

Workshop on Epidemiology and Social Determining Factors of Chagas Disease. Basic information for surveillance and control policy in Latin America

Introduction, Regional Context, Precedings, and Recommendations

ALC+UE Health (Alcúehealth) project is a joint initiative between Latin America, the Caribbean, and European Union with the objective of strengthening co-operation and developing a network with knowledge on high priority aspects of public health, through research projects, training programs, and seminars with specialists and experts, with the final goal of transforming knowledge into practice and policies of health.

Chagas disease is a neglected disease related to poverty which affects excluded social groups. It displays intrinsic and extrinsic biological factors with a complex life cycle where vector, human host, and environmental factors affect control strategies.

Extrinsic factors can be altered and it is thought that Public Health multi-disease and interprogrammatic activities within integrated interventions can support and possibly accelerate its prevention and control, especially in usually excluded population groups.

To accomplish this purpose, the Organización Panamericana de la Salud/Organización Mundial de la Salud (OPS/OMS) is developing a strategic plan to prevent and control neglected diseases such as Chagas, considered a priority.

The *Workshop on Epidemiology and Social Determining Factors of Chagas Disease* had the aimed at evaluating its present situation in the Southern Cone, Central America, Andean Countries, Amazon region, and Mexico, with the purpose of obtaining basic data to formulate a surveillance policy and control, which could be used as a model to other emerging infectious and neglected diseases.

The Workshop has also looked into the expansion of the diseases due to international migration, to access to diagnosis, treatment of the infection/Chagas disease in both endemic and non-endemic countries, as well as a strategy on neglected/emerging diseases that affect neglected population groups.

Chagas disease is an endemic vector transmitted parasitic disease with alternative routes of transmission (transfusional, congenital and oral, among others) and whose epidemiology is based on poverty and low quality of living conditions, housing and the environment. It is estimated today that 12 to 14 millions of people are infected.

It is an American pathology, endemic in 21 countries, that causes important morbimortality with different epidemiological determinants according to the ecological, biological, social, historical, economical, and cultural aspects that compose the subregional ecosystem with local characteristics for transmission.

It is an excellent model to design and reproduce strategies of prevention, monitoring, and control directly related to Chagas disease itself as well as to other en-

demical pathologies, as based upon: (a) a complex epidemiology that integrates vectors, reservoirs, population affected or at risk, and several transmission routes; (b) ecological and epidemiological variants with bio-geographically restrictions; (c) social, economic, and cultural factors associated to house and near house-living activities, affecting local population and ethnic groups, local and regional economies, community practices and attitudes, among others; (d) capacity to expand the borders of its endemic areas based on man acting as reservoirs and related to national and international migrations; (e) being a major but neglected disease affecting millions of people; (f) constituting an emergent disease for determined areas in which it was not previously identified, or recurring in areas with increased prevalence as a result of environmental or social changes, or expanding by migration; (g) representing for many countries and agendas a neglected disease, with low priority politically, scientifically or technologically.; (h) being supported, however, by a forceful and coherent scientific community, which contributed to delineate and reinforce visible public health actions in prevention, control, surveillance, and care in all affected regions, with decisive contributions; (i) having generated at national level positive decisions which led to the integration of subregional control projects, known as "Initiatives"; (j) having achieved outcomes of major impact in control and continuously confirming the social responsibility that society has in defending health of large populations at risk.

Since 1991, Subregional Initiatives, supported by the OPS Technical Secretary and subregional programs, were developed aiming at control of Chagas disease in endemic countries.

These initiatives, in coordination with the National Programs, have produced, horizontally, technical cooperation between countries and generated strategies and methodologies for prevention, monitoring, and control. Supported by the participation and contribution of the countries RD scientific community a number of actions took place with results being evaluated, in a coordinated and complementary form.

The following Initiatives are still productive:

1. Southern Cone Initiative established in 1991, integrated by Argentina, Bolivia, Brazil, Chile, Paraguay, and Uruguay, aimed at eliminating *Triatoma infestans* and to interrupt transfusional transmission of American trypanosomiasis.

2. Central American Countries Initiative (IPCA) : established in 1997, integrated by Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama, aimed at interrupting vectorial and transfusional transmission of Chagas disease.

3. Andean Initiative, (IPA) established in 1997, integrated by Colombia, Ecuador, Peru, and Venezuela, aimed at vector control and interruption of transfusional transmission of Chagas disease.

