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POSSIBLE PAHO RESEARCH ACTIVITIES IN CHAGAS' DISEASE

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The threat that Chagas' disease poses to public health in the Western Hemisphere has been a constant source of preoccupation to the Pan American Health Organization and the countries affected by the disease. Though various and rather ambitious control programs exist to cover endemic areas, no effective and safe drugs are available, and eradication campaigns depend on the use of insecticides or on housing improvement. The high cost of the latter measures, coupled with the slow progress achieved in economic and educational developments have hampered the effectiveness of these programs.

The basic control measures continue to be intradomiliary spraying of insecticides. These steps are not, however, devoid of problems as in many areas, resistance to the organochlorines HCH and dieldrin, causes operational problems. Alternative insecticides are generally more expensive.

The consensus therefore exists that present attack measures are inadequate to control a disease whose sylvatic transmission cycle requires constant efforts directed against the domestic cycle.

As the disease continues to take its toll in deaths and disabilities, activities to extend and intensify its control should be increased, even though their efficacy, which ranges from 90 to 98 percent may not be of long duration. It is also evident that without further research investment, future control of Chagas' disease cannot be ensured.

In recognition of the above, the Organization has made repeated efforts to stimulate and coordinate research activities in American trypanosomiasis, by convening meetings and symposia to review current achievements, foster information exchanges among scientists, analyze felt needs and identify areas of ignorance, and make recommendations for future research. Among the most important meetings on Chagas' disease held under the sponsorship of PAHO in the last few years are the Meeting of the Study on Chagas' Disease, which took place at Washington, D.C. on 2-8 September 1969; the

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Study and Planning Meeting of the Chagas' Disease Vector Research Unit, which was held in Maracay on 29-30 March 1973 and in Acarigua, on 31 March of the same year; the Meeting on the Immunology of Chagas' Disease in Mexico City, held in December 1974; the International Symposium on New Approaches in American Trypanosomiasis Research, which was convened in Belo Horizonte, M.G., Brazil, on 18-21 March 1975; and the Symposium on Chagas' disease held in conjunction with the Fifth Congress on Protozoology, last month in New York City.

In 1973, at the request of the Government of Brazil, the Organization sent an Advisory Group on Chagas' disease research to visit several Brazilian institutions engaged in that line of research. The visits, which lasted from 5 March to 1 June, were described in a comprehensive report on Needs and Opportunities for Research on Chagas' disease in Brazil.

As a result of this study, the Organization understood that in addition to promote, coordinate, and advise institutions it needed to support directly ecological, entomological, and epidemiological studies, the need for which had been felt for many years in the absence of systematic studies with an adequate intensity. This measure led to the creation by the World Health Organization of the Chagas' Disease Vector Research Unit in Venezuela whose work plan was designed by the Study and Planning Meeting mentioned above and which is reviewed yearly.

Dr. Tonn, of that Unit, described in detail the research program in progress there, underlying the wide spectrum of problems, but also stressing an aspect of the Unit which is very much appreciated by other research institutions in Venezuela, namely, their constant contact with the field and the link they provide between these institutions and control services. At the same time, because the services were geared to the field, there was a need for collaboration of more specialized laboratories for in-depth studies of the abundant materials it collected. Thus, the Unit became a focus of collaboration among a great number of research workers interested in partial aspects of parasitology, clinical pathology, or epidemiology.

In October 1976, the XXIV Directing Council of PAHO approved Resolution XVII which requests the establishment of a regional program of control and the granting, by the Organization, of a high priority for research in this disease. Resolution XVII also called for an active participation of the WHO Tropical Diseases Research and Training Program.

The Organization is now setting up a cooperative program of research for the improvement of control methods. This program is a multidisciplinary effort involving different Divisions of PAHO which are pooling their technical and administrative resources for a common purpose.

As foreseen by the Directing Council, such a wide program requires an important research component that includes both basic epidemiologic studies for the design of control strategies and the evaluation of the results of their application. These studies will lead to the classification of problems with geographical differences for Chagas' disease, the collection of material for the study of parasite strains, the development of strain banks, and the standardization of strains of the main vector species. Evaluation studies will permit the determination of the frequency, origin, and mechanisms of house reinfestation, and, in some instances, will justify complete studies of natural foci of infection and the eventual need of planning control measures on the natural biotopes, or attempts to intercept their communication with human habitats.

