

**PAN AMERICAN HEALTH  
ORGANIZATION**

**ADVISORY COMMITTEE  
ON MEDICAL RESEARCH**

**TWELFTH MEETING**

**25-29 JUNE 1973  
WASHINGTON, D.C.**

**REPORT TO THE DIRECTOR**

**Ref: RD 12/6**

**29 June 1973**

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Advisory Committee on Medical Research  
Pan American Health Organization.

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PAHO ADVISORY COMMITTEE ON MEDICAL RESEARCH

Report to the Director

1973

Introduction

The Twelfth Meeting of the Pan American Health Organization Advisory Committee on Medical Research was opened by the Chairman, Professor John C. Waterlow, who noted the great loss to the Committee caused by the death of Dr. Herbert G. Birch, a member since 1971. As a mark of respect, the participants stood in silence. The Chairman then called on the Director, Dr. Abraham Horwitz, to deliver his address.

The Director welcomed the Committee and extended special greetings to Dr. Eugene Aujaleu, Sir Ernst Chain, Dr. Bertram Cohen, Dr. Miguel Layrisse, Dr. Albert Sabin, and Dr. Robert Stone as new members. The Director thanked the retiring members of the Committee for their services and regretted that Dr. Brown had been prevented from attending by illness, and that Dr. Chagas, Dr. Aujaleu, and Dr. Stone had been unable to be present owing to other commitments.

Dr. Horwitz spoke of the ten-year health plan, approved by the Ministers of Health of the Americas, in Santiago, Chile, last October. Under this plan, the problem of the underprivileged who do not now have access to minimal health services, will be corrected through active community participation, including the use of medical auxiliaries. The Director expressed his appreciation to Dr. Charles V. Kidd and his colleagues for their efforts in surveying biomedical research in Latin America, and to Professors Thomas H. Weller, John C. Waterlow, and Philip P. Cohen for organizing the two symposia on the agenda. The Director concluded his address with a review of the topics to be covered in the week-long meeting.

1. Progress in methods for the surveillance  
of nutritional status

The key objectives of a nutrition survey are: (a) to provide sound scientific data for defining the incidence and risk of malnutrition, its location, and its cause; (b) to define the current and potential resources (manpower, food, money, education) for practical solutions; and (c) to establish a baseline of nutrition and health data from which future monitoring and evaluation of nutritional status can be made in reference to either the success or failure of intervention programs.

The simplicity of the methods used in a survey and the cost in terms of money, personnel, and time are directly related to sample size, type of sampling, and to the objectives. The logistics of defining the sample population for study is the greatest cost. The simplest method of nutritional and health appraisal consists of precise, standardized measurement of height, weight, and age of preschool- and often school-children. In general preschoolchildren provide the best indicator of community nutrition and health status. For screening surveys to identify key problems, the sample size to provide reliable estimates varies from all preschoolchildren for communities with less than 800 inhabitants, to 15 percent or less to ensure a sample of 150 preschoolchildren in communities of over 5,000 inhabitants.

The anthropometric measurement has many advantages in that it also provides a good objective measure of health status, predicts risk, assesses the degree of malnutrition and risk, and is simple and of low cost; it does not however, define the cause nor provide guidance for applied programs. Clinical assessment identifies primarily overt malnutrition and other forms of ill health. Biochemical assessment is a diagnostic tool which identifies the percentage of population at "risk" or at "severe risk" of malnutrition; it provides a base for future evaluation, and can be restricted to a subsample of groups used for anthropometric measurements. In general, the biochemical tests can be restricted to the assessment of major problems such as hemoglobin

and hematocrit for anemia; subsamples may be taken of preschoolchildren for the assessment of serum albumin and vitamin A as second priority.

Dietary assessment is essential for developing intervention and preventive programs as it provides data on food habits, customs, and preparation techniques. Likewise, this type of study provides information on food production, processing, and storage and equally important, it provides data on sources of nutrients in foods and on nutrient intake. Dietary studies are time-consuming, and involve considerable computer processing. It was emphasized that a nutrition survey need not contain all the assessment methods nor all the techniques within each assessment procedure.

The current nutrition survey projects in Chile, Argentina, Brazil, and Peru are being directed toward the development of a simplified system of surveillance for the basic purpose of defining problems and resources and of providing such information for the development of National Food and Nutrition policies. Likewise, these projects will test the proposed data linkage and retrieval system.

Members of the Committee stressed the importance of planning surveys of this type so that a maximum of useful information could be obtained at a minimum cost. Multiple anthropometric measurements sometimes included information of little value, and it was generally considered that height, weight, and age provided the basic information for the assessment of nutritional status. Many of the other measurements that are often used do not provide information justifying the time and cost of collecting it. The grading of degrees of malnutrition is arbitrary; it is therefore essential that baseline and continuing data should be collected, so that it is possible to determine how far the grading is realistic.

Much discussion was devoted to the problem of implementing recommendations that could be made in the light of knowledge already existing. Economic and political considerations were thought to be delaying the eradication of malnutrition and undernutrition much less than lack of knowledge or inability to recognize malnourished states. The view that



it might be strategically advisable to desist from belaboring reluctant governments with growing evidence of malnutrition in their communities was hotly disputed. The contrary view was that investment in nutrition programs could be shown to improve the productivity of populations. Moreover, medical science cannot remain aloof from the implications of knowledge which it possesses, and where governments fail to establish a satisfactory balance between food crops and cash crops, pressure has to be brought to bear on politicians. PAHO should also provide guidelines to Ministries of Health as to priorities as well as specific proposals. In the particular instance of malnutrition, the preschoolchild constituted the most vulnerable segment of the population.

## 2. Collaborative study on iron absorption

The objective of this study is to investigate means of fortifying food with iron in a manner which is both practical to accomplish and effective in improving the iron status of the infant and of the adult menstruating female.

The study will be carried out in collaboration with a number of investigators in the Americas and a reference laboratory in Caracas, Venezuela. It will interdigitate with studies on the mechanism of food iron absorption and with similar studies supported by the World Health Organization and the International Atomic Energy Agency. The design of the study provides for developing and evaluating food fortification programs in infants and adult females. Four features were considered essential:

- (a) The identification of "typical" basal diets in eight locations in Latin America, and determination of the iron contents and availability of food iron in these diets;

(b) A study of the feasibility of fortification of specific food items in the "typical" basal diets which are suitable for provision to the population at large;

(c) The determination by isotope techniques of the availability of this fortification iron when consumed in the usual diet; and

(d) Field trials, including both an iron-supplemented and a control population, designed to determine the effectiveness of food fortification in improving iron status and decreasing the prevalence of iron deficiency anemia.

The proposal that radioactive isotopes be administered to infants and children aroused considerable concern among Committee members and the justification for its use in an investigational rather than a therapeutic context was felt to be questionable. The value of radioactive labeling from the experimental point of view was accepted, and it was realized that the technique could provide an accuracy of measurement that was unattainable by hemoglobin estimations alone; the element of hazard involved appeared, however, to be unacceptable and the use of a suitable animal model such as a nonhuman primate was suggested as a possible alternative. The consensus of Committee opinion took the view that it would be unwise for PAHO to support the use of radioactive tracers as proposed in the part of the study concerned with infants.

With this exception, the Committee supported the proposal, which is concerned with an important public health problem of the region, and which is particularly desirable because it involves collaboration between different laboratories. It was recommended that Dr. A. Hill of the University of the West Indies, Jamaica, be invited to participate in the project, in view of her considerable experience and interest in research in this field.

### 3. Studies on iron-deficiency anemia in Central America

The presentation was organized as follows:

(a) Establishment of hematological norms of the Central American population, based on the hematological values of individuals who appeared normal and who were found, by biochemical determinations, to have neither iron, folate, or vitamin B<sub>12</sub> deficiencies nor hookworm infection. Norms were calculated for groups according to age, sex, physiological status, and altitude. The norms proved to be very similar to and even slightly higher than those derived from nontropical healthy populations, and to correspond closely to the values obtained from the Gaussian distribution derived from the upper segment of the cumulative distribution of hemoglobin for each group.

