SUMMARY
BEST PRACTICES
from the Chagas Disease Control in Guatemala, El Salvador, Honduras and Nicaragua
2000 - 2014
April 2014
This document is a summary of the original report “Buenas Prácticas en el Control de la Enfermedad de Chagas en Guatemala, El Salvador, Honduras y Nicaragua 2000-2014” produced by the governments of these four countries and Japan, with assistance of Japan International Cooperation Agency (JICA) in Tegucigalpa, Honduras, in April 2014.
What are best practices?

Best practices are defined as a set of coherent actions that have generated favorable changes in sustainability, scalability and/or impact in a given setting. The definitions used for these terms are included below.

**Sustainability**
- The practice is functional for more than 5 years.
- The actors' mindset evolves from a state of "inertia" to one of "intrinsic motivation".

**Scalability**
- The practices are replicable in similar contexts to obtain resembling results.
- Although situational differences exist, the practice offers a foundational platform and indispensable factors.

**Impact**
- In addition to the expected results, other benefits are observed as effects of the implementation of the practice.

Best practices usually have a characteristic in common, that is, the cycle of "Plan – Do – Check – Act". This cycle is continually repeated from the beginning of the activity until the desired objective is achieved.

This process of continual improvement was employed when developing creative strategies, useful tools, systematic guidelines, etc., all of which helped to overcome these challenges.

In effect, the implementation of best practices strengthened at least one of the 4 fundamental elements of institutional capacity, that is “Core knowledge, Competence, Channel and Control”, that were needed to achieve success in the disease control efforts undertaken by the public health sector.
What is Chagas disease?

Signs and symptoms
Chagas disease, caused by infections with the parasite *Trypanosoma cruzi*, is characterized by two phases: acute and chronic.

The acute phase occurs in the first 6 to 8 weeks after contact with the parasite. This phase is more likely to be asymptomatic than symptomatic. However, the clinical manifestations that may occur include fever, loss of appetite and general malaise. *T. cruzi* may enter on a cutaneous or mucosal surface and in this phase the characteristic inflammation called a Chagoma can be observed.

Palpebral edema known as Romana’s sign is another well characterized clinical manifestation in endemic areas.

The chronic phase may also be asymptomatic or symptomatic. It is estimated that between 30 and 40% of infected patients who do not receive specific treatment will suffer from cardiac, digestive or neurological damage 10 to 20 years after the initial infection. The remaining infected individuals will likely remain asymptomatic for life.

Impact on society
The burden of Chagas diseases in Latin America is high, due to the morbidity and mortality that the disease imposes on the economically active population.

The most affected population is found in rural areas. Precarious housing and living conditions are important risk factors. Chagas disease can easily be left neglected in the midst of poverty.

*Hookworm, akariasis and Trichuriasis were excluded from the chart for the broadly ranged values of 130,500 - 1,923,000, 124,800 - 1,092,000 y 265,600 - 1,062,000 respectively.*

*Figure 1. Estimated burden of infectious disease in Latin America by Disability-Adjusted Life Year (DALY).*

Source: Hotes et al. 2008
**Epidemiology**
Chagas disease, discovered by the Brazilian doctor Carlos Chagas in 1909, is endemic only on the American continent. The disease affects more than 7.5 million people, among which 98% reside in the Americas. In Central America, approximately 0.8 million or 2% of the population is infected (PAHO 2006).

**Transmission routes**
The most common form of transmission is through hematophagous insects of the Triatominae subfamily, a route that accounts for more than 80% of cases (other forms include blood transfusion, congenital and oral transmission, and laboratory accidents). In Central America, *Rhodnius prolixus* and *Triatoma dimidiata* have been the principal vectors of infection. *R. prolixus* is the more efficient transmitter of the disease, being strictly domestic, but more susceptible to insecticides. Thus, the vector has been considered eliminable. *T. dimidiata* is found in domestic, peri-domestic and sylvatic environments, and thus a reasonable aim is to reduce or eliminate this vector only in domestic areas.

**Control of the disease**
Prevention and control measures should be directed towards elimination or reduction of triatomines, by increasing awareness among individuals, applying physical interventions (cleaning, improving and rebuilding of houses) and chemical control (residual insecticide spraying of houses). Community participation during these processes strengthens effectiveness, efficiency and sustainability of the disease control activities.
JICA Projects

Background
1975–1985: Onchocercosis (river blindness) Research and Control Project in Guatemala
1987–1990: Small scale malaria project in Guatemala
1991–1998: Tropical disease research project in Guatemala
2000–2014: Chagas vector control projects in Guatemala, El Salvador, Honduras and Nicaragua
  • With IPCA* objectives: Interruption of transmission through the elimination of *R. prolixus* and the reduction of *T. dimidiata*.

