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## Globalization and Chagas Disease

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### 1. Introduction

Globalization and Chagas Disease reflect several historic and social situations in Latin America (LA), with important influences and repercussions in the general society and between themselves. Originally, the disease was restricted to LA, with a socio-political context strongly marked by poverty, migration and the progressive enfeeblement of the State. (CNBB 2003, Macedo 1997, Schmunis 1997, Schmunis & Dias, 2000). In general, Chagas Disease emerges from a bio ecological context, deeply engaged with the people way of living and with the natural history of its etiological agent, the protozoan *Trypanosoma (Schizotrypanum) cruzi (T.cruzi)*, circulating among several mammalian reservoirs and intermediate vectors, occurring in different sylvan sceneries of the Continent. Later on, this trypanosomiasis began to affect the human being in the so called domestic cycle, involving man invasion of natural environment, people migration, very poor dwellings and multiple situations of anthropic character (Dias & Coura, 1997, WHO, 2002). In the last Century, the globalization phenomena influenced important changes in the endemic landscape of the Region, as well as the “urbanization” and the international migration of infected individuals, so increasing the risk of human Chagas Disease (HCD transmitted by blood transfusion or congenital route in endemic and non endemic countries.

Considering its original characteristics, HCD affects primordially rural people living in poor dwellings colonized by the vector insect. This disease can be extremely severe, with expressive mortality among children in its acute phase and severe heart lesions in about 10-20% of chronic adult patients. Its medical and social impact presupposes mortality, high hospital and social security costs, absenteeism and labor incapacity (Akhavan 2000, Briceño-León 2007, Dias et al. 1994). It has been estimated the prevalence of 8-9 million of infected individuals in LA, still being at under transmission risk about 30-40 million, in the Region (Carlier et al 2002, PAHO 2006, WHO 2010). The principal strategies for HCD prevention consist in vector chemical control, housing improvement and rigorous serologic screening of blood donors, chiefly in endemic areas. There is not available a strategy for congenital transmission prevention, but diagnosis and early specific treatment of infected babies are strongly recommended. The treatment with the current available drugs (Nifurtimox, Benznidasole) is more effective among young people and recent transmission, but is being also recommended to indeterminate and initial chronic cases (Albajar-Viñas 2007, Dias 2009-

B, WHO 2007). The correct and permanent medical assistance in chronic cases is also an important tool to improve the quality and quantity of life of chronic patients (Dias 2001, Sosa Estani 2007).

## 2. Globalization in Latin America

Social and political changes of the whole society have been very expressive in the last decades, when the process of globalization was intensified. In the poorest world regions like LA, the impact of globalization has been very clear in terms of HCD epidemiology, management and prevention (Almeida, 2002, Dias & Borges Dias, 1979). Besides the great complexity in the structure and relations of the society, with the increasing of communications and human migration, globalization has produced an economical effect tremendously unequal among different countries and social groups. Such a situation has been understood as depending on economical speculations, international & supra national competition and political management, inducing situations of immediatism, egoism and individualism. Regarding globalization and neglected diseases overcoming, Dr. Margareth Chan, Director-General of WHO, pointed out very clearly that *"efforts to control neglected tropical diseases constitutes a pro-poor strategy on a grand scale. The logic has changed: instead of waiting for these diseases to gradually disappear as countries develop and living conditions improve, a deliberate effort to make them disappear is now viewed as a route to poverty alleviation that can itself spur socioeconomic development"*. A very common result of globalization in poor countries has been the weakening of Public Policies, with remarkable consequences concerning social relations and solidarity. Regarding the political and socio-economical aspects, the consequences are clearly visible: distrust and disenchantment concerning politicians, weakening of State structures and social commitment, emptying of the low economies (mainly at the rural sector) and disordered swelling of urban peripheral zones could be some examples (CNBB 2003, Dias 2007). Particularly, the logic of globalization and of the different ways of market economy have deeply affected the developing countries, emphasizing social inequalities and making very hard the possibilities of social upgrade for marginal populations (Schmunis & Dias, 2000). In other words, Professor Aluizio Prata pointed some years ago, that globalization implies in domestic deregulation, commercial liberalization and privatization by means of foreign and volatile capitals, resulting in progressive social inequalities and unstable economy, generating several and complexes influences in Health Sector <sup>1</sup>. Among other globalization main antecedents, the wave of Neoliberalism (emerged in the 1970 decade) had a great importance, particularly in terms of the principles of Minimum State and free International Market. The major critics against Neoliberalism have pointed that this movement only (basically) benefit the great world potencies and the multinational enterprises. Poor countries usually suffer with neoliberal policies, in terms of underemployment, low salaries, inequity and strong dependency of international capitals, as well of the global market <sup>2</sup>. Another controversial point concerns with privatization of state enterprises or social programs, considering that poor populations