(b) Plotting of the frequency distribution of hemoglobin levels to determine the risk carried by each group of belonging to a subnormal (anemic) population. In general the hemoglobin levels corresponding to the mean -1 and 1-1/2 standard deviation for each group carry risks of 20 and 75 percent respectively of belonging to a population with subnormal hemoglobin.

(c) Determination of the prevalence of anemia in the Central American population based on the risks described in (b). Anemia is highly prevalent (in about 20 percent of the population), children 1-4 years of age and pregnant women being most vulnerable. Men and nonpregnant women are almost equally affected.

(d) Investigations of the cause of nutritional anemia. Populations with hemoglobin levels carrying a high risk of anemia have a high prevalence of iron deficiency according to biochemical determinations. Conversely, populations with hemoglobin levels corresponding to a low risk of anemia have biochemical evidence of adequate iron nutrition. Biochemical evidence of folate deficiency is very prevalent and varies inversely with iron deficiency in adult populations. In pregnancy folate deficiency is accompanied by an increased prevalence of macrocytosis when iron nutrition is adequate. When iron is

administered to a population, both red cell and serum folate levels decrease, and macrocytosis is also more prevalent. Anemia and low iron intakes (in particular meat iron intake) are seen in low socioeconomic groups among rural Guatemalan individuals. Hookworm infection increases the prevalence of iron deficiency anemia. Folate intake also appears inadequate by composite analysis of representative diets.

(e) Studies of supplementation with iron and iron plus folic acid. Results indicate that hematological normality can be achieved by administration of iron plus folic acid to tropical-hookworm infected populations. The proposed Central American norms are therefore validated. The administration of folic acid in addition to iron seems necessary for a small but significant number of individuals to achieve hematological normality. Iron administration alone can worsen folate nutrition, as judged by biochemical evidence and macrocytosis.

(f) The consequences of anemia, iron, and folate deficiencies were discussed in terms of mother and child relationships and in terms of anemia and physical capacity (fitness). In the first case blood from newborn babies of mothers with low hemoglobin and low serum iron and folates had lesser hemoglobin content and lower serum iron and folates than blood from those born of normal mothers. In the second case a highly significant relationship was found between packed cell volume (PCV) and the Harvard Step Test score (HST), which is a measure of the capacity for severe exertion. Significant increases in HST score were seen with 5 to 10 percent increases in PCV.

During the discussion several questions were put concerning the effect of anemia on physical effort, and the benefits to be gained from eliminating iron deficiency states. It was stated that anemic individuals were often unaware of any disability until treatment restored their hemoglobin to normal levels and dramatically enhanced their physical well-being. The positive correlation between PCV and HST performance is relevant, since it may be presumed that a test of this sort is comparable to physical activities such as cutting sugar cane.

The Committee felt that the establishment of norms for hemoglobin, and the exploration of the relationships between deviations from normal and functional disability, represent a notable contribution to medical science--a contribution that is of both practical and theoretical value.

4. Evaluation of nutrition education in a developing country

A 3-year project initiated in July 1971 with the assistance of a grant from the Freedom from Hunger Campaign (United Kingdom Committee), was described. The planning and establishment of a program in nutrition education was envisaged in three phases - preliminary, action, and evaluation. A major consideration was to design a project of low cost that would use as far as was feasible resources readily available in the study area, and that would be reproducible in other areas.

From inception and into the stage of implementation, emphasis has been put on the need for community participation. For this purpose a local committee works in association with the project team. Education is promoted through schools, clinics, social organizations, and volunteer home visiting. The part to be played by the indigenous volunteer home visitor who is given simple training in nutrition is an important aspect, and special attention is being devoted to maintaining the interest of these workers and to developing a suitable system of record keeping.

The Committee recognized the usefulness of a nutrition education scheme of this sort and looked forward to future reports which would provide an evaluation of the results.

5. Symposium on Medical Auxiliaries

The allocation of a half day to a special symposium on medical auxiliaries reflects the continued concern of the Pan American Health Organization regarding inadequacies of delivery of medical care to underprivileged peoples. The impact of population growth, and of the

ever more sophisticated nature of medicine, are two major trends with which health services have to cope. The composition and activities of constituent members of the health team need reexamining and redefining in the light of changing requirements.

It is primary medical care that poses the quantitative demand, whereas referral care requires a qualitative approach. Systems of medical care must be devised within the economic, educational, and social resources of each country, and in harmony with indigenous cultures. To be useful, knowledge requires effective application. Efficient application requires a social and working environment that is conducive to optimal utilization of all levels of manpower.

Low- and middle-level manpower, with less intensive and less expensive implications, has a place in developing the capital of human resources, but the optimal mix of the various levels is still a matter of pragmatism and contention. The effectiveness of various mixes could well be tested by a series of operational programs, and such operational research is needed.

A presentation of medical assistant programs around the world shows that most experience resides in the South Pacific, Asia, Africa, and Eastern Europe. Limited experience in the United States demonstrates the applicability to industrialized problems.

Latin America and the West Indies in the past five years have initiated several successful medical auxiliary pilot programs, both officially and nonofficially sponsored. Programs exist in Venezuela, Guyana, Guatemala, Costa Rica, Colombia, Peru, Brazil, Haiti, Cuba, and Jamaica. These programs cover a variety of categories and levels of workers; but all undoubtedly reveal the considerable additive value that auxiliaries can make to the delivery of medical care. Evidence was presented of extension of care, of lower costs, of enabling new programs to be mounted, and of their capacity to employ the swelling ranks of the semiliterate, thus contributing to solving a growing social problem.

Medical and health auxiliaries may be utilized both in general and in specific roles, the latter at a lower level of schooling. Cuba

in particular has mounted an effective program of meeting primary care needs through nonprofessional personnel, whereas other countries in the region still rely heavily on professional cadres. Despite a rapid rate of production of physicians and in some countries rural internships, population growth rates, maldistribution, specialization, and migration currently leave large sectors of the population of the Americas with inadequate health care. Studies need to be undertaken to determine the minimal requirements that must be satisfied to attract professional personnel into deprived communities. Such studies will need to take into consideration differing systems of medical care services, differing cultures, and differing socioeconomic levels.

Three contrasting instances of the utilization of auxiliaries were discussed in detail:

(a) Encouraging results had been achieved in Guatemala where such personnel were being used for the delivery of primary care in rural villages.

(b) A school for dental auxiliaries had been successfully established in Jamaica, an accomplishment which reflects credit on PAHO; the recent graduation of the first class of two-year trained personnel brings to fruition the first phase of a program that is expected to demonstrate the applicability of this principle to other parts of the region.

(c) Dramatic benefits had ensued from a large-scale demonstration project using auxiliaries to combat neonatal tetanus in Haiti; this had been recognized by the local inhabitants who were now actively seeking immunization at centers manned by auxiliary personnel.

Such objective studies need to be extended in differing settings in both urban and rural areas. Programs of utilization of auxiliaries can be compared for effectiveness and cost against physician-mounted programs. The evaluation studies have already revealed a halving of costs between physician and nonphysician fees.

Studies are required on disease epidemiology at village level in those countries where medical auxiliaries might provide primary medical care of the major diseases, and on the proportion of such cases needing referral to physicians, hospitalization, and special care. The adequacy of screening, diagnosis, and treatment must be determined for each of the different levels of auxiliaries and in the different settings. Although discussants referred to the auxiliaries as being crucial to the effective delivery of medical care, there was no clear pattern of relationship established between numbers and ratios of physicians to medical assistants. One speaker posed the question as to whether there is a point when physicians become noneffective.

Questions were raised as to why application of knowledge lags, as to medical and social factors that impede progress, and as to how corrective measures may be taken. The application of sociology to medicine as a hierarchical structure, and on behalf of medicine in relation to the community, offers study prospects. It is apparent from the case studies presented that resistance to the delivery of medical care by nonphysicians is seldom encountered from the community, but that there are professional and political viewpoints to be considered.