* Intergovernmental Commission for the Central American Initiative for Interruption of the Vector and Transfusion Transmission of Chagas Disease

Chagas vector control strategy
Attack phase:
• Entomological and serological baseline survey, followed by massive insecticide spraying
Surveillance phase:
• Implementation of the community-based surveillance system for notification of vectors and institutional response

![Chagas disease vector control strategy](image)

**Figure 3. Chagas disease vector control strategy**

Differences between vector control methods

<table>
<thead>
<tr>
<th></th>
<th><em>R. prolixus</em></th>
<th><em>T. dimidiata</em></th>
</tr>
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<tbody>
<tr>
<td>Objective</td>
<td>Eliminate</td>
<td>Reduce</td>
</tr>
<tr>
<td>Main intervention</td>
<td>Insecticide spray</td>
<td>Insecticide spray, house improvement and cleaning</td>
</tr>
<tr>
<td>Geographic Area</td>
<td>Focalized</td>
<td>Extensive</td>
</tr>
<tr>
<td>Duration</td>
<td>Defined</td>
<td>Permanent</td>
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</table>
Expansion of the JICA cooperation

• In 2000, a pilot project began in the 4 most endemic departments in Guatemala and a model of cooperation was established for development of capacity in Chagas disease vector control.

• JICA cooperation continued to expand until it reached a total of 30 departments in Central America: Guatemala (10), El Salvador (7), Honduras (8) and Nicaragua (5) in 2009.

• The cooperation consisted of two elements. One is allocation of the Japanese adviser at the central level and volunteer assistants at departmental level of the Ministry of Health. Another is the donation of equipment and supplies such as vehicles, insecticides, spraying equipment, serologic diagnostic kits, educational materials and training expenses.

During 2000-2013, JICA sent more than 80 advisors (16 long-term, 64 short-term) and more than 85 assistant volunteers (73 with a two year stay, the rest with a scheme of less than 10 months periods) from Japan.

Figure 4. The 30 departments covered by JICA for Chagas disease control in Guatemala, El Salvador, Honduras and Nicaragua, from 2000 to 2014.

Figure 5. Chronogram for implementation of JICA cooperation on Chagas disease control in Central America from 2000 to 2014
Epidemiology of Chagas disease

Estimates of the affected, 2000-2010
Between 2000 and 2010 a notable reduction was observed in the prevalence and incidence of Chagas disease in Central America.

Prevalence (total number of infected persons in the population)
The total number of people infected with Chagas disease in Central America was reduced by 78%, which implies that approximately 1.4 million individuals became free from the disease.

Incidence (number of new cases per year)
The number of people newly infected with Chagas disease was reduced by 94% as a result of the vector control interventions.
International certifications

For achieving the IPCA goal to interrupt the transmission of Chagas disease by *R. prolixus* and eliminate this vector, Guatemala, El Salvador, Honduras and Nicaragua received IPCA-PAHO international certification between 2008 and 2011.

<table>
<thead>
<tr>
<th>Certificación</th>
<th>Guatemala</th>
<th>El Salvador</th>
<th>Honduras</th>
<th>Nicaragua</th>
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<tbody>
<tr>
<td>Interruption of transmission of Chagas disease by <em>R. prolixus</em></td>
<td>2008</td>
<td>-</td>
<td>2011</td>
<td>2011</td>
</tr>
<tr>
<td>Elimination of <em>R. prolixus</em></td>
<td>-</td>
<td>2010</td>
<td>-</td>
<td>-</td>
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</table>

**Guatemala**

Awarding of the certification to the Coordinator of the Subprogram of Chagas Disease of Guatemala by the IPCA secretariat in Costa Rica, November 2008.

**El Salvador**

The Minister of Health of El Salvador received the first certification of elimination of *R. prolixus* in Central America in San Salvador, June 2010.

**Honduras**

National and departmental technical staff of the Secretary of Health in Honduras, with the awarded certificate at the XIII IPCA meeting in Tegucigalpa, August 2011.

**Nicaragua**

The Coordinator of the National Neglected Disease Program of the Ministry of Health in Nicaragua received the certification from the PAHO Headquarters Deputy Director and PAHO Director of Honduras in Tegucigalpa, August 2011.
Previous Situation
The National Program of Chagas Disease conducted activities on demand, without a plan for directing the Secretary of Health and to orient other accompanying institutions.

