

# Strategy to improve access to etiological treatment of Chagas disease at the first level of care in Argentina\*

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## ABSTRACT

**Objective.** *Improve distribution of etiological treatment of Chagas disease by identifying barriers to the decentralization of treatment to the first level of care in Argentina.*

**Methods.** *A qualitative, exploratory, and descriptive study was conducted using semi-structured interviews of key actors belonging to the National Chagas Program and members of health teams at the first level of care, for the purpose of identifying barriers to diagnosis and treatment of Chagas disease at different levels (administrative, health agents, and community) that could affect a decentralized distribution strategy. Additionally, pilot decentralization was instituted in 10 primary health care centers in an Argentine province.*

**Results.** *Semi-structured interviews were conducted with 22 program heads and health professionals. Principal obstacles found were lack of systematic case-finding, poor coordination among levels of care and health system actors, lack of health team training on treatment, patient monitoring, and patient-related barriers. A pilot decentralization program was carried out and strategies were evaluated to optimize large-scale intervention.*

**Conclusions.** *The results made it possible to improve implementation of the plan to decentralize treatment through better inter-program coordination, capitalization on existing monitoring and communication tools, and sensitization of health teams. Furthermore, recommendations were developed to improve diagnosis and treatment of Chagas disease.*

## Keywords

Research; Chagas disease; treatment; decentralization; Argentina.

\* Official English translation provided by the Pan American Health Organization. In the case of discrepancy between the two versions, the Spanish original shall prevail.

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Chagas disease is a severe public health problem in Latin America, home to an estimated 6 million infected people (1).

Based on the latest case estimates in Argentina, approximately 2 300 000 people are at risk of Chagas disease, 1 500 000 are infected (3.7% of the population), and more than 370 000 have Chagasic cardiopathy (1). The epidemiological profile has changed in the last 15 years; now, the greatest number of new cases occur through congenital transmission, more

than through vector and transfusion transmission (2, 3). In 2014, congenital transmission occurred in 5.72% of children studied and followed to 1 year of age (4).

The objective of etiological treatment is to eliminate the parasite (*Trypanosoma cruzi*) from the infected person to diminish the probability of developing clinical manifestations of the disease and to break the chain of transmission (5). The literature shows that there is sufficient evidence to recommend etiological

treatment in the acute stage of Chagas disease (congenital- or vector-borne), as well as in any stage in children aged ≤19 years (5, 6).

The National Chagas Program (NCP) in Argentina (7) seeks to optimize early diagnosis and timely treatment of acute and chronic Chagas infection, through design and distribution of patient care guidelines (8) and the purchase and free distribution of trypanocidal medication by the Argentine Ministry of Health to provincial Chagas disease programs. These, in turn, distribute the drug to hospitals and primary health care (PHC) centers—part of the public subsystem—based on demand. The Argentine health system has free and universal public coverage, which coexists with charity care and the prepaid medical system financed by compulsory or voluntary insurance regimens, respectively.

Historically, despite free services and the availability of medication, prescription of etiological treatment for Chagas disease has been low, especially in the first level of care (9, 10).

Furthermore, not only has the prescription of drugs been low in the first level of care, but so has implementation of all Chagas disease control measures. Etiological treatment of Chagas disease with trypanocidal drugs requires prior vector control in the area.

The NCP (11) and the National Institute of Parasitology (12), together with the Remediar Program (which ensures access to essential drugs in the public health system) (13), all part of Argentina's Ministry of Health, advocated learning the causes of these problems. They devised a decentralized strategy for distribution of the trypanocidal drug to improve access to treatment. To evaluate the best way to carry out this new strategy, they felt it would be appropriate to conduct this study from an implementation research perspective.

The NCP proposes decentralizing medication—which includes distribution of trypanocidal medication and materials on diagnosis, treatment, and pharmacovigilance—directly to PHC centers through the Remediar Program, in order to increase use of the drug and to ensure adequate restocking of inventories. This strategy involves not only decentralized distribution; it needs to fit the requirements and needs of PHC centers, since the goal is to increase the prescription rate at the first level of care.