<sup>1</sup> Prata, A.R., 2003. Conference about Tropical Medicine in Brazil. Congress of the Brazilian Society of Tropical Medicine. Belém, Pará, Brazil, February, 2003.(apud Dias, 2007)

<sup>2</sup> [Http// www. WikimediaFoundation.org](http://www.WikimediaFoundation.org) , access in June 27, 2011

generally depends on public policies and investments, e.g., Public Health. Considering LA, after two decades of Neo Liberalism, the World Bank evaluation in 2005 considered that the results (economic grow) remained much lower than it was formerly awaited (Dias 2007, Schmunis 2007).

### 3. Globalization and Chagas disease

By different ways globalization has affected the epidemiology, the prevention and the management perspectives of HCD. The intensification of migration and the progressive changes in rural economy modified the epidemiological patterns of the disease, in terms of transmission and medical access. In the last decades, the disease arrived in urban areas and non endemic countries, so increasing not only the risk of transfusion transmission but also the medical and social demand of infected individuals. (Dias 2007, Schmunis, 1997). Today, in Brazil, it has been calculated that at least 75% of “chagasic” people are living in urban spaces, a proportion that seems to be lower in other countries such as Bolivia and Paraguay. With the reduction of demographic densities in rural endemic areas, for the next decades a decreasing of vector is naturally expected, as a “positive” effect of globalization. In addition, Latin American rural areas have been slowly modernized in terms of housing and production aspects, as a “macro” transformation from the classical subsistence way of life to an agro-industrial and grand scale economy. By another angle, the expansion of agriculture frontier in some places has making possible the spreading of infected individuals and even of vectors, a situation particularly existing in the Amazonian Region. For instance, infected individuals and the risk of transfusion transmission of *T. cruzi* have been registered in Beni and Pando (Amazonic regions of Bolivia), as a consequence of people migration from classical endemic areas where mining economy has failed (Dias et al 2002).

### 4. The global market, the role of the state and HCD

Considering the social and political evolution in LA, the expansion of HCD also can be considered a reflex of the regional historic evolution, particularly in terms of production relations and equity. By the stand point of the infected population, globalization as much as market implications produced bad and good results, spreading the disease for non endemic areas, but also improving the conditions for the treatment and access of infected individuals. In general, the market is weak in terms of HCD. Chagasic individuals are always very poor and usually depend of State resources. From market standpoint, the main commercial profits (relatively low) result from laboratory diagnostic reagents and insecticides. In addition, private enterprises not always rely on LA governments, making difficult sometimes the governmental acquisition of products. A correlated situation in the past was related to international insecticide prices, with high disparity among the different countries. In this aspect, globalization has been benefic, mainly after the emergence of Southern Cone Initiative, with the assistance of WHO and PAHO, inducing the equalization of product prices. The specific treatment also did not stimulate the development of new drugs, chiefly in terms of private industry. For instance, Roche considerate its product Benznidazole as “a social drug” some years ago, and gave the patent to Brazilian Government. In terms of electoral gains, also HCD shows to be inexpressive, since the poor chagasic population

usually has not political density, being unable to carry out an effective social and political demand.

By the side of preventive actions, different situations have been observed in LA. First of all, vector control depends basically on chemical control and housing improvement. In this aspect, the poor communities depend almost exclusively of governmental programs, in other words, of political will. Notwithstanding, several observations and also mathematical models have shown that vector control can follow simply social improvement of the community, without a direct governmental intervention (Dias et al 1994, TDR 1981). Conversely, two very positive situations were reinforced by globalization. From the side of Blood Banks, since the 1980 decade, the proportion and the quality of HCD control have been highly improved in endemic and non endemic countries, following the global demand for AIDS control (Carlier et al 2002, Coura & Dias 2009, Miles et al. 2004). Another situation arose in the 1990's, considering international cooperation for HCD control. Following the economic and political commitments of globalization, sub regional "Initiatives" emerged in the regions of Southern Cone, Andean Pact, Central America and Amazon, to face HCD in terms of vector and transfusion transmissions, with technical assistance of PAHO and WHO. It is opportune to consider that the control of HCD is achieving great success not only on the epidemiological and scientific context. Briceño-León (2007), Dias et al (2008), and Schmunis (2007) observe that the correspondent activities, successes and difficulties are completely integrated in the scenario of retrieval and rescue possibilities of LA, as a region that seeks its identity and its better political and social expression.

