

Commentary

Critique of "First quantitative assessment of the effects of parasite control in dogs and cats in the UK": Re-examining Parasiticide-Industry-Funded Estimates of Parasite-Control Benefits in UK Dogs and Cats

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A recent parasiticide-industry-funded modelling study by Giannelli et al. (*Parasites & Vectors* 18:498, 2025 <https://link.springer.com/article/10.1186/s13071-025-07137-8>) estimates current preventive parasiticide usage in UK dogs and cats, and concludes that this generates substantial economic savings in veterinary costs for households through averted infections/infestations. It further predicts that increased parasiticide use – namely, full compliance with ESCCAP (European Scientific Council Companion Animal Parasites) guidelines – would yield proportionately greater savings. However, several of the model's key inputs and assumptions are incorrect or inadequately justified. In several instances, higher parasite-prevalence estimates are used as model inputs whilst lower estimates derived from larger or more representative datasets are not included; none of the clinical-disease prevalence used in the model correspond to the quantities reported in the studies cited to support them, and the economic analysis lacks transparency and excludes the costs of preventive parasiticides themselves, which far exceed the claimed savings. These issues materially affect the study's conclusions and risk misleading clinicians, policymakers, and pet owners. We note that the clinical-disease prevalence values used in the model, which do not correspond to the quantities reported in their cited sources, constitute major errors that compromise the reliability of the findings, meeting the Committee on Publication Ethics (COPE) criteria for retraction.

Background

To model savings attributed to preventive parasiticide use, Giannelli et al. ^[1] estimate prevalences of major dog and cat parasites in the UK (*Toxocara canis*, *T. cati*, *Angiostrongylus vasorum*, fleas and ticks), the proportion of infected/infested pets developing clinical diseases, and the costs of treatment of clinically affected animals. Quantitative evaluation of the effects of routine prophylactic parasiticide use is welcome. Despite being a widespread, large-scale intervention affecting animal health, household expenditure, and environmental contamination, little research has explored the epidemiological or economic implications. However, as explained below, several serious methodological problems materially affect the model's output.

Representativeness of the parasite prevalence estimates used as model inputs

In several instances, higher parasite-prevalence estimates are used as model inputs, while lower estimates derived from larger or more representative datasets are not included (see Supplementary Information S1 for additional information). This points to an incomplete search and/or synthesis of the available literature, and may result in non-representative prevalence data being used to parameterise the model.

For example, a 30% tick prevalence from Abdullah et al. ^[2] is treated as representative despite acknowledged recruitment bias likely leading to inflated estimates, whereas larger primary-care datasets reporting far lower prevalences of 0.6–2.0% ^{[3][4]} are not included in the analysis. Similarly, smaller flea-prevalence studies prone to selection bias ^[5] – having used the same recruitment methodology as Abdullah et al ^[2] – are cited while large-scale primary-care datasets ^{[3][6]} reporting substantially lower flea prevalences are not included.

For *T. canis*, the UK prevalence estimate used was 4.4%, derived from a meta-analysis ^[7] which included studies not representative of the preventively treated pet population, whilst a more recent, more representative UK study that found a 0% prevalence of *T. canis* from 304 dog faecal samples from parks across the UK, suggesting far lower prevalence rates in the UK ^[8], is not included.

For *T. cati*, the meta-analysis estimate of 18.8% ^[9] relied on small or unrepresentative datasets (see S1) and excluded a more recent study led by Giannelli ^[10], which reported a substantially lower prevalence.

For *Angiostrongylus vasorum*, the prevalence figure used (1.3%) was based on serological samples submitted for diagnostic testing, mostly from endemic regions and clinical populations ^[11]. Such samples are unlikely to represent the general UK dog population and may substantially overestimate prevalence, especially where true prevalence is low and the test's false-positive rate has a proportionately greater impact.

Collectively, these choices are likely to inflate the model's estimate of the number of infested/infected animals.

Discrepancies between clinical-disease parameters and their source data

Several model inputs described as reflecting the prevalence of clinical disease do not correspond to the quantities reported in the studies cited to support them. For example, the estimate that 1.4% of *T. canis*-infected dogs develop diarrhoea is attributed to Batchelor et al. ^[12]. However, Batchelor et al examined faecal samples from UK dogs presenting with gastrointestinal disease and reported the prevalence of *T. canis* within that selected population. This is the conditional probability $P(\text{infection} \mid \text{GI disease})$, not $P(\text{GI disease} \mid \text{infection})$, and therefore cannot be used to estimate the proportion of infected animals developing diarrhoea (see S2 for discussion on the evidence of *T. canis* as a cause of diarrhoea in dogs). Moreover, Batchelor et al. studied dogs with *T. canis*; Giannelli et al.'s extrapolation to cats with *T. cati* is not justified.

