABORATING CENTER FOR STUDIES ON MYCO LEPRAE

United States of America

PAHO reference number: HCI/AMR/8900/28/USA-14

Director of the institution: Dr. John R. Trautman
                         Acting Director

Director of the WHO collaborating center: Dr. Robert C. Hastings
                                         Chief, Laboratory Research Branch

Other senior staff:
Dr. P.W. Brand, Chief, Rehabilitation Research Branch; Dr. C.K. Job, Chief, Pathology Research Department; Dr. R.R. Jacobson, Chief, Clinical Branch; Dr. R. O'Connor, Chief, Training Branch; Dr. K. Prabhakaran, Chief, Biochemistry Department; Dr. W. Coleman, Chief, Podiatry Department; Dr. J.L. Krahenbuhl, Immunologist, Laboratory Research Branch; Dr. W.A. Krotoski, Deputy Chief, Laboratory Research Branch; Dr. E.J. Shannon, Immunologist, Laboratory Research Branch.

Address: National Hansen's Disease Center Laboratory Research Branch U.S. Public Health Service Hospital Carville, LA. 70721

Telephone: (504) 642-7771

Terms of reference (activities performed as WHO Collaborating Center):

1. To carry out experimental transmission of Mycobacterium leprae, particularly in the armadillo.

Training and research training offered

Seminar offered on Hansen's Disease in April and September.
Seminar on management of insensitive feet offered in February and October.
Seminar on management of insensitive hands offered in March.
Dermatology seminar offered in May and October.

Publications, 1981 and 1982:


Feng, P.C.C. Metabolism of clofazimine in leprosy patients. Drug Metabolism and Disposition, 9:521, 1981.


WHO COLLABORATING CENTER FOR PARASITES OF INSECT VECTORS AND THE IMPACT OF BIOLOGICAL CONTROL AGENTS ON NONTARGET SPECIES

United States of America

PAHO reference number: HCI/AMR/8900/28/USA-29
Director of the institution: Dr. Edwin I. Hazard
Director of the WHO collaborating center: Same as above
Other senior staff:
Dr. R.E. McLaughlin, Research Entomologist; Mr. Tokuo Fukuda, Microbiologist; Mr. James J. Becnel, Biologist, Electron Microscopy.
Address: Gulf Coast Mosquito Research Laboratory
U.S. Department of Agriculture
Agricultural Research Service
P.O. Drawer 16923
Lake Charles, LA. 70616
Telephone: (318) 433-0696

Terms of reference (activities performed as WHO Collaborating Center):

1. To continue studies on the effects on selected nontarget organisms of biological agents supplied by WHO.

2. To provide cultures of Romanomermis culicivorax and other available pathogens to designated scientists.

3. Upon request by WHO, to make available staff of the GCMR Laboratory for consultantships in biological control for such purposes as to assist in the establishment of mass production facilities for mermithid nematodes, and to collaborate with WHO grantees in developing methods of detecting, isolating, developing and field testing biological control agents of tropical disease vectors.

4. To aid in the development of microbial agents by evaluating primary powders and formulations of entomopathogenic spore-forming bacteria, and contributing to the development of standardized quality control bioassays, and the development of specifications for microbial agents for mosquito control.
5. Identification of microsporidian pathogens and to supply *Romanomermis culicivorax* for research and field studies by collaborating members.

Other ongoing research:

Laboratory culture of copepods and the fungus *Coeomomyces*.

Gather information on the complete life cycles of microsporidia.

Mode of transmission of microsporidia.

Taxonomy and classification of microsporidia.

Development of new methods for distribution of *Bti* for the control of rice field mosquitoes.

Foreign exploration of pathogens for the control of insect disease vectors.

Training and research training offered:

Research training as per the terms of reference and on insect pathology.

Publications, 1981 and 1982:


Petersen, V.J.J. Comparative susceptibility of larval mosquitoes exposed separately by instar or in mixed populations to the nematode *Romanomermis culicivorax*. J. Nematol., 13:228, 1981.


Yamamoto, T. and McLaughlin, R.E. Isolation of a protein from the parasporal crystal of *Bacillus thuringiensis* VAR. Kurstaki toxic to the mosquito larva, *Aedes taeniorhynchus*. Biochemical and Biophysical Research Communications, 103:414, 1981.


WHO COLLABORATING CENTER FOR BIOLOGICAL CONTROL OF VECTORS OF HUMAN DISEASES

United States of America

PAHO reference number: HCI/AMR/8900/28/USA-30

Director of the institution: Dr. E.H. Jennings

Director of the WHO collaborating center: Prof. John D. Briggs, Ph.D.

Other senior staff:

Prof. Roland L. Seymour, Ph.D. and Sheila E. Milligan, M.P.A.

Address: Department of Entomology
College of Biological Sciences
Botany and Zoology Building,
Room 185
The Ohio State University
1735 Neil Avenue
Columbus, OH. 43210

Telephone: (614) 422-1085

Terms of reference (activities performed as WHO Collaborating Center)

1. To maintain records of the occurrence and distribution of biological agents affecting vectors and associated nontarget organisms, based on the specimens received by the Center and on data received from cooperating individuals and institutions.