Thus, it is admitted that HCD and other so called "neglected diseases" have received and will continue to receive strong influences of the globalization process. Poor, isolated and marginal areas in LA will continue to exist, as remaining foci of disease prevalence and active transmission, depending on poverty and social problems (Briceño-León 2007, Dias & Borges Dias 1979, Dias et al, 1994, Schmunis 1997). The overcoming of these constraints highly depends on political will and of the reduction of inequity all over the world. As mentioned in a recent WHO document, *"sustaining the progress made in controlling Chagas disease will depend on political commitment and the retention of public health resources. Resolution WHA 63.20, adopted by the Sixt-third World Health Assembly in May 2010, urges Member States where the disease is both endemic and non-endemic to control all transmission routes (namely vectors, transfusion, organ transplantation and vertical and oral routes) and to integrate the care of patients with all clinical forms of the disease into primary health-care services. WHO has been requested to facilitate networking at the global level and to reinforce regional and national capacities on strengthening global epidemiological surveillance of the disease... to advance intersectoral efforts and collaboration; and to support the mobilization of national and international public and private financial and human resources towards the achievement of these goals, (WHO 2010)*

## 5. Globalization and medical attention

In spite of some social improvement recently observed in parts of endemic countries, the majority of infected individuals probably will continue poor and with little possibilities to access all the benefits of the modern medicine. The major challenge, at this point, consist in to assure an integral and permanent medical attention and social security to these individuals, by means of an adequate social policy all over the world. This point reflects the

classical dilemma between globalization and equity (Briceño-León 2009, Dias 2007). Regarding medical attention, enormous technical progresses have been achieved in terms of cardiac and digestive management of HCD, mainly resulting from the global advances of Medicine in other diseases (more involved with rich populations and better market). For instance, several drugs developed for cardiac failure and several arrhythmias of other etiologies, as well as for systemic hypertension, showed to be very useful in chronic Chagas heart disease. The same could be said regarding medical resources such as pace makers and cardiac implantable defibrillators or, in case of mega esophagus, the modern surgeries employing video laparoscopy. Multiple evidences have shown a clear correspondence between adequate and precocious medical attention and the survival and better life conditions of chronic chagasic individuals. In Brazil, Argentine Chile and Venezuela, for instance, the age of death is becoming significantly higher than in two or three decades ago, in parallel with the decreasing of severe chagasic cardiopathies in infected individuals (Albajar Viñas 2007, Dias 2007, Sosa Estani 2007).

## 6. The visibility of HCD and its trends in a globalised world

Considering the reduction of transmission, the visibility of HCD tends to decrease as well as its political priority. In addition, the emergence of other public health problems such as dengue fever, influenza and epidemic AIDS will contribute to resources deviation from HCD programs (Dias, 1995, Schmunis & Dias, 2000). Considering migration and urbanization, HCD during some years tends to call attention in urban spaces and non endemic countries (Albajar-Viñas 2007, Schmunis 2007). In terms of large scale economy, anthropic actions and a slow improvement of medical attention for chagasic patients, the future sceneries of HCD in endemic countries could be summarized as follows (Barretto 1979, Dias 1988, Dias & Schofield 1999, Forattinni 1980):

- Main echological modifications: reduction and condensation of wild ecotopes (mosaic of sceneries and concentration of vectors, reservoirs and parasites)
- Progressive reduction and focalization of domiciliated vector population;
- Still existing risks of new vector foci in areas of agricultural frontiers (Amazonic Region e.g.);
- Reduction of rural demographic densities, resulting from sector modernization and massive implementation of agro-industries (economic scale)
- Increasing of marginal population in urban centers, with two principal consequences:
  - a) Arrival of infected people from endemic areas, so increasing the risk of HCD transmission in blood banks as well as the theoretical betterment of patients access to medical care, and,
  - b) The possible arrival of triatomines in urban houses, passively carried<sup>3</sup>
- The facement of transfusion transmitted HCD all over the world;
- The progressive decreasing of infected individuals, reflecting in the reduction of risks both in congenital and transfusional transmission (progressive reduction of infected pregnant women and blood donors);

<sup>3</sup> - In general, significant colonies of carried triatomines do not use to prosper in big towns of Brazil, Argentina and Venezuela. Nevertheless important colonies have been detected in San José (Uruguay), Cochabamba, Sucre and Santa Cruz (Bolivia), Guayaquil (Ecuador) and Tegucigalpa (Honduras).