Strategies
The National Program prepared its Strategic Plan with participation of key actors, including technicians and politicians within the Secretary of Health and cooperating agencies.

Results
The Strategic Plan facilitated systematic and strategic programming and implementation of activities, and better integrated projects by cooperating agencies.

Keys to success
- Supportive international public policies
- National Program leadership
- Actors with different specialties but the same purpose
- Vision shared through discussions
- Formation of a steering committee
- Political commitment key in the launch
- Application and evaluation of the Strategic Plan

Executors
National Program of Chagas Disease with assistance from the National Chagas Laboratory, PAHO, CIDA, CARE, JICA, World Vision and other cooperating agencies
Strategic design of a national plan and normative documents

Previous Situation
Activities for control of Chagas disease were conducted on-demand without a vision or systematic program. The health service staff had little idea of their functions, assignments and responsibilities.

Strategies
The National Program prepared the National Chagas Operating Plan, Technical Standards and Procedures Manual for Chagas disease in a coherent and strategic manner.

Results
A vision was shared between the health service and the national government. The Standards and the Manual presented clear regulations, procedures, flowcharts and indicators that were legally supported.

Keys to success
- Follow protocol for document preparation
- Involve the Ministry’s legal commission in the review
- National Program initiative
- Horizontal coordination within the Ministry of Health
- Review experiences and existing knowledge
- Link the vision to normative and operational guidelines
- Emphasis on operability


Executors
General Directorate of Public Health Surveillance, National Chagas Devision, MINSA-JICA Chagas Project.
Creating a diploma course on vector-borne diseases

Situations
- Limited commitment and progress in Chagas-related operational activities when the Project began

Causes
- Lack of knowledge and interest among the staff of the Ministry of Health

Strategies
- Organized a dedicated course with experts and trained the staff

Previous Situation
It was difficult to advance the vector control activities of Chagas disease due to limited involvement of the staff at various levels of the Ministry of Health, resulting from their scarce technical knowledge and lack of interest.

Strategies
The Regional and National Units organized a diploma course on vector-borne diseases in coordination with the local university. The course focused on medical entomology, and was open to staff with different disciplines and levels within the Ministry of Health.

Results
The trained staff created operational teams, implemented Chagas-related vector control activities and expanded the geographic coverage of intervention.

Keys to success
- Platform for organizing diploma courses
- Ministry’s interest in human resource development
- Employees’ interest in professional development
- Self-motivated investment in high quality classes
- Positive reputation of the course
- Economic and physical access to the course
- Academic service and support from the university
- Financial support from cooperating agencies

Executors
National Unit of Vector Borne Diseases and the Western Regional Health Office of the Ministry of Health, Autonomous University of Santa Ana in El Salvador and JICA.
Integrating technicians from different disciplines for vector control operation

**Situations**
- Some operational staff did not execute and/or record their activities
- Inconsistent data recording

**Causes**
- Operational activities were not regulated
- Data formats were not standardized

**Strategies**
- Established minimum standards for daily data entry for different disciplines

**Previous Situation**
Progress in Chagas vector control activities was limited due to lack of operational human resources in the Vector Control Unit. Although other operational disciplines participated in Chagas-related activities on occasion, the data were not systematized.

**Strategies**
The National Units coordinated and incorporated required operational activities in daily data entry for the different disciplines, trained the staff, and linked the data through an online information system.

**Results**
They found an increase in the recording of Chagas disease control activities, and the interventional geographic coverage. The data sharing between different disciplines facilitated operational planning.

**Keys to success**
- Availability of operational human resources
- Data entry machines for the online information system
- Integration of data in the information system
- Better estimation of workload allowing for effective approach
- Access to the information system for decision-makers
- Annual review of the daily data entry formants
- Revision of operational personnel profiles
- Most required activities assigned per jurisdiction
- Continuous training for the operational personnel

**Executors**
National Unit of Vector Borne Diseases in coordination with National Community Health and Environmental Sanitation Units

Regular check of the spraying equipment by Vector Control Technician (left) and Environmental Sanitation Inspector (right) at the Guaymango Health Unit, Ahuachapán, November 2010.
Applying Geographic Information Systems (GIS)

Situations
- Data tables offered limited visual projection of the risk and advances of the intervention

Causes
- Limited use of maps in information analysis

Strategies
- Implemented geographic information system by training the health personnel

Previous Situation
All the data related to the risk and progress in Chagas disease control were presented with tables and occasionally with graphs. The spatial interpretation of the data presents depended on individual geographic knowledge.

Strategies
The National Program on Vector Borne Diseases in collaboration with JICA introduced a GIS software and trained the staff. Various maps were prepared with existing data and utilized in presentations.