4. Intergovernmental Initiative for the Surveillance and Prevention of Chagas Disease in Amazon (AMCHA), was established in 2004, integrated by Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Peru, Surinam, and Venezuela.

5. Control, prevention and surveillance of Chagas disease in Mexico, since 2003, under the responsibility of the Mexican Health Secretariat, at the National Centre of Epidemiological Surveillance, and Control of Diseases.

PRECEDING AND REGIONAL CONTEXTS

Southern Cone Initiative (SCI) aimed at eliminating *Triatoma infestans* and to interrupt transfusional transmission of American trypanosomiasis

Incosur was the first "Initiative" resulting from a number of scientific events and exhibiting visible achievements on the vectorial and transfusional control of the disease, as carried out in a number of countries. A major effort from the Latin American scientific community was seen, which contributed with their experience and knowledge on strategies for control, associated to major encouragement of policy makers. The role of OPS, throughout this process, in terms of integration, technical support, as well as subsistence in developing a successful programme, was fundamental. Officially, it began in 1991 with the aim of maintaining and consolidating already existing programs (Argentina, Brazil, Chile, and Uruguay) and to definitively initiate other activities and programs (Bolivia and Paraguay, and later on, South of Peru). The main objectives were the control of *T. infestans* (the main resident vector) and to increase serologic coverage of blood donors. As this Initiative progressed, other relevant subjects were associated, such as the control and surveillance of secondary vector species, better care of infected people and attention to surveillance/treatment of congenital transmission.

Central America Countries Initiative (IPCA) aimed at interrupting vectorial and transfusional transmission of Chagas disease

In 1997, at the XIII Reunion of the Central America Health sector (RESSCA) held in the city of Belize, approved a Resolution no.13, stating that the "Control of Chagas disease is a priority activity to Central America countries", with the implementation of a multinational program to interrupt vectorial and transfusional transmission of the disease. The program is known as IPCA and it was launched in October 1997 in the city of Tegucigalpa, Honduras. In collaboration with OPS, the Intergovernmental Technical Commission was created acting as Technical Secretary. This commission followed and evaluated programmed activities in the countries, looking for international co-operation support and participation of non-governmental organizations (NGOs), encouraging exchange of knowledge and experiences aiming at reinforcing prevention and control. Since its foundation, the Intergovernmental Technical commission

of IPCA has organized eight annual meetings, the last being held in Tegucigalpa, Honduras, in December 2005.

The IPCA objectives are: (1) elimination of *Rhodnius prolixus* in Central America; (2) control of intradomiciliary vectorial transmission of *T. dimidiata*; (3) elimination of transfusional transmission of *Trypanosoma cruzi*.

R. prolixus is an introduced species in Central America that can only be found inside houses, making it susceptible to eradication by the commonly application of residual insecticides and entomological surveillance.

On the other hand, *T. dimidiata* is a wild species whose origin is thought to have been the Yucatán Peninsula and that is found all over Central America, both intradomiciliary and peridomiciliary and in urban areas. Its elimination is not possible and control strategies are based on intradomiciliary transmission.

The main achievements of IPCA, since its foundation in 1997 until now, with a major effect on the subregion view of Chagas disease, are the following: (a) significant advances in the accomplishment of IPCA first objective, with the foreseen elimination of *R. prolixus* from Central America; (b) 99% control of transfusional transmission; (c) technical co-operation between countries through TCC/OPS/Chagas/El Salvador/Guatemala/Honduras projects, with the formalization of the "Rules and Regulations for Diagnosis, Treatment, and Epidemiological Surveillance" in the three countries; (d) substantial achievements in the inter-sectorial coordination, strengthening and widening of international co-operation in IPCA member countries, with the support of bilateral agencies, as the Japanese International Cooperation Agency (JICA), the Canadian International Development Agency (ACDI), other multilateral agencies, such as OPS, NGOs such as Medecins Sans Frontieres (MSF) and World Vision (WVI), the European Community with projects "Chagas Disease Intervention Activities" (CDIA) and "American Tripanosomiasis Update" (SSA-ATU), as well as the ECLAT network; (e) widening the etiological treatment coverage area in both interrupted vectorial transmission and low surveillance areas; (f) designing sera-epidemiological diagnostic strategies, entomological surveillance, and collective treatment with community participation; (g) approval of Resolution no. 5 at the XXI RESSCA held in the city of Belize, in September 2005, concerning Chagas disease: "to take responsibility in achieving, within the period of 2 years, a minimal of 50% coverage of *T. dimidiata* vectorial control in endemic regions and to develop a *T. cruzi* universal serological test to be used by all public and private donor blood banks".