- The progressive reduction of severe acute and chronic cases, with the consequent decreasing of disease visibility;
- The expectable reduction of resources for HCD control and research;

## 7. Macro policies and organization

In terms of political strategy, these points must remain in the agenda of WHO and of the governments of endemic countries by the next two or three decades, to keep alive the interest and the priority of Chagas disease and its control. National and regional programs must be adapted to the decentralization of health systems, another universal consequence of globalization (Schmunis & Dias 2000). New non-governmental partners such as Médicins Sans Frontières, JICA, IDRC, ECLAT and others are showing to be very effective and opportune to face HCD in endemic and non endemic countries. The recent institution of a global scientific network to face HCD by WHO Neglected Diseases Department is very opportune <sup>4</sup>. For the particular case of LA, it is very important to keep Pan American Health Organization in the coordination of the regional Initiatives (Dias et al 2008, OPS 2006).

## 8. The role of the remaining sylvatic cycle of *T. cruzi*

In terms of the next future, the wild cycles of the parasite will have an important role in the maintenance of HCD. It is expectable that with the improvement of domestic cycles control in endemic areas, the major risks of HCD incidence will depend of sylvatic triatomines and wild trypanosome populations. The enzootic cycle of *T. cruzi* also has some implications with globalization. Human intensive movements, intensive modifications of sylvatic ambient (macro projects considering deforestation, mono cultures, cattle and plant protection pesticides) are clearly changing the general landscape since America discovery. In the next decades, the existing domestic cycles of HCD vector transmission will remain in those more isolated and poor rural zones, with lower taxes of social and ambient changes. The future will be marked by the progressive reduction of some classical species such as *T. infestans* and *R. prolixus*, besides a residual peridomestic infestation by ubiquist species (*T. dimidiata*, *T. pseudomaculata* and *T. brasiliensis*, e.g.). Also, due to anthropic affaires, wild species such as *P. geniculatus*, *R. pictipes*, *T. rubrofasciata* and *T. picturata* could occasionally invade human dwellings, eventually stablishing little colonies and being able to transmit HCD. This is a typical situation requiring an effective epidemiological surveillance. The same can be said for some emergent foci of *T. infestans*, when passively carried to new áreas very far of its natural áreas of dispersion (Amazon, for instance). Until now, strong evidences of a high risk of domiciliation of sylvatic *T. infestans* in its areas of occurrence (Bolivia, Chile, Chaco) seem do not exist (Dias 2009-A, Moncayo & Silveira 2009, Noireau 2009, Schofield et al. 2006). Another situations concerns with sporadic invasion of wild triatomines in dwellings located nearby sylvatic ambients, eventually resulting in HCD

<sup>4</sup> The basic structure of this network involves the following components (Albajar Viñas & Dias 2009): to strength epidemiological surveillance and information systems (communities, vectors, cases, and other factors relevant to transmission), to prevent transfusion and organ transplantation transmission of *T. cruzi* in endemic and non-endemic countries (Policies and regulations), to achieve a consensus on diagnostic tests for screening and diagnosis of the infections and to identify improvements needed, to expand prevention and control of congenital transmission and case management of congenital and non-congenital infections in endemic and non-endemic countries. .

transmission, such as in Panama (with *R. pallescens*), in Amazon (with *R. pictipes*), in Brazil Southwest (with *T. vitticeps*) and in Uruguay and Rio Grande do Sul (with *T. rubrovaria*). Another related speculation concerns with the pathogenesis of the “wild strains” of the parasite in HCD, considering mainly the *T. cruzi* I and III groups (Coura & Dias 2009, Zingales et al 2009). As a conclusion, for the future, anthropic actions and globalization will be associated much more with the enfeeblement and focalization of the sylvatic cycle of *T. cruzi* than with its exacerbation (Dias et al 2008, Zingales et al 2009). Several examples can be remembered, showing strong linkages between HCD and globalization mainly involving the evolution of the productive system, spatial occupation and human movements, such as (Dias & Coura 1997, Dias et al. 2002, Schmunis 2007):