Apart from studies on the cost-effectiveness of medical personnel, comparative studies on the utilization and cost of institutions need to be undertaken. It was stated that in one instance a large hospital established at great cost had only a 40 percent occupancy rate, and therefore a very low cost-effectiveness. This emphasizes the need for comparative studies of the roles and utilization of various types of medical institutions and of how their cost-effectiveness can be improved. In what institutional settings can medical assistants be most beneficial to lowering costs, and what ratio of professionals is required?

The role of the medical school in a developing country came under discussion in relation to its impact on prospects for use of medical auxiliaries as well as the role of the school in relation to their training. It was pointed out that the issues under consideration often have nothing to do with "enough or not enough" doctors, or with what



types of personnel are most relevant within a given set of parameters of need. At what point in time does a country decide that it has an adequacy of a specific type of health worker?

Most developing countries cannot afford large numbers of physicians who are socially adapted to the niceties of life, but nevertheless continuing effort should be made to produce physicians trained specifically to community requirements. There are convincing arguments for training and utilizing medical auxiliaries both for specific and generalist roles in diagnosis and treatment. Much more operational research is required to provide hard data in the South American context. PAHO should sponsor and fund such research. It can also assist by promoting the training of auxiliary teachers, which is a totally neglected field. Teaching to minimal rather than to maximal input of knowledge introduces restraints on curriculum structure. Teacher training material and auxiliary-student textbooks are limited. PAHO could support teacher-training workshop seminars, promote interest in the production of textbooks, and subsidize cheap editions of selected existing texts.

Fellowships and bursaries to teachers in this field would help to break down prejudice and promote interest. Such fellowships could be of a travel variety, to enable trainees to see selected programs in action. Support for postgraduate doctoral (field) studies would also encourage serious operational research.

The Advisory Committee on Medical Research endorsed PAHO's commitment to this subject as a priority area for operational research and developmental activity.

#### 6. Strategy for the organization of medical research in Latin America

The ACMR has since its inception been concerned with the strategy of health research in Latin America. In 1965 it requested a special study of the way in which Latin American countries set their general

policies for biomedical research. This led to the extremely valuable report on Science Policy in Latin America (Sci. Pub. No. 119). To take advantage of the experience of other bodies which have been active in the support of research in Latin America and other parts of the world, a symposium was organized at the Eleventh Meeting of the ACMR, in 1972, during which representatives of a number of national and other organizations discussed the policies and principles of their research programs. Finally, last year PAHO arranged for another survey of the state of biomedical research in Latin America and the Caribbean by a study group whose members visited most of the countries. The draft report of this survey was presented to the Committee.

The salient points that emerged from this study were as follows:

(a) Research effort is still very unevenly distributed throughout the region.

(b) Though research is strong in such fields as genetics, biochemistry, nutrition, reproductive physiology, immunology, and parasitology, it is weak in clinical investigation, epidemiology, virology, and public health administration. The older tradition of the special sanctity of "pure" research is, however, weakening.

(c) Many barriers are restricting the development of biomedical research: (1) absence of a tradition of science; (2) political instability; (3) lack of resources in many countries; and (4) poor scientific communications. In many places the most important limiting factors are the rigidity of the university structure, and the unlimited entry of students, which swamps the capacity of the staff for both teaching and research.

(d) The pressure on universities has been one factor stimulating the setting-up of separate research institutes. The latter in some cases represent centers of excellence; in others they have outlived their period of usefulness and creativity.

(e) In the last few years many countries have set up national councils for scientific research. These vary in the range of their

activities, from participation in policy making at the interface between science and politics to acting as a grant-giving body. Many difficulties have been encountered in the operation of these research councils. There is a tendency to bureaucracy, and to inadequate consideration of the necessary balance between basic and applied research.

(f) There has been a decline in outside support, both from governments and private foundations, but an increase, though not to the same degree, of national and international support. Although this development has in many places been extremely painful, in the long run it is likely to be beneficial. Too much reliance on outside support may, in some cases, impose outside priorities on the pattern of research.

(g) Perhaps as a result of the decrease of outside support, there has been an extension of regional efforts and of multinational collaboration. At the same time reliance on separate, self-contained research institutes is being supplemented by the concept of networks of collaborating laboratories.

The ACMR considered that the draft report, which should be published by PAHO, presented a remarkably clear and useful picture of the position of research in Latin America. One aspect, however, needs to be considered in more detail: the extent to which resources of trained manpower are adequate or inadequate in different disciplines.

Many of the difficulties and restraints described in this survey arise from cultural patterns which themselves are derived to a large extent from Continental Europe. It was therefore extremely useful for the committee to receive an account of the organization of biomedical research in Europe. Many of the difficulties now being encountered in some European countries, notably Italy, France, Germany, Spain, and Portugal, are very similar to those described in Latin America.

In Continental Europe the chief impediment to the development of research is the educational system, with rigid school curricula, very

long training programs that inhibit originality, and extremely conservative university structures. The effect of unlimited entry to medical schools has already been alluded to. In many countries the clinical care system provides inadequate opportunities for research. There are too few full-time positions; salaries are low, so that private practice becomes a necessity. In some countries these difficulties have so far proved insoluble. In others, notably France, they have been bypassed by the establishment of institutes outside universities.

A perennial subject of discussion is the relative emphasis to be given to "basic" and "applied" research in the conditions prevailing in Latin America. The Committee was unanimous that from a scientific point of view it is entirely wrong to regard these aspects of research as being in opposition. It is very well recognized that so-called basic research frequently, although not necessarily, leads to practical applications. Equally, research that is initially "applied" may direct attention to important theoretical problems. Nevertheless, it must be recognized that there are real differences in the motives of those who do research; some have a more practical, others a more intellectual interest. Similarly, there are differences in the motives and objectives of organizations which support research. It follows that it may be useful to look at this question from the point of view of organization. Three types of research need to be promoted for different objectives:

1. Educational research has the objective of maintaining the quality of training of scientists and doctors. This should be supported by Ministries of Education, as the authority responsible for universities.
2. Basic research has the objective of advancing knowledge; it is appropriately supported by scientific academies and research councils.
3. Operational research is aimed at the solution of defined health problems. It should be supported by Ministries of Health.

These three types of research are necessary, and it is part of the planning process of each government to determine the relative support to be given through the three different channels, according to

the limitations of manpower and money. This pragmatic approach may be more useful than a theoretical discussion of the emphasis to be put on applied and basic research.

The creation of National Councils for Scientific Research does not by itself solve these decision problems, since these councils tend to consist mainly, if not entirely, of scientists, whereas the process of decision-making involves the interaction between science and governments. It was suggested that PAHO can make an important contribution in this area because it has a unique access to Ministries and other national decision-making bodies. It might be useful for PAHO to prepare a description of model systems for discussion by each country. At the same time it should promote a mechanism for continuing dialogue between those responsible for research planning and organization in each country.

The ACMR recognized the very important role played by research institutes, many of which have been built up by PAHO. It also recognized the necessity for avoiding the danger of creating an internal brain-drain away from universities. It emphasized that these institutes must play a part in training as well as in research.

Some consideration was given to the question of scientific and technologic manpower. It was stressed that all Latin American countries, in varying degrees, suffer from a great shortage of scientific, technologic, and professional manpower that is not merely a consequence of so-called brain-drain, which in several areas has decreased in recent years. The Committee emphasized that programs for increasing the scientific, technologic, and professional manpower can actually be counterproductive if they are not part of total national planning which would absorb the services of the additional manpower. Since this is a recurring theme in ACMR discussions, it might be useful to review periodically the number of full-time posts available for biomedical research in universities and institutes in countries of the region.

PAHO has long recognized that the means for scientific communication have a profound effect on the capacity for research. The PAHO Regional Library of Medicine has made an important contribution, but

it needs to be expanded by a network of subsidiary libraries. Concern was expressed at the very large number of Latin American biomedical journals, and the necessarily poor level of many of them. However, there was little support for the suggestion that PAHO should promote the establishment of regional journals in some disciplines. The Committee was informed of a proposal for the creation of a Latin American Federation of Biological Sciences, which would have under its umbrella all the Latin American bioscientific associations, and which would be active in promoting contacts and exchanges.

