© JAN 2026 | IRE Journals | Volume 9 Issue 7 | ISSN: 2456-8880
DOI: https://doi.org/10.64388/IREV9I7-1713395

Prevalence of Parasitic Infections among Internally Displaced Persons and Host Communities in North-Eastern Nigeria

EMMANUEL, T.[1], PUKUMA, M. S.[2], QADEER, M. A.[3]
[1, 2, 3]*Department of Zoology, Modibbo Adama University, Yola, Adamawa State, Nigeria*

Abstract- ***Armed conflict and population displacement in North-Eastern Nigeria have intensified public health challenges, particularly the transmission of parasitic infections among internally displaced persons (IDPs) and host communities. This study assessed the prevalence and distribution of parasitic infections in selected IDP host communities across Adamawa, Borno, and Yobe States, Nigeria. A descriptive cross-sectional study design was adopted, involving 1,094 participants drawn from twelve IDP host communities. Data collection involved structured questionnaires and laboratory investigations, including stool examination using the Kato–Katz technique for intestinal helminths, urine microscopy for schistosomiasis, and thick and thin blood smears for malaria parasites. Data were analyzed using descriptive and inferential statistics. The overall prevalence of parasitic infections was 40.4%. Intestinal helminths recorded the highest prevalence (19.5%), followed by malaria (10.4%) and schistosomiasis (6.2%). Ascaris lumbricoides (8.1%) and hookworm (6.6%) were the most prevalent helminths, while Plasmodium falciparum accounted for 9.2% of malaria infections. Infection prevalence was higher among host community members (29.6%) compared to IDPs (10.8%). The findings indicate that displacement-related environmental and socioeconomic conditions significantly contribute to parasitic disease transmission. Integrated water, sanitation and hygiene interventions, routine deworming, malaria control strategies, and community-based health education are recommended to reduce the burden of parasitic infections in displacement-affected communities.***

Keywords- ***Parasitic Infections; Internally Displaced Persons; Host Communities; Prevalence; North-Eastern Nigeria***

I. INTRODUCTION

Parasitic infections remain a major public health concern in many low- and middle-income countries, particularly in sub-Saharan Africa, where environmental, socioeconomic, and health-system challenges facilitate sustained transmission [1], [2]. These infections—including malaria, schistosomiasis, and soil-transmitted helminths—are responsible for significant morbidity, reduced productivity, and impaired quality of life, especially among vulnerable populations [3], [7]. In Nigeria, parasitic diseases are endemic and continue to pose serious threats to public health despite ongoing control efforts [1], [8], [10].

Armed conflict and population displacement have further exacerbated the burden of parasitic infections in North-Eastern Nigeria. Since the escalation of insurgency in the region, millions of people have been forcibly displaced from their homes and now reside either in internally displaced persons (IDP) camps or within host communities [4], [5]. These displacement settings are often characterized by overcrowding, inadequate housing, poor sanitation, unsafe water supplies, and limited access to healthcare services, all of which create favourable conditions for the transmission of parasitic diseases [6], [15], [21].

Malaria remains one of the most prevalent parasitic infections in Nigeria, with *Plasmodium falciparum* accounting for the majority of cases nationwide [1], [10]. Transmission is intensified in displacement-affected communities due to increased exposure to mosquito breeding sites, insufficient vector-control measures, and disrupted health services [8], [21]. Similarly, schistosomiasis remains endemic in many parts of Northern Nigeria, particularly in communities with frequent contact with contaminated freshwater bodies for domestic and occupational activities [3], [9], [14]. The coexistence of open defecation practices and unsafe water use further sustains transmission cycles in both IDP camps and host settlements [7], [20].

Soil-transmitted helminths such as *Ascaris lumbricoides*, hookworm, and *Trichuris trichiura*

continue to thrive in environments with poor sanitation and hygiene [2], [7]. Several studies have shown that displacement-related conditions significantly increase the risk of helminth infections due to environmental contamination, inadequate waste disposal, and limited access to preventive chemotherapy [11], [17], [24]. Polyparasitism, involving concurrent infection with multiple parasite species, has also been reported as a common occurrence in displacement-affected populations, further compounding disease severity and public health burden [12], [13].

Although internally displaced persons are often regarded as the most vulnerable group, emerging evidence suggests that host communities may experience equal or even greater health burdens due to prolonged exposure to deteriorating environmental conditions and overstretched social services following population influxes [5], [19], [20]. However, epidemiological studies that systematically compare parasitic infection prevalence between IDPs and host community members in North-Eastern Nigeria remain limited [6], [12]. This lack of disaggregated data constrains effective public health planning and targeted intervention strategies.