- Deforestation resulting of a strong wood market and the expansion of agro industries in endemic areas;
- The extensive use of pesticides in agro-industrial projects;
- The expansion of the use of electricity and industrial machinery, interfering with wild triatomine behavior and influencing the rural demography;
- The progressive reduction of mammal reservoirs of the parasite, resulting from deforestation, pesticides and extensive monocultures;
- Progressive changes in the productive model, prioritizing agro industries instead the classical strategy of family subsistence;
- In the same logic, the dominant market and scale economy, overlapping classical micro economies;
- The global implementation of modernization factors, specially automatization, robotisation and housing improvement.

## 9. The role and trends of urbanization

The “urbanization” of HCD has been occurring all over the Continent, mainly after the second half part of the Century XX. In strict correspondence with globalization, the rural-urban migration was caused by several changes in the productive system, specially industrialization and weakening of the traditional rural economy. Concerning HCD the more visible consequences concern with the arrival of chronic infected individuals in urban centers, increasing the demand for medical & social security assistance, as well as the risk of transfusional transmission. The access to medical attention certainly has been improved in the urban context, particularly in terms of more complexes interventions, mostly depending on public health sector.

## 10. The medical management Chagas Disease in a globalised world

Presently, all over the world, the increasing life expectance has been a great tendency of the population, resulting of better medical and social assistance. The management of HCD in old people requires new knowledge and practices in terms of disease physiopathology and of the superposition of several other medical problems occurring in elevated age groups, such as hypertension, diabetes, coronary diseases, Parkinson, physiological denervation etc. In such a scenery, the medical management of HCD involves three major challenges, highly depending of the political and social processes, as well as with the question of inequity (Albajar-Viñas 2007, Dias 1995):

- a. The improvement of medical expertise for HCD management in chronic cases all over the world, mainly in terms of the Primary Health Care level. In corollary, the improvement of drugs and other medical proceedings is highly desirable, considering the elder patients and the superposition of other chronic and degenerative diseases;
- b. The betterment of medical and social security systems in order to assure adequate access and coverage for all infected individuals, in endemic and non endemic areas;
- c. To ensure political and administrative conditions to maintain at least two decades more the medical expertise able to manage adequately the infected individuals;

Other predictable situations could be emphasized for HCD management at medium term, all of them being correlated with globalization: First of all, globalization has been a strong stimulus for the advance of medical security enterprises, able to increase the access of a number progressively higher of infected people to medical attention. The specific treatment is another important question, because it has been more and more indicated for chronic patients (because of its possibility to minimize and/or to prevent severe clinical conditions, specially advanced heart disease and sudden death). The basic problems considering this subject remain in diagnosis access, medical expertise and drug availability, besides a good treatment adherence (Albajar-Viñas 2007, Dias 2001, Dias et al. 2008, Sosa Estani 2007). In chronological terms, the best moment to improve specific treatment for chronic cases of HCD has been estimated from now until one or two decades more, a time when the number of young infected individuals is still high. After 2020, with the progression of transmission control and the natural aging of infected people, the demand for specific treatment will decrease significantly. In pragmatic terms, globalization tends to facilitate specific treatment, bettering the availability of drugs around the world, chiefly with the assistance of health and humanitarian institutions such as WHO, PAHO, DNDI and MSF (WHO 2010).

## 11. Globalization and research on HCD

Scientific development is very important to face HCD, mainly in Latin America.

