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MULTINATIONAL CENTERS

At its 64th Meeting, the Executive Committee adopted Resolution XIX on multinational centers, the second operative paragraph of which requested the Director to submit "a report on the program and activities of present multinational centers."

In the implementation of that resolution, the Director is pleased to submit to the XVIII Pan American Sanitary Conference, XXII Meeting of the Regional Committee of the World Health Organization for the Americas, reports on the following multinational centers:

- Pan American Foot-and-Mouth Disease Center
- Pan American Zoonoses Center
- Institute of Nutrition of Central America and Panama
- Caribbean Food and Nutrition Institute
- Pan American Health Planning Center

Annexes

CSP18/22 (Eng.)
ANNEX I

PAN AMERICAN FOOT-AND-MOUTH DISEASE CENTER

1. Brief Notes on the Establishment of the Center

Foot-and-mouth disease is the main animal disease in the countries affected by it and a constant menace to the other countries of the Hemisphere which are, at present, free from it. The chief factors concerning the disease and its effects may be summarized as follows:

1. Its highly contagious nature and the rapidity with which it spreads among cattle, pigs, sheep, and other cloven-hoofed animals.
2. The economic losses suffered by agriculture as a consequence.
3. The setbacks it causes to the production of animal protein, and the relation between these lower production levels and the serious problem of protein malnutrition among the growing population of the Americas.
4. The losses suffered by the economies of the countries concerned on account of the closing of export markets, since countries that are free of foot-and-mouth disease cannot run the risk of importing animals or products of animal origin from areas attacked by the disease.

In recent years the effects of the disease on the economy and development of countries which are largely dependent on stock raising have been fully recognized, together with the urgent need for national and multinational campaigns to combat foot-and-mouth disease. The major economic significance of the disease, coupled with the complex and difficult control measures entailed, were the principal reasons for the establishment of the Pan American Foot-and-Mouth Disease Center, which was set up in 1951 at the request of certain countries of the Organization of American States.

2. Purpose and Objectives

2.1 Purpose

The initial purpose was to provide the countries with technical assistance and a diagnosis and virus-typing service. However, it was realized from the start that the assistance to be furnished by a Center serving the entire Continent could and ought to be on a much wider scale than routine assistance and diagnostic work. The purpose of the Center was accordingly extended to include the provision of assistance to countries affected by the disease, in their efforts to control it, and to the countries free from it, in the implementation of their preventive measures, by means of research and training programs and technical advisory services.

2.2 Objectives

To fulfill the above-mentioned purpose, the Center is divided into three main divisions (Research, Training, and Field Advisory Services), with the following objectives:

2.2.1 Research

2.2.1.1 Identification and study of the strains of foot-and-mouth and vesicular stomatitis viruses which cause outbreaks in rural areas, together with the utilization and production of vaccines and checking of their effectiveness by means of typing and subtyping.

2.2.1.2 Study of new foot-and-mouth vaccine and improvement of inactivated and modified live virus vaccines already available with a view to obtaining better and longer-lasting immunity.

2.2.1.3 Preparation and maintenance of a collection of strains of various foot-and-mouth disease virus subtypes considered of epidemiological importance and adapted by the Frenkel method to cell cultures and newborn rabbits, for dispatch to, and vaccine production in, countries needing them during emergencies.

2.2.1.4 Study of new methods for checking the effectiveness of foot-and-mouth disease vaccine and standardization, simplification, and adaptation to the conditions of the Hemisphere of those already available.

2.2.1.5 Study of the problems connected with the consequences of the disease, such as the survival of the virus and the study of carriers, on trade in meat and meat products.

2.2.1.6 Studies of the basic nature of the biological and physiochemical characteristics of the foot-and-mouth disease and vesicular stomatitis viruses, and;

2.2.1.7 Provision of advisory services to national foot-and-mouth disease research centers.

2.2.2 Training

2.2.2.1 Organizing and conducting international seminars.

2.2.2.2 Organizing and conducting national courses.

2.2.2.3 Participation of its specialists in seminars, courses, and meetings organized by other national or international institutions.

2.2.2.4 Provision of fellowships for individual training.

2.2.2.5 Supplying available information on the epizootiology of the vesicular diseases.

2.2.2.6 Sending out the updated bibliography of all works published on subjects related to these diseases.

2.2.3 Field Advisory Services

2.2.3.1 Encouragement and cooperation for the planning, execution, and evaluation of national foot-and-mouth disease control programs.

2.2.3.2 Study of technical and administrative methods for the control of foot-and-mouth disease by means of demonstration pilot areas.

2.2.3.3 The provision of advisory services to the countries in the preparation of credit applications related to anti-foot-and-mouth disease campaigns for submission to international credit agencies.

2.2.3.4 Promotion of intercountry coordination by means of meetings and bilateral, regional, or multinational agreements on the control and prevention of foot-and-mouth disease.

2.2.3.5 Provision of advisory services on organizing and conducting prevention programs in the area free from the disease.

2.2.3.6 Studies regarding the most effective means of prevention, control, and evaluation of the national campaigns.

2.2.3.7 Establishment of a Hemisphere-wide system of surveillance of animal vesicular diseases, including the summarizing, compiling, analysis, and publication of epidemiological data.

3. Administrative Development and Present Organization

3.1 Budgetary Resources

The Center began operations in 1951 as an OAS Technical Cooperation Program project, with the Pan American Sanitary Bureau as administering agency, and continued in this form up to 30 June 1968. From that date it was made a regular PAHO program, financed by a system of contributions by the Member Countries of that Organization, in accordance with the recommendations and resolutions adopted at the meetings of the Inter-American Economic and Social Council (IA-ECOSOC), Viña del Mar, Chile, June 1967; the Inter-American Committee on the Alliance for Progress (CIAP), Rio de Janeiro, Brazil, September/October 1967; and the Directing Council of the Pan American Health Organization, Port-of-Spain, Trinidad and Tobago, October 1967.

The Center's budget for the current year is US\$1,320,716. The Government of Brazil, in addition to its normal contribution, provides special assistance towards the upkeep of the buildings and grounds and the wages of 25 men employed in this work. The amount of this assistance for 1970 was Cruzeiros 208,600.

The budget for 1971 submitted for the consideration of the Inter-American Meeting, at the Ministerial Level, on Control of Foot-and-Mouth

Disease and Other Zoonoses, and approved at the 64th Meeting of the Executive Committee in Washington, D. C., held from 29 June to 10 July 1970, is US\$1,405,034. Table I shows the breakdown of the 1971 budget over the different activities of the Center.

Table II summarizes the growth of the Center's budgetary resources from its foundation up to the present year, including the forecasts for 1971, with reference to the origin of the respective funds.

3.2 Personnel

The Center's personnel consists of 26 international technicians, 122 local officials, and 25 workmen. The distribution of the international technicians and the local professionals is as follows:

Office of the Director

Director	1
Administrator	1

Field Advisory Services

Chief	1
Epidemiologists	2
Biostatistician	1
Administrative Methods Consultant	1
Vaccine Production and Control Consultant	1
Area Consultants	5

Research

Chief	1
Virologist	1
Serologists	3
Research Officers	3
Biochemist	1
Immunologist	1
Chief Research Assistant	1
Research Assistants	4

Training

Chief	1
Technical Officer, Publications	1

3.3 Premises and Equipment

The Pan American Foot-and-Mouth Disease Center occupies the premises that were transferred to it at the start by the Brazilian Government. These are located some 30 km. to the north of the city of Rio de Janeiro, in the state of that name. The Government of Brazil has since provided further premises to permit the realization of the Center's expansion programs.

The Center at present occupies an approximately 450,000 sq.m site, of which 10,850 sq.m is built up, as follows:

Director's office, Administration, Technical Assistance, and Training	750 sq.m
Laboratories	2,500 sq.m
Animal quarters	2,000 sq.m
Stables and isolation quarters for large animals	3,000 sq.m
Workshops and generating plants	200 sq.m
Stores	900 sq.m
Garage	600 sq.m

The Center possesses all the equipment necessary for the functional and efficient operation of all the laboratories and sections, including audio-visual and printing equipment.

3.4. Administrative and Technical Organization of the Center

The organization of the Center comprises the Director's Office and four Departments dealing, respectively, with research and diagnosis, training, field advisory services, and administrative matters, as may be seen from the organigram appended to this report.

The research and diagnosis activities are carried out by the headquarters group of laboratories, with its diagnosis and reference, inactivated vaccines, modified live vaccines, virus survival, and general research sections. Certain research activities are carried out jointly with the countries concerned.

The Training Department handles the fellowships, the organization of training courses and other scientific meetings, the library, and the publication and information services.

The field advisory services are organized by the technical staff at the Rio de Janeiro headquarters and through the consultants in different countries.

Advice is provided on epidemiological matters, administrative methods, statistics, and the planning and evaluation of foot-and-mouth disease control campaigns.

The Administrative Department operates through the finance, personnel, supplies, and general services sections.

4. Brief Description of the Main Activities Carried Out Over the Years

4.1 Field Advisory Services

By means of its central services and the area consultants, the Center's Technical Assistance Branch carries out the following activities:

Promoting, advising, and supporting the planning, organization, and implementation of national programs for the control or prevention and eradication of foot-and-mouth disease.

Determining of problem areas in the anti-foot-and-mouth disease programs and cooperation in finding solutions.

Promotion of coordination between countries, by means of visits, meetings, and regional or multinational agreements for the control and prevention of foot-and-mouth disease.

Cooperation with the countries concerned in the preparation of applications for financial assistance for campaigns against foot-and-mouth disease, for submission to international credit agencies.

Gathering, compiling, analyzing, and publishing epidemiological data concerning animal vesicular diseases in the Americas.

Developing a system of epidemiological surveillance of animal vesicular diseases in the Americas.

Since 1961 the national anti-foot-and-mouth disease programs have been increasing and have been consolidated at a constant rate. In that year just one country, Venezuela, carried out a vaccination campaign that could be termed nationwide in scope, while nine years later there are programs under way in Argentina, Brazil, Chile, Paraguay and Uruguay. One of these campaigns, that being carried out in Argentina, is the world's largest in terms of the number of cattle involved; it has reached 45 million head vaccinated three times yearly since 1968 and represents 90 per cent of all cattle in the area covered by the campaign.

The Brazilian program, started in 1965, shows considerable progress, the targets set having been reached. In 1966, 25 million cattle were vaccinated three times in the year, in the country possessing the largest number of cattle in the Hemisphere - estimated at 80 million head. In April of this year the state of Rio Grande do Sul completed the vaccination of its entire herd of 12 million cattle.

Chile embarked upon a national-scale program last May, for which it obtained the financial support of the Inter-American Development Bank (IDB). Paraguay, which has also obtained an IDB loan for the same purpose, has a control program under way in the southern part of the country, where approximately 1.5 million cattle, representing about a quarter of Paraguay's total estimated herd, are located. Uruguay's program, started in 1968, covers the entire country and provides for the regular vaccination of all of its 8 million cattle.

In this way, approximately 70 million cattle, representing about 90 per cent of all cattle in the area, are kept under systematic vaccination (every four months) in the part of the Continent comprising Argentina, Chile, Paraguay, Uruguay, and the Brazilian state of Rio Grande do Sul.

Argentina recently obtained a loan of US\$10 million from IDB for the completion and refinement of its campaign. Brazil's project, also organized with the cooperation of the Center, was concluded a short while ago and approved by IDB, while the projects of Bolivia, Colombia, Ecuador, Peru, and Venezuela are under study.

The cooperation of the Inter-American Development Bank in anti-foot-and-mouth disease programs will undoubtedly prove a major factor in boosting their effectiveness in coming years.

Intercountry coordination has been a policy of the Center ever since its foundation. Those in charge of operations are fully aware that only national-scale campaigns, integrated first at the regional and subsequently at the Hemisphere level, will produce results. In this respect the following agreements may be listed:

The Inter-American Animal Health Agreement, signed at Rio de Janeiro, Brazil, in 1967 by Argentina, Brazil, Chile, Paraguay, and Uruguay. Its executive commission, the Regional Animal Health Technical Commission, has achieved real progress in its efforts toward regional integration. Bolivia has recently become a party to this Agreement, and it is hoped that Peru will also shortly do so. Bilateral agreements between Argentina and Chile, Argentina and Paraguay, Brazil and Paraguay, Brazil and Uruguay, and Colombia and Ecuador represent further steps toward this integration. Others under study are between Brazil and Argentina, Ecuador and Peru, Bolivia and Peru, and Brazil and Guyana with Venezuela. It is also likely that in the near future a planned "Bolivarian Animal Health Organization" will link Colombia, Ecuador, and Venezuela. In the area free from the disease there is in operation an Agreement between the International Regional Organization for Health in Agriculture and Livestock (OIRSA) and Mexico, Central America, and Panama for a protection program for the Isthmus of Panama, while the Choco Agreement between Colombia and the OIRSA countries is under study with a view to a prevention campaign for that department of Colombia. With the support of an OIRSA-Panama-PAHO Agreement dating from 1964, a Center consultant is working

in the area. At present, nine agreements are under study by the countries of the free area (North America, Mexico, Central America, and Panama) for joint efforts against a possible outbreak of foot-and-mouth disease. The Center cooperates with the Governments in the promotion, study, and implementation of these agreements and attends all international or regional meetings at which problems connected with foot-and-mouth disease are discussed.

4.2 Training

Through this branch of its activities the Center provides the veterinarians and other technicians of the government services responsible for the control or prevention of foot-and-mouth disease, with further training for the exercise of their functions. Its plans cover both the field aspects (planning, organization, and evaluation of campaigns; prevention programs for the free countries; epizootiological studies of outbreaks) and the laboratory aspects (diagnosis, typing, and subtyping of viruses; methods of vaccine production and control).

The Center's library supplies interested persons and institutions in Latin America, together with the Center's professional staff, with the necessary bibliographical information regarding foot-and-mouth and other vesicular diseases and provides copies of the works listed to those requesting them.

For this purpose the Center possesses a collection of books and receives around 200 specialized journals. Summaries of the works of greatest interest are published in the Center's "Cuadernos," which came out monthly from 1960 up to 1966, when publication had to be suspended because of financial difficulties. Only one number appeared in 1967; another was published early in 1970; and the necessary steps are being taken to bring publication up to date and to resume issue in a periodical and regular form.

Each number of "Cuadernos" is produced in a printing of 1,000 copies which are distributed to institutions in all countries of the Americas, 13 in Europe, 4 in Asia, and 4 in Africa.

"The Epizootiological Report on Foot-and-Mouth Disease and Vesicular Stomatitis," a publication which first appeared at the close of 1969 and which has been issued monthly since January 1970, is compiled from the material processed by the Field Assistance Branch from the information it obtains from the different countries.

This report, which summarizes the epizootiological movement of vesicular diseases in Central and South America, is sent out to the governmental authorities and official laboratories of all countries of the Hemisphere.

4.2.1 Training Fellowships at the Center

Between its foundation and the end of 1969, the Center received 543 veterinarians from all countries of the Americas, almost all of them as fellowship holders, who attended courses or received individual training, as indicated in Table III.

4.2.2 International Courses and Seminars

Up to the present, the Center has run 25 courses and seminars at the international level. Table IV summarizes the venues, dates, main topics, veterinarians participating, and their nationalities.

4.2.3 National Courses and Seminars

National courses were first organized in 1968 and up to the present there have been four: the first in Asuncion, Paraguay, from 9 to 14 September 1968; the second in Salvador, Bahia, Brazil, from 7 to 11 April 1969; the third in Pôrto Alegre, Rio Grande do Sul, Brazil, from 19 to 21 November 1969, and the fourth in Asuncion, Paraguay, from 25 to 30 May 1970. All or nearly all of the veterinarians engaged in the local programs took part in these courses.

4.2.4 Participation by the Center in Regional and National Courses

At the request of institutions organizing courses, seminars, or congresses at which subjects connected with foot-and-mouth disease are discussed, the Center has undertaken to handle such matters. In 1969 it assisted in this way with courses in applied epidemiology given at the School of Public Health, Medellin, Colombia, and the Faculty of Medicine of San Marcos University, Lima, Peru. The Center also took part in the National Veterinary Medicine and Animal Breeding Congress held in Lima, Peru, in July 1970 and is preparing the round table on foot-and-mouth disease at the III Pan American Veterinary Medicine and Animal Breeding Congress, to be held in Santiago, Chile, at the end of September this year.

4.3 Research

The Center acts as a reference laboratory for the Americas, in close collaboration with the World Reference Laboratory, for the typing and subtyping of the foot-and-mouth disease and vesicular stomatitis viruses. Since its establishment, it has examined about 10,000 samples of vesicular diseases from 18 different countries of the Hemisphere, either free of the disease or not. Up to 1969 these studies had enabled identification of 17 new subtypes of foot-and-mouth disease virus (12 type A Vallée, 1 type O Vallée, and 4 type C Waldmann) and, for the first time in the world, two subtypes of the vesicular stomatitis virus (types Indiana II and III).