2. To contribute to design, produce, and distribute collection kits which meet the specific needs of cooperating individuals, for the detection, isolation, and identification of biological agents.

3. To dispatch identified agents to collaborating institutions for their preliminary evaluation as biological control tools.

4. To recommend action which seems required for:
   - improving surveys of vector habitats for specimens of vectors affected by biological agents, and the subsequent isolation and evaluation of these agents;
   - encouraging the establishment of cooperative activities between field and laboratory researchers for the development of potential control agents;
assuring the maintenance of collections and cultures of biological agents for their study and distribution.

Other ongoing research:

To develop and establish information systems for and reference collections of biological control agents in institutions in the Region.

To prepare systems analyses of vector control programs incorporating the use of indigenous and exotic biological agents.

To establish in regional laboratories biochemical methodologies to supplement the conventional systematic and taxonomic methods for identification and investigation of biological agents.

Training and research training offered:

Research training on entomology, biological control of insects, microbiology, and parasitology, including isolation and identification of fungi associated with vectors.

Publications, 1981 and 1982:


WHO COLLABORATING CENTER FOR THE EVALUATION AND TESTING OF NEW INSECTICIDES

United States of America

PAHO reference number: HCI/AMR/8900/28/USA-75

Director of the institution: Dr. William H. Foege

Director of the WHO collaborating center: Dr. James M. Miles

Chief, Control Technology Branch

Other senior staff:

Dr. Frederick C. Churchill, II; Dr. Dwight L. Mount; Dr. William G. Brogdon.

Address: Div. of Parasitic Diseases
Control Technology Branch
Center for Infectious Diseases
Center for Disease Control
1600 Clifton Road,
Atlanta, GA. 30333

Telephone: (404) 452-4053

Terms of reference (activities performed as WHO Collaborating Center):

1. To conduct research on basic principles of insecticide formulations, chemical, and physical methods.

Other ongoing research:

Development of a GLC method for analysis of the gamma-isomer of BHC in BHC formulations. Collaborative trial of the method.


Study of a $^{31}$p NMR method for analysis of malathion formulations for determination of isomalathion content.

Study physical properties of formulations of Bacillus thuringiensis VAR. Israelensis.

Characterization and quantitation of minor components found in malathion formulations.
Publications, 1981 and 1982:


WHO COLLABORATING CENTER FOR THE HISTOPATHOLOGY OF FILARIAL DISEASES IN MAN

United States of America

PAHO reference number: HCI/AMR/8900/28/USA-77

Director of the institution: Col. William R. Cowan

Director of the WHO collaborating center: Dr. Daniel H. Connor
  Chairman, Department of Infectious and Parasitic Disease Pathology

Other senior staff:
Col. Douglas J. Wear; Dr. Wayne M. Meyers; Dr. Dean W. Gibson;
Mr. Ronald C. Neafie; Dr. James R. Palmieri.

Address: Department of Infectious and Parasitic Diseases Pathology
  Armed Forces Institute of Pathology
  6825 16th Street, N.W.
  Washington, D.C. 20306

Telephone: (202) 576-2213

Terms of reference (activities performed as WHO Collaborating Center):

1. To collect and preserve biopsy and autopsy specimens from persons with filarial diseases.

2. To file, register, examine, and report the histopathology and all relevant aspects of all tissues collected, both biopsy and autopsy specimens.

3. To establish a reference collection of such histopathological material.

4. To collaborate with other workers and institutions in the furtherance of the above objectives.

5. To train qualified personnel in this branch of pathology.
Other ongoing research:

Transmission of *Onchocerca volvulus* and *Wuchereria bancrofti* to silvered leaf monkey (a primate model for onchocerciasis and bancroftian filariasis).

Collaborative immunofluorescent studies of "Major Basic Protein MBP" in eosinophils of patients with onchocerciasis, following treatment with diethylcarbamazine.

Collaborative studies on microfilariae of *Onchocerca volvulus* after combined treatment with diethylcarbamazine and corticosteroids and other anti-inflammatory drugs.

Collaborative studies in Ghana on chemotherapy of onchocerciasis.

Collaborative studies on onchocerciasis and other diseases in Sierra Leone.

Collaborative studies on immunosuppression of Mazzotti reaction in onchocerciasis.

Collaborative studies on infections of man by *Mycobacterium ulcerans* in Liberia.

Life cycle and pathology of *Anatrichosoma* sp. in primate colonies.

Histopathology of suramin and DEC-treatment in patients with onchocerciasis.

Lymphadenitis, dermatitis, encephalitis and other manifestations of infection by *Loa loa*.

Filariasis in Africans with leprosy.

Training and research training offered:

Research training as per the terms of reference and on ongoing research projects. Each year approximately twenty-five trainees, fellows and visiting scientists and research collaborators visit and work at the Center.