Since its discovery, American Trypanosomiasis has showed to be an excellent model of research and scientific development in several correlated aspects, such as the parasite (Biochemistry, Genetics, Cell Biology), the disease (Physiopathology, treatment, diagnosis), the Epidemiology (incidence, prevalence, morbidity, social impact), the control (strategies, tools, political aspects) etc. Research, meetings, international networks and publications and scientific development agencies have been multiplied all over the word, mainly from the 1940 decade, an epoch when HCD became internationally recognized (Dias & Schofield 1999). Particularly in the last forty years the “universal” and internationally shared research on HCD had an exponential growth, resulting in several practical advances, as well in scientific development of endemic countries (Coura 1997, Dias & Schofield 1999). This aspect must be considered a very significant aspect of globalization (Dias 2007, Schmunis 2007). As a consequence, some correlated aspects of HCD management and research, such as the development of new drugs and combined drug strategies, the possible use of stem cells etc. Considering this particular aspect, globalization can represent an extraordinary element of help, by means of integrated universal internet programs and nets for HCD treatment and management. The most remarkable examples have been the international Benefit trial with Benznidazole in chronic cases of Chagas cardiomyopathy and the already

existing internet sites for global discussion of disease management (Dias & Schofield 1999, Marin Neto et al. 2009, WHO 2010).

## **12. Globalization, social security, prevention and educational aspects**

In general terms, the great advance occurred in the scenery of the fight against HCD was the implementation of the intergovernmental control initiatives, launched in Brasilia, 1991 (Coura & Dias 2009, Dias et al. 2002, OPS 2006, WHO 2002, 2010). This very successful movement can be considered a resultant product of the globalization in terms of the development of a more agile and less bureaucratic international market, but also as a strong determination and political pressure from the side of Latin American scientific community (Dias & Schofield 1999, WHO 2010). As seen above, the predictable reduction of chagasic people will progressively minimize the costs of social security. The proportion of severe cases requiring social benefits tends to be reduced, chiefly because of the mortality occurred in previous years and the expectable betterment of disease medical care. By the side of blood banks, globalization has been very opportune in order to maximize the rules and strategies concerning blood donors all over the world, as well as to optimize the distribution of standardized kits and reagents (Dias 2007, Schmunis 2007). By the angle of vector control, the main challenge will be the maintenance of a permanent epidemiological surveillance, with special attention to peridomestic triatominae foci (Dias 2009-A, Schofield et al. 2006). As an indirect result of globalization, this task has been transferred to local (municipal) health services, thus generating the extinction or deactivation of the classic national institutions like FUNASA and Malariologies. The decentralized scheme has some important advantages such as local decisions, rapid responses and better social control, but also implies the risk of low quality and epidemiological loosing, as well as of the reduction of interest and technical expertise. The best thing to do, in this case, seems to be the reinforcement of national and regional technical staffs in order to ensure coordination, technical training and regular supervision of local teams (Dias et al 2008 Schmunis & Dias 2000). By the side of housing improvement, the ancient national programs for rural dwellings improvement tend to disappear, because of the social and productive changes in countrified regions. As seen above, rural demography is rapidly decreasing and no market interest exists to improve rural houses in poor and economically depressed areas. In the same way, very little hope is expected in terms of the improvement of big national programs for people education in terms of HCD control and surveillance (Dias & Schofield, 1999, Schmunis & Dias, 2000). This is a very important aspect, since the modern surveillance against the vectors of HCD is primordially based on the effective community participation with must be stimulated and oriented by educational activities (Dias 1995, Schmunis & Dias 2000, WHO 2002). Facing these aspects, globalization is presenting positive (facilitators) and negative aspects. The main protagonists of surveillance are several and must be integrated at local and regional levels. The financial involved aspects are complexes and presuppose clear and sustainable public policies (Schmunis & Dias, 2000).

## **13. Globalization and macro policies of health**

At the macro political side, the question of globalization and HCD involves two basic situations, according social scientists such as Max Neef, Pedro Demo and Paulo Freire (In Dias, 1995):

- a. In Latin America, the political macro structures like governments and political parties require historical compromises and are characterized by immediatism, corruption and the lack of ethical references;
- b. From the programs and projects of real interest for the communities, such as the HCD control, a new collective consciousness can be reinforced, resulting several possibilities of a more healthful and consequent social reality.

In this way, the global effort concerning the persecution of non corruption and social equity is also considered as a fundamental challenge for HCD and other neglected disease overcoming. In other words, considering mainly Latin America, the mismanagement of globalization and inequity on endemic countries make to appear several and severe questions of political management, governmental administration and citizenship, according many Authors. The future claims for a sword, well organized and efficient State, at national, regional and municipal levels, besides a conscious and participative population

(Almeida, 2002, Macedo, 1997, Schmunis & Dias, 2000). Concerning the fight against HCD, in particular, national and international efforts must to be made to reach specific preventive and curative actions progressively integrated with other Health and Social sectors and activities such as Family Medicine, Primary Health Care, Immunization, Formal Education, Social Security etc. (Dias 2007, Schmunis & Dias 2000, WHO 2010). More over, following the new global wave of social control, the theme of HCD must be compulsorily inserted in the regular local, regional and national Health Conferences, consolidated in Brazil since 1988 and now being pursued all over Latin America, as a consequence of the new Policies for Health (Dias 2007).