During the past year the Center received 652 samples for diagnosis from 18 countries, including those of the area free of the disease. It must

be stressed that swift diagnosis of all samples from this area is of vital importance for the application of the health policy most suited to the area's interest. The serious repercussions which may ensue from a foot-and-mouth disease outbreak underscore the urgency of early diagnosis. In 1969, 41 of the 652 samples received by the Center were from the free area.

Table V summarizes the results obtained from the study of the 611 samples from the countries of the affected area.

The Center provides the sera and reference and reference virus for the national diagnosis and control laboratories. In 1969, 1,224 ml. of reference sera was supplied, sufficient material for approximately 600,000 complement-fixing reactions.

Regarding inactivated vaccines, it should be noted that, since so far it is necessary to vaccinate cattle three times a year, immunization of the entire South American herd would call for a production of the order of 450 million doses, or an increase of 40 per cent compared with present production.

Any improvement in the length of the immunity afforded by the inactivated vaccines, which constitute from 96 per cent to 98 per cent of all vaccines used in South America, would have a favorable repercussion on the campaign costs (30 per cent or more). This is why the Center is actively continuing research on new cell lines susceptible to the foot-and-mouth disease virus, in an endeavor to obtain more economical sources for the production of the antigen; new inactivants which give a better guarantee regarding the innocuousness of the vaccines produced, without affecting their antigenic immunizing qualities; and new adjuvants which make it possible to obtain more potent vaccines.

The foregoing, coupled with the fact that no vaccine which confers adequate immunity upon swine is available commercially, together with the need to learn more about the behavior of the vaccines in sheep, were the reasons for the experiments now being carried out in cooperation with the U.S. Department of Agriculture's Plum Island Animal Disease Laboratories, using a vaccine inactivated with an oil as coadjuvant. The results obtained show that this vaccine gives a good immunity for about one year to sheep receiving their first vaccination with it. The results with swine and cattle are highly promising, and this research is being actively pursued.

The modified live vaccines have been one of the Center's major contributions to the battle against foot-and-mouth disease; through the years it has gained considerable experience in this field, for it has applied around 50 million doses of monovalent vaccine in different countries since 1962, especially in Venezuela.

The Center has available strains of the O₁ Campos, A₂₄ Cruzeiro, and C₃ Rezende strains, while the modification of other strains is nearing completion.

The Center pays particular attention to the problems that foot-and-mouth disease can cause for the livestock and meat products trade. With this aspect in mind, it has carried out a study of carriers, in cooperation with the Governments of Brazil and Venezuela, which has enabled the latter country (which has so far been free of the type C virus) to import Zebu breeding stock from Brazil. Thanks to the Center's research, the risk of introducing the virus was limited and an important commercial transaction was made possible.

Another line of research worthy of special mention consists of the cross-immunity tests with different virus strains. Recently, for instance, it has been possible to demonstrate that the subtype C Rezende produces a good immunity to the subtype C Tierra del Fuego. The practical conclusion to be drawn from this is highly important, since the subtype C Rezende is the one which has been used up to the present in vaccine production, and in the event of outbreaks caused by the C Tierra del Fuego subtype the current vaccines may be used without the strain having to be changed.

In addition to the research referred to, the Center is also working on studies connected with research on new cell lines which offer susceptibility to the foot-and-mouth disease virus, the production of interferon in cell cultures and susceptible animals, studies on genetic markers which may characterize the virulent and attenuated strains of foot-and-mouth disease viruses, and so on. Research is also being carried out on the influence on these characteristics of the passage of the virus into cultures in vitro and into cattle, while studies have also been started on the effects of polyionic substances on the production of plaques of some strains of the vesicular stomatitis virus. New techniques for obtaining plaques in tissue cultures and new immunological studies for the detection of antibodies are under study.

4.5 Applicational or Control Programs Carried Out in Collaboration With the Governments

Applying a method developed in its laboratories, the Center cooperated with Brazil and Venezuela in the study already referred to for the detection of possible carriers among two batches of cattle sold to Venezuela by Brazil. Of the total of 250 animals involved, 36 were found to be carriers.

In 1964 the Center planned and participated actively in a serological survey on the Island of Tierra del Fuego, in collaboration with the Chilean and Argentine Governments, in order to verify the absence of foot-and-mouth disease and thus to support the livestock products export market of the Island, which belongs to both countries. The methodology developed by the Center proved to be sufficiently effective for Argentina to extend this type of study later to other parts of Patagonia.

In a joint effort with Argentina, Chile, and Peru, the Center is studying the epidemiological problems connected with the exportation of cattle from the first of those three countries to the consumer markets of the other two, and providing advisory services regarding the technical regulations which govern this trade.

For five years, from 1964 to 1968, the Center supplied Bolivia with the vaccine needed for the development of a pilot foot-and-mouth disease control plan at Cochabamba designed to demonstrate techniques and train Bolivian personnel. This experience is being utilized at the moment for the planning of a countrywide program. During the same period, demonstration plans of the same type were set up in Chile, Colombia, and Ecuador.

Argentina, Brazil, Chile, Colombia, and Paraguay are countries which have benefited particularly from direct assistance from the Center for the establishment of official foot-and-mouth disease vaccine control organizations and systems, by means of the planning, execution, and provision of biological elements and through the training of many of the professional staff required.

The Center has worked on a joint basis with Colombia, Panama, and Central America to promote, study, work out, and implement a foot-and-mouth disease prevention program in the Colombia-Panama frontier region. It was put into practice between 1964 and 1968 and is now under review.

For the countries of the area free from foot-and-mouth disease, a Plan of Action in the Event of a Foot-and-Mouth Disease Outbreak and a corresponding Procedures Manual have been prepared. At the same time a study was made of the resources available in Central America and Panama for the implementation of a prevention program and the eradication of any outbreak of the disease. The Center's consultant, based in Panama, is engaged mainly on the consolidation of these activities.

The Center has cooperated with Colombia, Ecuador, and Venezuela on the study and planning of animal quarantine stations, one of which (Venezuela) is in full operation.

The Center is acting as a link between Brazil, Guyana, and Venezuela for a foot-and-mouth disease control and prevention program in the border region between the three countries. On two occasions (1961 and 1969), besides direct technical advice in the field, it has provided Guyana with the vaccine necessary for the eradication of outbreaks of the disease in the southern part of the country. Similar field advisory services plus direct assistance in the form of laboratory services were given to Argentina in 1967, to Colombia in 1967 and 1970, and to Chile in 1970, to eradicate outbreaks which occurred in the areas free of the disease in those countries.

4.6 Direct Services Provided to Governments

In addition to replies of a scientific or technical nature to questions put to the central services or area consultants, the Center provides the countries with various supplies. During the first six months of the present year, 37,000 doses of foot-and-mouth vaccine were sent to Colombia, Guyana, and Paraguay; various virus subtypes were dispatched to different countries; 170 ml. of hyperimmune sera was sent to Argentina, Bolivia, Brazil, Chile, Colombia, and the Plum Island Laboratories in the United States of America, and hemolytic sera to Brazil, Peru, and Venezuela.

4.7 List of Works Published

Since its foundation the Center's technical staff have published 81 research articles in various scientific reviews in Europe and the Americas.

A complete listing of these works is given as an annex.

The foregoing is a brief summary of the work carried out by the Pan American Foot-and-Mouth Disease Center, in the knowledge that a better understanding of the disease in its scientific and technical aspects and its economic and social repercussions, together with the perfecting of the measures employed against it, intensification of the campaigns organized by the countries concerned, and better coordination between them, cannot but bring about a distinct reduction in the losses caused by it and contribute, in the last analysis, to the improvement of living standards in Latin America.

Table I
PAN AMERICAN FOOT-AND-MOUTH DISEASE CENTER
BREAKDOWN OF BUDGET FOR 1971

	Office of Director	Research	Training	Field Services	Administration	Common Services	Meetings	Total	Percentage of Total
Salaries and Allowances	66,980	635,806	53,535	262,281	53,306			1,071,908	76.3
Duty Travel	5,945	17,328	2,435	38,478			39,000	103,186	7.3
Fellowships			44,766					44,766	3.2
Short-term Consultants			2,972				2,000	4,972	0.4
Supplies and Equipment		96,017	14,600	1,000	1,815	28,000		141,432	10.1
Contractual Services		2,700	2,970		1,100	20,000	9,000	35,770	2.5
Publications			3,000					3,000	0.2
T o t a l	72,925	751,851	124,278	301,759	56,221	48,000	50,000	1,405,034	
Percentage of Total	5.2	53.5	8.8	21.5	4.0	3.4	3.6		100.0

Table II

BREAKDOWN BY YEAR OF THE CENTER'S FUNDS IN US\$

Year	Organization of American States	Pan American Health Organization	Agency for International Development	National Research Council	US Department of Agriculture	Ministry of Agriculture of Brazil	Total
1951	165,341.87					10,000.00 ⁺	175,341.87
1952	198,410.24					10,000.00 ⁺	208,410.24
1953	267,407.00				19,600.00	10,000.00 ⁺	297,007.00
1954	212,712.23					10,000.00 ⁺	222,712.23
1955	196,462.53					10,000.00 ⁺	206,462.53
1956	219,421.00					10,000.00 ⁺	229,421.00
1957	231,060.84					10,000.00 ⁺	241,060.84
1958	256,911.88					12,464.64	269,376.52
1959	323,129.00					6,201.40	329,330.40
1960	382,124.92					12,880.21	395,005.13
1961	520,633.00					10,337.65	530,970.65
1962	537,808.00		134,365.00			11,092.25	683,265.25
1963	603,900.00		93,265.00			26,038.76	723,203.76
1964	632,105.00		132,100.00			9,842.21	774,047.21
1965	800,128.00		40,845.00	7,967.00		27,325.82	876,265.82
1966	975,382.61		8,000.00	5,745.00		28,870.00	1,017,997.61
1967	781,466.00		200,000.00	3,442.13		18,174.34	1,003,082.47
1968		625,871.00	133,009.00			29,373.17	788,253.17
1969		1,202,836.00				24,096.38	1,226,932.38
1970		1,320,716.00				45,151.51	1,365,867.51
1971		1,405,034.00					1,405,034.00

* Estimated figures

Table III

NUMBER OF PROFESSIONALS, BY COUNTRY, TRAINED AT THE
CENTER FROM THE TIME OF ITS FOUNDATION UP TO 1969

Argentina	55	Guyana	6
Bahamas	2	Haiti	1
Barbados	1	Honduras	8
Bolivia	17	Jamaica	4
Brazil	152	Martinique	2
Canada	1	Mexico	12
Chile	21	Netherlands Antilles	2
Colombia	54	Nicaragua	6
Costa Rica	11	Panama	20
Cuba	7	Paraguay	20
Dominican Republic	5	Peru	19
Ecuador	26	Surinam	2
Egypt	1	Trinidad and Tobago	3
El Salvador	7	United States of America	13
French Guiana	2	Uruguay	27
Guatemala	10	Venezuela	25

Total: 543

Table IV

INTERNATIONAL COURSES AND SEMINARS CONDUCTED
 BY THE CENTER SINCE ITS FOUNDATION

<u>No.</u>	<u>Venue</u>	<u>Date</u>	<u>Participants</u>	<u>Countries</u>	<u>Main Topics</u>
1	Rio de Janeiro (Brazil)	29 Apr. to 23 Jun. 1953	7	6	Foot-and-mouth disease in general - Diagnosis - Campaign programs
2	Rio de Janeiro (Brazil)	31 Oct. to 25 Nov. 1953	9	6	Foot-and-mouth disease in general - Diagnosis - Campaign programs
3	Rio de Janeiro (Brazil)	12 Apr. to 5 Jun. 1954	9	4	Foot-and-mouth disease in general - Diagnosis - Campaign programs
4	Panama City (Panama)	8 Nov. to 20 Nov. 1954	31	14	Prevention programs for countries free of the disease
5	Bogota (Colombia)	6 Jun. to 17 Jun. 1955	41	9	Foot-and-mouth disease in general - Diagnosis - Campaign programs
6	Rio de Janeiro (Brazil)	16 Nov. to 26 Nov. 1955	59	7	Prevention programs for countries free of the disease
7	Rio de Janeiro (Brazil)	16 Apr. to 8 Jun. 1956	9	8	Foot-and-mouth disease in general - Diagnosis - Campaign programs
8	Rio de Janeiro (Brazil)	5 Nov. to 30 Nov. 1956	9	8	Foot-and-mouth disease in general - Diagnosis - Campaign programs
9	Rio de Janeiro (Brazil)	20 Oct. to 13 Dec. 1957	7	5	Laboratory diagnosis of vesicular diseases
10	Rio de Janeiro (Brazil)	12 May to 20 Jun. 1958	9	6	Diagnosis of foot-and-mouth disease, vaccine production
11	San Jose (Costa Rica)	10 Nov. to 22 Nov. 1958	14	8	Prevention programs for countries free of the disease

Table IV (cont.)

<u>No.</u>	<u>Venue</u>	<u>Date</u>	<u>Participants</u>	<u>Countries</u>	<u>Main Topics</u>
12	Buenos Aires (Argentina)	8 Nov. to 28 Nov. 1959	18	5	Diagnosis of foot-and-mouth disease and vesicular diseases
13	Bogota (Colombia)	5 Jun. to 18 Jun. 1960	11	10	Prevention programs for countries free of the disease
14	Rio de Janeiro (Brazil)	1 Nov. to 30 Nov. 1970	20	11	Foot-and-mouth disease vaccines
15	Rio de Janeiro (Brazil)	2 Oct. to 28 Oct. 1961	13	3	Laboratory techniques used with foot-and-mouth disease
16	Bogota (Colombia)	13 Nov. to 24 Nov. 1961	12	9	Prevention programs for countries free of the disease
17	Mexico City (Mexico)	28 Oct. to 10 Nov. 1962	10	10	Prevention programs for countries free of the disease
18	Belo Horizonte (Brazil)	14 Oct. to 31 Oct. 1963	16	1	Laboratory techniques used with foot-and-mouth disease
19	Rio de Janeiro (Brazil)	16 Nov. to 11 Dec. 1964	13	8	Foot-and-mouth disease in general - Diagnosis - Campaign programs
20	Maracay (Venezuela)	7 Jun. to 19 Jun. 1965	10	8	Prevention programs for countries free of the disease
21	Rio de Janeiro (Brazil)	13 Sep. to 30 Sep. 1965	15	10	Evaluation of health campaigns
22	Maracay (Venezuela)	4 Sep. to 17 Sep. 1966	18	10	Modified live virus vaccines
23	Rio de Janeiro (Brazil)	26 May to 13 Jun. 1969	14	12	Diagnosis of vesicular diseases
24	Guayaquil (Ecuador)	8 Sep. to 19 Sep. 1969	14	8	Prevention programs for countries free of the disease
25	Maracay (Venezuela)	1 Dec. to 12 Dec. 1969	7	5	Prevention programs for countries free of the disease (in English)

Table V -- RESULTS OF THE EXAMINATION OF 611 EPITHELIUM SPECIMENS RECEIVED FOR DIAGNOSIS AND TYPING
AT THE PAN AMERICAN FOOT-AND-MOUTH DISEASE CENTER DURING 1969

Types and Subtypes of the Foot-and-Mouth Disease Virus														Total			
Country	0-1	A-10	A-24	A-25	A-26	A-27	A- Bra/ 68*	A- Col/ 69*	A- Urug/ 68*	A- Peru/ 69*	C-3 Res	C-4 T.F.	C- Arg/ 69*	C- Para/ 69*	A- Vallée **	Neg.	Total
Argentina	13		3+	18	11						7	1+	42		14	7	116
Bolivia	10		1	1													12
Brazil	24		14	3			14				48	5				8	116
Chile	5			1+	4												10
Colombia	3					5		8									16
Ecuador	44					2											46
Guyana	10															7	17
Paraguay	84					1					3			38		54	232
Peru	1		2		1	6				9			1++				20
Uruguay	2	1		4					4								11
Venezuela	1		3+			7					4+						15
Total	197	1	75	27	16	21	14	8	4	9	62	6	43	38	14	76	611