Therefore, this study assessed the prevalence and distribution of parasitic infections among internally displaced persons and host communities in selected IDP host communities across Adamawa, Borno, and Yobe States, North-Eastern Nigeria.

II. METHODOLOGY

Study Area

The study was conducted in selected internally displaced persons (IDP) host communities across Adamawa, Borno, and Yobe States in North-Eastern Nigeria. These states have been severely affected by prolonged insurgency, resulting in large-scale population displacement and increased pressure on host communities. The research was conducted across 12 IDP host communities located in Adamawa, Borno, and Yobe States, areas severely affected by conflict and displacement. The selected communities comprise both formal and informal IDP settlements integrated within host populations and are characterized by varying levels of sanitation infrastructure, water access, and healthcare services.

Study Design

A descriptive cross-sectional study design was adopted to assess the prevalence and distribution of parasitic infections among internally displaced persons and host community members. This design was considered appropriate for estimating disease burden and comparing infection patterns across population groups in displacement-affected settings [6], [15].

Study Population and Sample Size

The study population consisted of internally displaced persons and host community residents of all age groups living in the selected communities. A target sample size of 1,140 participants was determined based on population size and feasibility considerations. Out of this number, 1,094 individuals consented and were successfully enrolled in the study, yielding a response rate of 95.96%.

Sampling Technique

A multistage sampling technique was employed. In the first stage, Adamawa, Borno, and Yobe States were purposively selected due to their high displacement burden. In the second stage, four IDP host communities within each state were selected based on accessibility and population size. In the final stage, households were systematically selected, and eligible participants were recruited through simple random sampling. Both IDPs and host community members were proportionately represented.

Data Collection Instruments

Data were collected using structured interviewer-administered questionnaires designed to capture socio-demographic characteristics, displacement status, environmental conditions, and health-related information. The questionnaire was pretested in a similar community outside the study area to ensure clarity and reliability.

Laboratory Procedures

Biological samples were collected and analyzed following standard parasitological techniques. Stool samples were collected in sterile containers and examined using the Kato–Katz technique for the

detection and quantification of intestinal helminths [2], [7]. Urine samples were examined microscopically for the presence of *Schistosoma haematobium* eggs, while thick and thin blood smears were prepared, stained, and examined for malaria parasites following standard protocols [1], [3]. Quality-control measures, including duplicate slide reading, were implemented to ensure diagnostic accuracy.

Data Analysis

Data obtained from questionnaires and laboratory analyses were entered and analyzed using statistical software. Descriptive statistics were used to determine prevalence rates, frequencies, and proportions of parasitic infections. Chi-square test were employed to assess associations between parasitic infections and population groups. Statistical significance was set at $P < 0.05$.

Ethical Considerations

Ethical approval for the study was obtained from the three States ethics committee. Informed consent was obtained from all participants prior to data and sample collection. Participation was voluntary, and confidentiality of respondents' information was strictly maintained throughout the study in accordance with ethical standards for biomedical research.

III. RESULTS AND DISCUSSION

Overall Prevalence of Parasitic Infections

Out of the 1,094 participants examined, 442 individuals were infected with at least one parasite, giving an overall prevalence of 40.4%. This high prevalence confirms that parasitic infections remain a significant public health problem in displacement-affected communities in North-Eastern Nigeria. Similar prevalence levels have been reported in other conflict-affected and low-resource settings, where poor sanitation, overcrowding, and limited healthcare services facilitate sustained parasite transmission [6], [15], [21].

Intestinal helminths constituted the largest proportion of infections (19.5%), followed by malaria (10.4%) and schistosomiasis (6.2%). Mixed infections accounted for 4.3% of cases. The dominance of helminth infections reflects persistent environmental contamination and inadequate sanitation infrastructure in both IDP camps and host communities, as reported in previous Nigerian and regional studies [7], [11], [24]. as given in Table 1.

Distribution of Infections by Parasite Type

Among the intestinal helminths, *Ascaris lumbricoides* recorded the highest prevalence (8.1%), followed by hookworm (6.6%), *Trichuris trichiura* (3.4%), and *Taenia* species (1.4%). The predominance of *A. lumbricoides* and hookworm is consistent with their ability to thrive in environments characterized by open defecation, poor hand hygiene, and contaminated soil [2], [7].