The ACMR supported the development of a Latin American Federation of Biological Sciences and recommended that PAHO assist in any appropriate way the development of this Federation.

On the financing of research, the recent survey emphasized the extent to which foreign support has decreased. In many countries, but by no means in all, this has been balanced by an increase in local funds - a tendency which is entirely healthy. With the advice of PAHO, foundations for the support of biomedical research are being established in a number of countries. PAHO should help to define for these foundations priority areas for research and training. In addition, a certain amount of free money for the support of research is being set aside in the PAHO budget. This will help to provide the flexibility which the ACMR considers extremely important.

Many of the topics brought up in the two reports under review could not be considered in detail. Nevertheless, the ACMR was of the opinion that periodic discussions of this kind, albeit incomplete and inconclusive, made a worthwhile contribution to the definition of research policy. They expressed their gratitude to the authors of the two reports presented, which provided essential background material for the symposium.

#### 7. Research activities at the Trinidad Regional Virus Laboratory

During the period 1952-1961 there was a rapid growth of arbovirus studies at the Trinidad Regional Virus Laboratory within the Rockefeller

Foundation program. Between 1962-1968 the laboratory moved to a modern building and came under the administration of the University of the West Indies. In 1968 the Rockefeller Foundation support ended and the staff was reduced to half.

Studies have been carried out on the ecology of arthropod-borne viruses, rabies and mongooses, leptospirosis, streptococcal disease, enteroviruses, respiratory viruses, helminths and leishmania, and biting arthropods.

Future research activities should include an expansion of communicable disease surveillance. Yellow fever remains a serious danger in the Americas and Trinidad; ecological studies on monkeys are needed and new approaches to control should be investigated. The laboratory offers excellent facilities for dengue surveillance. The vertebrate host of Eastern Equine Encephalitis should be determined and agricultural developments monitored for changes in disease patterns in man and animals. Rabies is enzootic in a number of the Caribbean Islands and the present surveillance studies on mongooses and rabies in Grenada need expanded support as control measures develop. There is a need for increased studies to determine the morbidity and mortality associated with leptospirosis.

Opportunities exist in Trinidad for the study of streptococcal disease, nephritis, and rheumatic fever. The present studies lack support and should be expanded. There should be continued research on important biting arthropods; in particular the knowledge of mainland Simulium is extremely limited.

In the course of discussion the role of TRVL in surveillance was mentioned and Committee members felt strongly that this should be regarded as a research no less than a service activity. The two activities should be encouraged to run in parallel. The Committee felt that Trinidad has good facilities for carrying out this research, and it was possible that the withdrawal of Rockefeller support could be made good by a pooling of resources from Caribbean and adjoining continental regions; recent recrudescence of arthropod-borne disease emphasized the necessity for such collaboration.

8. Surveillance and research on infectious diseases along the Trans-Amazon Highway

Surveillance of infectious diseases along the Trans-Amazon Highway has been carried out since March 1971. Epidemiological studies on yellow fever and other arboviruses, leptospirosis, leishmaniasis, schistosomiasis, and also of a hemorrhagic syndrome (thrombocytopenic purpura) have been undertaken by a multidisciplinary team.

Six different sites have been surveyed along the Highway in the Marabá, Altamira, and Itaituba areas. In addition, another site on the Cuiabá-Santarem Highway was investigated. Both immigrants and natives of these regions have been examined, and investigations made on the reservoir hosts among wild animals and the role of certain arthropod vectors in the maintenance of zoonotic diseases. In November 1972 a surveillance program on a permanent basis was started in the Altamira region.

Attempts to isolate arboviruses from the blood of 207 febrile persons were negative. However, malaria parasites, mostly P. falciparum, were found in 18 out of 107 of these subjects. Almost 3,000 human sera were tested against 18 arbovirus antigens, usually by the HI technique, and it was found that there was a higher incidence of antibodies among the natives than among immigrants. Low antibody rates were found against the Western Equine Encephalitis (WEE), the Eastern Equine Encephalitis (EEE), and the St. Louis Encephalitis (SLE) viruses in these persons. Neutralizing antibodies to Piry virus, however, were more common among the immigrants, especially in those from Rio Grande do Sul State. Among almost 5,000 wild animals examined, birds were most commonly found with antibodies to arboviruses; they had high rates of immunity against WEE and SLE viruses. Antibodies to yellow fever (YF) and Mayaro viruses were commonly found in primates. Other animals had lower antibody rates. Of 11 strains of arboviruses isolated from these animals, 4 were SLE virus.



Three strains of Salmonella and two of Shigella were isolated out of 418 human coprocultures. Four additional isolations of Salmonella were made from wild animals. Serological evidence of infection with 7 different serotypes of Leptospira has been found among human subjects, and some sera from rodents and marsupials also had antibodies to a number of leptospiral agents.

A leishmanin skin-test survey of 157 adults and children yielded 47 percent positivity, but these positive reactions were in people immune because of past infections contracted elsewhere. A variety of different parasites, some of which are of medical interest, such as Toxoplasma and Histoplasma, has been encountered in wild animals. Eggs of Schistosoma mansonii were found in 3 of the 73 fecal specimens examined, but all patients belonged to the imported labor force. Two foci of planorbid snails, identified as Biomphalaria straminea (an important species in the epidemiology of schistosomiasis) were encountered in 171 ponds and streams examined along almost 300 Km of the Highway.

Some 50 cases of a hemorrhagic syndrome (AHS) were found in immigrants living in the Altamira region in 1972 and up to March of 1973. This disease was diagnosed as thrombocytopenic purpura.

The seasonal incidence of the disease appeared to be correlated with the appearance of Simulium. A high frequency of precipitin antibodies to macerated black flies was found in patients and contacts, which suggest the possibility that the disease may represent a hypersensitivity to a substance transmitted by the bite of Simulium flies. The hypersensitivity hypothesis is also supported by the fact that attempts to isolate a virus or other infectious agent from the blood and other specimens taken from the patients by inoculation of mice, hamsters, guinea pigs, and VERO and HEP-2 cells, have been unsuccessful. Hemoculture, cultures of urine, and throat swabs from patients failed to yield a pathogenic microorganism.

In contradistinction to the above negative results, bacteriologic tests carried out at the PAHO mission in Belém, Brazil, from February to May 1973, yielded an organism whose relationship to the hemorrhagic

syndrome needs to be elucidated. The infectious agent was recovered from 12 patients, 3 animals, and 18 pools of Simulium sp. This agent produced thrombocytopenic purpura in chicks, but the significance of this finding in relation to the human hemorrhagic disease has not been established.

The Committee congratulated the staff of the Evandro Chagas Institute on the large amount of work they accomplished during the two-year period. There was considerable discussion about the Altamira hemorrhagic syndrome and its etiology. It was stated that hemorrhagic dengue had been excluded because of the absence of Aedes aegypti as a vector and because immunological tests did not support dengue. Likewise, the possibility of leptospirosis was dismissed because sera had been tested against 18 different serotypes of leptospira, and no positive reaction had been observed. The Committee believed that the data on the organism recovered during the February-May 1973 studies were not sufficient to establish its etiologic relationship to this hemorrhagic syndrome, which may not be an infectious disease.

It was believed that the study of AHS should be pursued but that care should be taken to avoid generating unjustified alarm over the possibility of a new disease affecting communities in the areas being opened up by the new highway. Malaria remains the most important public health problem of the region.

9. Leishmania and leishmaniasis of the New World  
with particular reference to Brazil

In the past, most leishmanial parasites isolated from man or wild animals in Brazil or neighboring countries, have been regarded as Leishmania braziliensis.

At least three different parasites, however, may cause cutaneous leishmaniasis in man in northern Brazil alone. It is essential to take this into account when considering immunological, biochemical, morphological, or clinical studies.