Results
The prepared maps enabled visual integration and association of the data, risk projection and overall advances. The maps had greater impacts on government authorities and cooperating agencies.

Keys to success
- Computer equipment
- Personnel with basic computer skills
- Availability of geographic data
- User-friendly GIS software
- Continuous support for software usage
- Learning to utilize the tool and its effects


Executors
National Program of Vector Borne Diseases in collaboration with JICA
Establishing Collaboration between the Ministries of Health and Education

Situations
- Little awareness of Chagas among the population
- Limited participation by schools

Causes
- Lack of knowledge, commitment and educational materials for schools

Strategies
- Established an agreement between the Ministries of Health and Education
- Worked jointly on curriculum

Previous Situation
To increase awareness of Chagas disease among the population, the Ministry of Health had some support from schools, but it was sporadic and dependent on the teacher's will.

Strategies
The Ministry of Health formalized the collaboration of the Ministry of Education at regional level and subsequently at national level, as an official agreement, integrating teaching classes and surveillance of Chagas disease as part of health education.

Results
Teachers and students showed greater participation in the surveillance and celebration of National Chagas Day throughout the country. The agreement facilitated coordination between health and education staff of the two Ministries at local level.

Keys to success
- Decentralized education and health systems
- Active key persons in the Ministries
- Favorable social relationship between highest authorities
- Involvement of third parties in lobbying
- Analysis of existing coordination at local level
- Building inter-institutional collaboration from the field
- Useful educational materials for teachers

Executors
The process initiated by the Western Regional Health Office and extended throughout the country by the National Unit of Vector Borne Diseases and the Ministry of Education, with support of JICA.
**Strengthening diagnosis of acute cases**

**Situations**
- Inconsistency was found in the methods, data and diagnostic systems of Chagas acute cases

**Causes**
- Limited knowledge and awareness among the health services staff

**Strategies**
- Identified weaknesses
- Prepared educational material
- Trained the staff

**Previous Situation**
Although Chagas disease cases were reported as a mandatory issue, inconsistencies were observed in the diagnostic methods and in the medical and laboratory records.

**Strategies**
After identifying the weaknesses, the National team with an expert prepared a physiopathology diagram as a guide, updated the diagnostic methods and mechanisms, and trained the medical, nursing, operational and laboratory staff throughout the country.

**Results**
Health service personnel became trained on the standardized diagnostic methods. The recording and case referral systems were established.

**Keys to success**
- Good access to the health services for the population
- Local laboratories with equipment and specialists
- Simple and economic diagnostic methods
- External assessment and intellectual inputs
- Training with an effective tool
- Cross-sectorial surveillance network

**Executors**
National Unit of Vector Borne Diseases and National Referral Laboratory in coordination with the Network of Clinical Laboratories, Epidemiology and Health Promotion Units
## Developing a sustainable and scalable surveillance method through knowledge management

**Situations**
- Chagas surveillance was limited in its geographic coverage and not established as a system

**Causes**
- Lack of systematized and agreed surveillance knowledge, and expansion plans

**Strategies**
- Accumulated experiences
- Created a model and a guide for replication
- Trained the staff

### Previous Situation
Chagas surveillance activities were carried out in limited geographic areas, without planning or technical guidelines that would constitute its sustainability.

### Strategies
The National Program accumulated experiences in pilot sites, constructed an efficient surveillance model between operational and normative staff, and scaled up this effort training the health service personnel using a practical guide.

### Results
A sustainable and scalable method was established for the community-based surveillance system and was documented in a practical guide. Surveillance coverage was expanded as planned.

### Keys to success
- Agreed concept for surveillance
- Efficient model, practical guide and feasible plan
- Trial and error approach
- Accompaniment at pilot sites
- Open discussions with effective facilitation

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*Educational chat in the rural community of Vega Grande, Ocotepeque, given by the Environmental Health Technician, 2008.*

### Executors
National Program of Chagas Disease in coordination with the Departmental Health Office, pilot Health Units and municipal governments.
**Previous Situation**

In Guatemala, leadership for Chagas disease was not consolidated by the Ministry of Health but by the universities. There was incoordination and unnecessary competition.

**Strategies**

An inter-institutional Chagas committee was formed by the Ministry of Health through policy advocacy, and improved communications with other institutions.

**Results**

Leadership became cultivated at the Ministry of Health. The committee established a mechanism for quality control and technical and intellectual collaboration, as well as harmonization.

