

Factors limiting the domestic density of *Triatoma infestans* in north-west Argentina: a longitudinal study

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Reported are the environmental and demographic risk factors associated with the domestic infestation and density of Triatoma infestans in three heavily infested rural villages in Santiago del Estero Province, Argentina. In a one-factor unadjusted analysis, the number of T. infestans captured per person-hour was associated significantly and negatively with the use of domestic insecticides by householders, type of thatch used in the roofs and the age of the house; and positively with the following: degree of cracking of the indoor walls and presence of hens nesting indoors. In one model, using multiple linear regression and a backward stepwise elimination procedure, most of the variation in the overall abundance of T. infestans was explained by insecticide use and the presence of hens nesting indoors; in another model using the same procedure it was explained by insecticide use, bug density in 1988 and previous spraying with deltamethrin in 1985. Variations in bug density per capture stratum (household goods, beds, walls and roof) were explained by the bug density in other strata and by one or two of the following risk factors: hens nesting indoors, type of roof, presence of cracks in the walls and number of people living in the house. Bug density might be locally controlled by the availability of refuges in the roofs and walls, by the presence of hens nesting indoors and by the use of domestic insecticides. Certain local materials, such as a grass known as simbol, could be successfully used in rural housing improvement programmes aimed at reducing the availability of refuges for insects in the roof.

Introduction

Triatoma infestans Klug is probably the most important vector of *Trypanosoma cruzi*, the causal agent of Chagas disease (1). The prevalence and incidence of human infection with *T. cruzi* have been reported to increase with bug density, both of *T. infestans* (2) and of *Panstrongylus megistus* (3, 4). Factors limiting the domestic density of triatomine bugs are therefore of the utmost importance for predicting vector density and transmission of *T. cruzi*.

The main factors associated with the prevalence or density of domestic bug infestations are the types

of material used to build the roof and walls (3, 5), the numbers and types of resident host (6, 7), and the use of domestic insecticides reported by householders (8). Most previous studies have used one-factor (unadjusted) analysis (3, 6, 9–11). Only two studies (12, 13) used multivariate analysis: these considered house infestation but not vector density as the dependent variable.

In infested rural communities from the Chaco Region of Argentina that had not been sprayed with residual insecticides, houses with roofs made of a grass known as *simbol* (*Pennisetum* sp.) harboured lower domestic densities of *T. infestans* than other houses (14). The presence of cracks in the walls and the numbers of people and dogs living together were also positively and significantly associated with domestic bug density. Another study (15) showed that the presence of hens nesting indoors or the percentage of domestic bugs that fed on poultry were the only demographic predictors of the density of bugs in houses. These studies were cross-sectional, however, and did not include the history of infestation and the age of the houses. A relationship between the presence and number of peridomestic outhouses and domestic infestation has been suspected but not studied in detail.

In this study we used longitudinal data to test

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