

Southern Cone Initiative for the elimination of domestic populations of *Triatoma infestans* and the interruption of transfusional Chagas disease. Historical aspects, present situation, and perspectives

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Created in 1991 by the governments of Argentina, Bolivia, Brazil, Chile, Paraguay, and Uruguay, the Southern Cone Initiative (SCI) has been extremely important for Chagas disease control in this region. Its basic objective was to reach the interruption of this disease, chiefly by means of the elimination of the principal vector Triatoma infestans and by the selection of safe donors in the regional blood banks. After a summarized historic of SCI, the text shows the advance of technical and operative activities, emphasizing some factors for the initiative success, as well as some difficulties and constraints. The future of SCI will depend of the continuity of the actions and of political priority. Scientific community has been highly responsible for this initiative and its maintenance. At the side of this, national and international efforts must be involved and reinforced to assure the accomplishment of the final targets of SCI. Very specially, the Pan American Health Organization has cooperated with the Initiative in all its moments and activities, being the most important catalytic and technical factor for SCI success.

Key words: Southern Cone Initiative - elimination - domestic *Triatoma infestans* - interruption of transmission - Chagas disease - blood transfusion

Since his discovery, Carlos Chagas called attention to the continental distribution of infected triatomines and to the role of American governments in the prevention of the new trypanosomiasis. At that time, with neither effective drugs against the disease, nor available insecticides for vector control, the basic preventive possibility was housing improvement. Chagas and his collaborators, in the beginning, and others like Salvador Mazza and Rodolpho Talice, two decades after, emphasized the correlation existing between the huts of bad quality and triatomine infestation in endemic areas. In the decade of 1940, the pioneer studies performed in Bambuí, Brazil, by Emmanuel Dias (a disciple of Carlos Chagas), can be considered the starting point of the modern fight against domiciliated triatomines, mainly with the description of the effective action of the product "Gammexane" (hexachlorocyclohexane), in 1947 by Dias and Pellegrino and Romaña and Abalos (Dias 2002). In the following decade the medical impact and the systematization of the chronic chagasic heart disease were clarified, mainly throughout of field studies performed in Brazil and Argentina, at the same time in which Emmanuel Dias described the general situation of the disease in the Continent and formally claimed for a more effective actuation of Pan American Health Organization (PAHO) against the disease (Dias 1957, Dias & Schofield 1999). In the 1960s regular national and re-

gional programmes against Chagas disease started in Brazil, Argentina, Venezuela, Chile, and Uruguay. In the 1980s new pyrethroid insecticides replaced the ancient organochlorine and organophosphate compounds, and the emersion of AIDS epidemics strongly stimulated the control of blood banks along the Continent. In the 1990s the endemic countries decided to share their efforts against the disease, launching regional cooperation activities, being pioneer the Southern Cone Initiative (SCI) (Schofield & Dias 1999, WHO 2002). Southern Cone, in spite of not being a formal grouping tied by convention, has been used by the PAHO for discussion of regional health problems. This Region is constituted by six countries (Argentina, Bolivia, Brazil, Chile, Paraguay, and Uruguay), all of them highly endemic for Chagas disease in recent years, being *Triatoma infestans* the main vector species. Excepting Brazil, where other native species like *Panstrongylus megistus*, *T. brasiliensis*, *T. sordida*, *T. pseudomaculata*, and *Rhodnius nasutus* additionally invade and colonize human dwellings, is considered the fundamental transmitting vector in the Region, so representing the basic target for the Initiative. By another hand, the real possibility of preventing transfusional Chagas disease by means of blood donors serological screening became a complementary task for the Initiative since its very early beginning (Schofield & Dias 1999). Three basic and different order of factors were involved in the deflagration of the SCI, such as: technical factors: a sufficient knowledge on the control of the main mechanisms of transmission of HCD (vectorial and through blood transfusion) was available, as well as the basic inputs (insecticides, programme strategies, serology) to carry on the activities in all endemic areas; political and administrative factors: by one side, epidemiological data were demonstrating the large dispersion of the disease in the Continent and its high medi-

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cal and social impact; on the other, successful trials and even national or regional well conducted programmes revealed the concrete feasibility of transmission control and gathered unquestionable political credits for their executors; in the base of political decision and technical aspects, the third factor was undoubtedly the great effort and the unity of the scientific Latin American community, who acted as the principal catalytic sponsor of programme implementation in the Region (Coura 1997, Dias & Schofield 1999, Dias 2002).

