

# EDUCATIONAL APPROACH IN THE CONTROL OF CHAGAS' DISEASE<sup>1</sup>

Walter B. Petana, M.Sc., Ph.D.<sup>2</sup>

*Chagas' disease is a serious and lamentable health problem affecting several million people in Latin America. Because the infection is spread almost exclusively by blood-sucking reduviid bugs living in peoples' homes, the most obvious means of control is to break up this pattern of cohabitation. Therefore, extensive long-term education programs are needed to alert rural populations about the danger, to promote basic preventive measures, and to provide information about how to improve housing conditions. Right now, these are clearly the most appropriate tools at hand for controlling this scourge of mankind.*

## Introduction

Since its discovery in 1909, Chagas' disease (American trypanosomiasis) has featured prominently among the parasitic diseases of man in many Latin American countries. Only two decades ago this disease was still assumed to be a rarity and a pathological curiosity. That assumption, however, has since been disproved. An apt new description of the infection by Köberle in 1968 carried the following serious warning:

*"Advances in our knowledge of American trypanosomiasis during the last fifteen years have reoriented this illness from an exotic and rare disease into the most frequent and dangerous plague of the American continent." (1)*

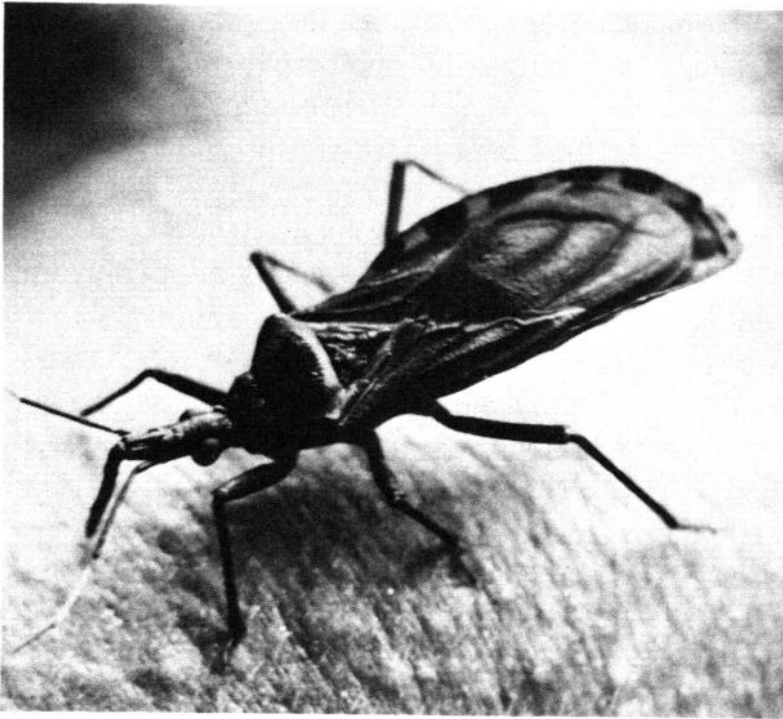
Since this situation became known, researchers in the various affected countries have gathered a great deal of useful information

about the disease. Their work has provided important data on the wild animal reservoir hosts of the agent, *Trypanosoma cruzi*, and on the distribution and ecology of the reduviid bug vectors. It has greatly enhanced our knowledge of the pathology and pathological anatomy of the illness. And, through large-scale serologic surveys, it has provided and continues to provide valuable data on the disease incidence among human populations. Progress has also been made in the area of control, by using insecticides to partially eradicate the vector bugs from human dwellings. Nevertheless, we are still missing two key ingredients—an effective non-toxic drug to use against the parasite, and a way of achieving more thorough and permanent eradication of the reduviid vectors from human habitations. It is the simultaneous lack of both of these which constitutes the chief obstacle to effective control.

The greatest drawbacks to the implementation of preventive measures are poverty, poor housing, unhygienic conditions, and, above all, the ignorance of the affected populations regarding the presence of reduviid bugs in their homes and the association between these bugs and the disease. These factors are under-

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<sup>2</sup>Medical Parasitologist, Department of Preventive Medicine, Division of Infectious and Parasitic Diseases, Medical School of the Federal University of Rio de Janeiro. Consultant on assignment to Brazil from the British Ministry of Overseas Development, London, under the Anglo-Brazilian Agreement on Technical Cooperation.



LEFT: *Triatoma infestans*, vector of Chagas' disease, feeding on a human subject.

BOTTOM: Victims of *T. infestans*. These three children, photographed in front of their mud house in 1971, were found to be infected with *Trypanosoma cruzi*. The two dogs were also infected. A total of 169 *T. infestans*, many carrying *T. cruzi*, were captured inside the house. The family subsequently moved into improved quarters, and other infested houses in the neighborhood were treated with insecticide to clear them of the bugs.



stood by the public health authorities of the countries concerned, and have in the past been discussed at length during several international conventions on Chagas' disease.

### The Educational Approach

A few years ago, the urgent need for an educational approach to control of the infection, together with certain recommendations for implementing such measures, were discussed in Washington, D.C., by a PAHO-sponsored Study Group on Chagas' Disease (2). The group emphasized that community cooperation was absolutely essential for introducing control measures against domestic reduviid bugs, creating better housing conditions, and improving general hygiene; and, in fact, experiences in Brazil and Argentina did show that community cooperation helped greatly in coordinating sanitary and prophylactic measures used to combat the disease among the local population.

On the other hand, despite the urgent need to free many millions of homes from the health risks posed by these unwholesome insects, there is little concrete evidence that public health and educational authorities have become fully aware of the overall need to adopt an educational approach to this problem. While the statistical figures on the incidence of Chagas' disease have tended to rise steadily, and alarming data about the rates of *T. cruzi* infection in domestic reduviid bugs have been received from many parts of Latin America, public ignorance of the danger persists, along with housing conditions that encourage the disease. It is relevant to note here that many of the endemic areas affected make a vital economic contribution to their countries in the form of agricultural products that are needed to supply urban zones, a fact which further emphasizes the importance of assigning the problem high priority.

The PAHO Study Group on Chagas' Disease (2) recommended various educational approaches for combating the infection, and it is appropriate that some of these be described here, together with additional suggestions.

One important point is that elementary schoolteachers can make a vital contribution to securing effective community participation, since they are in close touch with the affected population. Thus, it may be a considerable help to prepare an inexpensive explanatory booklet on Chagas' disease for distribution to teachers in rural areas, so that they can acquaint themselves with the basic facts. Such a publication should include elementary information on reduviid bugs and their biology, a simple description of their role as blood-suckers and transmitters of Chagas' disease inhabiting human dwellings, and some basic ideas about prophylactic and hygienic measures. The presentation of these facts should be simple but forceful. The insects, for example, should be referred to by their local names instead of by the names or symbols reserved for them in zoological nomenclature.

It would also be helpful to display posters—in schools, railway stations, and other public places—that would show the bug and provide a short and meaningful caption about its importance as an enemy to public health. Schoolchildren should be encouraged to tell the teacher about the presence of reduviid bugs in their homes, so that the teacher can pass the information to the appropriate public health authorities. This would pave the way for inspection of the suspect dwelling and for spraying with an effective insecticide if the infestation were confirmed.

Providing schoolchildren with basic knowledge about Chagas' disease may be more important than educating the adult population. That is because a child is often able to convey the message more vividly and convincingly to the parent than is the more

sophisticated educator, who may not be well-acquainted with the often simple and conservative ways of people in rural areas.

A short and informative radio series about the disease and its prophylaxis should also be included in the educational program. This informative measure can be highly effective, since the radio is a popular entertainment medium and is often the only type of mass communication that effectively reaches the rural population.

In some countries, government-sponsored mobile movie theaters provide free entertainment for the rural people. As these theaters tend to attract large audiences, they could be used quite effectively for showing an appropriate short film on Chagas' disease. In general, any large rural gatherings, including church meetings, should be used for wholesale education of the people.

The extent of community participation in these educational programs, and the degree to which the message is understood and acted upon, will depend largely on the effectiveness of the specific approaches and presentations employed by local and national public health and educational authorities in each case.

### The Housing Problem

Amelioration of the housing problem is a more difficult task. Most dwellings in rural parts of Latin America have traditionally been made from locally available materials, and no doubt this practice will continue for a long time. As a rule, walls are constructed of wooden or bamboo frames and wall spaces are filled with an earth and water mixture to which dried grass is sometimes added. The mud invariably shrinks on drying, producing numerous cracks that offer an ideal hiding place for reduviid bugs. The roofs of most houses, which consist of thatch made with palm leaves or dried grass, also offer an ideal refuge for the bugs, as well as for wild animals (such as opossums

and rats) that sometimes make their homes there. These two animals in particular are known to be natural reservoir hosts of *T. cruzi*, so that it is very possible for the infection to spread from the animals to the bugs, and later from the bugs to the people when the infected bugs move from the roof into the lower parts of the house.

The opinion of the PAHO Study Group was that the physical condition of housing plays an important part in the control of Chagas' disease. Noting that substandard housing is essentially a manifestation of underdevelopment, the Group agreed that Latin American countries should adopt a realistic policy in dealing with this problem.

Efforts to make across-the-board improvements in housing conditions invariably require long-term policies and investments before effective results can be achieved. Since the budgets of most developing countries are already overburdened, it is doubtful that much overall improvement in rural housing conditions can be expected for some time. Because of this, it is important to seek inexpensive alternate ways for improving the health conditions in simple rural houses constructed along traditional lines.

Although considerable experience has been gained in eliminating reduviid bugs with insecticides, this method should not be considered the ultimate way of overcoming disease-prone housing conditions. Among other things, none of the substances currently available fulfill all the requirements of an ideal insecticide—namely, low cost, rapid action, satisfactory residual effects, lethal effects on reduviid eggs, and low toxicity for man and other vertebrates.

Since it is impossible to halt the construction of mud houses in many rural parts of Latin America, consideration should be given to improving the building style of these traditional dwellings of the poor. In particular, eliminating the cracked walls which make ideal hiding places for the bugs is of primary importance. This can be done by

applying a plaster made from fine earth and water over the cracked inner and outer walls; alternatively, a plaster mixture that lasts better and gives a cleaner appearance can be made from sand and cement mixed with water. The plaster, apart from sealing the cracks, makes the house more hygienic and cleaner-looking, and provides a fairly good barrier against infestation with reduviid bugs. Sometimes small cracks will appear after the first application of plaster, especially if the plaster contains only mud and water and if the region has a very hot climate. It will then be necessary to apply a further layer of plaster later on to make the seal effective.

The building section of the government public works department could make a strong positive contribution here by experimenting with various plaster mixtures and passing information about the most effective to rural communities. If cement is found to be an essential ingredient, the government should consider providing this free, or at a very nominal sum, to needy citizens (one 50 kg bag of cement usually suffices to make all the plaster needed to cover the inside and outside walls of the average house). This method of improvement should not be considered an ultimate answer to the poor housing problem. However, until more hygienic accommodations can be provided on a large scale, this method—as well as any other temporary measures available—should be considered and actively employed to diminish the health problem posed by inferior housing.

Most people in rural areas prefer thatched roofs to ones of zinc or galvanized iron, feeling that thatched roofs minimize the heat inside the house while metal roofing has the reverse effect. There is no doubt that the bugs will continue to live and breed in the thatched roofs after the walls have been smoothed and all crevices in them sealed. However, the insects must descend the walls at night to feed on the sleeping occupants and must return to the roof after their blood

meal. Therefore, spraying the walls with a residual insecticide will expose the bugs to insecticide twice during their journey, and should progressively diminish their numbers.

Unfortunately, the insects may find places besides the walls and roof that can provide refuge. In fact, any dark and untidy part of the house will serve as a hiding place. It is therefore of the utmost importance that community schools and adult education courses provide instruction in domestic and personal hygiene.

In addition, the government should seriously consider making it compulsory for homeowners to report the presence of reduviid bugs in their dwellings. Besides providing basic information about local infestations, such reporting would tend to make the community more aware of the problem and would make it harder to regard the presence of the bugs with indifference.

### Conclusion

Although Chagas' disease is termed the "plague of the poor and ignorant," poverty need not be a barrier to clean living. Ignorance, not poverty, has until now been the greatest obstacle to control of the disease, and the proliferation of infection has been due not so much to lack of a cure as to lack of basic health education. In fact, even if an effective drug were currently available, it is doubtful that transmission of the disease would be greatly reduced.

Although certain aspects of the malady are of international importance, education of the communities involved and implementation of basic control measures are and will remain within the sphere of activity of the individual countries involved. This makes it especially important that the public health and education authorities of each affected country play an active role in implementing programs to control Chagas' disease, and that they confront the existing difficulties with determination and without despair.

### SUMMARY

The serious threat posed by Chagas' disease demands an urgent and realistic approach to controlling the infection in multitudes of affected Latin American communities. Education is undoubtedly the best current means available for combating widespread public ignorance, both of the threat posed by reduviid bugs and of the association between the bugs and the disease. Especially high priority should be given to informing schoolchildren about the disease and to providing adults with an appropriate education

on elementary hygiene and advice about how to make their homes secure against reduviid bug infestations. In general, the obstacles to control of Chagas' disease do not involve lack of a cure so much as lack of public awareness and education. A need thus exists for public health and education authorities to take an active interest in the implementation of control programs, and to make a determined effort to overcome existing difficulties by means of an educational approach.

### REFERENCES

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