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Spatio-temporal clustering and risk factor analysis of bovine theileriosis (Theileria Parva) in Zimbabwe from 1995 to 2018

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Background

Bovine theileriosis is considered the most important tick-borne disease of cattle in sub–Saharan Africa. It presents a huge economic threat to cattle production in Zimbabwe. The disease is a major constraint limiting livestock production and improvement through cattle mortalities and widespread morbidities. Despite the huge threat posed on the Zimbabwean cattle industry, bovine theileriosis remains a disease with scant and outdated distribution dynamics data in the country.

Objective(s)

To investigate the spatial and temporal distribution of bovine theileriosis and to establish the high-risk areas and associated risk factors of the disease in Zimbabwe.

Materials and methods

Records on bovine theileriosis spanning 23 years (January 1995 to December 2018) were obtained from the Epidemiological Unit of the Division of Field Veterinary Services of Zimbabwe (DVSZ). Data were analysed using SatScan® version 9.4.6 for spatio-temporal clustering and Studio R® version 11.0 for regression analysis.

Results

Communal farmers (72%), adult cattle (29%), the year 2018 (60%) and the hot wet season (42%) had the highest proportion ($p < 0.05$) of bovine theileriosis cases recorded. Seven out of the country's ten provinces and 36 of its 59 districts were affected. Bovine theileriosis was observed to lose seasonality when cases rose exponentially in 2018. Five and four high-risk clusters of bovine theileriosis were detected using one-year and one-month time aggregate, respectively, all within the last eight years of the study (2011–2018). Two potential risk factors (province and farming system) were significantly ($p < 0.050$) associated with bovine theileriosis occurrence.

Conclusion

Bovine theileriosis was found to be widespread and if left unchecked will spread and adversely affect the whole country. Improved theileriosis surveillance and control is warranted. Recommendations for control and prevention strategies revolve around better farmer awareness about the disease, correct and consistent use of acaricides, cattle movement control and disease surveillance.