IPCA challenges for the near future are: (a) to develop alternative strategies to the control and surveillance of *T. dimidiata*; (b) to carry out surveillance of other triatomines emerging species such as *R. pallenscens*, *T. nitida* and *T. ryckmani*; (c) to maintain 100% coverage of quality control of transfusional transmission with serological tests; (d) to support politically countries with successful measures and help introducing these in others, initiating these activities; (e) to maintain international co-operation support; (f) to develop

entomological surveillance involving community participation; (g) to plan epidemiological surveillance and preventive education; (h) to supply medication and etiological treatment; (i) to assure sustainability of national programs and the Central America Initiative.

Andean Countries Initiative (ACI) to control vectorial and transfusional transmission of Chagas disease

The Chagas Andean Subregional program and the Chagas Andean Initiative are a co-operative activity involving Colombia, Ecuador, Peru, and Venezuela with specific characteristics: (a) a large geographic area widely distributed; (b) it exhibits important eco-biological diversity; (c) biogeographic factors are influenced by latitude and altitude; (d) shows diverse epidemiologic situations of chagasic endemism; (e) there is social, economical, and cultural diversity; (f) ethnic diversity; (g) different peri and intradomiciliary structure and characteristics; (h) diverse *T. cruzi* vectors are implicated in transmission; (i) there are diverse development patterns and control/surveillance programs aimed at Chagas disease.

Although the Initiative, funded in 1997, went already through periods of discontinuity it has given strong support to prevention, control, surveillance, and health care with institutions for Chagas disease, developed by the member countries.

The antivectorial control plan was based on a proposal developed by the Initiative, on operational actions and an approach on sustainable prioritisation of the risk concept.

Some triatomine species of the subregion considered as important epidemiological vectors are feasible of being controlled or eliminated, such as *R. prolixus* (Colombia and Venezuela); *T. dimidiata* and *R. ecuadoriensis* (Ecuador); and *R. ecuadoriensis* and *T. infestans* (Peru) as a consequence of being species strictly associated with antropomorphic constructions.

In what health care of Chagas disease is concerned, namely diagnosis, handling, and treatment of patients, major efforts are needed to optimize the national health system resources, aiming at a better quantification of prevalence, morbidity, and mortality, with improvements of treatment aspects in terms of prescription, opportunity, accessibility, and drug availability.

The main aims of the Chagas Andean Initiative are the control of vectorial and transfusional *T. cruzi* transmission and/or some of its members have been supported by CDIA/EC, SSA/EC, ECLAT, CIDA, TDR/OMS and OPS Technical Secretary.

A interesting feature of the four member countries is that they are part of both the Andean and the Amazon geoepidemiological programs of endemic Chagas disease. As relevant groups and research institutions have already shown collaborative work and with the subregional program it will be easier to develop Chagas disease better organized and coordinated international and horizontal technical cooperation.

The Chagas Andean Initiative is a subregional ongoing project that is a strong reliable tool for member countries to record and validate their advances/goals in an integrity international cooperation program.

Intergovernmental Initiative for the surveillance and prevention of Chagas disease in Amazon (AMCHA)

Transmission of *T. cruzi* to humans was thought not to occur in the large area of the Amazons. It was to be considered an open natural space disease or a result from human activities, and that in shadow areas, such as the Amazons territory, it was constrained to episodic or accidental cases, as a result of incursion of men on the parasite sylvatic cycle. Endemic transmission in domiciliary habitats would have been a consequence of degradation of natural conditions and displacement of vectors and reservoirs from primitive ecotopes now adjusted and adapted to human housing conditions.

Chagasic zoonosis in the Amazons is known since early reports. In 1924, Carlos Chagas identified *T. cruzi* in monkeys of the region. Emergence of the disease was not dependent on domiciliary conditions and transmission patterns seem to differ from those where endemism was already established.

Although big environmental changes and new occupational activities occurred/are occurring in the Amazons, there was no evidence on a domiciliary colonization associated to a transmission pattern, such as in naturally endemic infections.

