

Treating dogs with insecticide reduces leishmaniasis transmission in human populations

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Treating dogs in a community with systemic insecticide could help control the transmission of the leishmania parasite Credit: Geoff Gallice

Treating dogs at a community level with systemic insecticide could considerably reduce the transmission of visceral leishmaniasis in Brazil, according to a modeling study led by ISGlobal, an institution supported by "la Caixa" Foundation. The results, published in *PLOS Neglected Tropical Diseases*, will help define which kind of insecticide is needed and how to apply it to achieve maximum effectiveness.

Zoonotic visceral leishmaniasis is caused by the *Leishmania infantum* parasite, and can be lethal. It is transmitted to humans through the bite of female sand flies that feed on infected mammals, particularly dogs. In Brazil, where disease prevalence is high (more than 3000 cases per year), the culling of infected dogs has proven inefficient in controlling parasite transmission. Treating community dogs with systemic insecticide (i.e. that enters blood circulation) could represent an alternative, although to date, there are no

systemic insecticides registered for use against sand flies.

In this study, the researchers developed a mathematical model to estimate the impact of systemic insecticides in dogs on the number of human infections by *L. infantum*, in an endemic region in Brazil. They considered different combinations of insecticide efficacy, percentage of treated dogs, and duration of insecticide activity. The model revealed that in order to halve the number of cases, 70 percent of community [dogs](#) should be treated with an insecticide whose initial efficacy is of 80 percent and does not drop below 65 percent over six months. The same result can be obtained with other combinations of coverage, efficacy and duration.

"Our model predicts that at the community level, the use of systemic insecticides targeting the parasite's canine reservoir could considerably reduce the number of [human infections](#) by *L. infantum*," explains ISGlobal researcher and study coordinator Albert Picado. He says that treated baits or chewable tablets could facilitate their administration. "In addition, the [model](#) results will help us define the [insecticide](#) product profile and how to apply it to maximise its effectiveness," he adds. This will guide the development of new products or the repurposing of existing ones for their use as a public health intervention to control zoonotic visceral [leishmaniasis](#) in endemic regions.

More information: *PLOS Neglected Tropical Diseases* (2018). DOI: [10.1371/journal.pntd.000679](https://doi.org/10.1371/journal.pntd.000679)

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