#### 14. The role of scientific community

Since its discovery, the fight against HCD has been progressively embraced by the researchers, beginning with the own Carlos Chagas. Besides the elucidation of several medical and biologic aspects of the disease, Chagas always was claiming for its recognition, its treatment and its prevention, stimulating his colleagues and international scientists to work in these themes and to advocate beyond everything else the overcoming of this so hard medical and social problem (Chagas 1911, Dias 1995, Dias & Schofield 1999). Very soon it became clear that the more vulnerable point for disease coping was prevention, initially in terms of vector control (insecticides, housing improvement), and after blood banks control. Scientists such as Souza Araujo, Ezequiel Dias, Romaña, Emmanuel Dias, Mazza, Pedreira de Freitas, Nussenzweig, Schenone and others developed the necessary strategies and tools between 1918 and 1950, but very soon it became clear for them that the implementation of regular programs would depend of political will and of the mobilization of public financial and human resources. Among others, Dias, Freitas and Pinotti (Brazil), Torrealba and Pifano (Venezuela), Abalos, Romaña and Cichero (Argentina), Neghme and Schenone (Chile), were true scientific pioneers in the task of calling attention and commitment of their governments for Chagas program implementation. In 1958, E. Dias and Fred Soper were the protagonists of a memorable international discussion, resulting in the definitive engagement of PAHO and WHO in the challenge of HCD. In 1959, Carlos Chagas Filho organized a first International Congress on HCD, where E. Dias and A. Neghme declared that *T. infestans* could be eliminated from domestic foci. By the 1960's, a regular program was launched in São Paulo State (Brazil), involving many scientists and serving as a model for other regions.

In 1979, another congress in Rio de Janeiro called the attention of João Figueiredo, the President of Brazil, who determined the prioritization of the National Program. Since 1990, a great scientific pressure on Argentina, Uruguay and Brazil governments resulted in the memorable launching of the Southern Cone Initiative against HCD, very soon followed by similar initiatives in Andean Pact, Central America and Amazon regions (Dias & Schofield 1999, WHO 2002). Some years more, in an international scientific meeting promoted by WHO, in Geneva was launched the Initiative for HCD control and management in non endemic countries (WHO 2010). And since 2008, Argentine and Brazilian scientists have been stimulating their governmental authorities to put together the technicians of the Ministries of Education and Health in order to ensure better University curricula and regular formal education about HCD in endemic regions. In general terms, the scientific community involved with HCD has been consistently recognized as the most important defensor of chagasic people (Albajar-Vinas 2007, Briceño Leon 2007, Dias & Dias 1994, Dias 2007, Schmunis 2007)

## 15. Final remarks

Chagas Disease has been a concrete and impacting social and medical problem in LA, with multiple aspects associated with iniquity and globalization. In spite of different financial and political constraints, HCD has been controlled, remaining two or three decades more of program consolidation and medical attention for infected people in the Region. This is a particular task for LA, not involving important global markets. Much more, HCD requires a main action of the State, as the basic social provider for the poorest citizens. The main strategies to face HCD have showed to be considerably effective at medium & long term, depending on global people social improvement, as well as on transmission control and medical attention. Considering these points, the persistence of iniquity and other negative aspects of globalization have been hard challenges to be overcome in endemic areas. For instance, globalization has stimulated the State shrinkage and the decentralization of the health sector, both these aspects representing a high risk of deterioration of HCD programs in poor regions (Schmunis & Dias 2000). The transition of Health Sector all over LA has been slow and complicated, in spite of its highly stimulant theoretical approach. Contextual difficulties and inequities exist but must be overcome by an universal effort involving people, governors and scientists, because HCD constitutes an important public health problem and because several examples showed that its control is an attainable goal. At the time of globalization, the expected success of the Initiatives and the consequent epidemiological results can represent and stimulate a new and positive time in the search for the Continent political coherence and self reliance (Almeida 2000, Briceño- León 2007, Dias et al.1994, Macedo 1997).

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