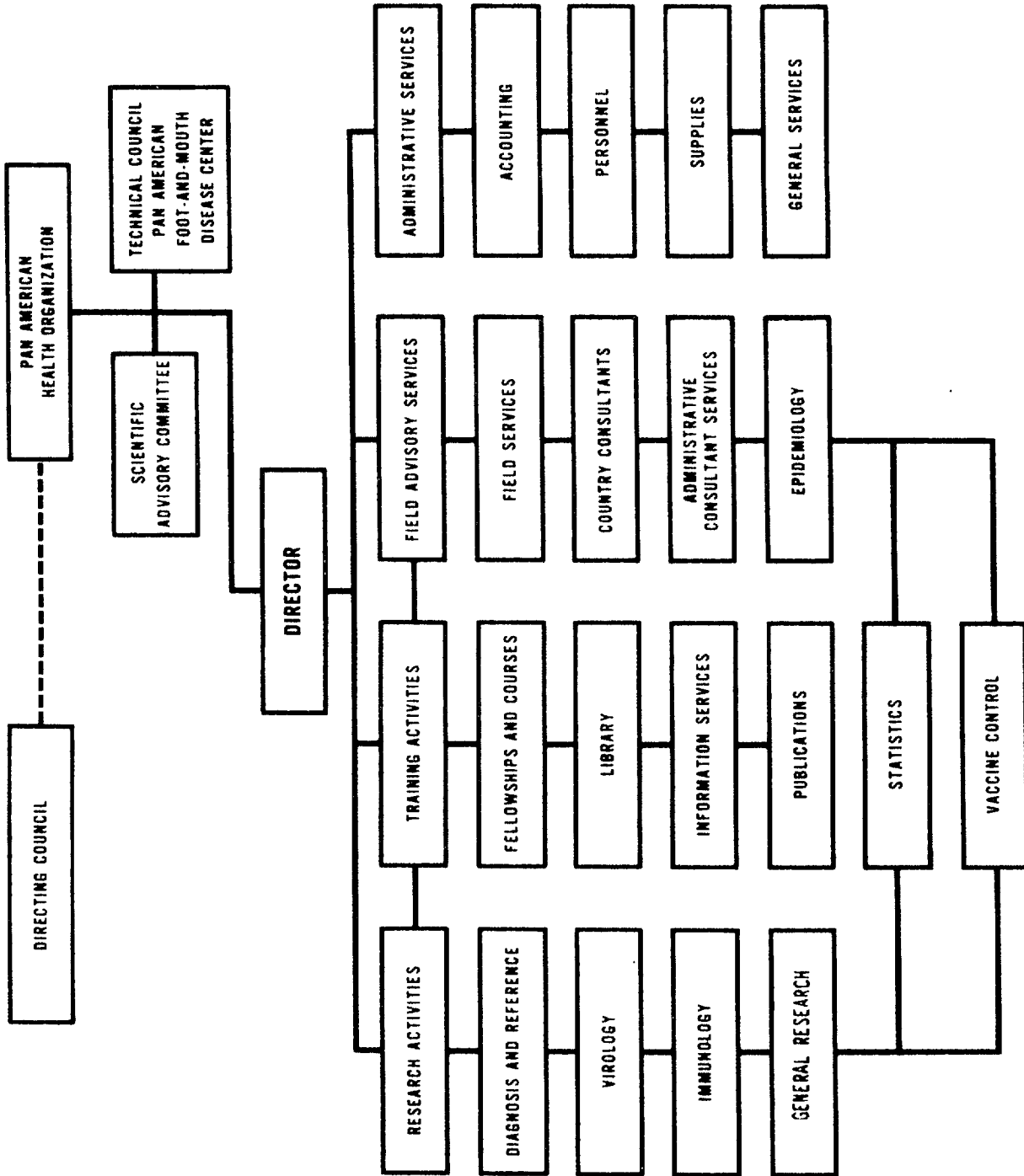
* Awaiting assignment of the appropriate international classification number

** Under Study

+ Laboratory specimens

++ Specimen taken - on board ship - from an animal purchased in Argentina

ORGANIZATIONAL CHART OF THE PAN AMERICAN FOOT-AND-MOUTH DISEASE CENTER



PAN AMERICAN FOOT-AND-MOUTH DISEASE CENTER

Papers Published - 1951/1970

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PAN AMERICAN ZOONOSES CENTER

The Pan American Zoonoses Center owes its origin to a resolution passed by the III Special Meeting of IA-ECOSOC (Inter-American Economic and Social Council) held in Caracas, Venezuela, in February 1953. The Pan American Sanitary Bureau (PASB) was asked to carry out this project, which started in August 1956, with joint financing by PASB/WHO/TA and the Argentine Government. The Center was set up in Azul, Buenos Aires Province, Argentina, in 1957; between then and 1966 it gradually expanded its laboratories, experimental field, research tasks, and training activities and started to provide technical assistance in zoonoses control to the Argentine Government and to the countries of the Hemisphere.

The size of the problem posed by zoonoses, from both the economic and the health point of view, together with the limited ability of the Pan American Zoonoses Center to meet the calls made on it for technical assistance, led the Argentine Government to provide it with new facilities in Ramos Mejia (Buenos Aires Metropolitan Area), increase the contribution made toward its support, and submit to UNDP a proposal for the "Reinforcement of the Pan American Zoonoses Center in Ramos Mejia and Azul." This project is currently being executed, over the five-year period 1967-1971. The Plan of Operations is progressing satisfactorily, having already reached and even surpassed the goals set in the working program.

The contribution made by UNDP has enabled the Center to greatly expand its country programs, and has gained it a reputation as a leading center for the study and control of zoonoses. A Special Mission appointed by the Director of PASB recently visited 15 Latin American countries to collect information on each country's needs in the field of zoonoses control; everywhere this Mission found a unanimous desire that the Center expand its technical assistance program on a regional scale, and received pledges of financial support. Resolution II approved by the III Inter-American Meeting of Ministers of Agriculture, at the Ministerial Level, on the Control of Foot-and-Mouth Disease and Other Zoonoses, held in Buenos Aires, Argentina, from 14 to 17 April, 1970, reaffirmed the intention of the countries to support a proposal to UNDP to step up financial assistance to the Zoonoses Center, in the form of a regional project. To maintain the continuity of the present project, it is hoped that the regional project will start on 1 January or 1 February 1972.

Purpose

To provide countries with technical assistance in support of zoonoses control programs.

Objectives

1. Training of professional and technical staff in control and laboratory aspects in the following fields: (a) brucellosis, (b) rabies, (c) tuberculosis, (d) hydatidosis, (e) leptospirosis, (f) food hygiene and microbiology, and (g) breeding and handling of laboratory animals.

2. Technical assistance in (a) planning, execution, and evaluation of control programs, (b) preparation of loan applications to the Inter-American Development Bank and other financial agencies, for zoonoses control, (c) epidemiological investigations, (d) preparation of biological agents (vaccines, sera, antigens) and (e) conducting of diagnostic tests to check the quality of biological agents.

3. Laboratory services, taking the following forms: (a) supply of strains for the preparation of vaccines, sera, and antigens and also for microbiological typing and testing of potency; (b) supply of reference antigens, vaccines, and allergens; (c) supply of sera for identification and microbiological typing; (d) supply of marked sera for immunofluorescence testing; (e) gamma globulins for research projects; and (f) receipt of biological agents for reference testing in quality control.

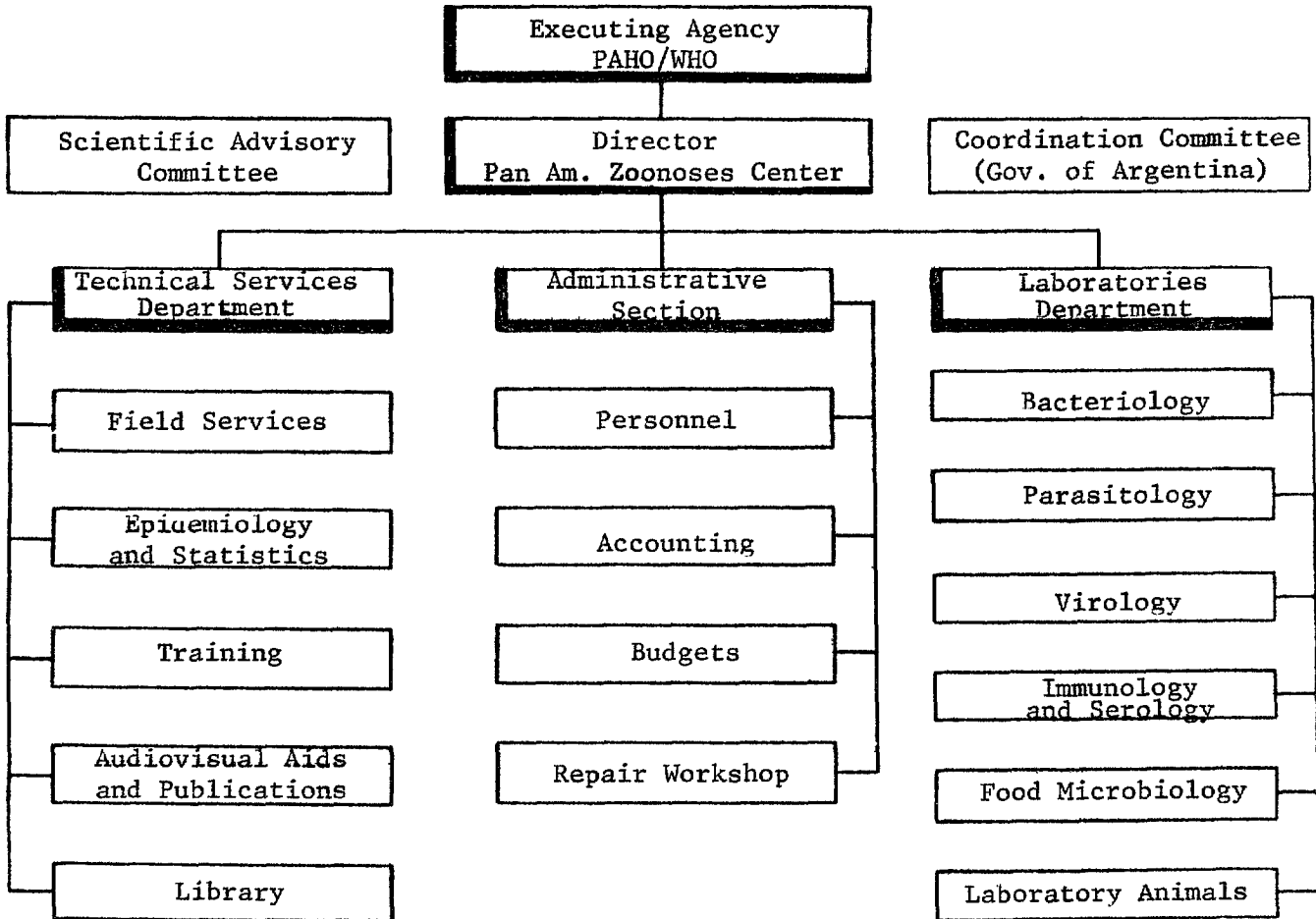
4. Research, taking the form of (a) projects to evaluate and improve biological products and to develop simplified diagnostic tests, improved microbe typing techniques, improved methods of treatment, and ecological and epidemiological studies, and (b) cooperation with national scientific institutes in the study of regional pathology in the zoonoses field and of problems resulting from the development of control programs.

5. Technical and audiovisual information, as follows: (a) publication of a quarterly bulletin; (b) publication of a Rabies Epidemiological Surveillance Bulletin, and starting the publication of a similar service for brucellosis, tuberculosis, and hydatidosis; (c) publication of technical notes; (d) publication of a new series of scientific publications in the form of monographs; (e) bibliographic research for national scientific institutes; and (f) lending of films, slides, and filmstrips.

6. Intercountry coordination in the following fields: (a) uniform Pan American standards on diagnosis, production of biological agents and their control; (b) uniform procedures for zoonoses control; (c) criteria for microbiological examination of foodstuffs of animal origin; (d) standards for cross-border trade in animals and products of animal origin; (e) intercountry coordination of zoonoses control activities; (f) coordination of epidemiological investigations of general interest; and (g) epidemiological surveillance of zoonoses.

Administrative Development and Present Organization

When the Plan of Operations of the project for the "Reinforcement of the Pan American Zoonoses Center in Ramos Mejia and Azul" was signed with the UNDP, WHO was appointed as executing agency. Both technically and administratively, the Center comes directly under the Department of Human and Animal Health of the Central Office of PASB. With the growth in numbers and fields of activity of the staff, the Center was divided into two technical departments and an administrative section: (a) Laboratories Department; (b) Technical Services and Training Department; and (c) Administrative Section. Each of the departments is subdivided in turn (see Organigram).



The Center currently has a staff of 19 international experts, supported by 73 local personnel, 8 of them university graduates. Of the total staff, 80 work in Ramos Mejia, in the Center's headquarters, and the remaining 12 in Azul.

Funds are obtained from a variety of sources. The budget for 1970 is as follows:

Argentine Government	US\$277,313
UNDP	462,556
PASB	153,402
WHO	<u>73,270</u>
Total	US\$966,541 =====

The Argentine Government has made available to the Center two stories with a total of 64 rooms in the National Institute of Health, Ramos Mejia, near Buenos Aires. In the town of Azul, 300 km. from Buenos Aires, the Center has a building and an experimental field of 150 hectares.

The main activities take place in Ramos Mejia, and the facilities in Azul are now used for field studies and experiments and as animal rooms. The Argentine Government is to construct additional facilities in Ramos Mejia for the Center's expanded program of activities, and a new building is being specially designed at an approximate cost of US\$2 million.

As a result of the contribution from the UNDP, the Center now has modern equipment with which to conduct its laboratory and field projects, carry out its training and information programs, and provide services to the countries.

TECHNICAL ASSISTANCE

While all the Center's activities could be regarded as technical assistance, only those services to countries are included under this heading which are directly concerned with problems in this sector, whether conducted in the laboratory or in the field. The following tables summarize activities during the period 1962-1966 and the years 1967-68-69 and the first half of 1970.

TECHNICAL ASSISTANCE AND APPLIED PROGRAMS

Year	Zoonosis	Type of Assistance	Countries Assisted
1962/66	Rabies	Diagnosis, production, and control of vaccines and serum	Argentina, Chile, Colombia, Paraguay, Peru, Uruguay
	Rabies	Control of canine rabies	Argentina, Uruguay
	Rabies	Ecology and control of vampire bats	Argentina
	Brucellosis	Control in cattle	Argentina, Chile, Colombia, Costa Rica, Ecuador, Guatemala
	Brucellosis	Control in goats	Peru
	Tuberculosis	Control in cattle	Chile, Colombia, Costa Rica, Ecuador, Guatemala
	Leptospirosis and Anthrax	Administration and evaluation of vaccine	Argentina, Paraguay
1967	Miscellaneous	Control programs	Guatemala, Panama
	Miscellaneous	Advice on control and prophylaxis	Nine countries
	Brucellosis	Survey among humans	Panama
	Rabies	Vaccine production	Colombia, Cuba, Mexico, Venezuela
	Rabies	Border control	Brazil, Uruguay
	Hydatidosis	National control program	Uruguay
	Tuberculosis	Control among cattle	Argentina
1968	Miscellaneous	Methods of control	Cuba
	Rabies	Control among dogs	Argentina, Uruguay
	Rabies	Control among cattle	Argentina, Brazil, Uruguay
	Brucellosis	Control among cattle	Argentina, Bolivia
	Brucellosis	Control among goats	Peru, Mexico
	Hydatidosis	Control	Argentina, Uruguay
1969	Tuberculosis	Control among cattle	Argentina
	Hemorrhagic fever	Control	Bolivia
	Rabies	Control among cattle	Argentina, Bolivia
	Rabies	Vaccine production	Brazil
	Rabies	Control among cattle	Argentina
Rabies	Ecology and control of vampire bats	Argentina	

Year	Zoonosis	Type of Assistance	Countries Assisted
1969 (cont.)	Rabies	Epidemiological surveillance	Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Peru, Venezuela, and Central America
	Brucellosis	Control among cattle	Argentina, Bolivia, Mexico
	Brucellosis	Serodiagnosis; production of vaccine Rev. 1	Mexico
	Hydatidosis	Control	Argentina, Uruguay
	Tuberculosis Encephalitis	Control among cattle Control among horses Breeding and handling of laboratory animals	Argentina Paraguay Argentina, Venezuela
1970 (first half year)	Hydatidosis	Epidemiological research	Bolivia
	Hydatidosis	National program	Argentina, Peru, Uruguay
	Hydatidosis	Serological diagnosis	Argentina
	Tuberculosis	Qualitative control of Tuberculins and BCG	Argentina
	Miscellaneous	Breeding and use of laboratory animals	Argentina, Brazil, Costa Rica, Cuba
		Organization of the microbiological control of foodstuffs of animal origin	Argentina, Chile, Colombia, Guatemala, Uruguay
	Brucellosis	Control programs	Brazil
	Brucellosis	Vaccination of goats	Peru
	Brucellosis	Diagnosis; production and use of vaccines (strain 19, 45/20, Rev. 1)	Chile, Ecuador, El Salvador, Mexico, Paraguay
	Brucellosis	Control of antigens	Chile, Venezuela
	Rabies	Control among cattle and dogs	Argentina
Rabies	Control of vaccines	Twelve countries	
Rabies	Control among dogs	Brazil, Chile, Peru	

TRAINING ACTIVITIES

The Center is the only institution in Latin America devoted to the training of professional staff in control of, and research into, zoonoses. The Center's training activities have expanded steadily from 1967 onward, with special attention being paid to the fields of brucellosis, tuberculosis, rabies, hydatidosis, and leptospirosis, together with food hygiene and microbiology and the breeding and handling of laboratory animals.

Training activities over the past three and a half years can be summarized as follows:

- a) 8 international courses and/or seminars attended by 196 professionals from practically every Latin American country.
- b) 11 national courses attended by 204 professionals from 6 countries.
- c) Participation in 13 regional and national courses in 5 countries.
- d) 60 professionals from 17 countries given individual training.
- e) 11 researchers appointed, all Argentine nationals.