**Keys to success**

- Existence of supporting regional policies
- External agencies for creation of the committee
- Goals shared among members
- Technical sense, not political partisanship
- Members assume roles
- Efforts united for international meetings
- Incentives for all members
- No financing, but with legitimacy and credibility

**Executors**

National Program of Vector Borne Diseases with other programs of the Ministry of Health, Universities and cooperating agencies.

Committee members: National Program of Vector Borne Diseases Chagas Subprogram, Blood Banks, National Laboratory, USAC, UVG, PAHO and JICA, October 2011.
Harmonizing institutions' efforts using Technical Roundtable

Situations
- The National Program did not know about Chagas-related work by other organisms

Causes
- Limited communication between the National Program and organisms working on Chagas issue

Strategies
- Created opportunities to facilitate communication and mutual monitoring

Previous Situation
Lack of coordination between the National Program of Chagas Disease, other programs and cooperating agencies resulted in deficiency in coverage and quality of the activities.

Strategies
The National Program formed a Technical Roundtable with the other programs and institutions, held periodical meetings, and exchanged their advances and experiences.

Results
Chagas-related activities of the Secretary of Health and other institutions were conducted in harmonization, with mutual monitoring and without dualities.

Keys to success
- Shared long-term goals
- National Program leadership
- Mutual process monitoring
- Exchange of valuable information
- Resources optimized by collective activities
- Low cost for holding regular meetings
- Rotation of meeting locations

Executors
National Program of Chagas Disease, National Laboratory of Chagas Disease, PAHO, JICA, with the participation of other programs and cooperating agencies.

Meeting of the Chagas Disease Technical Roundtable at the CIDA office, August, 2011.
Systematizing interventions through biannual evaluation

Situations
• Chagas-related operational activities were conducted and monitored in a sporadic manner

Causes
• Lack of systematic evaluation of the activities

Strategies
• Organized biannual evaluation on progress of the activities between the national and departmental level

Previous Situation
Chagas vector control activities were conducted without planning or systematic evaluation. Consequently, the Ministry of Health hardly had analyzable information or sharable experiences.

Strategies
The National Program organized evaluation meetings between the national and departmental level personnel, with Inter-institutional Committee members to analyze and discuss the operational activities.

Results
Implementation and evaluation of activities were systematized. This facilitated information analysis and the discussion of experiences from different departments.

Keys to success
• National Program initiative and incentives
• Financing for organizing the evaluations
• Standardized presentation formats
• Adequate setting of personnel, time and space
• Healthy competition between departments
• Opportunities for collective capacity development

Presentation by the departmental coordinator of Vector Control Unit during an evaluation held at the Ministry of Health in Guatemala City, March 2001.

Executors
National Program of Vector Borne Diseases with participation of the Health Areas.
**Reinforcing decentralization by biannual evaluation**

**Situations**
- Sporadic activities were conducted based on the National Program’s initiative

**Causes**
- Lack of local initiative, operational capacity, and national evaluation system

**Strategies**
- Organized biannual evaluations between the National Program and the departmental teams

**Previous Situation**
The National Program of Chagas Disease recorded and managed data based on their direct interventions and subsequently shared annual reports with the Departmental Health Offices.

**Strategies**
The National Program organized periodical evaluations with the Departmental Health Offices and gave them opportunities to present corresponding reports and plans, with participation of other organisms.

**Results**
Coordination improved between the departmental and national level with more fluid and systematized information. The departmental teams developed technical and administrative management capacity for Chagas disease control.

**Keys to success**
- National Program leadership
- Financing
- Standardized presentation formats
- Strengthening analytical skills
- Arrangement of personnel, time and environment
- Healthy competition between departments
- Atmosphere that surpasses discipline and status
- Sense of learning and capacity development

**Executors**
National Program of Chagas Disease with participation of Departmental Health Offices, other ministerial partners and cooperating agencies.
**Establishing evidence of elimination of *Rhodnius prolixus***

**Situations**
- There was lack of evidence about the absence of *R. prolixus*, the vector aimed for elimination

**Causes**
- Historical data had not been organized and analyzed
- Risk areas were yet to be determined and surveyed

**Strategies**
- Identified and investigated villages with a history or a possibility of presence of the vector

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**Previous Situation**
Although the control of *R. prolixus*, eliminable vector, had been conducted between 1950s and 1970s leaving the last report of the vector in 1976, there was no evidence that showed its elimination.

**Strategies**
Based on a review of historic documents, the National Unit identified villages with a history of the presence of the vector and those potentially at risk. After the entomological surveys, the results were consolidated and presented to the IPCA international evaluation commission.