A similar discrepancy is present for *Angiostrongylus vasorum*. Giannelli et al. estimate that 15.7% of infected dogs develop clinical angiostrongylosis, citing Morgan et al. ^[13]. However, Morgan et al. reported the prevalence of *A. vasorum* infection (by Baermann test) among dogs presenting with clinical signs broadly suggestive of angiostrongylosis that were not otherwise explained. Again, this represents the proportion of symptomatic dogs testing positive for *A. vasorum*, not the probability that infected dogs develop clinical disease.

The prevalence of pets presented to vets for ectoparasites is also inconsistent with the underlying source data. The proportions of flea-infested and tick-infested dogs and cats "referred to veterinarians" used in the model are not the proportions of infested animals that present for veterinary care, but the prevalence of flea and tick infestations in primary-care veterinary populations ^{[3][14]}. Similarly, the prevalence of flea allergic dermatitis in primary-care pet populations ^{[3][14]} is presented by Giannelli et al. as the prevalence of flea allergic dermatitis in infested pets, which does not correspond to what these studies report (see S2).

These distinctions are fundamental in epidemiological modelling; using these incorrect inputs entirely invalidates the model's subsequent estimates.

Key model inputs are not transparent

The parameter “Total costs of treating clinically affected animals” was derived from informal surveys of three unnamed veterinary clinics, with no description of survey methods, case definitions, or treatment assumptions. Given the wide variation in parasite management and costs across UK practices, these data cannot be verified or reproduced despite being central to the model's economic conclusions.

Similarly, where data were unavailable (e.g., for ticks or *Angiostrongylus vasorum*), treatment rates were inferred from PDSA reports or approximated using companion-animal parasiticide market values, but neither the sources nor the methods of inference are described. These gaps in reporting prevent independent evaluation and fall short of accepted standards for epidemiological and economic modelling.

Unsupported assumptions regarding household insecticide use

The model attributes most estimated savings (£32.2 million of £53 million) to avoided household insecticide spraying, assuming that all household flea infestations – numbers determined on the basis of a likely inflated prevalence estimate (see above) – require environmental treatment (A. Giannelli, personal communication 18/01/2026). Evidence from controlled trials in real-world household flea infestations indicates that modern systemic ectoparasiticides, particularly isoxazolines, rapidly resolve infestations without household insecticide use ^{[15][16][17][18]}. This assumption, therefore, further exaggerates projected savings.

Economic analyses omit the costs of prophylactic parasiticide use

The study reports projected savings for pet owners from preventive parasiticides but does not account for the costs of these treatments. Based on Giannelli et al.'s usage figures and a provisional estimate of £6 per month of flea treatment, UK spending on flea treatments alone likely exceeds £790 million annually, vastly more than the claimed £53 million savings from preventive flea, tick, and worm treatments combined. Under the model's scenario of full compliance with ESCCAP guidelines, estimated costs to pet owners would rise to over £1.3 billion (see S3). The model's own inputs therefore indicate that routine prophylactic parasiticide use represents a substantial net cost to UK households, not a saving.

Assumption that ESCCAP guidance represents ‘optimal control’

We also have concerns regarding the scientific rigour attributed to ESCCAP parasite-control guidelines, and regarding the paper’s characterisation of substantially higher levels of parasiticide use – through increased adherence with these guidelines as described in Scenario B of the model – as representing ‘optimal control’. In both human and veterinary medicine, best-practice guidelines are expected to be developed by multidisciplinary, transparent, conflict-of-interest-managed panels, grounded in systematic reviews or best evidence, with explicit methods for weighing quality of evidence, benefits, risks, and values ^{[19][20]}. By contrast, ESCCAP guidelines provide no citations of primary evidence or explicit consideration of One Health risks resulting from parasiticide use and lack clear conflict-management processes despite pharmaceutical industry funding. Furthermore, the model’s assumption that increasing parasiticide usage to full compliance with ESCCAP guidelines (Scenario B) would result in a proportional decrease in infections/infestations is unlikely to be true, because much of the current (Scenario A) flea & tick prevention is likely to be targeted to higher-risk times of year and circumstances.

Conclusion

Given the widespread use of parasiticides in UK companion animals, their substantial financial implications for households, and growing evidence of large-scale environmental and potential human health risks ^{[21][22][23][24][25]}, accurate and transparent modelling with balanced consideration of both benefits and risks – consistent with One-Health principles – is essential to support informed decision-making regarding their use. Taken together, the issues identified above – non-representative parasite prevalence estimates, clinical-disease prevalence values that do not correspond to their cited sources, opaque model inputs, unsupported assumptions, omission of preventive-treatment costs, and reliance on guidelines whose scientific rigour has not been demonstrated – indicate that the model’s output is not scientifically valid. We note that the clinical-disease prevalence values used in the model, which do not correspond to the quantities reported in their cited sources, constitute major errors that compromise the reliability of the findings, meeting the Committee on Publication Ethics (COPE) criteria for retraction ^[26].

Statements and Declarations

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Potential Competing Interests

No potential competing interests to declare.

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