

# Prevalence and Intensity of Toxocariasis Among Dogs and Cats in Katsina Metropolis, Nigeria

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**Abstract:** Toxocariasis is a zoonotic helminth infection caused by *Toxocara canis* and *Toxocara cati*, commonly found in dogs and cats. It represents a significant public health concern due to the potential for transmission to humans through environmental contamination with infective eggs. This study determined the prevalence and intensity of toxocariasis among dogs and cats in Katsina metropolis, Nigeria. A cross-sectional study was conducted in selected veterinary clinics. A total of 260 fecal samples (157 dogs and 103 cats) were collected and examined using standard flotation techniques. Infection intensity was categorized as low (<1000 eggs per gram [EPG]), moderate (1000–4999 EPG), and high (>5000 EPG). Prevalence and infection intensity were analyzed using descriptive statistics and Chi-square tests at a significance level of  $p < 0.05$ . The overall prevalence of toxocariasis was 25.8%, with dogs showing 22.9% and cats 30.1%. Most infections were of low intensity, accounting for 77.8% in dogs and 74.2% in cats. Moderate and high intensity infections were less frequent. The findings indicate that toxocariasis is prevalent among domestic dogs and cats in Katsina metropolis, with low-intensity infections predominating. Regular deworming and improved hygiene practices are recommended to reduce environmental contamination and human infection risk.

**Keywords:** Toxocariasis, Prevalence, Infection Intensity, Dogs, Cats, Nigeria.

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## I. INTRODUCTION

Toxocariasis is a popular zoonotic parasitic infection which is caused by the larval stages of the nematodes *Toxocara canis* and *Toxocara cati*. It inhabits the intestines of dogs and cats, respectively. These parasites are among the most widely spread, soil – transmitted helminths around the world and contribute highly to the burden of neglected tropical diseases (NTDs) (Macpherson, 2023). The adult *Toxocara* worms live in the small intestines of dogs and cats and shed thousands of unembryonated eggs in the feces every day. Under favorable environmental conditions, such as warmth, humidity, and shade, these eggs embryonate and become infective within 2-4 weeks, therefore contaminating soil, water, vegetables, playgrounds and household environment. (Overgaauw & van Knapen, 2022).

Transmission to humans accidentally occurs when infective eggs are ingested via contaminated hands, unwashed vegetables, soil, or fomites. Children are more vulnerable due to geographic

behaviour and frequent exposure to soil (Holland & Smith, 2006). Once ingested, the eggs hatch, and larvae move through different tissues such as the liver, lungs, eyes, and central nervous system, resulting in syndromes such as visceral larva migrans (VLM), ocular larva migrans (OLM), neurotoxocariasis and covert/asymptomatic toxocariasis (Despommier, 2003). These conditions can lead to organ damage, impaired vision, asthma-like symptoms, seizures, and cognitive impairment. Thus, Toxocariasis remains a significant yet under recognized public health concern.

All over the world, seroprevalence studies indicate that Toxocariasis is widespread, with higher rates reported in low- and middle-income countries where sanitation, veterinary care and environmental hygiene are limited. Research shows that seroprevalence can reach 40-60 % in many developing countries (Macpherson, 2018), and even higher in areas with large populations of free-roaming dogs and cats. In Africa, infection rates among dogs and cats range from 20% to over

70%, depending on climatic conditions, animal management practices, and deworming habits (Okoye et al., 2020); Sowemimo & Asaolu, 2021). Warm tropical climates-such as those found in Nigeria facilitate the survival of *Toxocara* eggs in the environment for extended periods, sometimes up to several years. Several studies conducted in different regions in Nigeria, have consistently reported high levels of *Toxocara* infections amongst companion animals. Studies from Ibadan, Ilorin, Zaria, Maiduguri, Lagos, and port Harcourt have reported prevalence levels ranging between 23% and 45% in dogs and up to 60% in cats depending on locality (Abera et al., 2023). These infections are often associated with poor deworming practices, lack of awareness of zoonotic disease, poor environmental hygiene, and the widespread practice of allowing animals to roam freely. This increases environmental contamination and enhances the risk of transmission to humans.

Katsina metropolis has similar ecological and socioeconomic characteristics with other Nigerian cities where toxocariasis has been reported. The region experiences a semi – arid climate with sufficient humidity during rainy seasons to support the development of *toxocara* eggs in the soil. The presence of numerous free-roaming dogs and cats, inadequate waste disposal practices, poor sanitation in some communities, and limited access to regular veterinary care further contribute to the risk of contamination (Garba et al., 2023). In addition, human socioeconomic factors such as low awareness, widespread open defecation by animals, and close human-animal interaction increase the likelihood of zoonotic transmission. Companion animals are increasingly kept in homes across katsina, yet most are inadequately dewormed, poorly managed, and allowed to roam freely. Environmental contamination with *toxocara* eggs poses a serious risk to public health, especially to children who play in open spaces. The absence of updated data on animal toxocariasis in katsina limits the ability of veterinary and health authorities to design effective control strategies. Understanding the burden and drivers of infection is essential for prevention of zoonotic spread (Fakhri et al., 2021).