**Results**
The evaluation commission certified that El Salvador was free of the vector *R. prolixus*. The relevant information was documented and published as a historical record.

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**Keys to success**
- Mechanism and incentive for international certification
- Historic documents published and archived
- Information on border areas
- Long term planning and investment for certification
- Strengthening vector identification skills
- Academic collaboration in documentation

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**Executors**
National Unit of Vector Borne Diseases of the Ministry of Health, in coordination with the investigator from University of El Salvador and the departmental Vector Control Units.
### Situations
- Difficulties found in establishing a Chagas baseline in extensive geographic areas

### Causes
- Ministry’s insufficient resources to conduct entomological and serological surveys

### Strategies
- Innovated and implemented a new efficient method to determine risk levels

### Previous Situation
Honduras had no serological or entomological baseline for Chagas disease. With limited number of operational personnel, it was difficult to implement the conventional survey methods based on domiciliary visits.

### Strategies
The National Program of Chagas Disease opted for the methodology of serological and entomological exploration with local health service personnel, utilizing primary schools as strategic points.

### Results
The obtained results constituted the baseline and facilitated determination of risk areas, especially those with a high disease transmission rate by the possible presence of *R. prolixus*.

### Keys to success
- Limited resources
- Creative ideas
- Availability of tools
- Cost-benefit
- Participatory trials at pilot sites
- Coordination with schools
- Regulate or discard
- Knowing the limitations of the method

### Executors
National Program of Chagas Disease in coordination with the National Laboratory of Chagas Disease, Departmental Health Offices and Health Units.

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*Taking a blood sample for serological exploration at a primary school in San Francisco de Opalaca, Intibucá, June 2004.*
### Establishing community participation in insecticide spraying and entomological survey

<table>
<thead>
<tr>
<th>Situations</th>
<th>Causes</th>
<th>Strategies</th>
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<tbody>
<tr>
<td>• Low geographic coverage of insecticide spraying and entomological survey</td>
<td>• Lack of operational personnel of the Secretary of Health</td>
<td>• Trained the community personnel on insecticide spraying and on subsequent bug search</td>
</tr>
</tbody>
</table>

#### Previous Situation
Insecticide spraying and entomological surveys for Chagas disease control hardly made progress. The principal reason was lack of operational personnel to conduct the activities.

#### Strategies
The Honduran Secretary of Health implemented an intervention, where the trained community personnel sprayed insecticide and searched the bugs appearing immediately after the spraying.

#### Results
Geographic coverage augmented in both insecticide spraying and entomological surveys. Consequently, a significant reduction was observed in the distribution of *Rhodnius prolixus*.

#### Keys to success
- Provision of equipment, materials and supplies
- Financing for sprayers
- Simple and delegable spraying techniques
- Quality control for spraying
- Incentives for local authorities
- Sensitizing and involving the community
- Developing a model at pilot site
- Strategic selection of community sprayers

#### Executors
National Program of Chagas Disease with assistance from the National Laboratory of Chagas Disease, PAHO, JICA, CIDA, World Vision, Cooperative for Assistance and Relief Everywhere (CARE) and other cooperating agencies.
**Campaign: “Search for the kissing bug and win a prize!”**

**Situations**
- Reduced community reports of kissing bugs
- Possible epidemiological silence

**Causes**
- Low infestation of kissing bugs
- Limited awareness or interest among inhabitants

**Strategies**
- Organized a kissing bug search campaign with schools

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**Previous Situation**
Kissing bug infestation was reduced by the massive insecticide spraying during the attack phase. The number of community reports of kissing bugs maintained low in previously endemic villages.

**Strategies**
The Jalapa Departmental Health Office organized a campaign for kissing bug search at the municipal level, involving schools as focal points for the diffusion of information and reception of the reported insects.

**Results**
The campaign increased the number of community bug reports, including *R. prolixus*, *T. dimidiata* and other species.

**Keys to success**
- Possible epidemiological silence
- Contribution from local companies
- Intensifying and controlling the campaign activities
- Schedule and slogan
- Involvement of various key actors
- Coordination between Health and Education
- Prizes by group
- Timely response to the bug reports

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**Executors**
Vector Control Unit and Directorate of the Health Area of Jalapa, in coordination with the Health Center of San Pedro Pinula, schools, private companies and NGOs.
Integrating deworming into the serological survey

**Situations**
- Malnourished children not appropriate for Chagas treatment
- Lack of deworming

**Causes**
- The deworming program was not established by the Honduran government

**Strategies**
- Distributed deworming tablets during serological surveys

**Previous Situation**
Children found positive for Chagas disease were not appropriate for receiving the etiological treatment, because of their poor nutritional condition. Honduras had no established institution for distributing intestinal dewormers for children.