In synthesis, the task was possible and several local or regional examples were demonstrating it. The main tools and strategies were available and a minimum of regional dialogue already existed. Above all, the regional routine of PAHO was extremely adequate for the Initiative functioning. More than this, PAHO became totally engaged on the “dream” and carried on all its efforts (including financial support) to help either field or administrative activities. The basic strategy was to join the countries under an official circumstance (PAHO convocation and direct communication among the ministers of health) and to begin by the countries where the national programmes were going on. The fundamental elements would be intensive dialogue, continuity, and good coordination. The frontiers and the bureaucracy should be completely open to international and regular supervisions. Each more advanced country assumed the duty for helping other countries, in case of necessity. At least one intergovernmental meeting would be carried on yearly, with the main task of the revision and planning of each national programme, as well as to develop a sharing scheme of policy and finalistic activities. In particular, it was idealized a very simple scheme for information interchanging, by which, for example, the regular prices of insecticides and other programme tools would be compared. PAHO was designed for helping in future international prices quotation, immediately assuming this task. As a point of departure it was assumed that no “new budget” would come to the Initiative, unless in the case of very exceptional circumstances (Bolivia and Paraguay, for instance, were thinking to get an international resource from World Bank or BID, but this would depend of a very long and complicated political affaire). At the macro standpoint, at that time all the world was living a new situation, with a strong appellation to international aggregation. In South America a regional market was being implemented (Mercosur) and the historical roots of the region were being emphasized. By another side, the Latin-American scientific community was growing up and being more and more conscientious that regional health problems – chiefly those pertaining to more depressed populations such as Chagas disease – represented a challenge to themselves. Another important departing point: Chagas disease does not represent an attractive target for the current market laws, since the consumers are generally poor and most of the main commercial issues (insecticides, treatment drugs, diagnosis kits) must be purchased by governmental instances.

Historically, at the end of the years 1980, very consistent results concerning triatomine and blood bank control were being presented and discussed in several

scientific Latin American meetings, much of them involving PAHO and national health authorities. In Brazil, the vector control programme received in 1983 a governmental priority, with an allocation of about US\$ 15 million, a sufficient amount to cover all the endemic area (2450 municipalities dispersed in an area of 2,450,000 km²), performing yearly around seven million dwelling inspections and almost seven hundred thousands of dwelling spraying (Dias 2002). At the same époque, Argentina also improved its budget, and Uruguay was showing dramatic reduction of *T. infestans* infestation and disease transmission in its endemic areas where the control programme was continuous and regular. The same occurred in Chile, mainly in the valleys of the administrative regions I to VI (Lorca et al. 2002). *T. infestans* – the main vector – was being considered a highly vulnerable target in all the Region, since the specie was basically restricted to artificial ecotopes, only being detected in natural foci in some Bolivian regions. As a matter of fact, the pioneer researcher Emmanuel Dias predicted in 1957 the “eradication” of this species in Brazil, since the control activities were conducted in a continuous manner, in contiguous spaces (Dias 1957). He also claimed that Chagas disease control was “an American problem”, in which the PAHO should necessarily to be engaged (Dias 2002). Since that time the disease became more and more investigated and recognized. New tools such as the pyrethroid insecticides appear in the market and new problems such as the AIDS epidemics affected directly the blood transfusion system. In parallel, after the Alma Ata Convention (1958), a great transition from the vertical to horizontal health structures began around the world.

DEVELOPMENT AND IMPLEMENTATION OF THE SCI

By 1990, it was becoming clear that the problems of Chagas disease control rested less with biological technical or operational aspects, and more with political and economic questions. In spite of the good results of chemical control against domestic triatomines in Brazil, Argentina, Uruguay, and Chile, in most of the endemic countries priority was no given to Chagas disease. In Southern Cone, the worst endemic situation remained in Bolivia and Paraguay, with extremely high infestation and prevalence rates, side by side with very few or absent control activities. So, two main challenges became the preoccupation to the people dealing with Chagas control: (1) how to maintain the interest and how to consolidate the activities in those countries with advanced programmes? (2) how to start and to improve a regular programme in Bolivia and Paraguay?