Only a few vector domiciliations have been reported, in restricted areas of some countries: *T. maculata*, *P. geniculatus*, *R. neglectus*, and *R. stali*.

With rare exceptions, not much knowledge exists on the mechanisms of transmission. These are summarized, as follows: (i) oral transmission by contamination of food with feces, from the infected triatomines themselves or by the contamination with the infected reservoirs, (ii) domiciliary vectorial transmission, without colonization, by the episodic or repetitive incursion of specimens into houses, (iii) extra domiciliary vectorial transmission, by the incursion of people into the forest and by the contact with wild triatomines, as it happens with *R. brethesi*, in the "piaçaba" extraction.

These elements create a particular epidemiological pattern that requires a special approach. This demands that study and development of methods and techniques be adjusted to the different biological dynamics of the parasite, in the region.

Several areas were identified that presented a direct relation between the cumulative risk of *T. cruzi* transmission and people age, which is in conformity with the disease endemic pattern. This situation occurs mainly where *R. robustus*, *R. pictipes*, and *R. brethesi* which are in direct contact with the population, without eliminating, however, the importance of other potentially vector species.

The development of new methods and instruments of surveillance and control should also consider, existing opportunities, represented by established resources, such as the on going surveillance of malaria which affects large populations in the Amazons region, and take into account operational difficulties due to the extension of the territory and its inaccessibility.

There are several documented observations that demonstrate the existence of endemic situations, with low levels of transmission, but with proved severe clinical forms, similar to the ones described in Sucumbíos (Ecuador), Guianía (Colombia), Cayena and Cacao (French Guiana), and in the region of Alto and Medio Río Negro and in the state of the Amazonas (Brazil).

Several countries have recognized Chagas disease as an emerging problem and the scientific community and control related organizations are mobilized in the search of a coordinated action to deal with it. As a concrete result, the I International Technical Meeting was held in 2002 in Palmarí, where some guidelines for the investigation, surveillance, and evaluation of possibilities of control were established. In this meeting the AMCHA was established and OPS/OMS was recommended as its Technical Secretariat. In addition, meetings in Manaus (Brazil) in 2004 and in Cayenne (French Guiana) in 2005 were held. The following was agreed:

1. A network/international surveillance system adapted to the Amazon subregion, with guidelines for the surveillance and prevention of Chagas disease, was required.

2. Proposals of diagnosis and clinical studies of the disease were discussed.

3. Research directed to the epidemiology, diagnosis, and treatment of the disease was needed.

It was also agreed that the strategy for implementing the Initiative should be based on a progressive characterization of the disease and infection patterns with risk assessment.

Control, prevention, and surveillance of Chagas disease in Mexico

The disease is known in Mexico since 1891, where Latreille detected one of the most important vectors in Mexico and Central America: *T. dimidiata*. Hoffman published a paper about possible hosts of *T. cruzi* in triatomines found in Veracruz. In 1936, Luis Mazzotti identified the two first human cases coming from Oaxaca, and several infected triatomines. In the last 15 years, the interest on the disease has grown and there are today at least six groups dedicated to research and two to medical care.

General aspects related to infection/Chagas disease in Mexico are: (a) 19 geographic regions limited by two coasts (Mexican Gulf and Pacific Ocean), two "cordilleras" that cross the country from North to South, a central plateau close to the shore and two peninsulas, Yucatán and Baja California, with specific characteristics and important ecological and biological diversity; (b) biogeographic patterns influenced by latitude and altitude; (c) diverse epidemiological situations of chagasic endemism, poorly known; (d) social, economical, ethnic, and cultural diversity, with predominance of rural areas and with fast growing non-planned urbanizations; (e) different housing structures with peri and intradomiciliary characteristics; (f) diverse *T. cruzi* vectors implicated in transmission; (g) recognized difficulty in establishing a final diagnosis of the situation; (h) passive surveillance of the disease, associated to research and with inquiries of people with self diagnosis of the disease; (i) control driven by associated antimalarial

activities that affected transmission in the last years due to the rationalized use of intradomiciliary insecticides, reducing in 90% malaria in the last 10 years.

Mexico has adhered to the initiatives, mainly at the elimination of the intradomiciliary transmission to, and has already promoted a national plan which reinforces on going programs.

Authorities were encouraged to constitute a Technical National Group coordinated by the National Centre of Epidemiological Surveillance and Control of Diseases, and with the participation of the National Centre of Blood Transfusion, the National Institute of Cardiology, and the Independent National University of Mexico.