Recent reclassification of the known leishmanias of the neotropics has been presented, as follows, based on biological, biochemical, and epidemiological study of the different parasites. All these are zoonoses, with natural hosts in wild or (rarely) domestic animals.

(a) The Leishmania mexicana complex

L. mexicana mexicana (rodents, man; Mexico, British Honduras, and Guatemala); L. m. amazonensis (rodents, marsupials, man; Amazon Region, Mato Grosso, Brazil, and Trinidad); L. mexicana s.sp., unnamed (rodents and marsupials; Panama); L. m. pifanor (man; Venezuela); L. enriettii (known only in guinea pigs; Brazil).

(b) The Leishmania braziliensis complex

L. braziliensis braziliensis (rodents, cutaneous/mucocutaneous leishmaniasis in man; Brazil, Peru, Ecuador, Bolivia, Venezuela, Paraguay, and Colombia); L. b. guyanensis ("pian-bois", man; north Brazil, the Guyanas); L. b. panamensis (rodents, procyonids, sloths, man; Panama); L. peruviana ("uta"; dog, man; W. Peruvian Andes); L. hertigi (only known in tree-porcupines; Panama).

Some sandfly vectors are known only for L. m. mexicana, L. m. amazonensis, L. b. braziliensis, and L. b. panamensis.

The medical and economic importance of cutaneous-mucocutaneous leishmaniasis, especially in developing countries, still needs to be determined. Insecticide control is very difficult because of excessive rains in tropical rain forests. Chemotherapeutic control is equally difficult, because of the high cost of the known, active drugs (antimonials and amphotericin B) for a disease that is essentially one of poor people (forest laborers). Also, these drugs are often ineffective.

The Committee expressed admiration for the progress made in this work. Discussion centered around the extent to which leishmaniasis constitutes a health problem. The exact dimension is difficult to determine because of inadequate prevalence data. This is caused in part by the nature of the disease and in part by the vast area over which it is distributed. The cost of this disease in terms of lost man-hours

and apart from treatment, remains to be determined by specially designed studies.

Reference to the control of Mediterranean kala-azar by DDT spraying led to a discussion comparing this condition to visceral leishmaniasis. Although it is possible that the latter may have been imported from the Mediterranean in a past century, the likelihood is that a reservoir of a similar but fundamentally different disease has long existed in the river forests of South America. Prevention by vector control with DDT in these forests is totally impractical. The Committee agreed on the need for promoting studies to determine more accurately the prevalence and incidence of all forms of leishmaniasis to have some reliable estimate of its magnitude as a public health problem.

It was not likely that expansion in this direction would be undertaken by the Wellcome Trust which, for the past 8 years, had supported the studies reported. The Committee wished, however, to commend this work most warmly to the Wellcome Trustees, and to express the hope that the Trust would see fit to extend the duration of this unusually valuable program, especially in association with well designed clinical and epidemiologic studies.

10. Needs and opportunities for research on Chagas' disease in Brazil

The Committee received a full report on a survey instigated by PAHO following discussions with the Brazilian Ministry of Health, when concern had been expressed at the fragmentary and repetitive nature of research being carried out into Chagas' disease. The recommendation of the highest priority was for a study that would provide a reliable estimate of the magnitude of Chagas' disease as a public health problem in Brazil. Other recommendations of the report were as follows:

a. The organism. Improved methods must be found to characterize strains of Trypanosoma cruzi so as to elucidate the importance of strain

differences in pathogenesis, diagnosis, and treatment, for vaccine development and for assessment of the importance of sylvatic infections.

b. Immunology. It is necessary to identify the immunogenic antigens of the organism and the antibodies they induce, and to study cell-mediated immunity. This is important both for elucidation of the pathogenesis and for the development of vaccines.

c. Diagnosis. Standardized serological methods and reagents are required. A reference serology laboratory should be designated. Xenodiagnostic methods need improvement and standardization and alternative culture methods should be sought.

d. Clinical. Longitudinal prospective studies of the life history of the disease by multidisciplinary teams should be encouraged and strengthened, particularly in terms of epidemiology and data analysis.

e. Distribution. New areas of infection should be identified by notification and followed by epidemiological studies. A widespread sampling study should be made to assess the prevalence and incidence of the disease caused by T. cruzi, and of infection without disease in areas of different ecology.

f. Chemotherapy and Chemoprophylaxis. Useful drugs should be urgently sought by screening and by biochemical and physiological studies of the organism. Clinical trials should be on a sequential basis centrally designed and managed.

g. Entomology. Field and experimental studies are required to assess the potential importance of sylvatic and peridomestic bug species. There should be regular and standardized surveillance for insecticide resistance in domestic species. Alternative methods of control should be studied - for example, the use of juvenile hormone mimics in long-lasting formulations shows particular promise.

h. Sociology. Methods of health education should be developed especially in relation to the value of better house construction and maintenance. The effects of education, like other control methods, should be carefully assessed.

i. Organization. An impartial multidisciplinary national committee with a rotating membership and powers to award grants should be set up to coordinate the distribution of funds and the dissemination and exchange of information. Organizations conducting research in the field should be consulted about the allocation of research funds. Formal liaison should be developed with organizations responsible for research and development of building and building materials. Salary scales for professional research workers should be radically reviewed so that full-time employment becomes general. Increased training facilities and an adequate career structure are required for technical staff to rectify the present widespread shortage of supporting staff for research.

More funds must be made available for expendable materials, transport, travel expenses, maintenance, and general running expenses (particularly for field work). Foreign help would best be provided by supplying expertise in additional disciplines to multidisciplinary Brazilian teams engaged in comprehensive and well-designed studies.

j. PAHO. The Organization should appoint an independent, high-level, multidisciplinary coordinating committee for Chagas' disease research to assist in implementing the recommendations contained in this report. The PAHO Regional Library of Medicine (BIREME) should include Chagas' disease in its program for the dissemination of selected information.

Although Committee members had not yet had the opportunity to study the full report it was agreed that Chagas' disease is one of the major diseases of the South American continent, that it had been insufficiently studied, and that well-planned coordinated research should receive a high priority. Discussion ensued on the present status of treatment. Chemotherapy was largely ineffective and research into new drugs was a pressing need. Patients were too widely dispersed in rural areas for treatment centers to be a feasible proposition, although such concentration of patients would clearly be of value for investigational purposes. Although a high level of control of domestic bug vectors could be achieved with insecticides, much more attention should be

paid to the longer term benefits of cheap measures for the improvement of housing.

11. Review of the activities of the PAHO/WHO immunology research and training centers

As immunologic techniques become more complicated, and interrelations with other disciplines become wider and more frequent, the need for proper training in immunology is urgent. The PAHO/WHO Regional Training Centers in Immunology can do much to fulfill this need, functioning as catalysts in a multidisciplinary field.

The activities of the Center in São Paulo between 1969 and 1973 were reviewed. A 4-month training course is provided for 10-15 students from Brazil and from other South American countries, comprising an intensive program of lectures, seminars, and laboratory work. Special emphasis is given to developing the capacity to analyze scientific papers and to elaborate research projects. The course is given full credit both by the University of São Paulo and by the Escola Paulista de Medicina. Postgraduate students are accepted to work in the Center for the master's or doctor's degree.

Other types of courses could also be provided by the Center, such as a vacation course on modern immunologic techniques, primarily intended for instructors in immunology, and a course on clinical immunology. This would be possible with a relatively small supplement from PAHO.

Research activities at the São Paulo Center have covered a wide range in relation to the facilities available. Among the topics studied are immediate hypersensitivity in guinea pigs, the adjuvant effect of lipopolysaccharides and nucleic acids, the action of snake venoms on the complement system, the role of gamma-1 and gamma-2 guinea pig antikidney antibodies in rats, autoimmune studies in pemphigus foliaceus, and the effect of allogenic leukocyte transfusion in lepromatous leprosy.