The tables below give details of activities in this sector in the period between 1967 and the first half of 1970.

1. International Courses and Seminars

<u>Subject</u>	<u>Number of Participants</u>	<u>Countries Represented</u>	<u>Dates</u>
Course on Laboratory Methods for Rabies	16	9	11-22 Sept. 1967
Regional Seminar on Rabies	57	17	24-30 Sept. 1967
Course on Leptospirosis	17	8	20-31 May 1968
Seminar on the Epidemiology of Zoonoses	33	14	5-16 Aug. 1968
Course on Epididymitis in Rams	15	6	11-16 Nov. 1968
Course on the Production of Brucellosis Vaccines and Antigen	17	7	2-13 June 1969
Course on the Breeding and Handling of Laboratory Animals	17	8	18-29 Aug. 1969
Course on the Production and Control of Antirabies Vaccines	24	10	17-28 Nov. 1969

2. National Courses

<u>Subject</u>	<u>Number of Participants</u>	<u>Countries Represented</u>	<u>Dates</u>
Epidemiology of Zoonoses	9	Argentina	October 1967
Immunofluorescence Techniques with Rabies	8	Argentina	27 Nov.-8 Dec. 1967
Brucellosis Diagnosis	16	Peru	30 July-3 Aug. 1968
Brucellosis Diagnosis	16	Brazil	5-10 Aug. 1968
Immunofluorescence Techniques	8	Argentina	16-19 Oct. 1968
Rabies Diagnosis	23	Brazil	19-31 May 1969
Brucellosis Diagnosis	24	Mexico	7-12 July 1969
Food Microbiology	13	Chile	1-8 Dec. 1969
Food Microbiology	7	Argentina	April-Nov. 1970
Rabies Vaccines for Human Use	11	Brazil	11-22 May 1970
Food Hygiene and Microbiology	69	Uruguay	11-15 May 1970

3. Participation by the Center in Regional and National Courses

<u>Subject</u>	<u>Place</u>	<u>Dates</u>
National Rabies Seminar	Medellin, Colombia	26-29 July 1967
National Zoonoses Seminar	Havana, Cuba	6-12 Aug. 1967
FAO Courses on Dairying	Santiago, Chile	(twice a year)
National Rabies Seminar	Cordoba, Argentina	27-30 Apr. 1969
Course on Immunofluorescence for Rabies	Buenos Aires, Argentina	14-15 Mar. 1969
Seminar on Epidemiology of Communicable Diseases	Tucuman, Argentina	24-25 Apr. 1969
Seminar on Public Veterinary Health	Santa Fe, Argentina	June 1969
Seminar on Public Veterinary Health	Buenos Aires, Argentina	June 1969
Course on Epidemiology of Zoonoses	Medellin, Colombia	19-28 July 1969
Course on Epidemiology of Zoonoses	Lima, Peru	Sept. 1969
Seminar on Rabies	Lima, Peru	1-12 Oct. 1969
Refresher Course in Medical Parasitology	Buenos Aires, Argentina	July-Aug. 1969
Course on Epidemiology	Buenos Aires, Argentina	Sept. 1969
Sanitary Inspection of Meat	Buenos Aires, Argentina	Mar.-Dec. 1970 (one a month)

4. Individual Training

<u>Country</u>	<u>Number Trained</u>	<u>Subject</u>
Argentina	20	rabies, hydatidosis, food microbiology, tissue cultures, immunofluorescence, typing by phages, laboratory animals
Brazil	11	brucellosis, rabies, anthrax, leptospirosis, hydatidosis, laboratory animals
Bolivia	2	rabies
Chile	1	laboratory animals
Colombia	3	brucellosis, leptospirosis, food microbiology
Costa Rica	1	rabies
Cuba	1	rabies
Ecuador	2	tuberculosis, rabies
El Salvador	2	brucellosis, rabies, laboratory animals
Guatemala	2	brucellosis, rabies
Honduras	1	various zoonoses
Mexico	2	various zoonoses
Nicaragua	1	rabies, brucellosis
Panama	1	brucellosis, rabies
Paraguay	2	rabies, leptospirosis
Peru	4	hydatidosis, rabies
Venezuela	4	brucellosis, rabies, hydatidosis, leptospirosis

5. Assigned Researchers

The Argentine Government has assigned a number of professionals to the Center and has awarded fellowships to various other professionals to carry out research projects in the Center that are of special interest to the country. These professionals work as "assigned researchers" in collaboration with, and under the guidance of, experts from the Center.

RESEARCH

The Center has carried out an extensive program of research, both in the field and in the laboratory, comprising a total of 54 projects (11 field projects and 43 laboratory projects), on problems of interest to the countries.

Field Investigations

Of the 11 field research projects carried out, 2 were concerned with rabies, 2 with brucellosis, 1 with leptospirosis, 3 with hydatidosis, 2 with tuberculosis, and 1 with hemorrhagic fever.

The most significant results obtained from this group of projects were:

- in an area in which bovine rabies is enzootic, a high percentage of the vampire bats were found to contain antirabies serum antibodies in significant quantities in the absence of rabies virus.
- examination of the saliva of apparently healthy vampire bats captured in northern Argentina revealed rabies virus in 3 per cent of the 1,500 specimens examined.
- treatment of dogs infected by E. granulosus with two doses of bumamide administered with a six-week interval is effective to a significant extent.
- in the northern section of Argentine Patagonia, 15.5 per cent of the foxes are infected by E. granulosus. Of 696 Patagonian animals examined, 49 reacted positively to Casoni's test, but only 11 to the hemagglutination, latex, or immunoelectrophoresis tests.
- for the intradermal administration of tuberculins in cattle, the neck area is to be preferred to the anal-caudal fold as it is more sensitive.
- PPD tuberculin is more potent than old Koch tuberculin and can be applied to both sites (neck and anal-caudal fold).
- inactivated 45/20 vaccine (Brucella abortus) causes agglutinins detectable for a short period to appear in a limited number of cattle, together with much more persistent complement-fixing antibodies.
- biological control of Bolivian hemorrhagic fever was attempted through selective destruction of Calomys callosus (reservoir in the domestic environment of the Machupo virus).
- in a study of various species of wild animals in the Argentine pampas, leptospire could be isolated only in the vizcacha (lagostomus maximus). A high incidence of brucellosis infection was found among foxes; little or no infection was found, however, among herbivorous species.

Laboratory Investigations

A total of 43 projects have been carried out, as follows:

Zoonosis	Object of Investigation	Number of Projects
Rabies	Evaluation of diagnostic methods	5
	Evaluation of bovine vaccines	2
	Study of passive immunity	1
	Study of suckling mouse brain vaccine immunity	4
	Study of immunity patterns in humans	2
Brucellosis	Typing of brucellae	3
	Studies of diagnostic methods	3
	Immunological studies	1
Hydatidosis	Anti-equinococcosis treatment in dogs	4
	Immunological studies	6
	Biological studies on <u>E. granulosus</u>	3
Tuberculosis	Evaluation of tuberculins for cattle	1
	Typing of mycobacteria of different origins	3
Salmonellosis	Investigation of salmonellae in abattoirs through the work process	2

The most significant results and those that are most important from the practical angle are given below:

a) Rabies

- The most sensitive method for isolating street virus is the tissue culture BHK-21 with the addition of DEAE-Dextran. This is much more sensitive than suckling mouse inoculated I.C. In its turn, a suckling mouse is more sensitive than a weaned mouse or an adult.

- the corneal test (ante-mortem diagnosis) has a sensitivity of 42 per cent and is 97 per cent specific.
- sixty five per cent of the tongues of rabid dogs with virus in the brain show virus in the taste buds of the tongue.
- current vaccines have markedly different powers of producing immunity among humans, and CRL (Fuenzalida-Palacios) vaccine is superior to other types. The immunogenic power of CRL vaccine for use in cattle is increased when Al (OH)₃ is added; the opposite is the case with modified live virus type vaccines.
- the practice of giving cattle a booster shot 30 days after vaccination is not justified, as it does not result in a permanent increase in the antibody count.
- the most appropriate way to inoculate dogs with CRL vaccine is intramuscularly.
- for pre-exposure immunization of humans, three subcutaneous doses of CRL vaccine a day, on the average, gives highly satisfactory results; a booster of one half dose given after one to three years rapidly produces a high antibody count.
- in humans, post-exposure vaccination with different doses of CRL vaccine (14, 7, and 3 doses a day) produces a degree of seroneutralizing antibody response proportional to the number of doses administered. Patients between 5 and 24 years of age show a proportionately higher serological response than older people.

b) Brucellosis

- for the serological diagnosis of epididymitis among rams (B. ovis), the Center has developed a high-sensitivity, high-specificity, practical, and low-cost diffusion method in agar gel (92-100 per cent agreement with complement fixing).
- strain 19 of B. abortus used in vaccination may be differentiated from field strains by the presence of mitomycin C (0.1-1.0 micrograms/ml) in culture medium.
- standardized agglutinating antigens, abortus and suis, always give the same result with any antiserum. Standardized melitensis antigen is more sensitive with melitensis antiserum. Consequently, the routine method of standardizing cannot be applied to melitensis antigen.
- evaluation trials with various vaccines for goats (Rev. 1 and B. abortus 45/20) and pigs (INTA, Rev. 1, cellular walls) are in progress.

c) Hydatidosis

- bunamidine (50 mg/kg) is effective against Echinococcus granulosus in dogs. It acts as a teniacide and is tolerated better than arecoline (teniafuge) when a repeat dose is required. Its ovicidal effect is under study.
- the organic compound Dowco 217, administered in a dose of 80 mg/kg, proved promising for the treatment of equinococcosis in dogs; 4,4'-diisothiocyanate was found to be ineffective.
- immunization of meriones with hydatid liquid does not have any effect on the development and growth of E. granulosus. This trial was carried out to evaluate the "biological treatment" of hydatidosis victims.
- the latex agglutination test, using Boerner slides, was found to be very useful, practical, sensitive, and specific for the diagnosis of hydatidosis in humans.
- antigen fractions are being isolated from the hydatid liquid, in order to improve diagnosis in humans and in animals.

d) Tuberculosis

- PPD tuberculin prepared with Mycobacterium bovis gives a better distinction between tuberculous and nontuberculous cattle, both in comparative tests and in simple tests.
- a study carried out in a Buenos Aires abattoir showed that M. bovis is the major source of infection among hogs. Other mycobacteria play a secondary role, and efforts to control infection should be directed principally to the eradication of bovine tuberculosis.
- a study into mycobacterial contamination of liquid milk in Buenos Aires showed that the pasteurization processes were being well supervised.

e) Salmonellosis (Food microbiology)

- out of 100 horses slaughtered, 27 were found to be carriers and 55 strains were isolated. Twenty seven of these were typed as belonging to 6 serotypes, the most widespread being the serotype S. good, with 25 strains.
- step-by-step study of the processing of meat in an abattoir has shown where the faults lie and how the hygiene of the final product can be improved. This study will serve as a model for application in another abattoir.

BIOLOGICALS PRODUCED IN THE CENTER AND DISTRIBUTED TO THE VARIOUS COUNTRIES
(From 1 January 1967 to 30 June 1970)

MATERIAL	P A H O Z O N E S					
	I	II	III	IV	V	VI
BRUCELLOSIS:						
- Quick-acting antigen (ml)	720	1800	1140	5700	1350	19350
- Slow-acting antigen (ml)	420	420	2070	2400	780	1470
- Ring test antigen (ml)	360	420	360	4080	360	660
- B. ovis antigen (ml)	-	-	-	30	-	-
- A and M monospecific sera (ml)	-	-	-	3	22	3
- Polyvalent abortus serum (ml)	-	3	-	3	9	-
- B. Ovis serum (ml)	-	-	-	2	10	-
- Bovine reference sera (ml)	6	6	-	-	-	-
- Strain B. abortus 19 and 1119-3	2	4	8	24	62	142
- Reference B. strains	6	3	6	21	6	58
- B. ovis strain	-	-	-	2	-	6
- Tb phage	-	-	-	-	-	1
RABIES:						
- IF conjugate (ml)	4	4	39	106	87	157
- Standard reference serum (ml)	1	1	2	3	11	5
- Hyperimmune equine serum	-	-	-	28	54	30
- Reference vaccine (ml)	-	-	-	4	5	11
- Virus strain 51	-	-	-	-	6	8
- Virus strain 91	-	-	-	5	6	22
- Virus strain DR-19	3	8	-	5	14	1
- Virus strain CVS	-	2	2	7	98	55
- Virus strains HEP-LEP	4	10	-	12	32	3
- Virus strain Pv	-	-	-	5	38	3
- Cellular cultures (BHK ₂₁ C ₁₃ -Vero-Nil-SIRG-GMK)	4	-	-	2	-	13
HYDATIDOSIS:						
- Casoni antigen (ml)	-	-	-	7	-	705
- Latex antigen (ml)	-	-	-	5	3	5
- HA antigen (ml)	-	-	-	-	-	1
- Ovine hydatid liquid (ml)	-	-	-	680	-	235
- Human hydatid sera (ml)	-	-	-	33	-	25

MATERIAL	P A H O Z O N E S					
	I	II	III	IV	V	VI
LEPTOSPIROSIS:						
- Serotype strains	32	19	2	113	78	128
- Antisera (ml)	15	-	-	44	44	12
TUBERCULOSIS*						
- Avian PPD tuberculin (ml)	-	30	-	610	-	2505
- Mammal PPD tuberculin (ml)	-	30	-	460	70	2685
- Production strains	-	-	-	6	-	6
- Sula medium	-	-	-	-	-	8
ANTHRAX:						
- Strains 34F2, Pasteur IV	-	-	-	12	4	10
SALMONELLOSIS:						
- Strains	-	-	-	3	-	-
LABORATORY ANIMALS:						
- Flemish rabbits	-	-	-	-	-	71
- Dutch rabbits	10	-	-	-	-	49
- Guinea pigs	-	-	-	-	-	85
- Hamsters	-	-	-	-	-	25
- Meriones	48	-	-	-	-	-
- Mice	-	-	-	-	855	1384
- Rats	10	-	-	-	-	10

TECHNICAL INFORMATION AND PUBLICATIONS

The Center's informational activities take the form of a number of publications, prepared and issued by the Center itself.

a) QUARTERLY BULLETIN "ZOOONOSIS"

This is distributed among all the countries of America, while a limited number of copies also find their way to other continents. Some 2,500 copies are printed in Spanish and English. It contains epidemiological reports from the countries and summaries of scientific work in the field of zoonoses.

* Supplies purchased for distribution

b) MONTHLY BULLETIN OF RABIES EPIDEMIOLOGICAL SURVEILLANCE

This is published in 1,500 copies every month, in Spanish and English. It contains a compilation, tabulation, and analysis of data on human and animal rabies in the Americas. It provides sufficient information for corrective action in rabies control programs.

c) TECHNICAL NOTES

These contain detailed descriptions of diagnostic techniques, vaccine and antigen production methods, preventive measures, and guides for sanitary inspectors.

Eleven of these notes have been published to date, in Spanish, covering the following fields: brucellosis (3), rabies (4), leptospirosis (1), and food microbiology (3).

In addition, the Center has compiled in a volume of 487 pages the work and discussions of the First International Seminar on Rabies in the Americas (PAHO Scientific Publication No. 169), in Spanish.

To round off this summary of the Center's informational activities, mention should be made of its Library Service, specializing in the zoonoses and related sciences. Its stock of publications (books and periodicals) now number 2,363; it has annual subscriptions to 63 scientific journals, while a further 350 periodic publications are received by way of exchange or donation. The Library has a photocopying service for reproducing scientific articles and works, and undertakes any bibliographical research the countries may require.

The results of the Center's scientific work are published in leading journals in the Americas and Europe (see Annex).

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INSTITUTE OF NUTRITION OF CENTRAL AMERICA AND PANAMA

Brief Notes on the Establishment of the Institute

In 1946, delegates from the five countries of Central America (Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua) and Panama attended a conference with representatives of the Pan American Sanitary Bureau and the W. K. Kellogg Foundation to discuss the possible establishment of a cooperative organization for the study of human nutrition: the Institute of Nutrition of Central America and Panama. The idea was put forward by the two bodies referred to, in response to the interest expressed by different countries in the area.

The Institute was to be provided with central laboratories and highly qualified personnel and would work actively on all the nutritional problems of the Member Countries. The Kellogg Foundation would contribute funds for study fellowships in other countries for the professionals who would make up the Institute's key staff and for the purchase of basic equipment. The Pan American Sanitary Bureau would provide the technical management for the Institute and would act as its administering agency.

The creation of the Institute was agreed upon by the representatives of the countries; the offer by the Government of Guatemala to erect the building necessary to house it received unanimous acceptance, and PASB was requested to undertake the administration of the Institute. Once the necessary specialist personnel had been trained and the basic equipment and administrative structure were available, the Institute - INCAP - was officially inaugurated on 16 September 1949.

Purpose and Objectives

The specific objectives set for the new Institute were:

- To study the nutritional problems of the area
- To seek means of solving these problems
- To assist the Member Countries to make such solutions effective.