**Strategies**
The National Program of Chagas Disease and Departmental Health Office distributed dewormers to improve the nutritional condition of children participating in the serological surveys for Chagas disease.

**Results**
Deworming increased tolerance to the etiological treatment among the children with Chagas disease, and also improved the nutritional condition of the population.

**Keys to success**
- Cost-effectiveness of deworming medications
- No additional cost for the government
- Community acceptance
- Interested donors
- No established deworming system
- Preparedness for a new modality
- Collaboration by local schools
- Action based on analysis
- Sufficient supplies of deworming tablets

**Executors**
National Program of Chagas Disease in coordination with Departmental Health Offices.
Reorganizing the Vector Control Unit at the departmental level

Guatemala, El Salvador, Honduras, Nicaragua 2000-2014

**Situations**
- Limited efficiency and coordination in vector control operations

**Causes**
- Vertical structure with monovalent personnel by disease

**Strategies**
- Trained operational personnel in various issues and relocated them to Health Centers

**Previous Situation**
There was limited coordination and communication in operational activity management by the Vector Control Unit of Santa Rosa, where the technicians were assigned to one of the specific-disease control teams and were concentrated at the departmental office.

**Strategies**
The executive group trained the Vector Control personnel in all vector-related issues found in the department, reassigned their responsibilities and redistributed them to the municipal Health Centers. The system was constantly reviewed.

**Results**
The Vector Control Unit expanded the geographic coverage of operations for different diseases, and improved coordination within the Unit, as well as between the Unit and the Health Centers.

**Keys to success**
- Civil Service Law
- Support from the Health Area Directorate
- Waiting for politically favorable moments
- Executive group with leadership
- Simultaneous changes of profiles
- Continuous empowerment of operational personnel
- Constant review of the system

**Executors**
Vector Control Unit in coordination with the Health Area Directorate of the Department of Santa Rosa.

Operational personnel of the National Malaria Eradication Service, original organism of vector control. Guatemala City, 1980.
Improving housing and environment with ECOHEALTH approach

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<td>* Continued house re-infestation of <em>T. dimidiata</em>, despite multiple insecticide spraying</td>
<td>* Structure of houses, especially walls and floors, encouraging vector re-infestation</td>
<td>* Improved walls and floors with local materials and reduce the risk factors</td>
</tr>
</tbody>
</table>

**Previous Situation**

Despite multiple cycles of insecticide spraying, re-infestation of *T. dimidiata* was frequently observed in some areas, because of cracked mud walls, dirt floors and animals sleeping inside the house.

**Strategies**

University of San Carlos developed the ECOHEALTH method, which focused on wall plastering using mixture of mud and sand, and on floor firming with volcanic ash and lime, making use of locally available materials.

**Results**

The percentage of houses infested with kissing bugs maintained below 5% for 8 years without use of insecticide. In the long run, the house improvement reduced the amount of kissing bugs feeding on humans.

**Keys to success**

- Research proposals and financing
- Developing practical methods for the community
- Continuous review of study design
- Constant communication with the Ministry of Health
- Replicable method with multidisciplinary support
- Cost-benefit method
- Involving key local actors

**Executors**

Laboratory of Applied Entomology and Parasitology of University of San Carlos (LENAP/USAC) in coordination with Vector Control Unit of Health Area of Jutiapa, local council and community leaders.
**Improving living conditions through community organization**

**Jutiapa, Guatemala 2011-**

**Operational level relevance**

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**Situations**
- Vector re-infestation persisted even after spraying, education and house improvement

**Causes**
- Kissing bug sources found inside the untidy houses, resulting from poor cleaning practices

**Strategies**
- Raised awareness and help the inhabitants to clean up their houses through community organization

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**Previous Situation**
The percentage of houses with kissing bugs persisted between 15% and 20%, despite multiple insecticide spraying, educational activities and housing improvement, due to poor cleaning practices.

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**Strategies**
The Vector Control team of Jutiapa organized and sensitized the inhabitants to clean the houses through the community leaders. The team divided the community into sectors and placed a leader in each sector to accompany and monitor the process.

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**Results**
Conditions improved in the majority of houses. The percentage of houses infested by kissing bugs reduced to less than 5% in the community.

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**Keys to success**
- Constructing and testing hypotheses in the field
- Committed community leaders
- Delegating responsibilities to community leaders
- Identifying and involving social groups
- Optimizing influence of existing leaders
- Dividing and scaling down to manageable areas
- Accompanying and monitoring the community

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**Executors**
Community oriented and supported by the Vector Control personnel in Jutiapa.

