

# Changes in Age and Geographic Distribution of the Risk of Chagas Disease in Chile from 1989 to 2017

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## VECTOR-BORNE AND ZOO NOTIC DISEASES

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## Abstract

The interruption of vector-borne transmission of Chagas disease was certified in Chile in 1999. Our goal was to determine the effects of the interruption of vector transmission on the age and spatial distributions of the risk of Chagas disease. We analyzed cases of Chagas disease by age and sex between 1989 and 2017, from notified disease reports of the Ministry of Health. Bayesian risk maps were constructed using the Besag-York-Mollie model. The reported cases of Chagas disease had a mean age of 45.9 +/- 17.6 years. Small changes in the age distribution were found among different periods ( $\chi^2(15) = 602.4, p < 0.001$ ). These were explained mainly by numbers lower than those expected in age groups 0-39 years in the 2011-2017 period. Part of the observed reduction in the proportion of individuals in the lower strata could be explained by the aging of the Chilean population. An increase of reported cases was detected after the interruption of vector-borne transmission ( $F_{-1, F-327} = 4.24, p < 0.04$ ), with regional differences ( $F_{-14, F-1308} = 4.35, p < 0.001$ ). The regions of the north-central area that have the highest burden of Chagas tended to decrease the relative risk, while the regions of the south tended to increase and small risk areas appear in zones where there are no insect vectors. There is still no clear evidence of a reduction in the reported cases in Chile. This could be explained mainly by an improvement in the detection of cases, but it cannot be ruled out that vector transmission still exists. The changes in distribution suggest potential impact from human internal migration and blood transfusion. This study provides strong evidence supporting the idea that entomological surveillance and long-term follow-up of Chagas disease need to be maintained after certification of interruption in endemic countries.

## Palabras clave

Palabras clave de autor: [Chagas disease](#); [Chile](#); [distribution](#); [relative risk](#)

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