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Global prevalence and epidemiology of *Strongyloides stercoralis* in dogs: a systematic review and meta-analysis

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Abstract

Background: *Strongyloides stercoralis*, a soil-transmitted helminth, occurs in humans, non-human primates, dogs, cats and wild canids. The zoonotic potential between these hosts is not well understood with data available on prevalence primarily focused on humans. To increase knowledge on prevalence, this review and meta-analysis was performed to estimate the global status of *S. stercoralis* infections in dogs.

Methods: Following the PRISMA guidelines, online literature published prior to November 2020 was obtained from multiple databases (Science Direct, Web of Science, PubMed, Scopus and Google Scholar). Prevalence was calculated on a global and country level, by country income and climate, and in stray/animal shelter dogs versus owned dogs. Statistical analyses were conducted using R-software (version 3.6.1).

Results: From 9428 articles, 61 met the inclusion criteria. The estimated pooled global prevalence of *S. stercoralis* in dogs was 6% (95% CI 3–9%). Infection was found to be the most prevalent in low-income countries with pooled prevalence of 22% (95% CI 10–36%). The highest pooled prevalence of *S. stercoralis* in dogs was related to regions with average temperature of 10–20 °C (6%; 95% CI 3–11%), an annual rainfall of 1001–1500 mm (9%; 95% CI 4–15%) and humidity of 40–75% (8%; 95% CI 4–13%). Prevalence was higher in stray and shelter dogs (11%; 95% CI 1–26%) than in owned dogs (3%; 95% CI 1–7%).

Conclusions: As with *S. stercoralis* in humans, higher prevalence in dogs is found in subtropical and tropical regions and lower-income countries, locations which also can have high dog populations. While this study presents the first estimated global prevalence of *S. stercoralis* in dogs, it is potentially an underestimation with 15 of 61 studies relying on diagnostic methods of lower sensitivity and a paucity of data from most locations. Standardized protocols (e.g. quantity of feces and number of samples for a Baermann) in future studies could improve reliability of results. More prevalence studies and raising veterinary awareness of *S. stercoralis* are needed for a One Health approach to protect humans and dogs from the impact of the infection.

Keywords: *Strongyloides stercoralis*, Canine, Neglected tropical disease, Soil transmitted helminth, Systematic review

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Background

A quarter of the world's population is impacted by helminthic infections that cause substantial rates of diseases and/or disabilities. Many of these helminths are zoonotic with carnivores, particularly dogs and cats, responsible for transmission of nearly 43% of the zoonotic pathogens