To sum up, the purpose for which INCAP was created is to collaborate with the Governments in their efforts to improve the nutritional situation of the population of the Central American area.

Administrative Development and Present Organization

A short while after the inauguration of INCAP, and in view of the fact that the period of the original agreement establishing the Institute was nearing expiry, a meeting was held in Tegucigalpa, Honduras, in December 1949 that was attended by all the Directors of Public Health of the Member Countries. This meeting resulted in the "Tegucigalpa Protocol," which set out the main outlines of INCAP's future development. It contained, inter alia, two major new features:

1. The formation of a Technical Advisory Committee, made up of leading nutritionists and specialists in related disciplines, whom the Director of the Pan American Sanitary Bureau would appoint annually to study INCAP's program and to advise on the technical problems connected with its work.

2. The official establishment, by each Member Government, of a Field Unit for nutritional work at the national level and which would comprise, as a minimum, one physician, one nutritionist, and one laboratory technician.

By 1951 the activities and services of INCAP had expanded to such an extent that the short-term agreements on which it had been based up until then were no longer adequate, and it was obvious that a permanent working basis had to be established. In 1953 the Basic Agreement was approved by the INCAP Board and, following ratification by the Member Governments, it came into effect as of 1 January 1955. Through this Agreement INCAP acquired permanent legal capacity in the Member Countries, with all the privileges and immunities usual for an international organization. It was laid down that the Institute's Board would be its highest authority and that this would be formed by one representative from each of the Member Countries and one PASB representative. It was agreed that the Bureau would continue as administering agency and that the Advisory Committee would continue to meet annually for the purposes as laid down for it.

As already stated, during the period between the foundation of the Institute in 1946, and as a preliminary step, physicians, biochemists, and nutritionists of the Central American region were sent on a training program in the United States of America, with fellowships from the Kellogg Foundation. By 1949 the first professionals had completed their initial training in different nutrition-related disciplines and were able to enter fully into their activities, using the basic laboratory equipment and the initial library facilities already provided as a further valuable contribution by the Kellogg Foundation.

During the early years of the Institute's operation the trained professional staff grew with the increasing demand of the work, while technicians were also successfully trained in the different disciplines and functions which had been entrusted to INCAP. The training of personnel to work in its headquarters was one of the Institute's main concerns to begin with, since it was considered indispensable to have a staff of scientists with the best possible training in the various disciplines required by the range of nutritional problems, if the responsibilities of the Institute were to be effectively met.

(1) Budgetary Resources

INCAP has the following sources of income to insure the functioning of its overall work program:

(a) The Institute's Regular Budget, which is based on the annual contributions of the six Member Countries. These have been rising progressively from the initial figure of US\$8,500 up to the present level, approved by the Governments, of US\$62,424 per country. The total under this head is currently US\$374,544 annually.

(b) Resources of the Pan American Sanitary Bureau Regular Budget: the funds from this source have also been increasing steadily on the basis of the contribution that INCAP has been making to the other countries of the Region outside Central America. In the course of 1970 the Bureau has assigned to INCAP the sum of US\$549,282.

(c) Resources from various subsidies granted by groups and institutions with an interest in nutrition, such as the United States National Institutes of Health (NIH); the Williams-Waterman Fund of the Research Corporation; the Nestlé Foundation; the Josiah Macy, Jr., Foundation; the Nutrition Foundation; and other non-profitmaking bodies. In 1970 these subsidies totaled US\$929,568.

Broken down by type of expenditure, INCAP's total income is applied as follows:

	<u>1970</u>
Personnel services	US\$ 1,044,761
Short-term consultants	17,050
Duty travel	76,647
Supplies and equipment	179,851
Fellowships	69,950
Common services for all programs	465,135
Total	<u>US\$ 1,853,394</u>

2) Personnel

At the present date the Institute has a total of 47 professionals, for the greater part Central Americans, who are highly trained in the following fields: 10 physicians who have followed specialized courses in public health, pediatrics, nutrition, internal medicine, physiology, or pathology; 9 biochemists who have specialized in agricultural and food chemistry, clinical biochemistry, or animal nutrition; 2 microbiologists, one with a D.Sc. degree; 3 statisticians; 1 anthropologist; 2 psychologists; 3 nutritionists, one with a doctor's degree in education; 1 dietician; 1 holder of a degree in pedagogy; 1 specialist in animal breeding; 1 agronomist; and 1 civil engineer.

The list of professional staff also includes experts in library administration, editorial work, audiovisual aids, and other functions of a technical nature, together with administrative personnel. Altogether, with its technical and auxiliary personnel, INCAP has at present a total of 209 skilled and dedicated employees.

3) Premises and Equipment

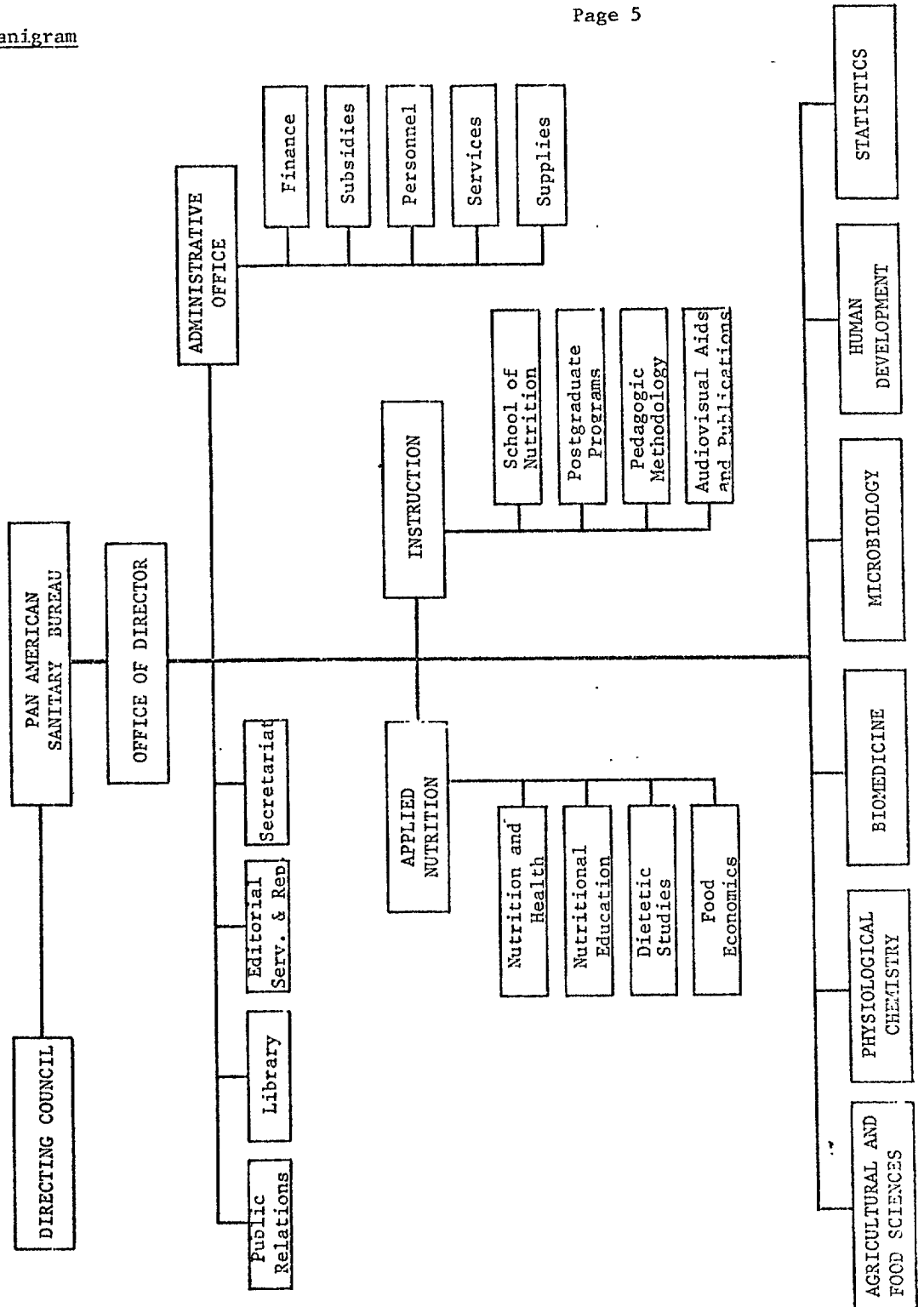
INCAP's main buildings were erected by the Government of Guatemala. In addition, using its own resources, the Institute has had various small annexes built to satisfy the requirements of the progressive expansion of its activities. In general, all these units include offices of the Director's staff and other administrative services, and laboratories provided with excellent equipment for work connected with physiological chemistry, agricultural and food sciences, clinical research, and microbiology. Facilities are available for studies on experimental animals, while there is also a central clinic with facilities for metabolic studies on hospitalized children, and a modern and well-equipped physiology laboratory. The Institute further has statistical laboratories with all the necessary equipment for the mechanical processing of data, a spacious auditorium, conference rooms, and classrooms, an audiovisual aids service, print shops, photographic, mechanical and carpentry workshops, storerooms, cafeteria, and so on. The library, one of the most complete in Latin America on nutrition and related disciplines, has a valuable collection of scientific reviews, textbooks, and other reference material.

Then there are the various field stations for epidemiological research among rural populations, a rural training center for the students who take part in its teaching programs, and an experimental farm. The latter is in fact another greatly appreciated contribution by the Government of Guatemala and is considered of inestimable value for conducting experimental projects designed for the improvement and biological evaluation of basic foodstuffs, and also for the utilization of domestic fowls, pigs, sheep, and cattle in nutritional and other experiments. For this reason, it has been laid out in the best way possible, both as regards physical facilities and equipment.

As far as major equipment is concerned, the Institute has available automatic spectrophotometers, fluorometers, microscopes, refrigerated centrifuges, an ultracentrifuge, analytical balances, Kjeldahl digestion and distillation apparatuses, an automatic amino acid analyzer, equipment for gas-chromatographic analysis, freeze-dryers, an ultrasonic apparatus, a water distiller with sterility control, autoclaves, Warburg apparatuses, respirometers with Clark electrodes, incubators for bacteria and virus cultures, apparatuses for taking anthropometric measurements, a complete physiology laboratory, a set of 500-milliampere X ray equipment with image intensifier, and electronic data-processing equipment.

4) Organigram

STRUCTURE OF THE INSTITUTE OF NUTRITION OF
 CENTRAL AMERICA AND PANAMA
 INCAP



Brief Description of the Principal Activities Carried Out Over the Years

a) Technical Assistance

Diagnosis of the Problem. When the Institute began operations, very little was known about the dietetic habits and nutritional deficiencies of the Region, or about the composition of the local foods. Its initial work was accordingly devoted to these three topics. In order to set a task of this scale in motion and to insure the benefits which should be derived from it for the countries involved, personnel were recruited from the public health departments of the area and formed into small groups which were termed Field Units for Nutrition Studies.

In this way the first epidemiological studies designed to orient INCAP regarding the main nutritional problems prevailing in the area were carried out and the results used for establishing priorities for action. These studies took the form of dietetic and clinico-nutritional surveys, together with laboratory and other tests.

The first investigations revealed that the diets in the area were deficient in good quality protein, iodine, vitamin A, and other essential nutrients. These deficiencies showed themselves in a marked retardation of growth and development in children, which resulted in turn in adults who were shorter and lighter than those in more highly developed regions of the world. There was a high prevalence of endemic goiter, clinical signs of other nutritional deficiencies, intestinal parasites, and anemia.

INCAP realized that, on account of its multifaceted nature, the nutritional problem in Central America and Panama would have to be approached from a large number of different angles. This called for the application of three basic activities: research, education, and advisory services. These were the factors which served as guidelines to the Institute in drawing up the working program which has been maintained up to the present day, with the immediate incorporation of such variants as are required by the results of its own work, the needs of the Member Countries, and the recommendations of its directing and advisory bodies.

In order to gain a more thorough knowledge of the problem of malnutrition, especially in children, its characteristics, causes, and effects, clinical and epidemiological studies of the serious forms were initiated. These served as a basis for subsequent work on the same problem, with a view to devising more suitable means for its treatment and prevention. As is noted in a later section, INCAP has devoted particular attention to this matter because it considers it to be one of the most serious public health problems of the area.

At the same time as the surveys, INCAP biochemists started intensive studies of the foods consumed in the Isthmus, collecting samples of native foods which were then analyzed in their laboratories in order to determine their chemical composition. In this way a table was drawn up containing data on the composition of all the foods analyzed; this table has been revised and expanded over the years. The fourth edition, the one at present in use, includes a total of 565 foods; to begin with it was distributed to the Member Countries, but it has now been placed at the disposal of the other countries of Latin America and interested persons and organizations in many other parts of the world.

Tables of foods in portions and common measures for use in hospitals and other institutions have also been prepared.

In 1961, after nearly two years of work, all these data were incorporated in the Table of Foodstuff Compositions for Use in Latin America, which has been published in English and Spanish. This represents the result of a joint project by INCAP and the Interdepartmental Committee on Nutrition for National Development (ICNND) of the United States National Institutes of Health (now known as the Office of International Research, or OIR), with the cooperation of all the nutrition institutes and departments of Latin America.

With a view to evaluating the results of the first food surveys, a Table of Nutritional Recommendations was also prepared, adapted to the weights of the inhabitants and the temperature of the Central American environment. This first appeared in 1953, and various modifications have since been introduced, the last of them in 1969. This revision was made in view of the new knowledge regarding the utilization of nutritive substances by the human body and because the latest reports of the FAO/WHO Committees of Experts on Nutrition and of the United States National Research Council indicated that the dietetic levels recommended for certain nutrients should be corrected.

Advisory Services and Applied Programs. In order to carry out the applied programs in the countries, basing them on INCAP's studies, and with the advice of the Institute, the Field Units originally established to help with the epidemiological studies referred to were officially designated Nutrition Sections, or Departments, in all the National Public Health Services. The consequent increase in personnel also resulted in an expansion of the respective national programs, which were thus made more effective.

Nutrition Education. One of the applied nutrition activities to which the Institute has paid special attention right from the start has been the nutrition education programs. INCAP's cooperation with the responsible agencies in this field comprises (1) the preparation of basic reference material for the carrying out of such activities, and (2) the training of the personnel required - firstly the training at headquarters, of the directing personnel from the countries, then cooperation with the training of local personnel at the national level.

Enrichment of Foods. The survey findings also indicated, as has been noted, that the prevalence of endemic goiter in the region was alarming and constituted a serious public health problem. A practical process that could be used in the area for the iodization of salt was required, since the use of potassium iodide had been found not to be advisable with moist, unrefined salt. Intensive research by the Institute revealed that potassium iodate could be effectively used for this purpose. At present the iodization of salt is obligatory, or shortly to be made obligatory, in all countries of the area. In addition, means have been found to enrich wheat flour with vitamins and minerals in all Member Countries.

Inclusion of Nutrition in Health Activities at the Local Level. In view of the seriousness of the problem of malnutrition, especially in children, INCAP has advocated the incorporation of nutritional activities in the regular local level health programs. Particularly worthy of mention in this respect is the progress achieved with the care of children suffering from protein-calorie malnutrition of all degrees, from those with third-degree malnutrition to those with subclinical malnutrition. Today many of them receive adequate medical care in hospitals, while others - according to what appears to be required - are given outpatient care in health centers, or semi-outpatient care by the nutritional education and recuperation services which function, with certain variations, in several of the Member Countries. In connection with the latter, it should be noted that they deal not only with the treatment of the affected children but also, and especially, with the education of the mothers regarding nourishment. Their immediate objective is the rehabilitation of the child, but the primary purpose of these services is to insure that no fresh cases of malnutrition occur in the families concerned.

Establishment of National Nutrition and Nourishment Policies. In view of the planning being done by the countries of the Isthmus to speed up their social and economic development, and the fact that improvement of the nutritional state of their populations is one of the essential requirements for achieving this objective, and considering moreover that the correction of the population's nutritional problems calls for coordinated multisectoral action, INCAP deemed it imperative that the countries should endeavor to define national nutrition and nourishment policies that would be fundamental components of their national development policies.

They had to have the necessary bases for drawing up such policies and for the preparation of programs to be derived from it. One of these bases was the need to possess an updated diagnosis of the situation in each particular country, including an analysis of the main factors responsible for the nutritional deficiencies noted. This resulted in the nutritional survey which, with the assistance of the Member Governments and the OIR, covered the six countries of the Isthmus. In this way an up-to-date and accurate diagnosis of the area's nutritional problems was developed, on the basis of which an extensive series of preventive and corrective actions was

formulated. Clear and detailed reports of the surveys carried out in each country were prepared, and these reports were then handed to the Ministers of Health for further transmittal to the competent authorities of the other sectors and organizations with responsibilities concerning, or interest in, the solution of the area's nutrition problem. In this manner, further emphasis was given at the national level to the need for coordinated multi-sectoral action, and introduction of the measures required to define national nutrition and nourishment policies in each of the six countries was speeded up.

