

Using public surveillance to study insect vectors of Chagas disease in Texas

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Chagas disease is caused by a parasitic protozoan (*Trypanosoma cruzi*) and transmitted via triatomine insects known locally in Texas as "kissing bugs". Due to the success of community based triatomine surveillance and collection in Central and South America, researchers from Texas A & M University set up a citizen science program to gain insight into the distribution and infection prevalence of triatomine insects in Texas.

The researchers used printed pamphlets, phone communication, an educational website with a dedicated email address and local news station announcements to provide public information about the program. Citizens were encouraged to submit triatomine insect specimens. Submitters were informed of the risk of Chagas disease and cautioned not to touch the insects with bare hands. Each submission was required to include the date, time and location of capture and whether the insect was alive or dead.

The submitted samples were sent to a laboratory to be examined by the researchers. Each insect was identified by species, measured, sexed and dissected. DNA from the insect gut was extracted and tested for the presence of *T. cruzi* parasite. Any insects reported to have fed on humans were sent to the state health department for processing. Submitters were notified of the species and infection status of their sample. An interactive map of the location of all submissions was published on the website.

Over 4000 emails were received from the public over the course of the 2

years, and 1980 kissing bug samples consisted of 7 triatomine species submitted. Of the submitted insects, 25% were found in dog kennels, 19% in patios or porches and 11% inside homes. In total, 375 citizens submitted samples, the majority submitting only one insect. Citizens submitting >20 samples were most likely to have found them in their dogs sleeping quarters. Tests for *T. cruzi* were carried out on 694 of the insects and 63% were found to be infected. The geographic distribution of the insects was similar to previous documentation spanning 8 decades, suggesting that citizen collections are a valid way to document insect distribution in future.

Using public citizens for this kind of initiative means that insects will only be found in places citizens have visited. This does, however, create a unique sample of the [insects](#) likely to be encountered by the public, which is a useful sub-set for studies of disease vectors. Using laboratory identification of samples also negates observer error which can be a risk of citizen identification. Finally the set up and running of the program strengthens relationships between researchers, health departments, disease control centers, clinical vets and the public, and provides a resource of public information on a local illness.

The study is published in *PLOS Neglected Tropical Diseases*.

More information: *PLOS Neglected Tropical Diseases*,
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