Chagas disease here can not be associated to a specific anti-vectorial control procedure, but for almost 50 years, the spreading of malaria control has shown a positive side effect on it as almost all of the known area of infection by triatomines coincides with malaria affected regions. With an effective malaria programme, a specific Chagas disease control program becomes necessary. On its own. The model to control malaria integrates housing and basic sanitation actions. These actions will be evaluated to observe its impact on the vectors of the Chagas disease. Further, the basic actions for controlling malaria, dengue, alacranism, and, more recently, Chagas vectors, will now be jointly evaluated.

Some of the triatomine species considered as important epidemiological vectors can be controlled: *R. prolixus* (under surveillance because it was recently detected a small number of specimens in three localities in Chiapas and Oaxaca) and *T. dimidiata*. Other native species of vectorial relevance are: *T. barberi*, *T. gerstaeckeri*, *T. longipennis*, *T. mazzottii*, *T. pallidipennis*, *T. picturata*, and *T. phyllosoma*.

In order to detect active and passive infection/Chagas disease, an epidemiological surveillance system is required. It is necessary to improve MD's knowledge on clinical care, diagnosis, handling, and treatment of infected/patient affected by the disease. This improvement should be established at a national level optimizing health centre capacities, and starting by quantification of prevalences, carrying out surveys on morbidity and mortality within specific groups, as in premature sudden death. Optimization of opportunity, accessibility, and drug availability is necessary and this seems to have been resolved with WHO, OPS, and the Mexican Health Secretariat interventions.

More specific objectives are: the control of domiciliary chagasic vectors, control transfusional transmission, and to reduce through treatment and suitable handling of patients, all clinical complications.

The Mexican initiative to control Chagas disease has the support of technical cooperation and medical supplies from WHO, Technical Secretariat of OPS, and National Technical Group. There is also known interest between Mexico and other Central American countries in developing integrate actions. According to this, the following should be developed:

1. Identification of research groups and institutions with known capacity for prevention, control, surveillance, and health care of Chagas.

2. Stimulate greater development in operational activities with improved organized and coordinated horizontal and international cooperation between member countries.

3. Wider participation in the quality control of diagnosis of the disease.

International migration and epidemiological, social, and control consequences of Chagas disease/infection in non-endemic countries

All Initiatives took into account the present situation of Chagas disease/infection in the different endemic regions with analysis of the different environmental contexts, a variety of socio-economical and cultural aspects, which support domiciliation of certain triatomine species responsible for the introduction and maintenance of the endemism. Knowledge about these epidemiological factors is behind the application of control measures.

In non-endemic countries the main concern about the disease lies on the diagnosis and handling of patients, depending on the magnitude and country of origin of emigration. Assessment can be made through knowledge of the epidemiology and morbidity situations in those countries of origin taking into account that the United States, European Union, Canada, Australia, and Japan are the host countries for Latin-American emigrants. In these regions, with absence of domiciliary triatomines, infection can be transmitted by blood transfusion and derivatives, organ transplants or by congenital route.

RECOMMENDATIONS OF THE WORKSHOP ON EPIDEMIOLOGICAL AND SOCIAL DETERMINING FACTORS OF CHAGAS DISEASE

General recommendations

1. To relocate Chagas disease control, handling, and health care as one of the priorities of the Millennium Objectives, namely Objective 6 "fight against diseases"; Under the ALC+UE Health (ALCUEH) project, search for international and inter-institutional commitments in supporting activities aimed at the control of the disease.

2. To establish protocols between ALCUE and Chagas Subregionals Initiatives to facilitate implementation of RD activities and strongly support the Initiatives national and scientific-technical representation.

3. To create, with ALCUEH support, planning interactions, interchange, and mobility between Chagas clinical working groups.

4. To contribute to the development of Chagas clinical care components as integrated in Subregional Initiatives establishing its morbidity and impact in the countries Public Health according to the document *Consulta Técnica Subregional OPS/MSF sobre Organización y Estructura de la Atención Médica del Enfermo o Infectado por T. cruzi/enfermedad de Chagas (OPS/DPC/CD/353/05)*. [Technical Subregional Consultation OPS/MSF on Organization and Structure of Medical care of the Patient or Infected by *T. cruzi*/Chagas disease (OPS/DPC/CD/353/05)].