(b) Training

Since it was aware that the shortage of professional and technical personnel who have been properly trained in nutrition and related disciplines was one of the factors which held back the applied nutrition programs, from the very start of its operations INCAP devoted a large part of its efforts to overcoming this obstacle. For this reason, and within the limits of the possible, it has contributed toward the training of area personnel at various levels through its teaching program.

To begin with, INCAP's efforts in this field were limited to assistance with the in-service training of personnel by means of short courses specifically oriented for staff of the Health, Agriculture, and Education Ministries participating in the applied nutrition programs. This included the training of key personnel at the Institute's headquarters, and later in the field in each country with participation by local personnel already trained at the Institute.

Later, short specialist courses were established which were attended not only by Central American staff but also by professionals from the rest of the Hemisphere and other parts of the world as well.

After a certain number of years had passed, INCAP decided that the time had come to set up a full-scale training program, on an academic basis, and accordingly reorganized its instructional plan, establishing the Instruction Division. The negotiations with Guatemala's San Carlos University on this subject culminated in the signing of an agreement in 1964 for the academic regulation of the courses given by the Institute. The training program today includes:

- The Nutrition School, whose four-year course leads to a degree in nutrition granted by the Faculty of Chemistry and Pharmacy of the University.

- A one-year course in public health with the emphasis on nutrition and maternal and child health, and leading to an M.Sc. Degree. This is a post-graduate course specifically designed for physicians and other professionals interested in acquiring such knowledge.

- Training of a tutorial type intended to provide practical instruction in the different areas of nutrition work which are INCAP's particular field.

(i) Fellowship-holders Trained at the Institute

To date, a total of approximately 1,160 persons have participated in INCAP's instructional programs. Table I shows the number of students who received training at the Institute between January 1950 and June 1970, indicating their countries of origin.

It should be added that of this number, a total of 118 - most of them from Central America and Panama - prepared their theses at the Institute prior to going on for a university degree. They were able to use as a basis for this purpose, special projects assigned to them in different fields, such as agricultural chemistry, microbiology, physiological chemistry, clinical nutrition, psychology, and many others, which they carried out under the direction and supervision of the responsible professionals.

(ii-iv) Participation by INCAP in National, Regional, and International Courses and Seminars

It would be impossible to give a full listing here of all the courses and seminars of this type in which INCAP's professional staff have taken part. It is sufficient to point out that they are constantly taking an active part in congresses, courses, seminars, round tables, and symposia on nutrition and related topics. In addition, they frequently visit the Member Countries for the specific purpose of assisting in the conduct of courses at the request of the authorities, and to give lectures or run seminars for various groups of personnel, such as nurses, schoolteachers, students, hospital staff, and medical associations.

(c) Research

Broadly speaking, INCAP's research program has passed through three main stages: (1) epidemiological studies to ascertain the region's nutritional problems, to determine their magnitude, and to establish the causative factors; (2) the search for solutions to the problems found; and (3) the development of an appropriate methodology, taking into account the particular situation of the area or population sector concerned.

As already stated, INCAP's epidemiological research revealed the area's major nutritional problems to be protein-calorie deficiency, endemic goiter, lack of vitamin A and riboflavin, and nutritional anemias.

The results of a number of INCAP's studies have already been put into practical application in the Central American countries and Panama, and also in other countries outside the area. The following are particularly worthy of mention:

(i) Improvement of food availability. Up to the present, the greatest efforts in seeking solutions have been concentrated on the problem that looms largest: the deficiency of high-grade protein. As a consequence, the Institute is studying means of improving food availability and is exploring the possibility of more efficient utilization of the Member Countries' natural resources.

With this as its guiding principle, the Institute directed its research toward developing vegetable mixtures based on native foods which, because they were of high biological value and cheap, could be used to supplement the people's usual diets. One example of the results of this work is Incaparina. This is the name given by INCAP to all the vegetable-based flours developed in its laboratories with a protein content not lower than 25 per cent and containing proteins of adequate nutritive value for human nourishment. It is intended that these flours should be used as supplements to the regular diets where there are protein deficiency problems. The mixtures have accordingly been prepared in such a form that the people of each particular area concerned can accept them in the dietetic pattern of the area. Incaparina is today being commercially produced and distributed in Guatemala, Panama, and Colombia and will soon be marketed in the other Member Countries as well. Furthermore, INCAP's pioneer work in this field has stimulated and guided the development of products based on the same principles in many other countries, both in Latin America and outside it.

The studies designed to produce means to increase and make more efficient the production of foodstuffs of animal origin should also be mentioned here. The results of one such study led to the preparation of milk substitutes for feeding young calves, something of particular importance for milk producers and of no mean economic and nutritional interest for the countries.

The manner in which the calves responded to the different substitutes tested, clearly showed the superiority of the formulas known by the name of Ternerina. These are already in use, and commercial-scale production has been started in Costa Rica with every success. The promising results with Ternerina are such that plans are being made for it to be used in other countries concerned.

INCAP has also made special efforts on behalf of the pig-raising industry, and today its cottonseed-based formulas permit the raising and fattening of pigs more economically and effectively than with the protein concentrates formerly imported into the area for that purpose.

Another field to which the Institute has paid particular attention has been the study of locally available grasses, fodders, and industrial by-products which can be used in animal feeds, with a view to selecting those

of greatest nutritional value and determining at the same time the most efficient ways of making use of them. These studies have resulted in the preparation of the first Table of Composition of Grasses, Fodders, and Other Feeds of Central America and Panama. This table summarizes the analyses of around 4,000 samples corresponding to 153 different products; it is thought that it will be of considerable assistance both to commercial producers of animal foodstuffs and to stock farmers who normally use their own facilities to mix feeds.

(ii) Iodization of salt. The method developed for iodizing raw, moist salt with potassium iodate instead of potassium iodide has proved to be a practical and effective means for the prevention and eradication of endemic goiter in areas where common cooking and table salt is not refined.

(iii) Methodology for dietetic and nutritional studies. On the basis of the experience gained with numerous dietetic and clinico-nutritional surveys it has carried out in Central America and Panama, INCAP has devised an appropriate and practical methodology for such studies.

(iv) Methods for treating and preventing protein-calorie malnutrition. The clinical and epidemiological studies carried out by the Institute have made it possible to establish the bases for adequate treatment for the different forms and degrees of protein-calorie malnutrition, and for formulating the necessary preventive programs.

The Institute's studies in this field have placed special emphasis on the effect of the synergical relationship between nutrition and infections. These studies have resulted in significant observations demonstrating the importance of environmental sanitation and the adoption of specific protective measures against various infectious diseases, both in the prevention programs and in nutritional rehabilitation programs.

(v) Effects of subclinical malnutrition. Under this heading, INCAP has sought to clarify the effects of malnutrition on the growth and physical and mental development of children, and on the capacity for physical labor of adult men. The Institute's essential concern has been to establish the true magnitude and importance of the damage caused by nutritional deficiencies to the human being, and in all stages of life.

The conclusions drawn from these longitudinal-type studies regarding children and adults will, obviously, have repercussions of quite exceptional importance for the Member Countries.

(d) Applied or Control Programs Carried out in Cooperation with the Governments

The following are especially deserving of mention:

- Commercial development, as already noted, of vegetable-based mixtures under the name of Incaparina.
- Commercial development of the Ternerina formulas for calf-feeding.
- Introduction of new, genetically improved, varieties of maize for cultivation in the Central American area.
- Inclusion of nutrition as a subject in the curricula of primary and teacher-training schools, together with the preparation of the recommended study program for this purpose and the instructional materials required.
- Preparation of an extensive series of pamphlets on various nutrition education topics, taking due account of the problems that it is desired to correct and the resources and limitations in each area, for adaptation to the local conditions prevailing in the different countries.
- Preparation of film strips, manuals, posters, slides, and so on, for instruction in nutrition to be given to primary and secondary school teachers, home economics instructors, nurses, agricultural extension service staff, and other personnel who can contribute directly or indirectly toward the education of the population in nutrition matters.
- Preparation of a book entitled Nutrition in the School which the Member Countries are already using and which, with the appropriate modifications as regards idiomatic expressions and local customs, has been printed for each country concerned, for use at the national level.
- Introduction of nutrition as a subject for study at university level, beginning with the schools of medicine.

(e) Direct Services Furnished to the Governments

In addition to the advisory and cooperation programs concerning instructional activities, the above services also include analyses of food-stuffs for human or animal consumption, together with analyses of raw materials to determine their nutritive value.

(f) List of Works Published

To date INCAP has published a total of 1,004 scientific works in Spanish and English, 6 monographs, 31 works of a cooperative nature, and 31 on miscellaneous subjects. To these must be added the Institute's information bulletin and technical documents and reports of various types.

TABLE I. NUMBER OF PERSONS, BY COUNTRY, WHO HAVE PARTICIPATED IN INCAP'S TRAINING PROGRAMS DURING THE PERIOD 1950-1970

Origen	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	Jan. June 1970 Totals	
<u>INCAP Member Countries</u>																						
Costa Rica	1	1	1	1	2	1	1	2	2	2	4	4	2	2	3	1	7	10	10	9	6	66
El Salvador	2	2	6	2	2	1	1	1	3	3	4	4	4	4	9	1	6	13	12	12	10	106
Guatemala	2	6	7	5	1	4	2	7	6	4	10	8	6	3	14	33	10	19	31	46	29	233
Honduras	1	1	3	4	1	1	1	2	1	3	1	3	2	2	2	2	4	11	11	8	6	66
Nicaragua	1	1	1	1	3	3	1	2	5	2	2	4	1	2	5	2	7	11	7	9	7	73
Panama	1	3	2	1	1	1	1	3	1	2	4	4	2	3	1	2	7	10	8	13	14	80
<u>Other Countries of the</u>																						
<u>Americas</u>																						
Argentina	2	2	2	2	1	1	1	2	2	1	1	4	4	3	3	1	7	2	1	1	1	29
Barbados	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
British Honduras	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Bolivia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Brazil	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Canada	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Chile	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Colombia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Cuba	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ecuador	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
United States	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Surinam	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Haiti	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Jamaica	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mexico	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Paraguay	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Peru	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Puerto Rico	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Dominican Republic	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Trinidad and Tobago	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Uruguay	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Venezuela	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
<u>Other Regions of the</u>																						
<u>World</u>																						
Europe	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Africa	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Asia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Australia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Totals	9	18	33	23	12	16	22	42	42	35	55	48	49	56	78	87	83	118	101	135	96	1158

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CARIBBEAN FOOD AND NUTRITION INSTITUTE

The Caribbean Food and Nutrition Institute (CFNI) was established by an agreement coming into effect on 1 January 1967 signed by the following:

The Government of Jamaica
The Government of Trinidad and Tobago
The University of the West Indies (UWI)
The Pan American Health Organization/World Health
Organization (PAHO/WHO)
The Food and Agriculture Organization (FAO)

This initial agreement was of five years' duration, ending on 31 December 1971. The Institute serves the English-speaking islands of the Caribbean and Guyana (excluding Puerto Rico, Netherlands Antilles, and the U.S. Virgin Islands). It is hoped that at the time that this agreement is renewed, other Governments of the area besides those of Jamaica and Trinidad and Tobago will be signatories, contributing to the financial resources of the Institute and designating their representatives as members of the Institute's Policy Committee. The Williams-Waterman Project of the Research Corporation of New York provides substantial financial support to the Institute.

The primary functions of the Institute, quoted from the agreement establishing the Institute, are:

1. To identify, assess, and define the food and nutrition problems of the Caribbean, especially those of the vulnerable groups, and to recommend priorities in programs for their solution.
2. To assess the economic, social, and agricultural factors which influence the production of foods for local use, and levels of production, consumption, import, export, and utilization of food, in order to assist Governments in establishing a sound food and nutrition policy for the improvement of the health of the population and economic development of the area.
3. To assess the resources, facilities, and services available and to promote the coordination of these for the effective solution of the food and nutrition problems.
4. To provide basic training in food and nutrition and in the methods applied in field operations, as appropriate, for personnel of various levels engaged in health, agriculture, education, social welfare, and related services and for community leaders engaged in programs of education and extension designed to reach both rural and urban families.

5. To support existing advisory services to Governments in the planning and implementation of the food and nutrition programs.
6. To establish methodology for the evaluation of various programs for nutritional improvement for use by Governments.
7. To assist in determining the need for further applied research and training of personnel in nutrition.
8. To strengthen, support, and develop those programs being promoted by universities, governments, or private institutions.
9. To assist in preparing appropriate literature and teaching aids for use in food and nutrition programs and to serve as a source of technical information on all aspects of nutrition.

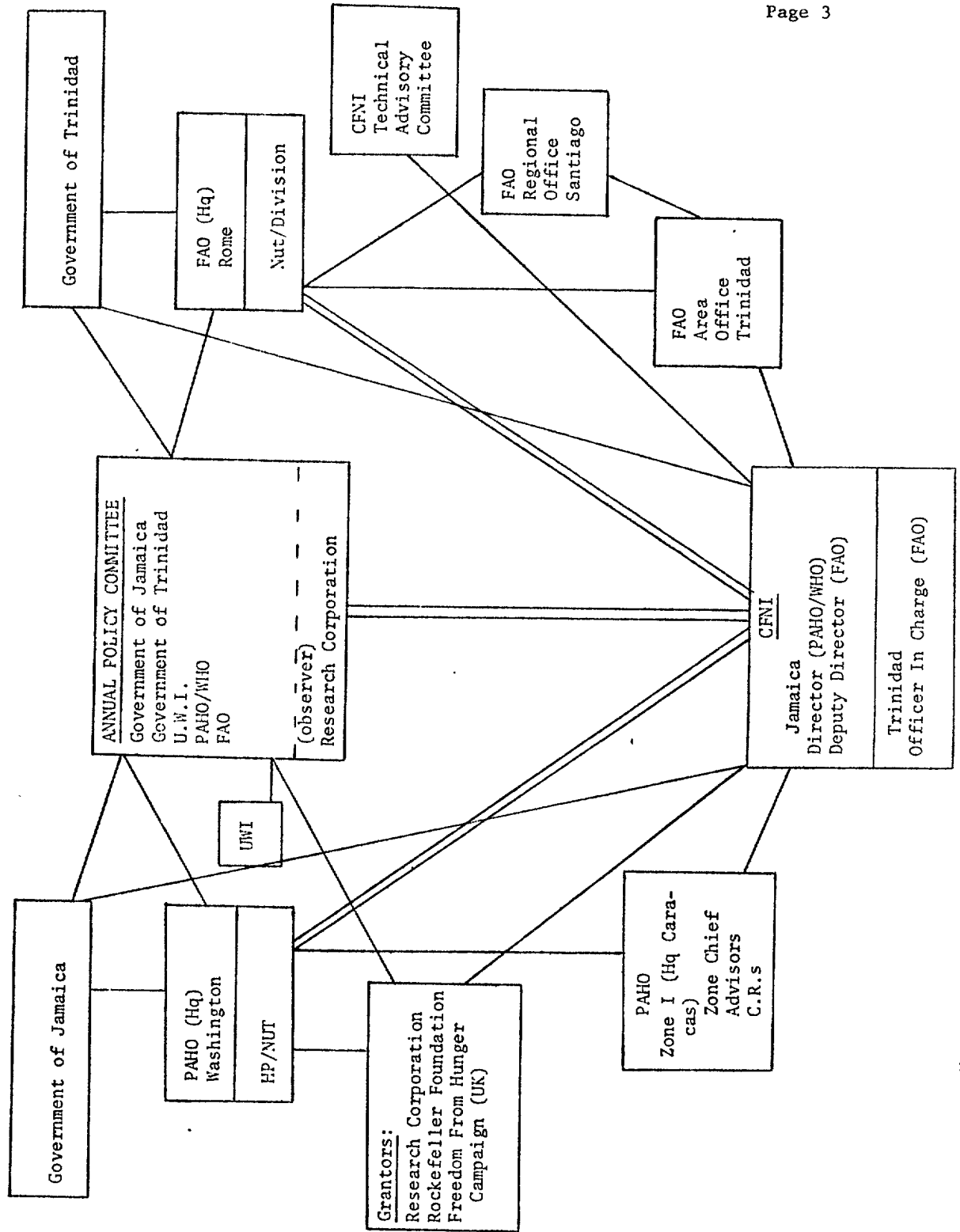
The main office of the Institute is situated on the University of the West Indies campus in Jamaica. In 1968 the Trinidad office, situated on the University of the West Indies campus in Trinidad, became operational. Currently the international staff consists of the following:

At the Jamaica Center: Director (PAHO/WHO)
Deputy Director (FAO)
Medical Nutritionist (PAHO/WHO)
Nutritionist (FAO)
Research Fellow (Research Corporation)
Medical Nutritionist (PAHO/WHO - Rockefeller
Foundation financed)
Statistician (PAHO/WHO - Rockefeller Foundation
financed)
(to arrive Sept. 1970): Sociologist (PAHO/WHO - Rockefeller Foundation
financed)
Associate Expert (FAO)

At the Trinidad Center: Food Policy and Planning Expert and Officer-In-
Charge (FAO)
Nutritionist/Dietitian (PAHO/WHO)
Nutrition Educator (PAHO/WHO)
(being recruited)

The Director, assisted by the Deputy Director, is responsible directly to PAHO/WHO and to FAO, and through the Annual Policy Committee Meeting to all the signatories of the agreement, for the administration and conduct of the affairs of the Institute. Its relationships and channels of communication with governments, other agencies, and other sections of PAHO/WHO and FAO are shown on the organizational chart attached.

