

Preventing Chagas in Central America through simple home improvements

Research in El Salvador, Guatemala, and Honduras confirms that low-cost and locally sustainable home improvements provide a sustainable means of controlling the spread of Chagas disease.

Results of home improvements

A total of 1,597 medium- to high-risk homes were improved in three countries to prevent infestation by *T. dimidiata*. In participating communities, infestation rates are now:

- zero in Honduras
- 4 times lower in Guatemala

Improvements are still underway in El Salvador, with 31% of targeted homes improved as of February 2014.

It begins with mild symptoms—typically aches, fever, and localized swelling. For most people infected with Chagas, it is only when the disease enters its chronic phase, sometimes years later, that it reveals itself to be a serious, even life-threatening illness.

Estimates suggest that 7 to 8 million people worldwide are infected with Chagas, mostly in Latin America, where the disease is endemic. It is caused by the protozoan parasite, *Trypanosoma cruzi* which, in Central America, is transmitted to humans by contact with the feces of *Triatoma dimidiata*, a native blood-sucking insect sometimes known as the “kissing bug.”

In about one-third of those infected, the parasites lodge in the heart and digestive muscle, and can ultimately lead to heart failure and sudden death.

As a chronic disease affecting mainly those in poverty, Chagas weighs heavily on the economies and health systems in areas where it is widespread.

With no vaccine to prevent the disease, public health prevention efforts have mainly relied on house spraying with targeted insecticides. But *Triatoma dimidiata* has proven very resilient, re-infesting houses within just months of spraying.



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Home improvements underway in Honduras. Using inexpensive local materials enables poor households to maintain the upgrades.

The research: making homes less welcoming to “kissing bugs”

A number of earlier research efforts in Latin America supported by IDRC have shown that simple home improvements can make housing much less attractive to the insects which carry Chagas. In Guatemala, for example, researchers perfected a combination of housing improvements, domestic animal management, community education, and joint government-community health prevention measures that significantly—and affordably—decreased house infestation rates.

Building on this earlier success, in 2011, a three-country project set out to replicate and scale up these measures to address the incidence of Chagas in border regions of El Salvador, Guatemala, and Honduras. The project was implemented in five communities in Guatemala, four communities in Honduras, and two cantons in El Salvador.



The strategy reduces contact between people and the vector insects by making houses and their immediate surroundings inhospitable to them, using inexpensive measures that can be easily maintained by local people. Garbage and clutter is removed from homes and yards to remove hiding spots for the insects and improve overall hygiene. Walls and floors are sealed with locally sourced materials to remove cracks that bugs can hide in. And outdoor shelters are built for domestic animals such as chickens and dogs, removing them from family homes, as they too are preyed on by *T. dimidiata*.

Working with local stakeholders, national health research institutions in each country have made significant advances, building local and national capacity to implement this approach, while documenting and sharing lessons and findings. Through partnerships with Ministries of Health and vector control programs, staff and community members have been trained in ecohealth approaches to vector control.

Results: a sustainable approach to preventing Chagas

These home improvements have led to a dramatic decline in infestation rates of *T. dimidiata*. In Guatemala, house infestation declined by a factor of four in participating communities, while in study sites in Honduras, the vector was completely eliminated from households. These mostly impoverished households now enjoy a better quality of life thanks to the upgrades to their homes. Unlike spraying, these interventions are durable. The cement-like coating used for interior walls, for example, lasts five years. And the improvements bring additional health benefits. Installing solid flooring, for example, reduces the risk of children contracting intestinal parasites from dirt floors.

The results confirm the feasibility and efficacy of scaling up ecohealth interventions in these three Central American countries. In less than 18 months, almost 70% of medium- to high-risk houses were improved, with further work still underway in El Salvador.



With upgrades such as plastered walls and solid floors, this home in El Salvador, shown before and after, is now free of the Chagas vector. Solid flooring also protects children from soil-transmitted intestinal worms.

This approach has been endorsed by the Central America Intergovernmental Chagas Control Initiative (IPCA) and adopted by vector control programs in the three countries. Furthermore, the strategy has been designated a best practice for Chagas prevention by the Ministries of Health in Guatemala, El Salvador, Honduras, and Nicaragua.

Most importantly, other organizations are now implementing the strategy in the region. Beyond the 1,597 houses upgraded through this project, over 3,000 more houses have been improved by municipalities, health ministries, NGOs, and the UN-FAO. Overall, in the three countries, approximately 26,000 people—5,000 families—have benefited from improvements carried out through IDRC-supported research and by other donors.

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Ecosystems and Human Health

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