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*Untidy house in a rural area in Jutiapa.*
Preventing vector infestation using a Livelihood Improvement approach

Madriz, NICARAGUA 2012

**Situations**
- Houses continued to be re-infested by kissing bugs, because of the inhabitants’ living conditions

**Causes**
- Inhabitants had no knowledge of how to prevent the kissing bug infestation

**Strategies**
- Organized a work group in the community
- Implemented the Livelihood Improvement approach

**Previous Situation**
*T. dimidiata* was constantly found even after three cycles of insecticide spraying, because the inhabitants’ lifestyle, such as allowing animals inside the house, incremented the infestation risks.

**Strategies**
Local health staff organized a work group and provided a series of workshops on the Livelihood Improvement method in a community, where the inhabitants decided actions to take. The staff facilitated and monitored the process.

**Results**
There were small, gradual changes observed in the lifestyle of the inhabitants, contributing to risk reduction of the kissing bug infestation.

**Keys to success**
- Facilitator from local health service
- Formation of a trusted and active group
- Taking advantage of existing leadership in the community
- Support from the local municipal council
- Identifying necessary and feasible actions by the community
- Gradual implementation
- Continuous orientation and communication
- Exchanging experiences between communities

**Executors**
The 15 families in the community of Las Cruces, Cayantú Sector, municipality of Totogalpa, Department of Madriz. Physician of the local health sector as facilitator of the process.
Integrating the Entomological Surveillance System into Primary Health Care

**Previous Situation**
Although the Primary Health Care (PHC) team who regularly visited communities to provide medical services, were assigned to kissing bug surveillance, the corresponding actions did not happen due to lack of established mechanisms and knowledge among the personnel.

**Strategies**
Based on the analysis of the role of the PHC team, their responsibility in the entomological surveillance system was defined in an operating guide, and implemented through training and monitoring of the health personnel at pilot sites.

**Results**
The PHC team became in charge of recording kissing bugs reported by the communities and visiting the infested houses as a response to the report. These actions increased the number of reports and the coverage of response.

**Keys to success**
- Organized communities
- PHC community visit team (ESAFC) system functioning
- Preparedness of the departmental and municipal personnel
- National Program leadership
- Understanding the Primary Health Care Service
- Defining the responsibilities through trials
- Establishing an information system
- Replication guide
- Constant monitoring and supervision

**Executors**
National Division of Chagas Disease, SILAIS (Integrated Local Health Care System) and municipalities.
**Maintenance is the key for sustaining the system**

This section of the document presents experiences of how the challenges were overcome to sustain the kissing bug surveillance system with community participation, focusing on some of the most frequently reported situations in Guatemala, El Salvador and Honduras during 5 years from 2008 to 2012.

**Summary of challenges faced and actions taken to sustain the surveillance system**

<table>
<thead>
<tr>
<th>Situation with a LACK of:</th>
<th>Key actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Financial resources</td>
<td>Avoid costs and propose ideas</td>
</tr>
<tr>
<td>2. Human resources</td>
<td>Simplify and distribute tasks</td>
</tr>
<tr>
<td>3. Transportation / fuel</td>
<td>Assign the local personnel</td>
</tr>
<tr>
<td>4. Spraying equipment / insecticide</td>
<td>Repair equipment and seek alternatives</td>
</tr>
<tr>
<td>5. Community bug reports</td>
<td>Organize campaigns</td>
</tr>
<tr>
<td>6. Consistency in recorded data</td>
<td>Utilize a drop box and a record book</td>
</tr>
<tr>
<td>7. Response to the community bug reports</td>
<td>Monitor the response coverage</td>
</tr>
<tr>
<td>8. Coordination between operational technicians and physicians / nurses</td>
<td>Officialize and increase communication</td>
</tr>
<tr>
<td>9. Quality control of surveillance performance</td>
<td>Evaluate regularly using a checklist</td>
</tr>
<tr>
<td>10. Coordination between health facilities and local schools</td>
<td>Establish a formal agreement</td>
</tr>
</tbody>
</table>

**Keys to success**

- Developing an integral model (Plan)
- Working jointly with local actors (Do)
- Constant evaluation (Check)
- Continuous modification and training (Act)
¡Chinche Vista, Chinche Capturada!
Guatemala

¡No Chinche, No Chagas!
El Salvador

¡Sin Chinches, No Hay Chagas!
Honduras

¡Busca Chinches, Salva Vidas!
Nicaragua

¡No a la Enfermedad de Chagas!
Regional