ORGANIZATION CHART OF C.F.N.I.I.



Note: The double lines represent the most frequently used channels of communication and financial administration.

The formal governing body of the Institute is the Annual Policy Committee, on which the five signatories of the agreement are represented. The Research Corporation, as principal grantor, also sends an observer. This Committee reviews both program and budget for the past, current, and coming year. In addition, a Technical Advisory Committee has been convened annually so far, consisting both of local experts from the Governments and the University and some experts from outside the area and from the international agencies. This Committee reviews the activities from the technical standpoint. It is particularly useful in giving selected local technical officers, for example, the Government Nutrition Officers of Jamaica and Trinidad, the opportunity to comment on and to help shape CFNI's program. In respect to the day-to-day administration of the Institute, the Director is responsible to PAHO/WHO Headquarters in Washington and FAO Headquarters in Rome.

Table I represents the actual 1967-1971 and proposed 1972-1976 budgetary resources of the Institute. The Rockefeller Foundation and the United Kingdom Freedom From Hunger Campaign grants are for specific programs (see below), but these programs themselves are in accordance with the functions outlined above, and the staff and resources proceeding from these grants are completely integrated within the Institute and play a helpful role in accomplishing the purposes for which the Institute was established.

The building in which the Institute is housed in Trinidad is on the whole satisfactory, particularly in respect to an excellent seminar or lecture room holding up to 100 people. The main center in Jamaica, however, is still housed in refurbished wooden buildings originally erected for refugees in the Second World War. Though fairly satisfactory until now, they do not include a lecture room and are at present grossly overcrowded. A request for assistance with a permanent building was submitted to the Canadian Government in 1967. This building would suffice for the Institute's needs for the foreseeable future, but the Institute has not been successful in obtaining the sum required (US\$480,000, according to the latest estimate of the architects and surveyors in February 1970).

The equipment consists of three vehicles, equipment for nutrition surveys, and the usual office equipment. There is need for more sophisticated printing equipment which would enable the Institute to help to meet the present unfulfilled needs in the area for technical and educational material concerning nutrition. The Institute's bimonthly newsletter of approximately 70 pages is still produced by cyclostyling, although 2,500 copies of each issue are currently required.

Principal Activities of the Institute, 1967-1970

(a) Technical Assistance

The nutrition surveys carried out in Barbados, Trinidad, St. Vincent, and Jamaica are included under Section (c), Research Activities.

In late 1969, arising from a Technical Group Meeting on Protein Foods for the Caribbean, convened by CFNI in Georgetown, Guyana, a team of international experts in food technology, marketing, and agricultural economics from FAO and PAHO toured the area with the task of reporting on the feasibility of locally producing and marketing high-protein, low-cost foods for young children, or suggesting alternative strategies. The team was under the direction of the Nutrition Division, FAO, used CFNI as the base of its activities and as a main source of information and discussion, and was partly funded by the Agency for International Development of the United States of America (AID).

CFNI has also in two other matters so far followed this pattern of attempting to solve technical problems, often made more complex by the physical separation and particular historical background of the islands, by convening and funding technical group meetings. At these meetings, which have specific tasks, the local workers in the particular field are enabled to meet together, with the assistance of CFNI staff and PAHO and FAO staff in the area and sometimes also with a small number of experts from outside the area. After presenting and hearing papers on the subject and after discussion, the appropriate conclusions are reached. The task of the Technical Group Meeting on Protein Foods for the Caribbean was to produce the recommendations which led to the expert team and its report, which in turn will lead hopefully to greater availability of more suitable foods for the young child.

Technical group meetings were convened by CFNI in December 1968 and June 1970 concerning Young Child Feeding in the Contemporary Caribbean. These were attended by most of the specialist pediatricians and nutritionists of the area, and by obstetricians and maternal and child health personnel. They fulfilled in two stages their appointed task of producing agreed and authoritative guidelines for teaching on the subject, based on modern knowledge and recent inquiry, much of it undertaken by or with the help of CFNI, as to the actual situation regarding infant feeding in the area. These guidelines will shortly be published and widely distributed by the Institute.

Likewise, a Technical Group Meeting on Food and Dietary Services, whose task will be to produce recommendations as to the form and content of training, will take place in Barbados in November 1970. The maintenance of satisfactory hospital and other institutional food services is a considerable problem to many Governments in the area, mainly because of a severe shortage of trained staff at all levels. CFNI's Nutritionist/Dietitian has been able, since her appointment in 1969, to begin to render assistance in this matter.

Another form of technical assistance has been the help given by the Food Policy and Planning Expert to Governments in compiling the Food Balance Sheets of Barbados for 1966 and of Guyana for 1967.

CFNI has also produced an interim Food Composition Table for the Caribbean. Mainly a compilation from a variety of sources, some analyses have also been necessary which CFNI has had carried out with the help of FAO. The interim version at present circulating for comment and amendment will be finalized and published in 1971, along with material concerning the proper use of the tables in dietetics, institutional catering, and agricultural economics. In addition, CFNI has several times for particular purposes published tables of cost of foods in relation to their nutrient value, i.e., cost of a specific quantity of protein or calories in the form of particular foods.

Finally, the Institute has a responsibility to disseminate technical and educational material widely through the area to as many as possible of those in health, education, agriculture, and community development whose work is related to nutrition. This task is at present fulfilled partly by its training programs and seminars (see below) and partly by the publication six times a year (beginning in January 1968), of Cajanus, the Institute's newsletter. Each issue contains four or five articles, keeping a balance between health and agricultural aspects of nutrition, and between articles of purely local interest and origin and of worldwide relevance. It also has news and opinion features, book reviews, and so forth. The newsletter is so written as to be readable by middle-grade personnel and the educated layman, and aims to avoid incomprehensibility because of technical jargon. Its postal circulation is currently 1,800, three-quarters of it to the area served by CFNI, and it is also much used in CFNI's teaching. A formal readers' evaluation at the end of its first year of publication was useful and favorable.

(b) Training Activities

(i) Fellows trained at CFNI: The principal training activity at the Institute has been the biennial course for the Diploma in Community Nutrition (DCN). This course, lasting one academic year, was conducted for the first time in 1969 and is due to be held again in 1971 and 1973. Thirty-one students, 29 from the area and two from the Philippines, began the course, and 28 were finally successful in obtaining the diploma. This is awarded by the University of the West Indies on the results of an examination and a report on the three-month research project which the individual student completes in his own country after his nine-month course. The participants were sent by almost all the 14 Governments which CFNI serves, and were either graduates or middle-grade personnel with the appropriate professional qualifications plus at least five years' experience. The class, the course, and the teachers alike represented an interdisciplinary cross-section of agriculture, health, education, and community development, and among the class were teachers of home economics, public health nurses, public health inspectors, agricultural extension officers, community development workers, and two physicians. The courses consisted of three months of lectures, seminars, and field visits in Jamaica; two

weeks of field visits in other islands; a month working in the Barbados National Food and Nutrition Survey, gaining experience in each section of the Survey (medical examination, socioeconomic inquiry, food consumption survey); and six weeks of lectures and field visits in Trinidad, prior to taking the examination and dispersing to their home countries to carry out their three-month research project.

Contact is maintained by CFNI with the DCN graduates by meetings and by correspondence, and PAHO/WHO and FAO field staff also assist in supporting the graduates in their work back home. Some have moved to specifically nutrition posts; others are back in their previous posts, their usefulness enhanced by their training.

In addition, there have been several visiting fellows from universities overseas, who have been attached to the Institute for varying lengths of time as part of their training, or on sabbatical leave. Some have made important contributions, particularly to the study of infant feeding practices and locally-held concepts of malnutrition.

One FAO Associate Expert is at present attached to CFNI.

(ii) International courses and seminars: Table II shows the international seminars and workshops (other than the technical group meetings described above) organized, financed, and conducted by CFNI since its inception. Because of the DCN course, CFNI's activities in this field tend to be concentrated in alternate years - 1968, 1970, and so on.

(iii) National courses and seminars: By agreement between CFNI, the PAHO Zone Office and the FAO Area Office, national courses and seminars (as opposed to regional or inter-island) are the primary responsibility of PAHO and FAO regular staff not attached to CFNI so far as international agency assistance is concerned. (In the case of FAO, this distinction will largely disappear when their Nutritionist/Home Economist stationed in Trinidad becomes formally attached to the Institute in the near future. In organizing courses and seminars, CFNI works sufficiently closely with FAO Area and PAHO Zone Officers that the activities are really joint ones, and it is not always possible or accurate to label them solely as activities of CFNI or of PAHO or FAO area staff.) CFNI has in the past, with the agreement of their PAHO and FAO colleagues, organized small ad hoc one-day seminars, usually unidisciplinary and for specific purposes. These are listed in Table III.

(iv) Participation by CFNI in regional and national courses: CFNI participates regularly with university and government staff in training courses for medical students (in Jamaica) and for agricultural

students (in Trinidad) and in the course for nursing administrators and the advanced nursing course (in Jamaica). It also frequently takes part on an ad hoc basis in short courses for public health inspectors, public health nurses, and teachers (e.g., summer refresher courses) and for volunteers (e.g., Peace Corps). The participation in the teaching of medical students takes the form of lectures to the students of preventive medicine in their fourth year and two discussion sessions with each group (7-10 in number) of medical students during their five-week clerkship in preventive medicine in their fifth or sixth year. The participation in the teaching of agricultural students takes the form of a two-day seminar every year in April for students in their final year for B.Sc. Agriculture and students taking the Diploma in Tropical Agriculture at the UWI Faculty of Agriculture in Trinidad. Several days of the courses for senior nurses are occupied by lectures from CFNI staff.

(c) Research Activities

One of the principal functions of the Institute (see list of functions quoted from the agreement establishing CFNI) is to assist Governments in the definition of the nutrition problems of their countries and in the assessment of the complex social, economic, and agricultural factors which influence nutrition and food availability, and to recommend, on the basis of these joint researches, practices in programs for the solution of the problems. Since its establishment, the Institute has evolved a program for food and nutrition surveys. All of it is supported by computer facilities for data analysis. CFNI is greatly assisted in the development of this resource by the three-year grant from the Rockefeller Foundation for a "Population Nutrition Unit" (medical nutritionist, statistician, and sociologist), whose main duties are in this field and include exploration of the relationship between population dynamics and nutrition. The various parts of this program, of a complete National Food and Nutrition Survey, are as follows:

- | | |
|--|---------------|
| (i) Anthropometric Examination | (Individuals) |
| (ii) Clinical Examination | " |
| (iii) Biochemistry and Hematology | " |
| (iv) Dental Examination | " |
| (v) Inquiries re Income and Expenditure,
including Food Prices | (Families) |
| (vi) Inquiries on Infant and Young Child
Feeding Practices | " |
| (vii) Inquiries on Knowledge and Beliefs about
Nutrition and Health | " |
| (viii) Surveys of Food Production in the Home Garden
or Small Farms | " |
| (ix) Food Balance Sheets | " |
| (x) Food Economics - Cost-Nutrient Value of Foods | " |
| (xi) Food Consumption | " |
| (xii) Food Consumption - Vulnerable Groups | (Individuals) |

Surveys other than those on a small scale for a limited research purpose (e.g., preparation for a Technical Group Meeting) are always joint efforts of the Government and CFNI, often also with the assistance of a department of the UWI. A government may wish all parts of the above program to be included in the national survey, as was the case in the Barbados National Food and Nutrition Survey in May 1969. Alternatively, it may desire only a limited part, as in the case of the Trinidad Food Consumption Survey in February-May 1970, which was a food consumption survey only among a national sample of 1,000 families. The Jamaica pilot nutrition survey in early 1970 included only anthropometry, clinical examination, and hematology and was limited to infants, preschool children, and pregnant and lactating women in nine areas where a previous all-island survey had been carried out in 1964; one of its main objectives was to detect if there had been any substantial change over the past six years. The national nutrition survey of St. Vincent, undertaken with CFNI assistance in November 1967, included all the parts of the program outlined above except biochemistry and/or hematology and food consumption.

Table IV summarizes the type of nutrition survey which has been carried out in the various islands by or with the help of CFNI, since its inception until July 1970.

In all cases involving nationwide samples, the results have been made available to the Governments. In respect to the Barbados National Food and Nutrition Survey, the results were discussed in detail at meetings with government officials and technical officers and the draft recommendations amended by the Government. The results and the recommendations are being published by PAHO/WHO with the permission of the Government. The Barbados Government has already begun to put some of the recommendations into effect. The results of the St. Vincent survey were also presented and discussed, with recommendations, with the government officers on two occasions. The results of the nutrition survey among under-five-year-olds and pregnant and lactating women in Jamaica were presented to the Minister of Health and officers of his Ministry and discussed at a recent meeting. The results of the Trinidad and Tobago National Food Consumption Survey, which ended only in April 1970, are still being analyzed.

In respect to the surveys not on nationwide samples, or not covering the whole scope of the subject, many of these were undertaken in connection with the two Technical Group Meetings on Young Child Feeding and/or as DCN student research projects. The results of all surveys have been presented either directly to the Government or indirectly to the Government through officers attending the meetings. It is difficult to evaluate the usefulness of these surveys, as even purposeful, united, and scientifically-based attempts to modernize infant feeding and make it more fully relevant to local circumstances must necessarily have gradual results.

Finally, several small research projects not included in the above account deserve mention.

(i) Comprehensive bibliographies of scientific work on nutrition over the last 20 years have been compiled, both general and for the Caribbean Area, by the Research Fellow. These are very near to publication.

(ii) The Research Fellow has also collaborated with the Medical Research Council unit at the UWI on studies of anthropometry and total body potassium.

(iii) A study on the possible benefits of acidification in the making up of infant milk formula was undertaken jointly with the Department of Microbiology at the UWI. The project was funded by the Nestlé Company. The results were quite inconclusive and did not justify recommending acidification.

(iv) CFNI collaborated with the Department of Research and Control of the Government of St. Lucia, a Rockefeller Foundation-funded unit mainly concerned with schistosomiasis (bilharzia), in a study of the effects of nutrition on liver enlargement in affected schoolchildren. The results were interesting, demonstrating that good nutritional status was significantly associated with prospects for regression of the liver to normal size. Hopefully this study may lead to special efforts to improve the nutritional status of children affected or at risk.

(v) An in-depth study of motivation and performance in respect to lactation was carried out by CFNI with the help of sociologists and psychologists in Montserrat. The results will shortly be ready for publication.

Among CFNI's future plans for research are a multipart national nutrition survey of Guyana, jointly with the Government of Guyana. Exploratory discussions are also taking place with the Governments of Grenada and the Bahamas.

(d) Applied or Control Programs Carried Out in Conjunction with the Governments

Apart from its contribution to government nutrition programs by means of research and teaching, the Institute is collaborating actively in the early stages of the Jamaica Maternal and Child Health Program. Its collaboration in this respect consists of advice on nutritional assessment, norms, and standards, and of evaluation in respect of the nutritional components of this program.

The Freedom From Hunger Campaign grant, involving an evaluation of a nutrition education program aimed specifically at mothers and children, will also give CFNI an opportunity to engage in an operational research type of field work in Jamaica, the details of which will be arranged so as to fit in closely with the Government's Maternal and Child Health Program.

(e) CFNI does not have laboratories and therefore does not supply services of this type. Its services in respect to technical information (the newsletter, food composition tables, nutrient-cost of foods, assistance with food balance sheets, arranging for analysis of foods) have been mentioned earlier. CFNI's services in respect to computer analysis of data related to nutrition are available to all Governments of the area, in respect to any nutrition-related research and not only that conducted by or with the help of CFNI. Such services have already been provided in respect to parts of the Ground Water Survey in Jamaica in 1968-69, and are being provided for a study of infant feeding conducted by the Nutrition Unit of the Ministry of Health, Jamaica.

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TABLE I
ACTUAL AND PROPOSED SOURCES OF CFNI FUNDING - 1967-76
(in U.S. \$)

Year	PAHO/WHO	FAO	RESEARCH CORPO- RATION AND/OR OTHER SOURCES	GOVERNMENTS	UNFINANCED*	ROCKEFELLER FOUNDATION	UK FREEDOM FROM HUNGER COMM.	TOTAL
1st Quinquen- nium								
1967	38,821	33,000	88,850	20,810	-	-	-	181,481
1968	68,765	66,000	118,400	20,810	-	-	-	273,975
1969	103,186	66,000	72,150	20,810	-	-	-	262,146
1970	122,356	68,800	109,900	20,810	-	64,000	-	385,866
1971	133,392	72,000	71,250	20,810	-	64,000	36,000	397,452
2nd Quinquen- nium								
1972	145,531	72,000	114,703	-	50,810	64,000	36,000	483,044
1973	158,004	72,000	162,830	-	50,810	-	36,000	479,644
1974	173,594	72,000	131,140	-	50,810	-	-	427,544
1975	189,753	72,000	153,481	-	50,810	-	-	466,044
1976	207,529	72,000	99,205	-	50,810	-	-	429,544

*This column represents modest increases in the allocations of the governments of Jamaica and Trinidad & Tobago plus proportionate support from other governments in the area served by CFNI. It is labelled 'Unfinanced' because these matters are currently being discussed, and would not be confirmed until the signing of an agreement for the second five years.

