



USE OF R TO CONSTRUCT A CHOROPLETH MAP TO EVALUATE BOVINE RABIES CASES IN RIO DE JANEIRO STATE

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Introduction

Rabies is an acute, almost inevitably fatal zoonotic disease, it has a worldwide distribution with significant economic implications related to the death of animals and the expense of their prophylaxis and their control (BRASIL, 2009). According to the OIE (World Organization for Animal Health), in Latin America the injury caused by rabies in herbivores is around 30 million dollars a year. In Brazil, this figure amounts to tens of millions of dollars, due to the deaths of around thousands of bovine heads.

The epidemiology of rabies in cattle shows a great relation with the anthropic pressure developed in the geographic space, conditioning the transmitter's ecological behavior, mainly by the offer of shelter and food (BRASIL, 2009). Geospatial analyzes allow the confirmation of man-made changes in space, such as: deforestation, changes in terrain (landfills), among others that cause deep roughness. Antropic actions can cause problems or even make them more noticeable. TAMADA et al. (2009) emphasize the importance of geotechnologies in several agro-business segments as data on deforestation, land use and use analysis, among other applications. According to these authors, all the data obtained by the agricultural defense service can be treated in geographic information systems allowing analysis, manipulation, consultation and spatialisation on the terrestrial surface.

Objective

For this study, the temporal and spatial epidemiological distribution of bovine rabies for bovine rabies in Rio de Janeiro for the period 2010-2016 are described.



Material and Methods

Counts of the number of confirmed bovine rabies cases in Rio de Janeiro municipalities for 2010-2016 were provided by the State Secretariat of Agriculture and Livestock and Agricultural Research Enterprise. A Bayesian, zero-inflated Poisson model, including spatially structured and unstructured random effect terms was developed to quantify the incidence of cattle of bovine rabies. Analyzes were performed using R.

Results and Discussion

The incidence rate of bovine rabies in Rio de Janeiro state decreased markedly since 2011 (Figure 1). For 2010-2016 the incidence rate of bovine rabies ranged from 0.81 (95% CI 0.52 to 1.22) cases per 100,000 cattle-years at risk in 2015 to 3.00 (95% CI 2.35 to 3.79) cases per 100,000 cattle-years at risk in 2011 (Figure 2). Some cities from the northwest and South Center regions had a higher incidence of cases. In these both regions there is a good service of surveillance and may have contributed for greater number of cases.

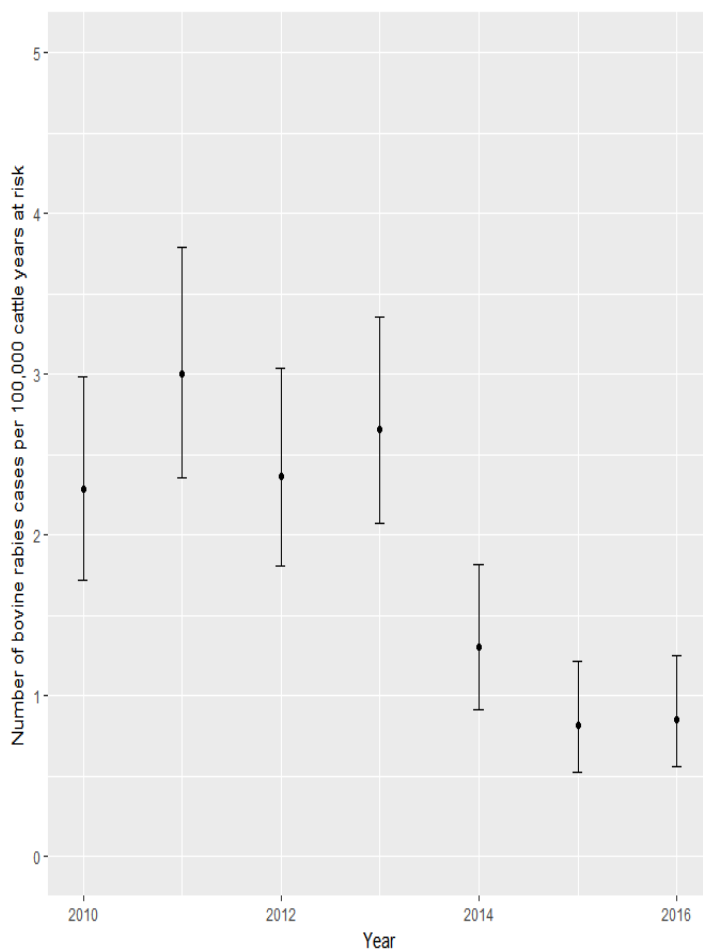


Figure 1: Number of bovine rabies cases in Rio de Janeiro state, in the period of 2010 to 2016.

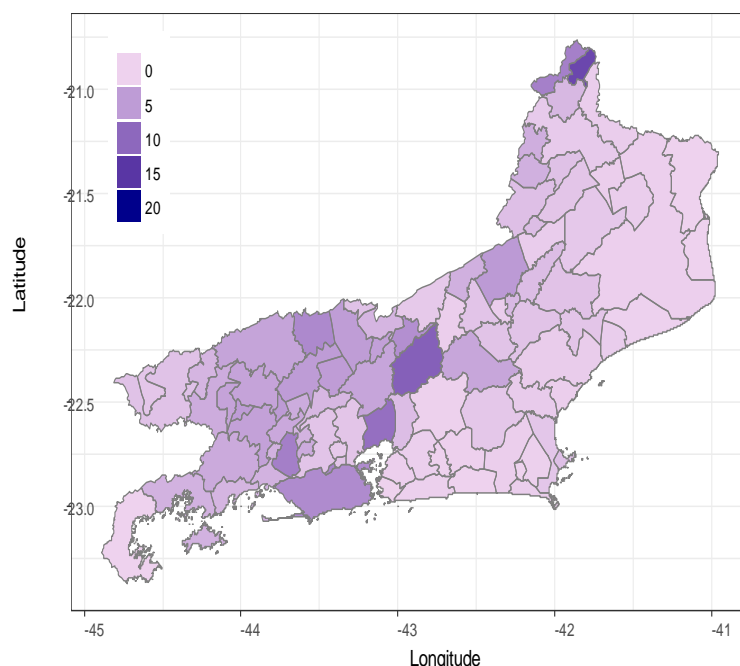


Figura 1 – Choropleth map showing the **local empirical Bayes smoothed** incidence rate of bovine rabies (expressed as the number of cases per 100,000 cattle years at risk), 2010 to 2016, by município, in Rio de Janeiro state.

Conclusions

We conclude that rabies incidence must be better investigated in the regions with more cases, but the regions with few or no cases can be a silent areas and this represent challenge for the surveillance.

References

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