The Immunology Research and Training Center in Mexico City is organized rather differently. Before 1969 the existing laboratories working in immunology in Mexico City were duplicating efforts in the achievement of the same goals. The Center consists of a collaboration between 6 initially and now 10 participating institutes and laboratories, belonging to different organizations.

Periodic short courses have been initiated in immunologic subjects, open to all interested workers, in order to update their knowledge in this field. This has led to an increase in interest in immunology among research workers in related disciplines, such as biochemistry, bacteriology, virology, parasitology, transplantation, etc. In addition to these more general courses, the Center provides opportunities for advanced training in immunology at the graduate level, for both Mexican and foreign workers, leading to master's or doctor's degrees in immunology. Increasing numbers of visiting professors have acted as lecturers, short-term consultants or collaborators in research projects. As a result of these activities of the Center, there has been an increase in the number and quality of the personnel engaged in the teaching of immunology in schools of medicine, and an increase in laboratory facilities for both research and teaching. There has been an improvement in the utilization of available resources, and a raising of standards in the diagnosis and treatment of clinical conditions related to immunology.

The participating institutions are playing an active role in subjects of national interest, such as immunization programs, transplantation legislation, and the teaching of immunology in medical schools. Basic research is under way on problems of local concern in Mexico, such as infectious diarrhea, leprosy, tuberculosis, and rhinoscleroma.

The participating laboratories pursue their particular programs without any restrictions from the Center, but up to now there have not been any refusals to admit a trainee, or to collaborate in a coordinated program. It seems that in the future, in addition to the activities described, the role of the Center in Mexico may include the function of adviser to several agencies on a permanent basis.



Although they differ in the nature of their organization and the scale of their activity, these two Immunology Research and Training Centers share two common functions: they are developing the potential for research and teaching in immunology at a high level, and they provide opportunities for workers in related fields such as clinical medicine, microbiology, and parasitology to gain experience of modern immunologic ideas and techniques.

The ACMR commended the successful efforts made by PAHO/WHO in the development of these regional research and training centers. The diversity of research problems being tackled is impressive. Some consideration should be given by PAHO to defining the public health problems in the region that most urgently need to be approached by immunologic methods. In addition, the resources available for the São Paulo Center need to be strengthened if its full potential is to be developed.

12. Immunodiagnosis of parasitic diseases  
with emphasis on hydatidosis

The immunodiagnosis of human hydatid disease has been extensively studied at the Pan American Zoonoses Center (PAZC). Many technical variants of each serologic technique have been employed by laboratories in different areas of the world for the diagnosis of this zoonotic infection. Since different techniques, antigens, and criteria for positivity have been employed by different investigators, the relative value and limitations of these techniques were not known. A study was therefore conducted at PAZC to select diagnostic tests which could be recommended to hydatid workers in the countries affected by this disease.

The evaluation of the different technical variants of each immunodiagnostic test resulted in the following conclusions:

(a) The immunoelectrophoresis (IEP) test based on the presence of the echinococcus granulosus-specific arc 5, is recommended for the laboratory diagnosis of the disease. To date, more than 400 positive tests have been surgically confirmed as hydatid disease and no false positives have been recorded.

(b) The indirect hemagglutination (IHA) test using tanned red cells was found to be superior to the glutaraldehyde, formol, and benzidine IHA tests because of its higher reproducibility and lower rate of nonspecific reactors.

(c) The latex agglutination test developed at the Center was as sensitive as the IHA test and is more specific.

(d) The Casoni skin test is not recommended for use in the diagnosis of hydatidosis because of its inherent nonspecificity. Furthermore, negative Casoni reactors, which can be immunologically confirmed by the IEP test, are lost if the decision to select patients for further study is based on a positive skin test.

(e) A screening study should not be based on the use of one technique alone: IEP-positive hydatid cases may be negative in either or both the IHA or latex tests.

Further studies are recommended to determine which techniques are most suitable for seroepidemiologic studies: the degree of antigenic variability of hydatid fluid antigens from different host sources for use in the IHA and latex tests; the applicability of hydatid serology to reveal the presence, after surgery, of other cysts arising from newly-acquired or disseminated infections; and the antigens and antisera that are most suitable for use as reference materials. Similar studies on the relative merits and limitations of immunodiagnostic tests for other parasitic diseases are necessary.

Studies at PAZC are being conducted in collaboration with institutions in several Latin American countries, thus stimulating interest in hydatid disease and channeling the latest research findings to workers in the field, which greatly facilitate the solution of problems presently encountered in the diagnosis and control of this disease.

The Committee thought highly of this work and was convinced of its ultimate importance. Questions were raised concerning differences

in immunologic reaction between subjects with hepatic cysts and those with pulmonary lesions. Lesions in the liver produced a greater immunologic response but those in the lung were detectable by X-rays. Cysticercosis did not produce arc 5 on electrophoresis. Despite its arc 5 specificity, however, the immunoelectrophoretic method could not be regarded as practical for survey work.

13. Some practical applications of the investigations performed at the Latin American Center of Perinatology and Human Development during the last four years

From the various lines of research accomplished in CLAP only those having direct clinical applications to the management of labor were reported. They were presented as concrete recommendations aimed at minimizing trauma and asphyxia of the fetus during labor. Most of the recommendations emphasized that maneuvers and medications that are unnecessary in the management of normal labor, and sometimes harmful to the fetus, jeopardize the future health and normal development of the child. The prevention of such iatrogenic effects will improve the quality and reduce the cost of the management of normal labor.

The first and most important recommendation was that if labor is progressing normally fetal membranes should not be artificially ruptured until full cervical dilatation has been reached.

In a collaborative study with six maternity hospitals in Latin America it was shown that in 80 percent of 238 women studied the membranes did not rupture spontaneously until the end of the first stage of labor. Early amniotomy alters the physiological timing of this process.

In the group subjected to early amniotomy there was a significantly higher incidence of caput succedaneum and malalignment between the cranial bones of the neonate. These anomalies were minimal when membranes ruptured only a few minutes before delivery.

The protrusion of the parietal bone in relation to the occipital and frontal bones, when it is very marked, may cause rupture of the cerebral falx and of the tentorium cerebelli, meningeal hemorrhage and brain lesions. These are present in 16 percent of autopsies performed on early neonatal deaths. Cephalic deformation of the fetus is augmented during each uterine contraction because the pressure exerted on the equatorial zone is greater than on the vertex. This pressure difference increases if the membranes are ruptured.

Cephalic deformation stimulates the vagus nerve and causes a transient fall in fetal heart rate (FHR). This fall is simultaneous with the corresponding uterine contraction (Type I dip). Following early amniotomy the percentage of uterine contractions causing Type I dips is significantly higher than it is when there is late rupture of membranes. Engagement of the fetal head in the pelvis increases the incidence of Type I dip, and again the effect is more marked when membranes have ruptured.

In fetuses having loops of the umbilical cord around the neck or shoulder, amniotomy facilitates the occlusion of the cord and causes a marked fall in FHR. If the occlusion lasts more than 30 seconds fetal hypoxia may occur.

The time needed to dilate the cervix is reduced by early amniotomy. Since intrapartum amniotomy does not increase uterine contractions it is postulated that the acceleration of labor produced by amniotomy is due to the naked fetal head acting as a semisolid wedge which is more efficient for dilating the cervix than the bag of waters. This interpretation is compatible with the finding that, within the group with early amniotomy, the labors of shortest durations resulted in the highest incidence of caput succedaneum and cephalic deformation. Acceleration of labor is thus obtained at the expense of increased trauma to the fetal head.

A further recommendation is that oxytocin should not be administered to accelerate labor when it is progressing normally, since this acceleration is potentially dangerous to the fetus, particularly in high-risk pregnancies.

There are indications that in such pregnancies fetal tolerance to uterine contraction may be lower than in normal fetuses.

In addition it is recommended that oxytocin should be employed only when the progress of labor is arrested or abnormally slow due to weakness or low frequency of uterine contractions. In such cases the dose of oxytocin should be designed to produce the least uterine activity consistent with promoting the progress of labor. Consideration must be given to factors that influence the uterine response to oxytocin such as gestational age, parity, prolongation of the pregnancy beyond term, and the presence of polyhydramnios.