Despite the increasing number of pet owners in katsina and the growing use of veterinary services, there is limited or outdated epidemiological information on Toxocariasis in the area. Existing studies have focused on other parasitic infections or were conducted many years ago, leaving a significant knowledge gap regarding the current burden, transmission dynamics, and associated risk factors for toxocariasis in the metropolis. Without updated data, effective control, prevention, and public health planning become difficult.

The findings of this study will be available to veterinary professionals, public health practitioners, and policymakers. By identifying the prevalence and key risk factors associated with

Toxocariasis in katsina metropolis, the study will provide evidence-based insights that can support targeted interventions such as routine deworming programs, health education campaigns, improved animal husbandry practices, and community-focused sanitation initiatives. Policy makers can also utilize the results to develop or strengthen regulatory frameworks on responsible pet ownership, vaccination, and control of stray animals. Ultimately, this research will contribute to improved animal health, reduced environmental contamination, and enhanced public health outcomes through an integrated one health approach. The objectives of the paper are to determine the prevalence of Toxocariasis among cats and dogs in katsina metropolis, to determine the infection intensity of *toxocara* species among cats and dogs in katsina metropolis.

## II. MATERIALS AND METHODS

### ➤ Study Area

The study was conducted in Katsina metropolis, northwestern Nigeria. The area experiences a semi-arid climate with distinct dry and rainy seasons and supports a large population of domestic dogs and cats.

### ➤ Study Design

A cross-sectional study was conducted in selected veterinary clinics in Katsina metropolis.

### ➤ Sample Collection

A total of 260 fecal samples were collected: 157 from dogs and 103 from cats. Fresh feces were collected in sterile containers and transported to the laboratory for examination.

### ➤ Laboratory Examination

Samples were analyzed using the standard flotation technique to detect *Toxocara* eggs. Eggs were identified based on morphological characteristics under a light microscope.

### ➤ Infection Intensity Classification

Egg counts were expressed as eggs per gram (EPG) of feces and classified into:

Low: <1000 EPG

Moderate: 1000–4999 EPG

High: >5000 EPG

### ➤ Statistical Analysis

Data were analyzed using descriptive statistics. Prevalence was calculated as the proportion of positive samples among the total examined. Differences in prevalence between dogs and cats were tested using the Chi-square ( $\chi^2$ ) test at a significance level of  $p < 0.05$ . Infection intensity was summarized using frequencies and percentages.

### III. RESULTS AND DISCUSSION

#### ➤ Prevalence of Toxocariasis

Out of the 260 samples, 67 tested positive for Toxocara eggs, giving an overall prevalence of 25.8%.

Table 1. Prevalence of Toxocariasis Among Dogs and Cats

Animal Type	No. Examined	No. Positive	Prevalence %
Dogs	157	36	22.9
Cats	103	31	30.1
Total	260	67	25.8

Source: field survey 2025

Cats had a higher prevalence than dogs, though the difference was not statistically significant.

Table 2. Intensity of Toxocariasis Infection Among Positive Animal

Intensity Category	Dogs (n = 36)	%	Cats (n = 31)	%
Low (<1000 EPG)	28	77.8	23	74.2
Moderate (1000 – 4999 EPG)	5	13.9	6	19.4
High (> 5000 EPG)	3	8.3	2	6.4

Source: field survey 2025

Most infections were low intensity, suggesting widespread environmental contamination but relatively low parasite burdens in individual animals. Moderate and high intensity infections were less common but indicate potential risk for zoonotic transmission.

The study demonstrates that toxocariasis is moderately prevalent among domestic dogs and cats in Katsina metropolis, with an overall prevalence of 25.8%. Cats showed slightly higher prevalence than dogs, which may be due to their roaming and hunting behavior, increasing exposure to contaminated environments.

The predominance of low-intensity infections is consistent with findings from other studies in Nigeria and similar developing regions (Overgaauw & van Knapen, 2013; Ugbomoiko et al., 2008). Low-intensity infections can still contribute significantly to environmental contamination, sustaining the transmission cycle.

Moderate and high intensity infections, though less frequent, highlight the risk of zoonotic transmission, particularly to children who may come into contact with contaminated soil. The findings underscore the importance of regular deworming, environmental hygiene, and veterinary care.

### IV. CONCLUSION

Toxocariasis is prevalent among dogs and cats in Katsina metropolis, with low-intensity infections predominating. Cats exhibited a slightly higher prevalence than dogs. These results indicate the need for routine deworming, improved sanitation, and public awareness to reduce environmental contamination and the risk of human infection.

### RECOMMENDATIONS

- Targeted Community Deworming Programs: Implement biannual mass deworming campaigns focusing on high-risk animals (outdoor pets, local breeds, raw-fed animals), integrated with existing veterinary outreach.
- Public Health Education initiatives: Develop culturally appropriate educational materials in local languages addressing raw feeding risks, deworming importance, safe feces disposal, and protection of children's play areas.
- Meat Source Regulation: Advocate for basic food safety standards for meat sold as pet food, including freezing requirements to kill parasite larvae.

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