5. To use the main program that originated ALCUE to overcome major problems such as inaccessibility of diagnosis and treatment which affect millions of infected/Chagasic patients.

6. To promote contacts and workshops between ALCUEH and specialized areas of health from the subregional integration projects (*MERCOSUR, Convenio Hipólito Unanue, Organización del Tratado de Cooperación Amazónica, Reunión del Sector Salud de Centroamérica and República Dominicana/RESSCAD*), strongly supporting by all means, prevention, surveillance, control, and health care of Chagas disease.

7. To facilitate the search and active diagnosis of patients and its corresponding etiological and non-etiological treatment.

8. To encourage the proper care of Chagas infected/patient in non-endemic countries, through inter-consultation of local health care centres and their counterparts in Latin-America, and to emphasize the need on quality proven serological reagents and etiological medicines.

9. To continuously evaluate control activities of Chagas disease, as a neglected disease, through multi-disease, inter-sector, and integrated programmes.

Recommendations concerning management of knowledge and information

1. To contribute to the development of generation models, aiming at the elaborateion and dissemination of information and knowledge to different decision makers involved in Chagas disease prevention, surveillance, control, and health care such as politicians, academic and technical staff, NGO's, and communitarian stakeholders.

2. To design web-accessible informatic tools to disseminate virtual training as well as information in high-priority aspects of prevention, surveillance, control, and health care of Chagas disease.

3. To promote a Media strategy of information on problems, results, and data, with regular updating on Chagas disease, at a regional and global scenario, by means of workshops (with health and social specialized press) coordinated by national programs.

4. To review and disseminate available information about Chagas disease to attract attention on the need of understanding the epidemiology of the disease in and outside Latin America.

5. To make an annual review of the most relevant and important information of Chagas disease, in the so called "grey literature" (non indexed Latin-American journals, articles, news, among others) with good interpretation of knowledge on this disease. As a possible approach, ALCUE could coordinate efforts in the future with the SciELO project and Bireme.

Recommendations on human resources qualification

1. To promote actual and virtual activities for the training of professionals and technicians on different aspects of Chagas disease.

2. To promote actual and virtual activities for the training of the affected communities related to prevention, surveillance, control, and health care of Chagas disease, taking into account cultural aspects of ethnies including specific languages in minority populations.

3. To promote discussions on Chagas disease at university programs and curricula updating the approaches

and perspectives related to the disease in order to provide scientific background to health professionals and related staff.

4. To organize human resource qualification programs specially on post-graduation skills in the same themes and subjects, according to national and international needs.

5. To promote training to sanitary first health care professionals concerning diagnosis and full handling of the patient with chagasic infection, in order to improve on access to diagnosis and treatment.

Recommendations to technological and knowledge transfer

1. To implement and support actions to promote knowledge and technological transfer from institutions and research centres to national control and health care programs.

2. To organize, through ALCUEH, workshops on planning and proposal submission with national and international agencies, in order to support and reinforce the critical mass required at controlling Chagas disease.

3. To integrate human resource training activities and dissemination of information through the existing projects and networks, such as CDIA, SSA, ECLAT, which work within OPS policies and strategies and adjusted to region and continental initiatives.

4. To promote exchange of information aimed at improving accessibility and effectiveness of diagnosis and treatment methods of Chagas disease.

Recommendations to knowledge production

1. To promote applied research, based on field campaigns that could generate in biological, economical, sociological, and medical knowledge aimed at the protection and recovery of people at risk, infected or ill.

2. To develop sustainable alternatives to all activities associated to control, health care and surveillance.

Recommendations to non-endemic countries

1. To guarantee that Chagas disease does not justify exclusion when laboral or public health reasons are at stake.

2. Blood donors must be examined by serologic tests when epidemiological antecedents are compatible with the hypothesis of infection. When this is not possible, donors should be excluded.

3. *T. cruzi* serological tests should be done to pregnant women whose file reveals that epidemiological antecedents are compatible with the hypothesis of infection and to new born babies whose mothers have positive serology.

4. To promote free access to diagnosis and treatment whenever required.

5. Non endemic countries should register and use validated diagnosis reagents.

6. To develop training modules of Chagas health care in medical schools especially in host countries for emigrants.

7. Problems related to migration of chagasic patients would diminished if specific medication for the treatment of the disease was more effective and this should also take into account that drug producing industry exists in these countries.

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