Earlier antecedents (Coura 1997, Dias & Scofield 1999) - In a sense, the SCI can be seen as a scientific response to political uncertainty. There was a scientific consensus that without large-scale vector and blood banks control the risk of an endemic spreading of the disease would certainly happen. In general, engaged scientists were also experiencing some frustration that the accumulated knowledge in terms of control was not being fully implemented. In order to overcome this frustration and correlated problems, in Brazil, some ante-

cedents of political involvement can be remarked, such as: (a) the creation and development of the Brazilian Society of Tropical Medicine (years 1960), an institution which always stimulated applied research and integration between scientists and health authorities; (b) the particular creation of a very productive research programme the “Integrated Programme for Endemic Diseases” by the Brazilian National Research Council in the 1970s; (c) the realization of several and very remarkable congresses and technical meetings about Chagas disease, such as the international congresses in 1959, 1979, and 1984, the annual meetings of Caxambu and Uberaba (respectively for basic and applied research), etc.; (d) the publication of national research journals in different Brazilian states and of text books such as of R Cançado (1968, 1984), Brener and Andrade (1979, 2000), Lent and Wigodzinsky (1979), A Raya (1981), Jarbas Malta (1990), Dias and Coura (1990), etc.; (e) the usual practice of the allocation of scientists and researchers in governmental positions and/or as health consultants. In Argentina occurred practically the same, being noteworthy the well done national services of the Mario Fatalla Chaben Institute (diagnosis, epidemiology, treatment) and the “Programa de Salud Humana”, designed to improve expertise in diagnosis, treatment, and control along the country and even neighbour countries. Departing from the above mentioned congresses, meetings and correlated scientific activities, an international integration emerged in the region, resulting in concrete cooperation among the countries. As some examples, the creation of an international committee for the fight against Chagas disease (1979-1990) and some particular control joint ventures between the countries (Brazil-Uruguay, Brazil-Paraguay, Argentina-Bolivia) can be mentioned (Coura 1997, Dias & Schofield 1999).

Recent antecedents (Schofield & Dias 1999) - At the end of the 1980s, with the emersion of a new democratic era in the region, the integration among the countries was intensified. Several analysis of cost benefits practical examples such as that from the state of São Paulo suggested that a large scale and continuous programme of vector control would be definitely effective against *T. infestans* and economically attractive. In March 1991, the ideas were aired during the XX congress of the Brazilian Society for Tropical Medicine. In May the proposals were put to the director of PAHO, and in June the Italian Consiglio Nazionale delle Ricerche hosted a discussion meeting in Rome to coincide with a new film on Chagas disease. The “dream” of a multinational programme for the elimination of all domestic and peridomestic populations of *T. infestans* as gathering scientific momentum. The political framework was beginning devepoled by PAHO through periodic meetings of Ministers of Health of the Region. Already in 1986, during the first of these meetings, it has been recognized that Chagas disease control would require multinational action, at least along frontier regions, and by 1990, delegates to the XXIII Pan American Sanitary Conference had included Chagas disease in a list of ailments to be studied as possible targets for elimination in the Americas. The next Southern Cone Ministers meet-

ing in Brasília (June 1991), became historic. A month earlier, the president Carlos Menen of Argentina had publicly endorsed the revised national plan of Chagas control, so that the Argentinian delegation, baked by that of Uruguay, was able successfully to propose Chagas disease as the priority target in the region. The consequent resolution was the following:

RESOLUTION 04-3-CS DISEASES CONTROL (ZOOONOSIS)

Considering that:

The zoonosis and other transmissible diseases cause important sanitary, economic, and social problems, by what it must be considered indispensable the reinforcement of the national programmes for their prevention and control.