TABLE II

REGIONAL AND INTER-ISLAND SEMINARS HELD BY CFNI*

	Subject	Participants	Countries served	Place held
1968 Feb.	'Food Nutrition & Health in the Caribbean'	30 senior administrators from nutrition related ministries	all CFNI area	Jamaica
1968 May	'Recent Developments in Food & Nutrition in the Caribbean'	60 senior technical officers	all CFNI area	Trinidad
1970 May	'Nutrition and Human Development'	50 technical officers	Jamaica, Bahamas and Cayman Is.	Jamaica
1970 October	'Food Nutrition & National Development'	50 technical and administrative officers	Grenada, St. Lucia & St. Vincent	Grenada
1970 October	- ditto -	40 technical and administrative officers	Antigua, Montserrat, Dominica & St. Kitts-Nevis-Anguilla	Antigua

In addition, CFNI assisted the government of Trinidad and the Inter-American Institute of the Child in a seminar which fulfilled a similar purpose held in Trinidad in April 1970.

*excluding the four Technical Group Meetings mentioned under section (a) Technical Assistance.

TABLE III

NATIONAL ONE-DAY SEMINARS ORGANIZED BY CFNI

	Subject	Participants	Place
29 Feb. 1968	Role of Home Economists in Nutrition Programs	14 senior Home Economists	U.W.I., Jamaica
3 March 1970	A general nutrition seminar	30 teachers and other government officers	Cayman Islands
25 March 1970	Nutrition in Community & Rural Development	40 social welfare and community development workers	U.W.I., Jamaica
6 April 1970	Nutrition in Agriculture	30 agriculturists and agricultural extension workers	U.W.I., Jamaica
25 April 1970	Nutrition and Volunteer Groups	40 international and national volunteers	U.W.I., Jamaica

TABLE IV

NUTRITION SURVEYS MADE BY OR WITH THE HELP OF CFNI 1967 - JULY 1970

(N = on a nation-wide sample. P = partial for special purposes either on a geographically restricted sample or not covering the whole subject)

	Anthropometry	Clinical Examination	Biochemistry/Haematology	Dental Examination	Enquiry re income & food expenditure	Studies of Infant Feeding Practices	Enquiry re Nutrition knowledge	Survey of home & small-scale food production	Food Balance Sheets	Food Economics (cost-nutrient value)	Food Consumption Families	Food Consumption Vulnerable Individuals
Antigua					P	P	P			P		
Bahamas										P		
Barbados	N	N	N	N	N	N	N	N	N	N	N	N
Bermuda												
Cayman Is,												
Dominica					P	P	P			P		
Grenada					P	P	P			P		
Guyana					N	N	N	N	N	P		
Jamaica	N	N	N		P	P	P	P		N		
Montserrat					P	N	P					
St. Kitts-Nevis-Anguilla							P			P		
St. Lucia	P	P			P	P	P			P		
St. Vincent	N	N	N	N	N	N	N	P		N		
Trinidad & Tobago					P	P	P			P	N	

CSP18/22 (Eng.)
ANNEX V

PAN AMERICAN PROGRAM FOR HEALTH PLANNING

Inception of the Program

The joint training program in health planning has been conducted since 1962 by the Pan American Health Organization, the Regional Office of the World Health Organization for the Americas, and by the Latin American Institute for Economic and Social Planning (ILPES).

In 1967 a number of countries of the Hemisphere submitted to the United Nations Development Program (UNDP) a request for the establishment of a multinational center that would continue and expand training programs and promote and undertake research, collect and disseminate information, and strengthen the advisory services being provided by PAHO/WHO to the Governments. All these activities would be directed to the improvement of health planning procedures in the countries of the Americas.

In January 1968 the Governing Council of UNDP approved the request to establish the Pan American Program for Health Planning. It also made funds available so that the program could be introduced and begin its activities in that year.

In July 1970, on the signature of the agreement between the countries, the United Nations Development Program (Special Fund), and the World Health Organization, formal recognition was given to the activities of the Program.

Aims and Objectives

1. The aims of the Program are to:
 - 1.1 Contribute to the introduction, implementation, and improvement of health planning procedures in the countries of the Region, and
 - 1.2 Provide for a better understanding of the problems of the health sector in the context of economic and social development as a basis for the development and improvement of approaches, methods, and techniques to be used in health planning procedures.
2. The objectives of the Program are to be achieved primarily through action in the fields of training, research, and information.

Administrative Growth and Present Organizational Structure

1. PAHO/WHO, as Executing Agency for the Program, is responsible for its organization and operation. It is performing this function through a principal technical advisor and through the divisions of training and research.

2. The Program's headquarters is at Santiago, Chile, a location that enables it to remain in continuous contact and association with the Latin American Institute for Economic and Social Planning, also a participant in the project.

3. The Program is being financed with grants from the Special Fund of the United Nations Development Program, with counterpart contributions in kind from the Participating Governments, and with PAHO/WHO contributions on behalf of the Governments, covering local operating expenses and project costs. Grants and contributions for the duration of the agreement are as follows:

(a) Grant from the Special Fund of:	US\$1,982,400
- Contribution from the Special Fund	US\$1,755,600
- PAHO/WHO contribution on behalf of the Governments for local operating expenses	226,800
(b) Counterpart contribution in kind by the Governments	1,119,000
(c) PAHO and WHO contribution on behalf of the Governments for project costs	906,700

The Program's permanent staff consists of a principal technical advisor, two division chiefs, five professionals (training, research, and statistical officers), three secretaries, and a driver/messenger. For the period of duration of the agreement, 216 short-term consultant months have been allowed. The agreement also provides for 189 months of services by the PAHO/WHO zone and short-term consultants who advise countries on health planning activities.

4. The Program's physical accommodation forms part of the United Nations building in Santiago, Chile. It shares with ILPES and the Economic Commission for Latin America (ECLA) classroom and seminar facilities. It makes use of the administrative and financial services of these bodies and of their facilities for the reproduction of documents, translation, and general services. The space occupied by the Program is extremely limited, and the need for its expansion is urgent.

The Program possesses one bus and one station wagon for the transportation of students during courses.

So far as equipment is concerned, it has been acquiring calculating machines, typewriters, reproduction equipment, and so on, within the limits laid down in the agreement or otherwise approved.

Description of Activities

1. Between 1962 and 1969, at eight international courses, a total of 272 officials from different countries of the Americas have been trained, the majority of whom now hold positions of responsibility in some way associated with the promotion and development of national health planning procedures. Information on the content of these international courses appears in the following appendix.
2. Since 1968 the Program has been engaged in the following research projects:
 - 2.1 Linc Model: This is a logical multisectoral model, which is to include the principal variables in the health sector. The aim is to determine the modifications of such variables that will result from various health policies. A scaled-down version of this model, programed at the Computer Department of the Central University of Venezuela, has been completed with a view to demonstrating the operation and use of models of this kind and providing opportunities for training personnel.
 - 2.2 Typologies of health policies: A procedure has been designed, making use of an electronic computer, for the classification of countries according to a group of selected indicators. The results obtained are being analyzed and compared with classifications based on different criteria adopted by other researchers.
3. The Program is also collaborating in the research project into the demand for services and their utilization being undertaken by the Government of Chile.
4. A number of studies have been undertaken, such as:
 - 4.1 Review of the methodology of health planning and preparation of a methodological model.
 - 4.2 Studies on health policy in association with the Social Affairs Division of ECLA.
 - 4.3 Studies on investment projects, in association with the Projects Division of the Latin American Institute for Economic and Social Planning.
 - 4.4 Studies connected with problems of food and nutrition, environmental sanitation, and mental health in the context of health planning procedures.
5. To date, the Program has prepared the following papers:
 - 5.1 Modelo Metodológico (Methodological Model), including the complete processing of the data from the local health area, applying the PAHO/CENDES planning methodology.

- 5.2 Esquema para el Estudio de la Política de Salud (Framework for the Study of Health Policy), outlining the concept of the political structure of health and its components.
- 5.3 Elementos Analíticos para el Estudio de la Política de Salud (Analytical Data for the Study of Health Policy), outlining the work undertaken by a group and presenting systematically the various types of analysis and a synoptical table.
- 5.4 Lista Tentativa de Indicadores para Tipología de Políticas de Salud (Tentative List of Indicators for the Typology of Health Policies).
- 5.5 Esquema de Flujo en el Sistema Político de Salud (Flow Patterns in the Political Structure of Health).
- 5.6 Encuesta Sobre Política de Salud (Inquiry into Health Policy), covering its study in the countries of Latin America.
- 5.7 Financiamiento de Salud (Financing of Health), a paper prepared with a view to analyzing financing problems in the health sector.
- 5.8 Política Alimentaria y Nutricional y Planificación de la Salud (Food and Nutrition Policy and Health Planning), which seeks to show how the health sector can exercise, through planning, a guiding influence on food and nutrition policies.
- 5.9 Nutrición y Planificación de la Salud (Nutrition and Health Planning), proposing a way in which nutrition can be integrated into health planning procedures.
- 5.10 Saneamiento Ambiental y Planificación de la Salud (Environmental Sanitation and Health Planning), outlining the problems of environmental sanitation and how they should be tackled in health planning.
- 5.11 Incorporación de la Salud Mental en la Metodología CENDES/OPS (Inclusion of Mental Health in the CENDES/PAHO Methodology).
- 5.12 Proyectos de Inversión para Salud (Investment Projects in Health), presenting an approach to the study of this subject.
- 5.13 El Modelo Vinculador, Bases para su Formulación (The Linc Model and Bases for its Formulation), describing the variables in the health sector to be included in the scope of research with the Linc model.
- 5.14 El Enfoque del Modelo Vinculador (The Linc Model Approach), describing how this model is to operate and the results it is hoped to obtain through experiments with various strategies of decision.

- 5.15 Modelo Vinculador (The Linc Model), describing briefly the indicators, the instrumental and external variables, and the processes of calculation required for the experiment.
- 5.16 Recursos Humanos (Human Resources), indicating those factors that should be taken into account in studying human resources, the economic implications of supply and demand, and the political implications of decisions to program such resources.
- 5.17 Adiestramiento de Planificadores de la Salud en América Latina (Training of Health Planners in Latin America), a document WHO was requested to prepare for the Committee of Experts on the Training of Health Planners and which describes the problems encountered in training health planners in Latin America.

APPENDIX

THE INTERNATIONAL COURSE HELD IN 1969

1. General Characteristics

Its aims were the following:

- (a) To provide intensive instruction in the principles and methods of health planning.
- (b) To familiarize participants with the concepts, methods, and content of economic and social programing.
- (c) To promote the interchange of experience and knowledge.

The course was held in the Institute's Headquarters in Santiago, Chile, for a period of 16 weeks and was attended by 28 officials from 14 countries. It was organized jointly by the Pan American Health Organization and the Institute. The academic staff consisted of experts from the Institute and from ECLA on economic and social development, and from PAHO on health, and health development and planning.

The Course program provided for 450 hours of instruction under three general headings, as follows:

<u>Subject</u>	<u>Number of hours</u>
A. <u>Health and development in Latin America</u>	152
1. The health problem	52
2. Planning of economic development	64
3. Sociology of development	13
4. The educational problem	6
5. The population problem	6
6. Housing and development	3
7. Regional planning	3
8. Projects in health programing	5
B. <u>Methodology of health planning</u>	268
C. <u>Health planning procedures and an analysis of the situation in Latin America</u>	<u>30</u>
TOTAL	450 ===

2. Content and Conduct of the Course

The content of international courses has been based from the outset on the existence in the countries of the Region of three principal levels of planning, i.e.:

- (a) The highest official level, technical in character, but at the same time directly associated with the political decision-making authorities of the sector.
- (b) A second level, generally representing officials with technical and administrative responsibilities within the sector. This level is more directly associated with executive responsibility for planning.
- (c) A level principally responsible for the operational tasks of planning.

The policy so far adopted has been to train officials of the first group at international courses, as this group is regarded as being most closely associated with the work of promoting planning in the countries, with political decisions, and with the technical advisory services involved in the formulation, execution, and evaluation of plans. The training in health planning of the other two groups is, accordingly, considered to be primarily a matter of national responsibility.

This policy has been based in the first place on a first-hand knowledge of the situation in the Latin American countries and, in the second place, on the extent to which it is possible to obtain the selection of candidates of the right caliber for international courses. The changes which will have to be made in this policy are the result of the experience acquired over seven international courses held between 1962 and 1968. There have been changes in the extent to which the principles of health planning have won acceptance in the countries and been introduced into them. This factor is likely to affect the criteria governing the selection of participants. Moreover, as a result of the more widespread dissemination of the principles and methods of planning, some participants now come to courses with considerable knowledge, firm opinions and often some experience of the field, although others have no such knowledge or experience.

This difference in the background of participants at one and the same course is making it necessary to review training levels, types of courses, and selection procedures.

Up to the present, the International Course has been primarily designed to cover three major fields of knowledge. The first is the study and discussion of the problems of economic and social development in Latin America and of the relationship between health and development. The aim has been to bring into relief those problems that will throw light on political decisions in the sector. The second area of instruction covers an intensive study of the formulation of a national health plan, based on a methodological analysis of exercises relating to local health areas and its application. The third takes the form of identifying the situation in Latin America and, in this context, those strategies best fitted to promote the process of health planning.



XVIII PAN AMERICAN SANITARY CONFERENCE

XXII REGIONAL COMMITTEE MEETING

WASHINGTON, D.C., U.S.A.
SEPTEMBER-OCTOBER 1970

Provisional Agenda Item 24

CSP18/22 (Eng.)
ADDENDUM I
26 september 1970
ORIGINAL: ENGLISH

MULTINATIONAL CENTERS

In addition to the reports on multinational centers presented in Document CSP18/22, the resolution on this subject approved by the Executive Committee at its 64th Meeting is reproduced below. Attention is invited to paragraph 1 of the resolution, which sets forth guidelines for the establishment and operation of multinational centers.

RESOLUTION XIX

MULTINATIONAL CENTERS

THE EXECUTIVE COMMITTEE,

Having examined Resolution XXXVII adopted by the Directing Council at its XIX Meeting and the Report submitted by the Director (Document CE64/2);

Recognizing the value of multinational centers for dealing with health problems of interest to several countries; and

Desiring to support the Organization in its role of stimulating and coordinating multinational programs by approving general guidelines for the establishment and operation of multinational centers,

RESOLVES:

1. To submit to the XVIII Pan American Sanitary Conference the following general guidelines for the establishment and operation of multinational centers:

(a) For the purpose of these guidelines, a multinational center shall be defined as an institution or center administered by international staff and supported to a significant degree by international funds, which provides services for all the countries in the Region, or a group of them in a particular area.

(b) The establishment and operation of multinational centers shall be based on the priorities arising out of the planning of the PAHO/WHO program. Under this system, each country's appraisal of its health problems shall determine the extent and nature of the international assistance that will best serve to support the health programs of the Member Countries.

(c) Where the solution of a country's health problems requires services of a standard and capacity not available within the country, it shall endeavor to obtain such services from institutions in other countries. PAHO/WHO shall continue to support these institutions with a view to improving the services to the countries in which they are situated and to countries that do not have sufficient resources to organize similar institutions.

(d) Where there are no suitable national institutions to deal with problems of common interest, multinational centers will be planned and developed in consultation with the Governments in order to make maximum use of PAHO/WHO assistance.

(e) In their own or related fields, multinational centers should support, assist, and supplement the programs of the countries and should promote international cooperation for the solution of common problems.

(f) In view of the fact that multinational centers are institutions and are created only when there are no adequate national institutions, international financial assistance is regarded as a long-term obligation. Nevertheless, each multinational center should be reviewed regularly in planning the program and in the light of its importance in relation to the needs of the participating countries.

(g) In planning a multinational center, the Director shall seek financial and other support from extra-budgetary sources, in addition to the regular budget. The host government should provide premises and, as far as its resources permit, also contribute supplies, personnel, and funds. The choice of a location should take into account the resources of the potential Host Government as well as any other factors affecting the services rendered to countries.

(h) Proposals for multinational centers shall continue to be submitted as part of the PAHO/WHO Program and Budget to the Executive Committee and to the Directing Council or the Conference, for consideration and approval.

2. To request the Director to submit to the XVIII Pan American Sanitary Conference a report on the program and activities of the existing multinational centers.

3. To request the Director that the regular review of multinational centers be carried out in the presence of their Directors at the Meetings of the Executive Committee when the Organization's program and budget estimates are discussed; and that, to this end, he invite the Director of the Pan American Foot-and-Mouth Disease Center and the Director of the Pan American Zoonoses Center to attend the 66th Meeting of the Committee.