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National seroepidemiological survey of *Leishmania* infection in dogs from Portugal- Preliminary results

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Background

Canine leishmaniosis (CanL) caused by *Leishmania infantum* continues to be a serious veterinary health problem in the Mediterranean region, particularly in southern European countries, where dogs are considered the main domestic reservoir host for human infection. A recent study on CanL trends in Spain and France suggests there is a northward spread [1]. In Portugal, the first national seroepidemiological survey performed in 2009 showed an overall prevalence of 6,3% with some regions reaching 17% [2]. Several risk factors were identified including living outdoors, having short fur, and living in interior regions of the country. With the increased movement of people and their pets throughout Europe, it is very important to update data on *Leishmania* infection in dogs in the different countries to monitor and reinforce control measures for this zoonosis. The present work aims to update canine *Leishmania* infection seroprevalence through a national survey conducted between January and March 2021.

Material and Methods

Veterinary clinics from the 18 Districts of Portugal were invited to participate in the survey. A minimum sample size of 1414 was calculated based on the previous estimated true prevalence, sensitivity and specificity of the serological method

used (Direct agglutination test, DAT), a precision of 3% and a confidence interval of 95%. After enrolment in the study, each veterinary clinic received a kit containing an explanatory letter, informed consent for the veterinarians and dog owners, filter papers, a prepaid return envelope and a questionnaire to capture each dog's characteristics, living place and habits, presence of any clinical signs compatible with CanL and use of preventive measures. Whole blood spotted on filter paper was used to detect anti-*Leishmania* antibodies by DAT with a cut-off titre of 400 [3].

Data retrieved from questionnaires and DAT results were analysed with IBM SPSS Statistics v.27 and EPITools to perform confidence intervals, hypothesis tests, and logistic regression models.

Results

A total of 1860 dogs from 98 veterinary clinics were screened. The mean age of dogs was 5.6 years, and 60,2% presented short fur. 35,3% of dogs lived mostly or strictly outdoors. The use of effective repellent insecticides was reported in 40,1% of the dogs. Clinical signs compatible with CanL were reported in 6,2% of the dogs. An overall true seroprevalence of 9,8% was observed with a range across several Portuguese Districts. Castelo Branco and Portalegre, from the Centre and Alentejo regions, respectively, reached the highest prevalence (25,9% and 26,9%) (Figure 1). The Litoral Districts, such as Viana do Castelo (0%), Leiria (1,1%) and Aveiro (1,3%) presented low seroprevalence.

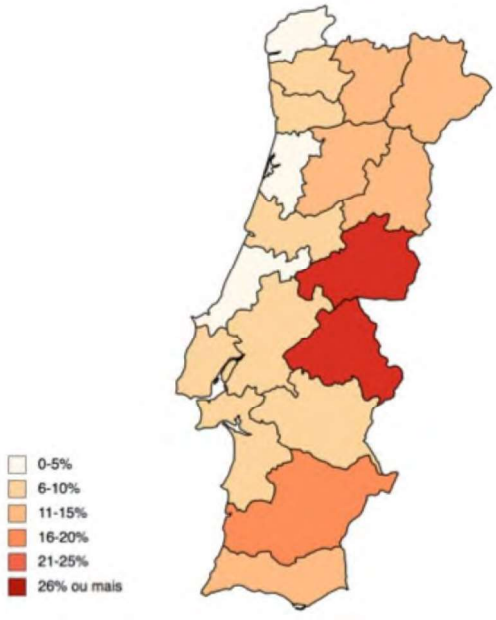

Figure 1. Canine *Leishmania* seroprevalence in Portugal.

Conclusions

The results highlight a general increase in the detection of anti-*Leishmania* antibodies in dogs from most Portuguese regions. The setting of risk factors should reinforce the need for continuous preventive measures such as vaccination and the correct use of effective repellents to minimize *Leishmania* transmission and infection and further progression to disease. This study also reinforces the need for constant surveillance in domestic animals which may impact animal health in Portugal but also in Europe.

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