Publications, 1981 and 1982:


WHO COLLABORATING CENTER FOR RESEARCH ON THE CHEMOTHERAPY OF PARASITIC DISEASES

United States of America

PAHO reference number: HCI/AMR/8900/28/USA-78

Director of the institution: Col. Philip K. Russell
                           Director, Walter Reed Army Institute of Research

Director of the WHO collaborating center: Col. Craig J. Canfield
                                       Director, Division of Experimental Therapeutics

Other senior staff:

Dr. Melvin H. Heiffer, Chief, Department of Pharmacology; Lt. Col. Willis A. Reid, Jr., Chief, Department of Parasitology; Lt. Col. Robert O. Pick, Chief, Department of Medicinal Chemistry.

Address: Division of Experimental Therapeutics
         Walter Reed Army Institute of Research
         Washington, D.C. 20307

Telephone: (301) 427-5411

Terms of reference (activities performed as WHO Collaborating Center):

1. To undertake a screening program for the identification of active compounds against human parasitic diseases, performing preclinical studies of the efficacy, toxicology, and pharmacokinetics of antiparasitic medicaments.

2. To provide research training in experimental chemotherapy.

3. To assist in the coordination of collaborative studies.

Training and research training offered:

Research training on clinical pharmacology of antimalarial drugs and the development of methods for culture of leishmania, under fellowships of variable duration designed to satisfy individual needs.
Publications, 1981 and 1982:


WHO COLLABORATING CENTER FOR HOST AND PARASITE STUDIES
ON MALARIA

United States of America

PAHO reference number: HCI/AMR/8900/28/USA-109

Director of the institution: Dr. William H. Foege

Director of the WHO collaborating center: Dr. Carlos C. Campbell

Other senior staff:
Dr. William E. Collins, Research Biologist (Med.); Dr. Joel Breman, Chief, Malaria Control Activity; Dr. Ira Schwartz, Medical Epidemiologist; Dr. Alexander Sulzer, Research Microbiologist; Dr. P. Nguyen-Dinh, Medical Officer; Dr. Jesse Hobbs, Research Entomologist; Dr. Hans Lobel, Medical Officer; Dr. John Sexton, Technical Support Officer; Dr. Gary Campbell, Research Microbiologist; Dr. Marguerite Pappaioanou, EIS Officer.

Address: Malaria Branch
Division of Parasitic Diseases
Center for Infectious Diseases
Center for Disease Control
1600 Clifton Road
Atlanta, GA. 30333

Telephone: (404) 452-4046

Terms of reference (activities performed as WHO Collaborating Center):

3. Guidelines for the production of serological reagents.
4. Studies on anopheline vectors.
5. Development of new and improved methodologies for antimalarial quantification and \textit{in vitro} sensitivity testing.
6. Field studies on the epidemiology and control of malaria.
Training and research training offered:

Research training on in vitro cultivation of malaria parasites and as per the terms of reference.

Publications, 1981 and 1982:


Revised recommendations for malaria chemoprophylaxis for travelers to East Africa. CDC, MMWR 31(24):328, 1982.


WHO COLLABORATING CENTER FOR REFERENCE AND RESEARCH ON HISTOLOGICAL
IDENTIFICATION AND CLASSIFICATION OF LEPROSY

Venezuela

PAHO reference number: HCI/AMR/8900/28/VEN-1

Director of the institution: Dr. Jacinto Convit

Director of the WHO
collaborating center: same as above

Other senior staff:
Dr. Oscar Reyes, Department of Dermopathology; Dr. José Luis
Avila, Department of Biochemistry; Dr. Marian Ulrich, Department
of Immunology II; Dr. Neil Lynch, Department of Immunochemistry;
Dr. Imelda Campo-Aasen, Department of Histochemistry, Dr. Rafael
Darricarrere, Department of Microbiology; Dr. Nieves González,
Department of Immunohematology; Dr. Antonio Breña, Department of
Electron Microscopy; Dr. José M. Soto, Department of Clinical
Dermatology.

Address: Instituto Nacional de Dermatología
Providencia a San Nicolás, San José
Apartado Postal 4043
Caracas 1010, Venezuela

Telephones: 817520; 814630; 817095

Terms of reference (activities performed as WHO Collaborating Center):

1. To attempt, in collaboration with other centers, to establish
criteria for the histological identification and classification of
leprosy acceptable on a worldwide basis.

2. To stimulate the teaching and practice of histopathology in leprosy.

3. To carry out research in areas of immunopathology of leprosy.

Other ongoing research:

Study of various sandfly species as vectors of cutaneous leishmaniasis.

Electron microscope studies of granulomas produced by leprosy and
leishmaniasis.

Immunocytochemical studies with the electron microscope of various
parasites.
Training and research training offered:

Three-year postgraduate course in Dermatology. Begins in January 1984. Title: Specialist in Dermatology, Central University of Venezuela.

Two-year postgraduate course in Medical Microbiology. Begins in March 1984. Title: Specialist in Medical Microbiology, Central University of Venezuela.

Five-month training course in Public Health Dermatology, to begin in June 1984, in collaboration with the School of Public Health of the Central University of Venezuela. Title: Public Health Dermatologist.

Research training courses of various durations in the different areas of ongoing research at the Institute: Immunology, Biochemistry, Dermopathology, Histochemistry, Electron Microscopy.

Publications, 1981 and 1982:


