

Social and epidemiological determinants of Chagas disease: basic information for a surveillance and control policy in the Southern Cone

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1. Which are the neglected or emerging aspects in the discussed issue that need information and additional knowledge for the formulation of a policy for surveillance and Chagas disease control?

Vector control - There are two recognized basic strategies for vector control and prevention of Chagas disease. The first one is the destruction of intra and peridomestic foci of triatomines through chemical control with insecticides and the other is to avoid the installation of vectors inside dwellings by improving housing conditions and/or using tools of early detection of triatomine populations that make possible their prompt elimination (Schofield 1985, 1992, Schofield & Dias 1991, Rojas de Arias 1995, Rios 1997, Rojas de Arias et al. 1999, 2005).

The first strategy currently leads initiatives of triatomine elimination in the countries of the Southern Cone and Central America focused in the application of insecticide mass campaigns with different modalities according to the country's plans. The latter is focused in the establishment of a surveillance program in the hands of the communities themselves and case-finding with tools of early detection of triatomines in order to avoid reinfestations. This surveillance phase implies monitoring and supervision with technology transfer that should give sustainability to the actions. Additionally, there is the fundamental importance of the coverage and quality achieved in the application of insecticides and the durability of their effect at different post-application times (Diotaiutti & Texeira Pintos 1991, Gurtler et al. 1994, Ferro et al. 1995, Rojas de Arias 1995, 2004, 2005, Guillén et al. 1997). The surveillance phase is longer, expensive and difficult to maintain (Paulone et al. 1988). Besides, there are neglected aspects that need additional knowledge. The massive insecticide application has recently shown the presence of populations with important levels of resistance in the North of Argentina and Southern Bolivia. The mechanisms that have triggered this resistance are still unknown, as well as the approach systems for control measures and if the phenomenon is

present in other regions where massive chemical control has been applied. On the other hand, there are few studies that have been performed about the remaining aspects of the early detection of triatomine populations, especially in the peridomestic area and the technology development of new tools that permit the early detection and timely elimination.

An important advance in entomological surveillance has been the incorporation of the geographic information system (GIS) for the location of triatomine infestations, reinfestations, species distribution, and intervention monitoring. This tool has made possible a broader and more dynamic vision of the behaviour of triatomine populations impacted by control measures. It has also shown the behaviour of species that play an important role as secondary species.

In recent years, there has been much progress in vector genetics and potential vector species. The application of techniques of advanced cytogenetics, molecular biology, cuticle hydrocarbons, and biological studies of structure, conformation and sensillas, have contributed to the knowledge of different species, especially in the Southern Cone, where the actions and studies are in more advanced stages (SSA-EC 2005). However, potential vector species still remain to be known as well as the variability of the populations in relation to the impact of the chemical control.

Transplacental and transfusional transmission - Concerning other modes of transmission, although a process of vector elimination will give a significant impact on the transmission of Chagas disease, the transfusional and congenital transmissions that are independent of this should be addressed in a public health context by the regional health services. For congenital transmission, the control of chagasic pregnant women and the monitoring and treatment of their infected children should be considered (Russomando et al. 1998). However, there are not simple and economically accessible techniques that would make possible to discard a congenital Chagas infection at birth time in those children where parasitological infection is not detected. The screening in blood banks has been established in all Latin American countries using diagnosis methods with high sensitivity and specificity but sustainability must be guaranteed.

Social aspects - The socio-cultural dimension of Chagas disease is undeniable because there is an association between the forms of social organization and precarious lifestyles. For this reason, it is necessary to stem from a conceptualization of health-disease as well

as of a socially adapted relation (Briceño Leon 1990). The disease, due to its asymptomatic character and its long-term appearance of symptoms, appears as a non-existent disease that hinders the establishment of the risk among the exposed individuals and consequently delays the execution of preventive measures. The incorporation of the populations at risk in a participatory model where their housing and health conditions become evident could be guaranteed by an educational component that socially represents the disease.

Aspects that still are unknown are those related to the knowledge level of the population about the disease and permanence of the infestation inside their dwellings. Why the expected change of behaviour does not occur in aware populations? The gender approach in the prevention and control policies is little disseminated. Although the disease affects men and women equally, the multiparity of women together with their poor diet and their domestic and agricultural forced work contribute to their physical deterioration during pregnancy, and in some cases to the reactivation in the chronic phase of the disease (Rosner et al. 1990). Chagas disease does not exist for the rural woman, the vector converts itself in the only visible link with the transmission chain because it is troublesome, irritates her and her family, sucks their blood and debilitates them. It is through these assertions that the injury attributed to kissing bugs persists as an immediate event, rather than a fact that could cause a negative future impact in health.