Malaria infections were dominated by *Plasmodium falciparum*, which accounted for 9.2% of cases, while *P. vivax* contributed 1.2%. This finding aligns with national malaria epidemiology, where *P. falciparum* remains the most prevalent and virulent species in Nigeria [1], [10]. The observed malaria prevalence may be attributed to increased mosquito breeding sites, inadequate vector-control measures, and disrupted healthcare services in displacement-affected areas [8], [21].

Schistosomiasis prevalence was 6.2%, with *Schistosoma haematobium* (3.2%) and *S. mansoni* (3.0%) occurring almost equally. This distribution reflects frequent human contact with contaminated freshwater sources for domestic activities, particularly in riverine and peri-urban settlements common in North-Eastern Nigeria [3], [9], [14]. As also given in Table 2.

Mixed Parasitic Infections

Mixed infections accounted for 4.3% of total cases, with malaria–helminth co-infections (2.0%) being the most common, followed by schisto–helminth (1.2%) and malaria–schisto (1.1%) combinations. The occurrence of mixed infections indicates overlapping transmission pathways and cumulative exposure to multiple environmental risk factors [12], [13]. Polyparasitism has been associated with increased disease severity, impaired immunity, and poorer

health outcomes, especially among vulnerable populations [11], [17].

Comparison between IDPs and Host Communities

When disaggregated by population group, host community members recorded a significantly higher prevalence of parasitic infections (29.6%) compared to internally displaced persons (10.8%). Helminth, malaria, schistosomiasis, and mixed infections were all more prevalent among host populations.

This pattern suggests that host communities may experience greater cumulative exposure to parasitic infections due to long-term residence in environmentally degraded settings and increased pressure on sanitation and water infrastructure following the influx of displaced persons [5], [19], [20]. While IDPs are often considered the most vulnerable group, humanitarian interventions such as targeted health services, deworming campaigns, and provision of basic sanitation in IDP camps may reduce infection risk relative to host communities [21], [30].

The high prevalence of parasitic infections observed in this study underscores the need for integrated disease-control strategies in displacement-affected regions. The predominance of intestinal helminths highlights gaps in sanitation and hygiene, while persistent malaria transmission reflects inadequate vector-control coverage. The presence of schistosomiasis further indicates unsafe water use and limited access to improved water sources [7], [20], [31].

Thus, the findings demonstrate that parasitic infections remain entrenched in both IDP and host communities, with host populations bearing a greater burden. This emphasizes the importance of inclusive public health interventions that address both displaced persons and the communities hosting them.

Table 1: Prevalence of Parasitic Infections by Type and Species

Parasite Type	Species of Parasites	Frequency	Prevalence (%)
Malaria	Plasmodium falciparum	101	9.23
	Plasmodium vivax	13	1.19
	Total Malaria	114	10.42
Schistosoma	Schistosoma haematobium	35	3.20
	Schistosoma mansoni	33	3.02
	Total Schistosoma	68	6.22
Intestinal/Helminthic	Ascaris lumbricoides	89	8.14
	Hookworm	72	6.58
	Trichuris trichiura	37	3.38
	Taenia spp.	15	1.37
	Total Intestinal/Helminthic	213	19.47
Mixed Infection	Malaria + Helminth	22	2.01
	Malaria + Schisto	12	1.10
	Schisto + Helminth	13	1.19
	Total Mixed Infections	47	4.30
Overall Prevalence	—	442	40.40

(Out of 1,094 respondents)

Table 2: Parasite Distribution by IDPs and Host Community Members

Parasite Type	Species of Parasites	IDPs Frequency (%)	Host Community Frequency (%)	Total Frequency (%)
Malaria	Plasmodium falciparum	25 (2.3 %)	76 (6.9%)	101 (9.2 %)
	Plasmodium vivax	3 (0.3 %)	10 (0.9%)	13 (1.2 %)
	Total Malaria	28 (2.6 %)	86 (7.9%)	114 (10.4 %)
Schistosoma	Schistosoma mansoni	10 (0.9 %)	23 (2.1%)	33 (3.0 %)
	Schistosoma haematobium	12 (1.1 %)	23 (2.1%)	35 (3.2 %)
	Total Schistosoma	22 (2.0 %)	46 (4.2%)	68 (6.2 %)
Intestinal/ Helminthic	Ascaris lumbricoides	20 (1.8 %)	69 (6.3%)	89 (8.1 %)
	Hookworm	18 (1.6 %)	54 (4.9%)	72 (6.6 %)
	Trichuris trichiura	10 (0.9 %)	27 (2.5%)	37 (3.4 %)
	Taenia spp.	5 (0.5 %)	10 (0.9%)	15 (1.4 %)
	Total Intestinal/ Helminthic	53 (4.8 %)	160 (14.6 %)	213 (19.5 %)
Mixed Infections	Malaria + Helminth	7 (0.6 %)	15 (1.4%)	22 (2.0 %)
	Malaria + Schisto	3 (0.3 %)	9 (0.8%)	12 (1.1 %)
	Schisto + Helminth	5 (0.5 %)	8 (0.7%)	13 (1.2 %)
	Total Mixed Infections	15 (1.4 %)	32 (2.9%)	47 (4.3 %)
Overall Total	—	118 (10.8 %)	324 (29.6 %)	442 (40.4 %)

