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Original Article

Socioeconomic Impact of Neglected Tropical Diseases on Households in UngwanRukuba, Jos, Nigeria

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ABSTRACT

Background:Neglected Tropical Diseases (NTDs) continue to present a major problem in resource-constrained settings, imposing heavy socioeconomic impacts. Endemic onchocerciasis, lymphatic filariasis, and schistosomiasis continue to exist in UngwanRukuba, Jos, Nigeria, but there is scanty evidence on their impact on household income, productivity, education, and social wellbeing. Methods:A structured questionnaire was administered in a cross-sectional household survey among 723 participants. The data gathered included demographics, knowledge and exposure to NTDs, morbidity, care-seeking behaviour, direct and indirect treatment costs, catastrophic health spending, productivity loss, stigma, and education-related outcomes. Descriptive statistics and inferential statistics were used, and chi-square tests were performed to determine associations between household characteristics and the burden of NTDs. Results: There was a significant proportion of households that experienced NTD-related impacts over the last year. Mean household spending covered both direct medical and non-medical expenses, while loss of productivity was measured in terms of lost workdays per illness episode. Catastrophic health expenditure was experienced in a high proportion of households, with borrowing and disinvestment in assets being frequent coping measures. NTD morbidity impacted on children through school absenteeism and poor school performance. Social stigmatization was frequently reported and took the form of exclusion from community activities and lower participation. Robust associations were detected between household income, educational attainment, and risk of catastrophic health expenditure ($p < 0.05$). Conclusion: NTDs in UngwanRukuba pose an empirically complicated burden that extends beyond the health sector to economic risk, lost productivity, educational disruption, and social exclusion. Actionable responses demand integrated approaches that align equitable health financing, enhanced access to healthcare, reducing stigma, and community-based solutions to counteract the far-reaching impacts of NTDs.

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Introduction

Neglected Tropical Diseases (NTDs) impact more than one billion people worldwide, often disproportionately affecting low- and middle-income countries with fragile health systems, limited infrastructure, and persistent poverty, which compound vulnerabilities [1]. NTDs like onchocerciasis, lymphatic filariasis, schistosomiasis, soil-transmitted helminths and trachoma are still endemic in Nigeria and add to the country's public health problems [2]. Nigeria is recognized to be one of the countries where multiple NTDs are most prevalent in sub-Saharan Africa, leading to possible urgency for local and national policymakers.

The socio-economic ramifications of neglected tropical diseases go beyond merely immediate physical health. Affected persons and their households may experience lost work capacity, reduced productivity, and reduced earnings due to either absenteeism or long-term disability [3]. Absenteeism due to illness may invalidate household income streams, especially in cases where livelihoods derive from manual labor and informal economic participation [4]. This contributes to socio-economic burdens that may lead families to cope with the resulting economic strain by borrowing money, selling assets, and cutting back on food and educational expenditures, thus embedding them in a cycle of poverty and vulnerability [5]. In addition, children in households affected by NTDs may experience absenteeism, poorer outcomes and in some cases withdraw altogether from education, undermining the development of human capital.

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Responses at the global and national levels include numerous mass drug administration (MDA) campaigns and public health interventions. However, these interventions are not equally successful in all contexts, primarily in communities where there are coverage gaps, low health literacy, and weak health systems [6].

UngwanRukuba, a semi-urban community of sector 5 in the city of Jos in Plateau State, embodies this challenge. It is an area abundant in water, with multiple NTDs shared among production of poverty, inadequate water and sanitation facilities, and poor access to health services [7]. The result leaves households facing the double burden of living with seemingly endless episodes of illness, while also living with ongoing demands on their economic consumption.

Evidence from Nigeria and other African settings has shown that NTDs are an important and consistent indicator of catastrophic health spending, further entrenching inequality among the poor [8]. However, location-specific evidence in terms of a socioeconomic context in Jos, particularly among peri-urban settings like UngwanRukuba, is largely unavailable. It is difficult for a government to provide context-sensitive interventions that can address the health and socioeconomic aspects of NTDs, due to a lack of evidence at the household and community levels.

Understanding NTDs (Neglected Tropical Diseases) socioeconomic impact at the community level is important because it can provide evidence to underpin integrated health and social protection approaches to breaking the cycle of disease and poverty.

This paper examines the socioeconomic impact of NTDs on households in UngwanRukuba (Low Cost Housing) and assesses these impacts based on the direct costs of accessing health care services, loss of productivity, school absenteeism, and the social stigma or psychosocial impact.