A recurring recommendation from various research need studies has been the creation of subregional research centers to coordinate specific activities in different countries.

The Organization established a Regional Research and Reference Center in Vector Biology and Control by incorporating to the Regional Office the WHO Research Unit in Venezuela. The Center, as already mentioned, has a wide research program on the ecology and epidemiology of the disease, the biology and bionomics of the vectors, the biology and pathogenicity of parasites, the nature and distribution of the reservoirs, and the possible control methods which could interrupt or decrease the

transmission of disease to man. The objective of these studies is to obtain better control and evaluation methods, as well as to develop models on ecological and epidemiological studies which may serve for a better planning and evaluation of control programs.

Within the aim of intercountry technical cooperation, the Organization could promote and coordinate, through the Venezuelan Center, the creation and operation of the subregional centers alluded to earlier. These subregional centers, like the one in Venezuela, should serve as spontaneous focal points for communication among research institutions in the countries of the area and between the latter and the control programs. An important contribution of the Venezuelan Center has been the encouragement and assistance to the technical personnel of the Control Campaign for the publication of their observations and epidemiological studies. In general, technical personnel working in control campaigns gather a considerable amount of observations that are rarely published for lack of time to carry out a complete study and write a scientific paper. These observations are therefore lost when they could be of value. Centers could provide the necessary support to follow up on the studies suggested by field observations and to allow the personnel of the campaigns to carry out more complete epidemiological studies.

According to the different ecological areas, it would be possible to test and evaluate new control methods such as:

(1) The study of the effectiveness of simple modifications of rural housing in eliminating infestations by domestic triatomines under different ecologic conditions. These modifications would include changes in the roofs and walls of houses, using traditional or new construction materials, as well as new building techniques.

(2) The study of cost effectiveness ratios of these measures.

(3) The study of community attitudes as regards housing and their cultural and sociological reasons. Acceptance by the community and their participations in the program and the elaboration of measures to

improve such participation. The primary health services and other programs such as those for the control or eradication of malaria, should serve as vehicles for the promotion of rural housing improvement, distribution of information and materials.

(4) The evaluation of the effectiveness of new insecticides, including the determination of the susceptibility of vector species, the measurement of their residual effect on sprayed surfaces, the selection of application methods, equipment, doses, and treatment periodicity.

(5) Testing and evaluation of new control methods which may become available in the near future, such as biological or genetic control, reservoir control, or methods of environmental modifications which could diminish house reinfestation from sylvatic cycles of transmission.

(6) Developing and testing of integrated control methods incorporating permanent measures of housing improvement and other methods of control, e.g., insecticides.

(7) Promotion of controlled clinical studies with new drugs that may become available.

Up to now, we have analyzed the investigation of epidemiological, ecological, or operational aspects oriented to control methodologies. Nevertheless, in order to be able to develop more effective control methods, it is necessary to make considerable investments in basic research on immunology, chemotherapy, genetics, and biology of vectors, etc.; likewise the improvement of evaluation methods depends on a better diagnosis which will require the identification of the presence of pathogenic T. cruzi in vectors, domestic and peridomestic reservoirs, better diagnostic techniques for human infections, etc. It has been discussed how control programs and subregional research centers may partly participate and collaborate in this type of basic research, which in general, because of its great cause and need for high specialization, has been out of the field of action of the Organization.

In many cases, these objectives could be achieved by establishing effective contacts between field and research workers, as these would welcome a way to give a greater practical aim to their work; in other cases it would be necessary to foster a more active cooperation among them, for the collection of field materials, for example; the establishment of a study area; or the provision of means for research workers to carry out field work. Finally, in other cases it would be necessary to establish a system of research grants with the aim of ensuring that the solution of certain problems is undertaken by the institutions better suited for these activities.

At present, PAHO uses the WHO Tropical Research and Training Program to promote and sponsor research projects. The Scientific Working Group on Chagas' Disease will meet for the first time in Buenos Aires in November 1977.

Finally, training programs in the different fields required by the control and research programs must be set up, not only for the development of control methods, but particularly for the organization of the research components and the development of human resources needed for broader investigations in countries. The Research and Reference Center in Vector Biology and Control will be a key resource in this activity.