It was decided that:

An Intergovernmental Commission for Chagas Disease must be created, with PAHO as its secretary, for the elaboration of a sub-regional programme and action plan for the elimination of the domestic *T. infestans* and the interruption of the transmission of *Trypanosoma cruzi* by blood transfusion. This work must take particularly in consideration the situation and the existing national plans and the mechanisms of technical cooperation between the countries, and must be concluded in a lapse of six months.

By September that same year, the first planning meeting for the Initiative was held in Santiago (Chile), with delegates of all the countries being supported by the Commission of European Communities. There was a clear scientific consensus, both for the feasibility of the proposals and for the operational methods to be used. In November 1991, under the auspices of the Ministry of Public Health of Uruguay and still with the help of European Community, the SCI was officially formalized. The basic objectives of SCI were the following (Salvatella 2003):

1. To eliminate *T. infestans* of dwellings and peridomestic ecotopes of endemic and probably endemic areas.
2. To reduce and to eliminate domestic infestation of other triatomine species in the same zones occupied by *T. infestans*.
3. To reduce and to eliminate the transmission of *T. cruzi* through blood transfusion by means of the improvement of the blood banks net and the efficient selection of blood donors.

In 14 years of activity, a total of 14 intergovernmental meetings were carried on, besides several technical meetings and 35 international evaluations of the national control programmes. Among others, some very successful results could be pointed:

(a) the interruption of the disease transmission following *T. infestans* elimination or drastic reduction in extensive areas such as:

1. Uruguay (country) 1997;
2. Chile (country) 1999;
3. Brazil (six states) 2000;
4. Brazil (two states) 2001;
5. Argentina (four provinces) and Brazil (two states), 2002;

6. Paraguay (one department), 2003;
7. Argentina (two provinces) and Brazil (two states), 2004;
8. Brazil (one state), 2005.

(b) The real improvement of the national programmes quality and rationality, including in terms of epidemiologic and operative methodology equalization, homogeneity of international prices (such as insecticides, spraying machines, and diagnosis reagents).

(c) The improvement of quality control in Chagas serology for the national reference laboratories of the Region.

(d) The concrete coordination of bi national activities in frontier areas.

(e) The systematic evaluations of national blood banks systems.

(f) The technical cooperation among countries and with PAHO for the development of control projects supported internationally.

(g) Projects "TCC" (technical cooperation between countries with PAHO support).

(h) The improvement of technical instances for the normalization and patronization for control and surveillance strategies and methods.

(i) Elaboration and edition of technical publications, with posterior divulgation and diffusion.

(j) Integration and reinforcement of Mercosur, at the level of the Working Sub Group number 11 (Health).

In a very special way, it was with the help of SCI that Bolivia and Paraguay finally launched their national programmes, with the desired coverage and continuity degree. By 1996 and 1997 a very long and delicate strategy was implemented in Bolivia in order to put clear for all the country that the disease consisted in a national important problem and that its control was basically a question of political will. The own Republic president (Hugo Banzer) was involved in a scientific meeting held in Santa Cruz, where general data and strategy details were presented by national and international experts, including the PAHO director. In particular, the basic arguments considered not only the social picture of the disease but also the feasibility of the control and the political and humanitarian credits that would result from the success. At that time the president declared the priority for Chagas control and recognized the great extension of the disease in the country, including affecting people from his own family. Also present authorities of BID in the meeting demarches were implemented to make available an international lending of about US\$ 25 million, to attend the programmes of Chagas disease and malaria. Two years later the entire programme was functioning, with the task to spray 700,000 houses and to make safe the transfusion in all the blood banks of the country.

In Paraguay, where full implementation of the programme was delayed due to budgetary restrictions, control concentrated on the more heavily populated eastern part of the country, although substantial parts of the Chaco region have also been treated. In spite of never been possible the reception of extraordinary funds, by means of a strong political determination the work could be progressively implemented. Besides a good manager

team, the fundamental factor was indeed the maintenance of the old and valorous Senepa (Servicio Nacional de Erradicación del Paludismo) service, a traditional and vertical institution responsible for malaria and other endemic diseases control. Even being scarce, human and material resources were rationalized and the field work was carried on regularly in contiguous areas and under strict continuity.

In Brazil and Argentina, particularly, it must be recognized the role of SCI concerning the national programme maintenance, in a moment when the wave of decentralization of health services practically destroyed the traditional control institutions. Additionally, other constraints involving the administration (limitation of human resources) and the epidemiologic scenery (the emersion and spreading of diseases such as dengue fever, AIDS, and leishmaniasis), reduced from Chagas the priority. In this frame, SCI was fundamental, holding on line the programme and maintaining priority on *T. infestans* elimination (even under depressed circumstances). For Uruguay it has been more or less the same, but with much higher budgetary constraints. Even though the work is being maintained with enormous sacrifices and determination of the extremely reduced operative staff. It was very lucky that the country reached rapidly its surveillance status (1996) and that municipalities, schools and regular police are being involved in the detection and elimination of the very rare residual *T. infestans* foci. More than this, two additional elements are helping the fight against Chagas disease in Uruguay: the progressive and strong wave of urbanization in all the country and the complementary action of a very effective rural housing improvement governmental programme, the Mevir, functioning regularly since several years.

GENERAL IMPACT OF SCI IN THE REGION

As mentioned above, the first thing to be considered is that CSI could maintain its regular function during all these 14 years, chiefly because of PAHO and national technical teams determination. In the reality, several and complicated political changes occurred in all the countries, as well as budgetary and administrative constraints, but the activities of the Initiative never were interrupted. More over, new possibilities and programme improvement such as other regional initiatives and the management and treatment of yet infected people were implemented along the time. For instance, problems such as the congenital transmission and the focal resistance of to the usual insecticides are being faced by means of induced research and field experiments programmed and stimulated in the context of CSI.

In terms of the classic indicators, after the implementation of SCI the *infestation* rate considering declined enormously in the highly endemic areas of Bolivia and Paraguay, as well as in the important residual foci located in North Argentina and in some Brazilian states such as Minas Gerais, Bahia, and Rio Grande do Sul. In the majority of the worked areas, indoors infestation generally decline to inexpressive levels (5% or less), also being followed by expressive reduction of the triatomine density and natural infection. The immediate

consequence has been the drastic reduction of the incidence of Chagas disease in such areas, disappearing the acute cases and being reduced the prevalence in low age groups. In those areas with the occurrence of native species in sylvatic and peridomestic foci, the elimination of *T. infestans* can be followed by sporadic or progressive invasion of secondary triatomines. This is the case particularly more important for Brazil, with the species *P. megistus*, *T. brasiliensis*, *T. pseudomaculata*, *T. sordida*, and others, a situation which requires a permanent epidemiological surveillance. At medium term it can be observed a significant and progressive reduction in the levels of seroprevalence, revealing a situation of non-transmission. Such reduction naturally will be reflected directly in the other more important transmission routes (transfusion and congenital) by the decreasing prevalence in blood donors and pregnant women (Dias 2002). At long term (decades), the impact can be also observed in terms of mortality and morbidity, including throughout the declination of hospital admissions for Chagas disease (Schofield & Dias 1999). The Figs 1-4 illustrate the performance of some indicators in SCI.

For Chile, the domestic infestation index was reduced from 29.0% in 1982 to 1.1% in 1998 (reduction of 96%). The incidence of the infection among children up to 15 years declined from 5.4% in 1990 to 0.9% in 1997.

For Paraguay, domestic infestation by *T. infestans* was reduced from 39.0% in the 1980s to 10% in 1996. For the same period, the prevalence in young boys (age 18) declined from 9.7 to 3.9%. It must be remembered that the programme started with a small delay (1994), reaching 30% of coverage until 1998 (135,400 sprayed houses).

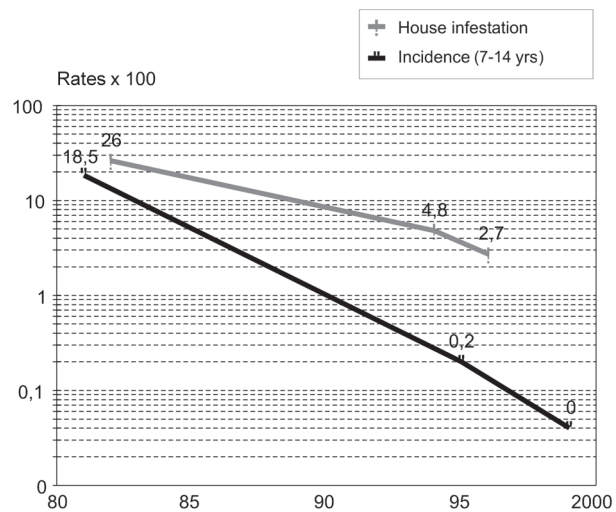


Fig. 1: Southern Cone Initiative Brazil: elimination of Chagas disease transmission, 1982-1998.

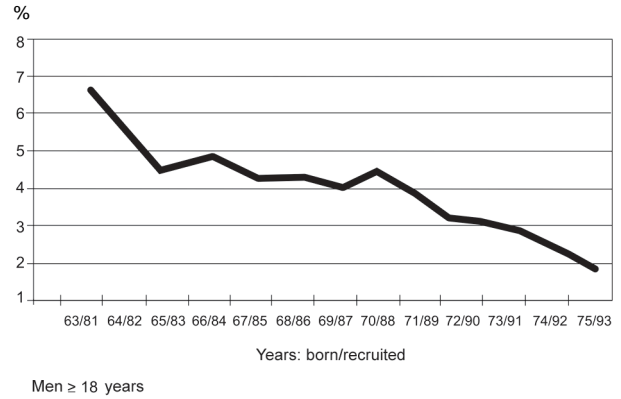


Fig. 2: prevalence of infection by *Trypanosoma cruzi* in recruited for military service. Argentina, 1981-1993.

In epidemiological terms, the key indicator is taken from serological surveys, especially of children born since the beginning of the programme. The reduction in seroprevalence among other age groups and blood donors also provide useful information. In Brazil, a very recent serological survey among children (age 0-5 years) started in 2002 all over the country. Preliminary results from 98,000 examined samples indicate that only 20 of them were seropositive (0.02%), and that only in five of these positive children the vectorial could be considered the unique mechanism of transmission (National Surveillance Department – preliminary data, Brasília, 2006). Considering the blood banks of the Region, specific legislation was introduced in all the countries, becoming mandatory the serological selection of candidates to blood donation. At the end of the century, the proportion of controlled banks in the Region reached more than 90%, with the exception of Bolivia (35%). It is also highly remarkable the progressive reduction of the proportion of seropositive candidates in all the countries. For example, in Brazil and Uruguay the prevalence is below 1% in recent years. Results are also showing that the age-prevalence curve has shifted towards older age-groups, meaning that in 10 or 15 years more the risk of transfusion Chagas disease practically will disappear in controlled areas. The same reasoning can be applied to congenital transmission, considering the progressive exhaustion of sero positive individuals among the women population in fertile age (Dias & Schofield 1998, Salvatella 2003).

A further indicator involves economic estimates. At the onset of SCI it was predicted of at least 14% the rate of return of the total investment (US\$ 190-350 million), basically taking into account direct medical costs (Schofield & Dias 1999). Nevertheless, recent studies in several situations are estimating averages annual returns of over 35% (Akhavan 1997). The general budget for vector and blood control has been maintained by the countries with national resources since the beginning of

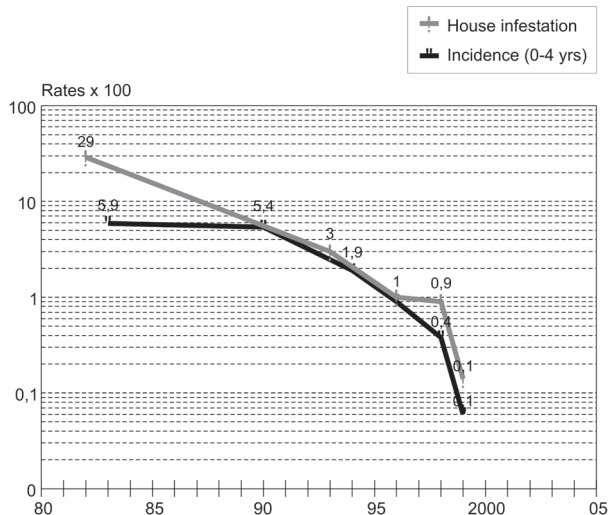


Fig. 3: Southern Conme Initiative Chile: elimination of transmission of Chagas disease, 1982-2000.

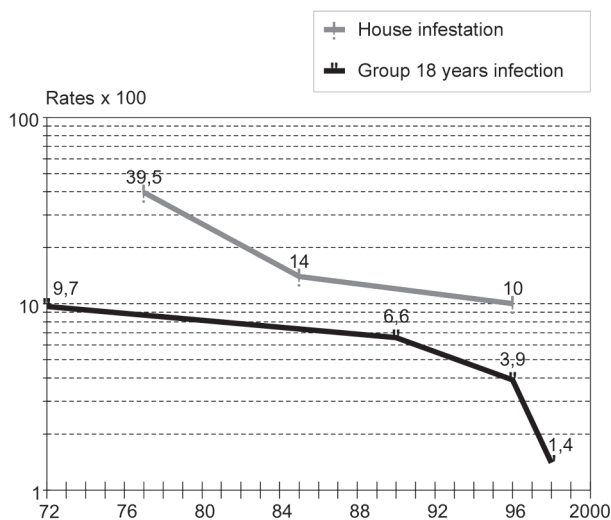


Fig. 4: Paraguay: domestic infestation rate and seroprevalence among 18 years old boys in different periods (Salvatella 2003).

SCI, with the exception of Bolivia, that established the priority in 1997. Basically considering vector control, in 1997 the expenses by country were (in US\$ thousands): Argentina = 13,000; Bolivia = 6,942; Brazil = 28,640; Chile = 650; Paraguay = 2,207; Uruguay = 40 (Salvatella 2003). These figures are being maintained approximately the same until to day, with a bias to decrease in the countries where surveillance areas are being expanded, such as in Brazil (Vinhaes & Dias 2000).

THE PRESENT SITUATION OF SCI

As a whole, the Initiative is going on, with its normal activities being performed regularly. From the technical point of view, as much as the basic methodology for field operation and the epidemiological parameters have been systematized, so making comparable the routine information of the countries. The tasks pertaining to PAHO are being perfectly accomplished, in terms of the regular intergovernmental meetings, routine supervision, and regular information to the members. In spite of the natural changes in the ministries of all the countries, the national technical staffs remain basically the same. Replacement of programme leaders occurred in Chile and Argentina due to disease and death of Drs Julio Valdés and Sonia Blanco, also in Bolivia, Brazil, Paraguay, and Uruguay (administrative changes), but all the substitutes were chosen among the same team, so avoiding technical rupture in the activities. In terms of programme advances and operative changes, the last improvements and modifications decided by SCI technical commissions in the last years were:

a. To introduce the concept of *transmission elimination*, for a determined area (or sub-region) with none or minimum residual infestation and negative sero epidemiology in low age groups.

b. To pay attention and to improve the monitoring of triatomine tolerance, regarding to prevent possible situations of insect resistance to current insecticides.

c. To pay attention to secondary triatomine species (chiefly in Brazil).

d. To improve the quality and sensibility of triatomine detection in situations of low density.

e. To improve the strategies and tools for triatomine control in peridomestic ambient.

f. To develop and to improve activities of health education, with the major objective to get permanent community participation in situations of epidemiological surveillance.

g. To accept the result of one only serological technique for blood banks screening, since the correspondent laboratory is considered a reference service equipped with the highest patterns of quality.

h. To stimulate all the countries to realize routine serological screening in low age populations of treated areas, in order to measure the impact of the actions and even to determine and to explore residual transmission foci.

i. To launch a regular sub programme for specific treatment in sero positive individuals up to 15 years.

j. To stimulate epidemiological evaluation of the risk of congenital Chagas disease in all the countries, as well to implement a sub programme for congenital disease management. In that case, some countries (Paraguay, Uruguay, areas of Argentina) are electing the regular study of all pregnant women, to follow the concepts of the chagasic mothers and treat the positive ones. Another model would be the new born routine serology at birth time, with a new serology after six months, preferred by Brazil.

k. Total support to the project "Benefit" and correlated researches on chronic cases, looking for the avail-

ability and possible benefits of specific treatment, at long term.