Source: Field Survey, 2025

IV. CONCLUSION

This study assessed the prevalence and distribution of parasitic infections among internally displaced persons and host communities in selected IDP host communities across Adamawa, Borno, and Yobe States in North-Eastern Nigeria. The findings revealed a high overall prevalence of parasitic infections (40.4%), indicating that parasitic diseases remain a major public health concern in displacement-affected settings. Intestinal helminths constituted the highest burden, followed by malaria and schistosomiasis, with *Ascaris lumbricoides*, hookworm, and *Plasmodium falciparum* being the most prevalent species.

Infection prevalence was higher among host community members compared to internally displaced persons, suggesting that prolonged exposure to poor environmental sanitation, unsafe water sources, and overstretched social and health infrastructure may place host populations at increased risk. The occurrence of mixed infections further highlights overlapping transmission pathways and the complexity of parasitic disease dynamics in these communities.

Overall, the findings underscore the need for integrated and inclusive public health interventions that target both internally displaced persons and host communities. Strengthening water, sanitation and hygiene infrastructure, expanding routine deworming and malaria control programs, and improving access to basic healthcare services are essential to reducing the burden of parasitic infections in conflict-affected regions of North-Eastern Nigeria.

ACKNOWLEDGEMENT

The authors sincerely acknowledge the cooperation and participation of community leaders, internally displaced persons, and host community members who took part in this study. Appreciation is extended to the Department of Zoology, Modibbo Adama University, Yola, for providing the academic and technical support necessary for the conduct of this research. The authors also thank the field assistants and laboratory personnel for their contributions to sample collection and parasitological analysis.

REFERENCES

[1] World Health Organization, *World Malaria Report*, Geneva, Switzerland: WHO, 2021.

[2] World Health Organization, *Soil-Transmitted Helminth Infections*, Geneva, Switzerland: WHO, 2023.

[3] World Health Organization, *Schistosomiasis: Progress Report*, Geneva, Switzerland: WHO, 2022.

[4] Internal Displacement Monitoring Centre (IDMC), *Global Report on Internal Displacement*, Geneva, Switzerland, 2023.

[5] United Nations High Commissioner for Refugees, *Nigeria Situation: IDP and Host Community Health Profile*, UNHCR, 2022.

[6] Olanrewaju, F. O., Johnson, T. A., and Okorie, P. N., "Conflict, displacement and public health outcomes in North-Eastern Nigeria," *African Population Studies*, vol. 34, no. 2, pp. 5123–5136, 2020.

[7] Adelakun, R. A., and Yakubu, I., "Soil-transmitted helminths and environmental risk factors in rural Nigerian communities," *African Journal of Health Sciences*, vol. 31, no. 2, pp. 145–154, 2021.

[8] Ali, S., and Gambo, Y., "Malaria prevalence and control strategies among displaced communities in Adamawa State, Nigeria," *Nigerian Journal of Parasitology*, vol. 44, no. 1, pp. 56–66, 2023.

[9] Ekpenyong, B., and Dike, A., "Distribution of schistosomiasis in riverine communities of Nigeria," *Journal of Helminthology*, vol. 96, e12, 2022.

[10] Okonkwo, E., and Oladimeji, A., "Burden of malaria among rural households in North-Eastern Nigeria," *Malaria Journal*, vol. 22, no. 1, p. 201, 2023.

[11] Afolayan, A., Johnson, T., and Mensah, K., "Co-endemicity of malaria and helminths in West African communities," *BMC Infectious Diseases*, vol. 22, p. 113, 2022.

[12] Anyakora, C., Mohammed, U., and Abubakar, S., "Polyparasitism among internally displaced persons in North-Eastern Nigeria," *Tropical Medicine and Health*, vol. 53, no. 1, pp. 1–12, 2025.