#### 14. Inter-American biomedical communications network

Assessing the experience of the PAHO Regional Library of Medicine over the past 8 years lends perspective to the feasibility and probability of an inter-American biomedical communications network. In the light of the current status of RIM and the staggering needs of biomedical libraries in Latin America, there is an urgent need for such a network. The actual development of the network will depend, however, upon a number of factors; the interrelationship of RIM to medical and library communities in Latin America, the supportive role of governments, and the allocation of resources. There are several practical problems in strengthening basic collections, training people, and increasing the awareness and sensitivity of the medical community to the potentialities of modern information handling. There are also problems external to medicine and related to transportation, postal service, and telecommunications which represent the technology or the mechanism of information transfer.

As the ACMR took the first step in recommending a Regional Library of Medicine, it should now begin to consider what actions in the next 10 years will significantly improve biomedical communications in Latin America. The question must be asked as to whether one regional library can serve the needs of all Latin American countries.

Perhaps such a network should be approached in the following way: A number of resource centers that are not at the broad international level of RLM, nor at the national level, could provide services within a geographic area and be related to both RLM and national institutions. The network would depend upon available resources and the determination as to what constitutes an effective balance between centralization and decentralization of functions and services.

15. Regional advisory committee on computers in health

At the last meeting of the Regional Advisory Committee on Computers in Health, a wide range of topics was covered; the official report of the Committee should be published later this year.

There were two essential aspects of the discussion on education and training. These were the teaching of biostatistics and computer science to medical personnel and the role of computer-aided-instruction to accomplish this. One of the recommendations of this Regional Advisory Committee was to review some successful applications that could possibly be exported to schools of public health and medicine in Latin America.

A film was shown to illustrate: (a) an elementary sampling theory; (b) a random sampling on physiological measurements, and (c) sampling distributions of two means on physiological measurements from blood cholesterol level data.

16. NIH-sponsored research on computer applications in the life sciences

The National Institutes of Health (NIH) has sponsored the use of computers in life science research since the early 1960s. Initially, almost all expenditures supported general purpose, batch-processing systems in medical schools and other research centers. Over the years,

there has been a marked trend toward special purpose rather than general purpose installations. This represents in part the emergence of reliable commercial data processing installations outside the health area and in part the evermore complex and sophisticated demands of life scientists (e.g. for "on-line, real-time" capability). Any group in the Americas involved in establishing and operating health computer centers can expect to be faced with this pattern of evolution.

NIH-sponsored activities also have spawned the minicomputer revolution in the United States and, in so doing, have opened an array of new opportunities for computer applications to health problems. It is now possible--and economically feasible in many instances--to dedicate a minicomputer to a highly circumscribed task in a basic research or clinical situation (e.g. radiation dosimetry, clinical laboratory automation). Without having to face a large number of medical computing problems simultaneously in order to justify a large computer center, medical scientists can now concentrate on one or more specific problems of their choice, dedicate a machine to that activity, and do so at relatively low cost.

In view of the intention of PAHO to introduce a program using minicomputers for self-instruction in Brazil, the Committee was gratified to be informed of these new advances and the availability of minicomputers at cost of only \$2,000 to \$3,000.

17. International symposium on the control of lice and louse-borne diseases

The problem of typhus and possibly other louse-borne diseases is underestimated by usual reporting systems because these problems are now largely confined to economically underdeveloped parts of the world where the means for recognizing disease are inadequate. Potentially, the threat of typhus is almost worldwide. Information is developing to indicate that there is a threshold of lousiness below which transmission of typhus from Brill-Zinsser disease is unlikely. Hence, eradication

of lice is not necessary to achieve typhus control. Control of lice by insecticides may be very effective in acute, short-term situations but has limitations in long-term control of endemic lousiness. Resistance of lice to insecticides is an increasing problem. Health education and economic development and incentives may aid long-term control. Control of typhus should be a balanced, coordinated program drawing upon all available methods, including chemotherapy, immunization, and health education, as appropriate in each instance and as determined by analysis of the specific problem.

The Committee believed that academic institutions owed a debt to PAHO for producing monographs that have become standard texts and reference sources for diseases of this sort. Because it was out of sight in many countries typhus tended to be out of mind and it was necessary to be reminded of its great potential danger. Lousiness had increased in recent years but a distinction should be made between head lice, pubic lice, and body lice since it is the latter that are to be feared. Chemotherapy was highly effective in the treatment of the disease, but before it can be instituted in remote communities several lives may be lost in an outbreak of typhus; for this reason despite the fact that antibiotics to destroy rickettsia could no doubt be found, the development of a vaccine would be of great value. It was agreed that there is an urgent need to disseminate knowledge of typhus among public health workers as well as susceptible populations.

18. Selection of topics for the special session  
of the thirteenth PAHO/ACMR meeting

After considerable debate it was decided that two symposia be included in the agenda of the next meeting of the PAHO Advisory Committee on Medical Research.

The first, which would occupy a full day, would be entitled Problems of ecology and pollution in Latin America. The Secretary agreed to write to Committee members giving further details as the plans for this symposium developed.



The second *symposium*, to which one half day would be devoted, will cover the subject of public health. A tentative title, Objectives of schools of public health in the development of health care in the region would be submitted for the consideration of outside experts who would be invited to organize the *symposium* with the advice of Drs. H. Groot and T. Weller. Dr. M. Wegman was suggested as an appropriate organizer.

The Thirteenth Meeting of the PAHO Advisory Committee on Medical Research has been tentatively scheduled for 24-28 June 1974.

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Pan American Health Organization

TWELFTH MEETING OF THE  
ADVISORY COMMITTEE ON MEDICAL RESEARCH

Headquarters Building  
Conference Room B  
Pan American Health Organization  
525 Twenty-third Street, N.W.  
Washington, D.C.

25-29 June 1973

AGENDA

Monday  
25 June

- |           |  |
|-----------|--|
| 9:00 a.m. | 1. Opening of the meeting - Chairman: <u>J. C. Waterlow</u>  |
|           | 2. Introductory statement - <u>A. Horwitz</u>  |
|           | 3. Review of selected topics in nutrition  |
| 9:20      | 3.1 Methods of surveillance for assessment of nutrition and health status - <u>A. E. Schaefer</u> (20 min) |
| 9:40      | Discussion   |
| 10:00     | 3.2 Collaborative study on iron absorption in nine centers - <u>J. Chopra</u> (20 min)                     |
| 10:20     | Discussion   |
| 10:40     | C o f f e e  |
| 10:55     | 3.3 Studies on iron-deficiency anemia in Central America - <u>F. Viteri</u> (20 min)                       |
| 11:15     | Discussion   |

- 11:35 a.m. 3.4 Evaluation of the nutrition education program  
in Jamaica - A. C. K. Antrobus (20 min)
- 11:55 Discussion
- 12:15 p.m. L u n c h
- 1:45 p.m. 4. Symposium on medical auxiliaries - Moderator:  
to T. H. Weller (for details, see page 8)  
5:30 p.m.