1. General dissemination and stimulus for regular courses and technical qualification concerning the medical management of infected individuals.

The general model for *T. infestans* and blood banks controlling has proved to be efficient since the resources and the technical staff are available and the work has the required continuity. Areas highly infested during decades in Bolivia (Tupiza), Paraguay (Amambay Department), Argentine (Jujuy Province), Brazil (Minas Gerais, São Paulo, Rio Grande do Sul), Uruguay (Rivera Department), and Chile (IV and VI Regions) have been virtually cleaned of that triatomine, in parallel with the total disappearing of acute and low age cases of the disease. An ancient preoccupation about the recrudescence of infestation from some existent sylvatic foci in Bolivia showed to be not significant, since such kind of insects are not invasive and have genetic and behavioral characteristics very different of the domestic *T. infestans* (Dias 2002).

New challenges and constraints - The basic problems of triatomine control will remain, even in the presence of political priority and the work continuity, specially in terms secondary species. Three correlate problems are emerging at the administrative and political sides, as a challenge for health authorities and engaged scientists: (a) the progressive loosing of interest and visibility concerning the disease and its control in already certificated areas. This point has been hardly reinforced because of the emergence of other diseases (dengue and leishmaniasis e.g.); (b) the progressive reduction of the technical staff and of the disease expertise in all the Region; (c) the progressive difficulty to maintain the activities in the new situation of decentralized health systems. In reality, the classic vertical "malariaology" system revealed to be extremely effective in triatomine control, mainly in attack phase.

Nevertheless, national and vertical programmes were progressively deactivated all over the Region since the final of the years 1980. In the decentralized system, the finalistic operations concern with peripheral levels (basically municipalities), corresponding to regional instances (states, provinces) the coordination and data consolidation. In terms of SCI, without a very strong and active central level, it will be extremely difficult to get actualized and universal epidemiologic data, as well as to implement new tools (or strategies) and to maintain a high level of field operation (Vinhaes & Dias 2000). Considering separately the question of housing improvement, this important sector seems to be not a priority for governmental authorities, in spite of some few exceptions. It must be considered that rural people does not represent a good political investiture for traditional politicians, in the same way as the modern social model is indeed prioritizing urban instead rural populations.

At the transfusion side, probably the level of blood donors control will be maintained during one or two decades. The main task, at present time, correspond to Bolivia, where about 50% of the banks still realize transfusions without serological control. With the new IBD

resource, probably in one or two years this situation will be surpassed, since the priority of the programme is maintained (Dias & Schofield 1998). By another angle, with the progressive reduction of the risk of transmission, at short-medium term, bureaucratic authorities certainly will manifest doubts concerning the need to maintain the regular blood screening, mainly with arguments of cost-benefit. At this time, it will be necessary a very deep discussion of the scientific team, in order to advice adequately health authorities.

Finally, considering the fundamental side of health education, in spite of several attempts (including in SCI, for instance, in punctual efforts of Paraguay, Uruguay, Bolivia, Chile), a national and permanent educative structure never has been improved, as much as in elementary or superior school level. This last point could be considered in the agenda of SCI for the present decade, eventually promoting workshops and integrated plans between the health and the education sectors of the countries.

Role of PAHO - Some last words about this crucial point. PAHO has been indeed indispensable for SCI implementation, continuity, and success. The governments of the Region must reinforce PAHO's activities, because other international institution has the required technical and/or political conditions to accomplish this desideratum. It must be taken into account that the visible loosing of priority of Chagas disease in the countries only can be faced if an institution like PAHO remains deeply engaged in the problem and involves directly its technical and political staff working both directly inside the countries and coordinating (and catalysing) cooperation and activities inter countries. In particular, the budget available for research in Chagas disease is becoming very restrict in TDR and correlated Agencies. It is another task for SCI and for PAHO to revert this situation, since several research lines are still very important for the definitely control of American trypanosomiasis.

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