This study was carried out in 2015 and had two main objectives: identifying potential barriers to decentralization of trypanocidal drugs through interviews with stakeholders, and a pilot decentralization program in the province of Tucumán, Argentina.

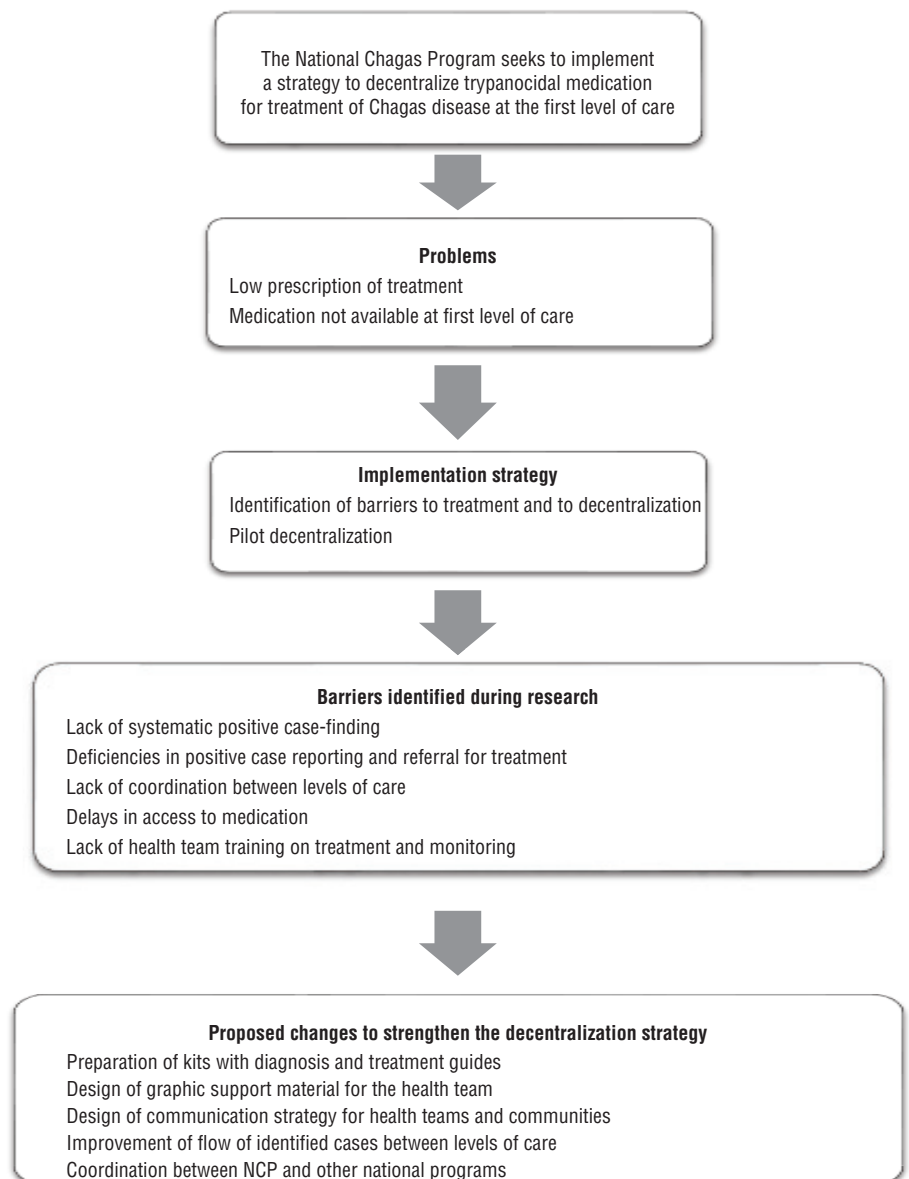
Figure 1 schematically presents the problem that gave rise to this project, as well as implementation strategies and expected programmatic changes. The results can be used to produce a plan to implement decentralization at the national level, for the purpose of increasing medication use in the target population.

## MATERIALS AND METHODS

### Study design

The study is part of a new initiative called Improving Program Implementation through Embedded Research (iPIER), carried out by the Alliance for Health Policy and Systems Research in collaboration with the Pan American Health Organization (PAHO). This initiative places program heads at the center of the research in order to understand deficiencies in health systems that create barriers to implementation, making it

**FIGURE 1. Basis for proposed recommendations to strengthen the decentralization strategy for treatment of Chagas disease in Argentina**



NCP, National Chagas Program.

possible to identify solutions and contribute to the effectiveness of health programs and policies (14). This study was carried out using implementation research methods based on two approaches. The first approach focused on research, using qualitative methods to identify barriers to access to etiological treatment for Chagas disease at the first level of care. The second focused on implementation, entailing a pilot intervention for decentralization in the province of Tucumán, endemic for Chagas disease.

The work team comprised professionals belonging to the NCP and investigators from the Institute for Clinical Effectiveness and Health Policy and the Gino Germani Institute, both in Argentina.

The study was approved by the Ethics Committees of the National Institute of Parasitology and PAHO. Interviewees consented to their participation through acceptance of the informed consent form.

### Identification of barriers

A qualitative, exploratory, and descriptive study was conducted to identify potential barriers. Semi-structured interviews were conducted with national and provincial professionals involved in decentralization and members of health teams at the first level of care in selected districts. Their perceptions were explored regarding current barriers to Chagas treatment at the first level of care and potential barriers to implementing decentralization.

Key informants were selected with the intention of including actors from the three levels of care, all of which will be affected by decentralization. The selection criteria for the centers where the interviews were conducted were the same as those used to select centers for the pilot intervention. The goal was to reflect heterogeneity with regard to geographical location and whether the personnel had received training on Chagas disease. Based on these criteria, four centers were selected intentionally: two in the interior and two in the capital; one in the capital and one in the interior had received training, while the others had not. Interviewees were those who were available in the PHC centers the day of the visit. Interviews were recorded and transcribed directly. The text was analyzed using qualitative analysis techniques

(thematic content analysis) (15) with ATLAS.ti® software. Interviews were coded based on the main themes and dimensions addressed by the study, and the thematic analysis was aimed at identifying barriers to implementation of the intervention.

### Pilot decentralization

With regards to implementation, a pilot project was planned in ten PHC centers in an endemic province with a view to evaluating it and producing recommendations to the NCP for implementation of an effective decentralization process at the national level. Three criteria were considered for inclusion of PHC centers. One was distribution according to jurisdiction and health regions (program area divisions responsible for a defined population). Another was whether or not the actors had training in Chagas diagnosis and treatment. The third was whether they had provided treatment in the previous four years. Although this was a convenience sample, various combinations among the three criteria were sought, to have a heterogeneous sample. Finally, the final list of PHC centers was agreed by representatives from the NCP, the National Institute of Parasitology, and the Provincial Chagas Program. In February 2016, decentralized delivery of the trypanocidal drug started in these ten PHC centers (which continues to the present), accompanied by communication material designed by the NCP for the health team and community (posters, fliers, and Chagas diagnosis and treatment guidelines).

### RESULTS

Twenty-two semi-structured interviews were conducted: six key actors in the design and implementation of decentralization (the heads of the NCP and the National Institute of Parasitology, and representatives of provincial Chagas programs and the Remediar Program; the coordinator of a municipal Chagas program, representative of an association of infected people from the south of Buenos Aires Province; and 15 health team members, with different specialties and functions (one PHC center director, two gynecologists, two pediatricians, two general practitioners, five health agents, two pharmacy heads, and one administrator).

The interviews identified barriers to diagnosis and treatment of Chagas disease at the first level of care and in the health system, health teams, and patients (Table 1). Shortcomings were identified in reporting and treatment flows for positive cases in the program area. Patients tend to be diagnosed at the second level of care and do not always receive technical assistance to continue treatment in health centers close to home. This poor coordination between the primary and secondary levels, and deficiencies in the referral and counter-referral system, were pointed out as problematic aspects for treatment and monitoring of patients in PHC centers.

Shortcomings were also pointed out in access to medication in the centralized system, from delays in shipment of medication and from missed opportunities for treatment due to providers' lack of medication. Difficulties were also detected in case-finding and diagnosis. With the exception of screening of pregnant women, active case-finding is not done in the adult or child population. Although this is an endemic region, the health teams do not consider Chagas disease among their main concerns. Another obstacle mentioned was the poor training of health teams at the first level of care in the treatment of *T. cruzi* infection. Several providers described limited clinical experience and little knowledge about prescribing and supervising treatment, along with a lack of training of nonmedical team members. A lack information and knowledge being transferred from professionals who attended trainings to those who did not was also pointed out as a potential barrier.

Factors that were linked to the community were people's lack of knowledge about Chagas disease and problems with treatment compliance linked to side effects or to the lack of treatment monitoring by the health team.

Opinions of the decentralization strategy were varied. For some, it would facilitate patient access to treatment by itself, while others were more guarded with regard to the potential advantages over current distribution. The interviewees agreed that these changes should be accompanied by other interventions, such as improving diagnostic efforts, health team training (more systematic trainings targeting all team members), distributing support material

**TABLE 1. Potential barriers to intervention effectiveness and recommendations to improve design of implementation of the Chagas treatment intervention in Argentina**

	Barriers	Verbatims	Actions	
Administrative or in the health system	Lack of coordination between levels of care and health system actors	Deficiencies in diagnosis and treatment flows. Poor communication between levels of care and sectors. Shortcomings in positive case reporting in the program area.	<i>There are a lot of diagnosed patients walking around, who perhaps did not receive guidance or treatment prescription when they were supposed to. Patients are referred to the hospital (but) they do not do counter-referrals ... we have to dig to find out what's going on with the patient.</i>	Design more fluid and effective strategies to improve flow between PHC centers and hospitals. Strengthen coordination between the National Chagas Program and other government programs and entities inside and outside the health system, such as the Remediar Program, and the education sector, which is required to carry out active case-finding in endemic areas, to agree on actions aimed at improving early detection and treatment. Improve the registry and reporting strategy for positive patients (reporting and registration) to monitor them, by working together with the National Health Surveillance System (SNVS is the acronym in Spanish) and the Argentine Integrated Health Information System. Consider planning a new research project to evaluate a reporting tool that enables the flow of information from the FLC to the SNVS and generation of alerts to the FLC for patient monitoring.
	Barriers in access to medication	Lack of medication in PHC centers. Missed opportunities for treatment prescription.	<i>Medication requests take a long time when you don't have it right in the PHC center; some time goes by until it arrives, not a great deal, but well, you have to go look for the patient ...</i>	Optimize monitoring of decentralization, based on drafting specific questions and appropriate indicators to evaluate the strategy.
Health team	Barriers to diagnosis	Lack of capacity to diagnose new cases in PHC centers. Health teams do not see Chagas disease as a problem. Limited resources: shifts, laboratory, others.	<i>The truth is that there's no systematic case-finding, with testing ... I don't know (if there are treatment protocols for Chagas disease); I can't say because I don't know; I've never read, never in the last few years ...</i>	Improve NCP and PCP training on the comprehensive approach to Chagas disease. Strengthen infrastructure for Chagas care in the FLC.
	Uncertainty regarding prescription of treatment	Doubts about who is responsible for prescribing treatment (specialist, generalist). Doubts about target population.	<i>In the past they used to say that treatment was not given to everyone; to be careful with Chagas disease; that only acute cases; afterwards we started to make headway, but there's still a group of people that continues with this issue ...</i>	Clarify the target population for etiological treatment by training prescribers.
	Deficiencies in training the health team on etiological treatment	Little knowledge of treatment prescription and monitoring. Unsystematic training. Lack of training of nonmedical health team members.	<i>They are going to have to train ... I'm not an infectious disease specialist; I have never treated a case of Chagas in my life; the infectious disease specialist has always treated it. We've gone to one training a long time ago and we don't all go; and like that it doesn't help us much, because we can't pass on everything we've learned.</i>	Improve NCP and PCP training on the comprehensive approach to Chagas disease. Expand training coverage to nurses, community health workers, pharmacy heads, and other FLC professionals.
Patients	Barriers associated with patients	Adherence problems due to adverse effects. Little knowledge of Chagas disease.	<i>The main barrier is patient adherence ... because there are patients that say "it made me feel bad, I won't take it anymore," and that's the story.</i>	Design a communication strategy aimed at health teams and communities to lend visibility to the problems of Chagas disease and provide treatment and prescription monitoring. Produce different types of publicity materials (pamphlets and brochures, posters, cell phone apps, others) with simple, concrete information. Change guides on benznidazole prescription practices (new material and changes to diagnosis and treatment guides); e.g., inclusion of drug dosing tables based on patient bodyweight; or easy-to-use tools to consult when doubts arise.
Decentralization	Resistance to decentralization by heads of PCP	Fear of losing information. Concern over traceability of medication. Uncertainty about the role of the PCP.	<i>It's now easier to control, to register delivery; I know that the box of medication was for these patients, when they're in Remediar; the big challenge is to see what happens with the doctor, that the medication doesn't remain in the pharmacy's display case.</i>	Strengthen coordination between the NCP and provincial programs in the new decentralized treatment system, spelling out and reaching agreement on the roles and responsibilities of each party. Provincial counterparts are expected to assume more strategic management of Chagas disease prevention and health team training.

PHC centers: primary health care centers. NCP: National Chagas Program. PCP: provincial Chagas programs. FLC: first level of care.



with easy-to-use tools, and community outreach. Barriers identified to implementation of decentralization included resistance by and concerns of the heads of the provincial Chagas programs, due to possible losses of information and uncertainty about the role of local programs in the new system. For the program heads who were consulted, the results of the BENEFIT study (16), which showed that trypanocidal treatment in patients who already have Chagasic cardiopathy does not significantly reduce clinical deterioration, could provoke uncertainty in health teams, but it would not affect the objectives of decentralization, since this seeks to reinforce treatment in cases where there is already evidence of benefit.

There were also opinions concerning treatment monitoring strategies using forms currently employed by the Remediator Program for other drugs to record medication prescription and dispensing. Even though the forms do not provide information on conclusion of treatment or on side effects, several interviewees mentioned the comparative advantages over current records. Familiarity by the health teams with these tools would facilitate adoption of monitoring.

Implementation of the pilot included contributions from the qualitative study and involved making changes both within the NCP and in its relationship with others programs and agencies (Table 2). In the first place, coordination with the Remediator Program was strengthened: the data collection tool for prescription and use of the trypanocidal drug was selected and developed, modifying the already existing tool (13) to control medication use and stocks, which makes it possible to quantify prescriptions and strengthening a restocking mechanism at the first level of care. Furthermore, it was suggested that the NCP continue evaluating implementation in order to measure its effectiveness.

Based on the barriers identified and with implementation of the pilot, recommendations were made to improve the design of intervention implementation (Table 1 and Figure 1).

## DISCUSSION

This qualitative study found barriers that hinder diagnosis and etiological treatment of Chagas disease at the first level of care.

**TABLE 2. Main changes based on the study “Strategy to improve access to etiological treatment of Chagas disease at the first level of care in Argentina”**

Level	Changes
Inter-program level	Strengthening coordination among national level programs. Coordination between the provincial Chagas program and the Remediator Program headquarters in Tucumán Province. Strengthening coordination with the NCP technical team and the team of consultants from the project to strengthen interruption of vector-borne transmission of Chagas disease in Argentina, together with the provincial Chagas team.
Program level	Capitalization on existing data collection tools for prescription and use of trypanocidal therapy. Implementation of a system to monitor the decentralization and prescription strategy. Coordination with the NCP's information, education, and communication areas to give them the results of this study and design a communication strategy targeting health teams and communities to lend visibility to the problems of Chagas disease and provide prescription and treatment monitoring. Inclusion of benznidazole in a previously existing medication distribution system of the Remediator Program, which cuts costs from parallel shipments. Development of appropriate indicators to evaluate decentralization. Development of a system to monitor operation of decentralization based on use of indicators by the NCP technical team.
Community and health system level	Sensitize the various actors at the first, second, and third levels on the current treatment gap and the importance of treating patients with Chagas disease, according to standards.

NCP: National Chagas Program.

Qualitative research on this topic has been limited (17, 18). Studies have mainly focused on prevention and vector control, addressing attitudes and knowledge of the general population, of people who are infected, and of vulnerable groups (19–21).

This study found deficiencies in systematic case-finding, reporting, and registry, as well as in treatment and monitoring of positive cases. Manne-Goehler et al. (22) coincide and attribute this both to a lack of knowledge and prioritization of the problem by physicians and the community, and to the lack of clarity on recommendations for care and to a lack of resources in health services. With regard to training, as shown in studies on the subject (22, 23), this paper underscores weaknesses in health team training with regard to treatment prescription and monitoring. Training activities should include medical and nonmedical personnel, such as nurses and community health workers, who could play an important role in detection of and support for positive cases.

It is also necessary to strengthen community empowerment, given that it was mentioned that people have little knowledge of and concern about the disease, in addition to problems with treatment compliance linked to side effects. Exploring these barriers better in future studies is essential to achieving effective treatment to reduce the burden of disease.

With regard to the clarity of the recommendations, three studies give special importance to the need for clear guidelines or recommendations (22–24). The history of controversies over which patients should be treated—including the recently updated recommendations motivated by the BENEFIT study (16)—has created uncertainty with regard to treatment prescription. Such updates require broad dissemination of the new protocols among health providers who should prescribe treatment.

Another difficulty mentioned in treating and following infected persons is the lack of case reporting (23), which means that registries and case reports to the health surveillance system should be improved (25, 26). Also, lack of the trypanocidal drug at the first level health provider is a potent barrier recognized in these studies (22–24).

The limited coordination among the levels of care and delays in access to medication were other barriers mentioned by the interviewees. Town et al. (24) conclude in their article that patient care should be centralized at the first level of care, with coordinated participation from the other levels. They also prioritize having medication available in the health service to improve treatment rates, which would support the decentralization strategy proposed in this study.

There was a range of opinions on the potential obstacles to the implementation of this decentralization strategy. Some interviewees considered that the intervention would facilitate access to treatment, while others expressed concern that decentralization by itself is not going to improve the current situation. Concerns by the heads of the provincial Chagas programs is a point to take into account in anticipating resistance to the decentralization strategy. The participants agreed on the need to supplement the intervention with actions targeting prescribers, the entire health team, and the community (training, availability of diagnosis and monitoring resources, and communication and publicity tools in PHC centers and the community). Furthermore, the use of the Remediar Program's forms would represent a significant contribution to treatment monitoring.

Noteworthy limitations of the study include administrative problems to evaluate the pilot study in the expected time frame, an activity that is planned to be completed with NCP support. Furthermore, due to the characteristics of qualitative research, the results cannot be generalized to all health centers in the country. The identified barriers made it possible, however, to more accurately define potential obstacles to implementation of decentralization and outline actions to overcome them.

The study's results and the pilot implementation process that has begun have produced concrete changes in the program and served as input into the design of specific interventions that should accompany the decentralization strategy to improve its effectiveness. It was proposed to the NCP to continue with evaluation of the pilot program to learn its effectiveness and, to this end, coordination was established with the Program's technical

team and the team of consultants of the project to strengthen interruption of vector-borne transmission of Chagas disease (27, 28).

Furthermore, the process has begun to update the official care guidelines for patients infected with *T. cruzi* in Argentina and to update the graphic support materials for the health team involved in treatment prescription. The program coordinated with the NCP's information, education, and communication areas to design a communication strategy that targets health teams and communities to lend visibility to the Chagas issue and provide treatment prescription and monitoring. Production of different types of publicity materials (pamphlets and brochures, cell phone apps, among others) with simple, concrete information for health teams and for patients concerning the disease, treatment, and monitoring was recommended and submitted for consideration.

Additionally, a number of recommendations targeting various health system actors were proposed, aimed at improving the conditions for Chagas diagnosis and treatment. The recommendations were sent to the NCP representatives and included strategies for continued evaluation of the intervention—once this can be implemented in its entirety—and for the design of a long-term sustainable national plan.

## CONCLUSIONS

This study made it possible to initiate implementation of a new strategy to distribute trypanocidal medication and to make changes at the programmatic level and in health services. Barriers were also identified and improvements were proposed for prescription of etiologic treatment of Chagas disease at the first level of care, and for the adoption of an effective decentralization

strategy, with a view to scaling it up to the national level.

Essential measures to improve access to appropriate care of patients with Chagas disease include strengthening coordination between programs and among levels of care, improving trainings and the communication strategy for health teams and communities, and making trypanocidal therapy available in health centers through the new decentralization strategy, as well as facilitating access to clear diagnosis, treatment, and monitoring guidelines.

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**Estrategia para mejorar el acceso al tratamiento etiológico para la enfermedad de Chagas en el primer nivel de atención en Argentina**

**RESUMEN**

*Objetivo.* Mejorar la distribución del tratamiento etiológico para la enfermedad de Chagas mediante la identificación de barreras para su descentralización al primer nivel de atención en Argentina.

*Métodos.* Se llevó a cabo un estudio cualitativo, de carácter exploratorio y descriptivo, en base a entrevistas semiestructuradas a actores clave pertenecientes al Programa Nacional de Chagas y miembros de los equipos de salud del primer nivel de atención con el objetivo de identificar barreras para el diagnóstico y tratamiento de la enfermedad de Chagas en diferentes niveles (administrativo, efectores de salud y comunidad) que podrían afectar una estrategia descentralizada de distribución. Además, se implementó un piloto de descentralización en diez centros de atención primaria en una provincia argentina.

*Resultados.* Se realizaron 22 entrevistas semiestructuradas con responsables de programas y profesionales de la salud. Los principales obstáculos hallados fueron la falta de búsqueda sistemática de casos, la poca articulación entre los niveles de atención y los actores del sistema de salud, la falta de capacitación del equipo de salud respecto al tratamiento, el seguimiento de los pacientes y las barreras asociadas a los pacientes. Se llevó a cabo un programa piloto de descentralización y se evaluaron estrategias para optimizar la intervención a gran escala.

*Conclusiones.* Los resultados permitieron mejorar la implementación del plan de descentralización del tratamiento a través de una mejor articulación interprogramática, la capitalización de herramientas de monitoreo y de comunicación ya existentes, y la sensibilización de los equipos de salud. Además, se formularon recomendaciones tendientes a mejorar el diagnóstico y el tratamiento de la enfermedad de Chagas.

**Palabras clave**

Investigación; enfermedad de Chagas; tratamiento; descentralización; Argentina.

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