Tuesday  
26 June

- 8:45 a.m. 5. Symposium on the organization of medical research -  
to Moderators: J. C. Waterlow and P. P. Cohen  
5:30 p.m. (for details, see page 11)

Wednesday  
27 June

- 8:45 a.m. 6. Research activities in the Trinidad Regional  
Virus Laboratory - M. C. Williams (20 min)
- 9:05 Discussion
- 9:25 7. Surveillance and research on infectious diseases  
along the Trans-Amazon Highway - F. P. Pinheiro ✓  
(20 min)
- 9:45 7.1 Leishmaniasis of the New World - R. Lainson ✓  
(20 min)
- 10:05 Discussion
- 10:35 C o f f e e
- 10:50 8. Needs and opportunities for research on Chagas'  
disease in Brazil - C. E. Gordon Smith (20 min)
- 11:10 Discussion

9. Review of the activities of the PAHO/WHO Immunology Research and Training Centers
- 11:30 a.m. 9.1 São Paulo - O. G. Bier/I. Mota (20 min)
- 11:50 9.2 Mexico City - J. Kumate (20 min)
- 12:10 p.m. Discussion
- 12:30 L u n c h
- 2:00 10. Immunodiagnosis of parasitic diseases with emphasis on hydatidosis - M. Varela Díaz (20 min) ✓
- 2:20 Discussion
- 2:40 11. Progress report on the research activities at the Latin American Center for Perinatology and Human Development - R. Caldeyro-Barcia (20 min)
- 3:00 Discussion
- 3:30 C o f f e e
- 3:45 12. Progress report on the inter-American biomedical communications network - M. M. Cummings (20 min)
- 4:05 Discussion
13. Reports on current and future research and scientific meetings
- 4:25 13.1 Regional Advisory Committee on Computers in Health - L. Hayward (15 min)
- 4:40 13.2 NIH-sponsored research on computer applications in the life sciences - W. F. Raub (20 min)
- 5:00 Discussion
- Thursday  
28 June
- 9:00 a.m. 13.3 International Symposium on the Control of Lice and Louse-Borne Diseases - C. L. Wisseman (20 min) ✓

9:20 a.m.

Discussion

9:40

14. Selection of topics for the special session  
of the Thirteenth PAHO/ACMR Meeting

10:25

C o f f e e

10:40

15. Other matters

12:00 noon

L u n c h

2:00 p.m.  
to

16. Preparation by the Rapporteurs of the meeting's  
report

5:30 p.m.

Friday

29 June

10:00 a.m.

17. Committee's recommendations

12:00 noon

18. Closure of the meeting

PAHO ADVISORY COMMITTEE ON MEDICAL RESEARCH

Dr. Hernan Alessandri  
Ex Decano, Facultad de Medicina  
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Santiago, Chile

Dr. Eugene J. Aujaleu\*  
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Paris, France

Dr. G. Malcolm Brown  
President, Medical Research Council  
Ottawa, Canada

Dr. Carlos Chagas  
Diretor, Instituto de Biofísica  
Universidade Federal do Rio de Janeiro  
Rio de Janeiro, Gb, Brasil

Sir Ernst Chain  
Professor, Department of Biochemistry  
Royal College of Science  
London, England

Dr. Bertram Cohen  
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Dr. Philip P. Cohen  
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Caracas, Venezuela

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Dr. Thomas H. Weller  
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Secretary

Dr. M. Martins da Silva  
Chief, Department of Research  
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\*Unable to attend

TWELFTH MEETING OF THE  
ADVISORY COMMITTEE ON MEDICAL RESEARCH

Participants

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Pan American Health Organization

TWELFTH MEETING OF THE  
ADVISORY COMMITTEE ON MEDICAL RESEARCH

Headquarters Building  
Conference Room B  
Pan American Health Organization  
525 Twenty-third Street, N.W.  
Washington, D.C.

25-29 June 1973

AGENDA

SYMPOSIUM ON MEDICAL AUXILIARIES

Moderator: Thomas H. Weller

Monday

25 June

- |           |   |
|-----------|---|
| 1:45 p.m. | 1. Introductory remarks - <u>T. H. Weller</u> (10 min)  |
| 1:55      | 2. Auxiliaries in the health team -<br><u>N. R. E. Fendall</u> (25 min)   |
| 2:20      | 3. Review of current utilization of medical<br>auxiliaries by national or regional health<br>agencies - <u>D. Flahault</u> (25 min)       |
| 2:45      | Discussion  |
| 3:05      | C o f f e e   |
|           | 4. Analytical reports illustrating the methodology<br>and benefits achieved through utilization<br>of medical auxiliaries in the Americas |

- 3:20 p.m. 4.1 Techniques of utilization of medical auxiliaries and analysis of benefits achieved in the delivery of primary medical care in a rural Indian village in Guatemala - J. P. Habicht (15 min)
- 3:35 Discussion
- 3:45 4.2 The control of neonatal tetanus in rural Haiti through utilization of medical auxiliaries - W. Berggren (15 min)
- 4:00 Discussion
- 4:10 4.3 Methodology and results achieved through use of medical auxiliaries in a child health program in an urban community in Colombia - A. Aguirre (15 min)
- 4:25 Discussion
- 4:35 4.4 Training and utilization of dental auxiliaries in Jamaica - G. Gillespie (15 min)
- 4:50 Discussion
- 5:00 4.5 Utilization of auxiliary personnel in a tuberculosis-control program in Brazil - E. Faria Alvim (15 min)
- 5:15 Discussion
- 5:25 Concluding remarks - T. H. Weller

SYMPOSIUM ON MEDICAL AUXILIARIES

Participants

Dr. Alfredo Aguirre  
Department of Pediatrics  
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Miss Ermengarda M. J. de Faria Alvim  
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Dr. Jean Pierre Habicht  
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Pan American Health Organization

TWELFTH MEETING OF THE  
ADVISORY COMMITTEE ON MEDICAL RESEARCH

25-29 June 1973

AGENDA

SYMPOSIUM ON THE  
ORGANIZATION OF BIOMEDICAL RESEARCH  
IN LATIN AMERICA

Tuesday, 26 June 1973

Moderators: John C. Waterlow and Philip P. Cohen

The Symposium on the Organization of Biomedical Research in Latin America will provide guidelines for strengthening the Pan American Health Organization's program in support of research in the health sciences in Latin America by allowing participants to discuss frankly the successes and failures in their own experiences in this field.

The moderators will be John C. Waterlow, from 8:45 a.m. to 12:30 p.m., and Philip P. Cohen, from 1:45 p.m. to 5:30 p.m. They will pose questions, such as those overleaf, for discussion by a panel of four people and by members of the Advisory Committee on Medical Research as a whole. The panel will consist of Drs. Charles V. Kidd and Peter O. Williams and two others--either members of the PAHO/ACMR or of the study group that recently completed a survey of medical research in Latin America (Charles V. Kidd, José Barzelatto, Otto Bier, Philip P. Cohen, Hernando Groot, and Marcel Roche).

Approximately 50 minutes will be allotted to the discussion of each topic. It is hoped that the discussion of each point raised will lead to policy guidelines that can be incorporated in a report to the Director.

## Questions for Discussion

1. National Organizations for Planning and Policy-Making
  - a. National research councils
  - b. National academies of science
  - c. Ministries of health and education: problems and dangers of planning; comparison of structures in Latin America and Europe
2. Principles of Support for Biomedical Research
  - a. Basic versus applied research

Since resources are scarce, can adequate emphasis be given to "basic" research without neglecting "applied" research? How can this dilemma be resolved?
  - b. To what extent should research be planned and commissioned?

Should outstanding investigators be supported regardless of the nature of their research, or should research that contributes to the solution of practical problems be supported even though the scientists involved may not be the best?
  - c. Should resources be concentrated on centers of excellence, or dispersed more widely, to raise the general level?
  - d. What priority should be given to regional collaborative research?
3. Roles of Research Organizations
  - a. How should the roles of universities and of independent research institutes be defined?
  - b. What factors in different countries determine the relative roles of each?
4. Research and Training
  - a. What are the best ways of promoting a career structure for scientists in Latin America?
  - b. Should more or less emphasis be given to postgraduate training?

5. Financing of Research

- a. What are the continuing needs for external financing, and which have the highest priority?
- b. How significant are grants from international sources?
- c. What is the most valuable contribution of international agencies?
- d. What support can be expected from private sources?

6. Scientific Communication

- a. How can scientific societies and journals in Latin America play a more effective part in promoting research?

7. PAHO as an Instrument for Development and Coordination of Research

- a. What elements of the PAHO's program need strengthening?
- b. Are there satisfactory mechanisms for assessing priorities?

SYMPOSIUM ON THE  
ORGANIZATION OF BIOMEDICAL RESEARCH  
IN LATIN AMERICA

Participants and Guests

Dr. José Barzelatto  
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