[13] Pukuma, M. S., Toman, E., and Lawan, A. B., "Environmental determinants of parasitic infections in displacement-affected communities," *Nigerian Journal of Parasitology*, vol. 45, no. 2, pp. 102–111, 2024.

[14] Umar, H., and Okoroafor, M., "Schistosomiasis transmission patterns in Northern Nigeria," *International Journal of Tropical Disease*, vol. 9, no. 3, pp. 87–96, 2020.

[15] Kaiser, R., Spiegel, P. B., and Henderson, A., "The public health impact of displacement," *The Lancet*, vol. 373, no. 9661, pp. 1079–1086, 2019.

[16] Abou-Zeid, A. H., Attia, M., and El-Sayed, M., "Parasitic infections among displaced populations in Africa," *Acta Tropica*, vol. 121, no. 3, pp. 210–216, 2012.

[17] Awariefe, J. O., "Conflict, sanitation and neglected tropical diseases in sub-Saharan Africa," *Journal of Public Health in Africa*, vol. 13, no. 1, pp. 45–53, 2022.

[18] NPC and ICF, *Nigeria Demographic and Health Survey*, Abuja, Nigeria, 2019.

[19] Abubakar, S. M., and Lawal, A. M., "Intestinal parasitic infections among displaced children in Nigeria," *Journal of Tropical Pediatrics*, vol. 68, no. 4, pp. 1–9, 2022.

[20] Musa, A. B., and Yakubu, H. M., "Water, sanitation and hygiene practices in IDP camps in North-Eastern Nigeria," *Journal of Environmental Health*, vol. 85, no. 6, pp. 24–31, 2023.

[21] Assefa, Y., Gilks, C. F., and Van Damme, W., "Public health effects of conflict and displacement," *BMJ Global Health*, vol. 6, e005532, 2021.

[22] Onyekachi, F. O., and Eze, C. C., "Epidemiology of intestinal helminths in Nigerian communities," *Journal of Infection in Developing Countries*, vol. 15, no. 9, pp. 1302–1310, 2021.

[23] Oyinloye, O. A., "Neglected tropical diseases in humanitarian emergencies," *Global Health Research and Policy*, vol. 7, p. 19, 2022.

[24] Maduako, C. O., Okafor, E. C., and Uche, I. K., "Sanitation and helminth infections in displaced populations," *International Journal of Hygiene and Environmental Health*, vol. 241, 113944, 2022.

[25] Siyan, P., Adeyemi, O., and Bello, M., "Parasitic infections and health-seeking behaviour in Northern Nigeria," *African Health Sciences*, vol. 19, no. 3, pp. 2897–2906, 2019.

[26] Abdullahi, M., and Balogun, O., "Environmental sanitation and parasitic diseases in Nigerian IDP settlements," *Journal of Community Medicine*, vol. 12, no. 1, pp. 15–23, 2024.

[27] Ikemefune-Kikanme, O., et al., "Socio-economic determinants of parasitic infections in conflict-affected regions," *PLOS Global Public Health*, vol. 4, no. 1, e0001423, 2024.

[28] Dabale, W. P., and Danjuma, I., "Health risks associated with displacement in Nigeria," *Journal of Humanitarian Health*, vol. 6, no. 2, pp. 67–75, 2021.

[29] World Bank, *Global Roadmap for Disease Control in Fragile Settings*, Washington DC, USA, 2023.

[30] UNICEF, *WASH in Humanitarian Settings*, New York, USA, 2022.

[31] Federal Ministry of Health Nigeria, *Neglected Tropical Diseases Master Plan 2021–2025*, Abuja, Nigeria, 2021.

[32] Salami, K. K., "Urban crowding and infectious diseases in Nigeria," *Journal of Urban Health*, vol. 98, no. 5, pp. 742–751, 2021.

[33] Onyeneho, N. G., and Ezeanochie, M. C., "Health vulnerability of displaced populations in Nigeria," *BMC Public Health*, vol. 18, p. 1206, 2018.

[34] Spiegel, P. B., Checchi, F., and Colombo, S., "Health-care needs of displaced populations," *The Lancet*, vol. 382, no. 9890, pp. 1309–1320, 2019.

[35] Anyakora, C., and Lawan, A., "Integrated control of parasitic infections in displacement-affected settings," *International Journal of Tropical Medicine*, vol. 20, no. 2, pp. 89–98, 2025.