The absence of future sense manifested by the adults with reference to the appearance of the disease lesions is not total, since they considered that the future of their children could be compromised. They manifest a sense of foresight against the disease and its dangers, consulting on the best control measures and prevention of the vector (González-Terlaz 1989). Therefore, the mother-child binomial without doubt is an important element for an approach oriented to prevention measures.

Finally, it is important to point out that in spite of the major advances in the area of health needs of the indigenous population of America, most studies sustain the need of renewing the efforts against serious health difficulties that still persist in several groups. Very little is known about the status of Chagas disease in indigenous populations and the real scenario of the epidemiological situation. Recent studies (CDIA-EC 2004) mentioned the principal and relevant difficulties to address the surveillance systems once *Triatoma infestans* is eliminated: linguistic and family characteristic of the different groups, migration, distances between communities, housing characteristics, and peridomestic areas.

2. What training and technology transfer projects could be developed under specialized supervision for surveillance and control of Chagas disease?

In my opinion, two proposals of training and technological transfer for surveillance and control of Chagas disease could contribute to develop both aspects. One, training of health service personnel in the elaboration of geographic information plans that will make possible to have a more holistic vision of the problem in endemic

areas and allow the monitoring of control measures. This tool applicability can concentrate the efforts on infestation areas that are not detected by regular control programs.

On the other hand, it is required to implement new tools for the early detection of reinfestation that demand a period of technology development and application that is still not reached. An initiative concentrating the tools to be evaluated and certifying their effectiveness would be an important contribution for decision-makers of control programs.

Chagas disease has a great quantity of scientific outputs on different aspects that requires an exhaustive analysis in order to make available all the scientific information compiled in the last 40 years by control programs. Thus, project implementation aimed at the generation of research topics leading to meta-analysis studies that will be available for the decision-makers of different countries could be a fundamental element in training and technological transfer of great importance for surveillance and control of Chagas disease at the regional level.

3. How can training and the technology transfer for the personnel of the different areas of incidence of Chagas disease be done with regard to its epidemiology, social determinants, diagnosis, surveillance, control, and treatment?

The training process should be conceived as a process of strengthening of the local capacities and different levels of training should be proposed, such as: management, health services, community participation, and into the program itself. It is feasible for the initiatives to prepare and implement training systems regionally since they share vectors and similar epidemiological scenarios, which will make possible to structure trainings and technologies that could have an impact on their specific regions. Another characteristic of the training processes that should be considered is their strategic incorporation and integration into other local health programs in order to guarantee the sustainability.

In most Latin American countries there are pathologies that can be jointly addressed using the same local human resources. Therefore, country support mechanisms are required to structure the integration of local programs to meet the common targets. Some countries have put in action this strategy but the set up steps and the results obtained are not known.

4. How could be implemented the dissemination of the information through a program of Internet to be created by ALC+UE Health for surveillance and control of Chagas disease?

The dissemination of successful experiences could be a modality to implement the supply of information at local levels. Online and printed manuscripts responding to the most common questions in control and surveillance areas would contribute to the dissemination of the successful experiences of different groups.

In my opinion, there should be a system of dissemination of information generated in the research centres of easy access to the control programs. The results obtained in the laboratory benches should be applied to the

action field. This process of adaptation is achieved formulating projects planned with this particular orientation since their conception. It is important to notice that the Southern Cone countries have accumulated enough information through their operational research that ALCUEH Network can disseminate. Undoubtedly, this will be a relevant contribution for the entire region.

5. Do the participants of this meeting have the necessary information and feel suitable in order to discuss the programs for surveillance and control of Chagas disease and its needs for the specified regions? Which?

Control programs do not have a unique manual to implement the surveillance in different endemic regions. Currently, there are few control programs that have clear outlines in the surveillance field. This is an expensive, long, and complex phase because it needs community participation with all its sociocultural baggage and level of community development. However, any control program should meet the goal of interrupting *Trypanosoma cruzi* transmission and eliminating or controlling domiciliary vectors.

The epidemiological scenarios can show various situations. However, they can be summarized in scenarios of low, medium, and high pressure of reinfestation with the presence or not of other vector or the participation of potentially secondary vector species. The confluence of one or more of these determinants can show the community profile under surveillance. Consequently, actions should be taken to meet the common targets of interrupting transmission and triatomine elimination. For this reason, the dissemination of the successful experiences previously mentioned could support inactive or unsuccessful activities of the different control programs within the context of surveillance.

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