Methods

Study Design and Setting

A descriptional cross-sectional study was carried to UngwanRukuba, a semi-urban community in Jos North Local Government Area, Plateau State, Nigeria. The area of the study had a large population density, low socio-economic status, and a shortage of quality health services. Many neglected tropical diseases (NTDs), including schistosomiasis, onchocerciasis, lymphatic filariasis, and soil-transmitted helminths, are endemic in Plateau State, therefore UngwanRukuba was the perfect place to do this study. Data collection took place from January to March 2025.

Sample and Participants

The study population consisted of household heads or adult representatives (≥18 years) who were sufficiently knowledgeable about household health and social issues. A systematic random sampling technique was utilized to select households from a revised community directory. 723 households were successfully surveyed, using a sampling interval that was based on the total population of households, and only one respondent per household was selected to avoid duplicating a sample.

Data Collection

Data were collected using a structured interviewer-administered questionnaire, developed based on previous NTD socioeconomic impact studies and adapted to the local context. The instrument was pretested in a nearby community to ensure clarity and cultural appropriateness. The questionnaire captured the following domains:

- Demographic and socioeconomic characteristics (age, sex, education, occupation, household income).
- Knowledge and awareness of NTDs.
- Morbidity and health-seeking behavior, including use of traditional and formal healthcare services.
- Direct costs (medical and non-medical expenditures).
- Indirect costs (income loss, workdays missed, and productivity decline).
- Coping mechanisms (borrowing, asset sales, and reduced consumption).
- Educational impacts (school absenteeism and performance decline among children).
- Psychosocial aspects such as stigma and community participation.

Interviews were conducted in English, Hausa, or Berom depending on respondent preference, ensuring inclusivity. Field supervisors monitored data collection for quality assurance.

Ethical Considerations

The DeshBhagat University Institutional Review Board (Approval No. IRB/DBU/2024/017) and the Wesley University, Ondo, Research Ethics Committee provided ethical approval for this study. All participants provided written informed consent prior to their enrollment. We took extreme measures to ensure confidentiality; no names were recorded, and responses were expressed in unique identifiers. Participation in the study was voluntary and participants were not offered any monetary or material incentives for their involvement in the study. All procedures were carried out in accordance with the ethical standards established in the Helsinki Declaration.

Data Analysis

Completed questionnaires were entered and cleaned using SPSS version 26. Descriptive statistics (means, standard deviations, frequencies and proportions) were used to summarize the key variables. Socioeconomic outcomes including catastrophic health expenditure, loss of income, and school absenteeism were cross-tabulated with household demographic factors. Chi-square tests were used to test for associations, with statistical significance at $p < 0.05$.

Results

Table 1. Demographic Characteristics of Respondents (n=723)

Variable	Category	Frequency	Percentage (%)
Gender	Male	396	54.8
	Female	327	45.2
Age group	<25	121	16.7
	25–44	381	52.7
	≥45	221	30.6
Education	None	142	19.6
	Primary	218	30.1
	Secondary	255	35.3
	Tertiary	108	14.9

Of the 723 respondents, slightly more than half identified as male (54.8%, compared to 45.2% female), indicating a small male predominance in household representation as indicated in this survey. In relation to age, there was a significant number of respondents (52.7%) that belonged to the economically active population (25-44 years). Respondents aged 45 years and older accounted for 30.6% of the respondents, while the youngest group (<25 years) made up 16.7% of the sample.

In relation to education, most respondents appeared to stop at secondary education (35.3%) and the second most was primary education (30.1%). A little under one-fifth of respondents stated that they had no formal education (19.6%) while only 14.9% obtained a tertiary level of education. In summary, the educational attainment is relatively low overall which could have repercussions for health literacy and socioeconomic resilience of the community population..

Table 2. NTD Morbidity and Care-Seeking

Variable	Category	Frequency	Percentage (%)
Household with NTD case (12 months)	Yes	298	41.2
	No	425	58.8
Care-seeking at facility	Yes	212	71.1
	No	86	28.9
First point of care	Public clinic	124	41.6
	Private clinic	58	19.5
	Pharmacy	19	6.4
	Traditional healer	37	12.4
	None	60	20.1

In the past year, 41.2% of households had at least one reported case of an NTD which reinforces that these conditions remain an important public health issue in UngwanRukuba. For households that reported NTD cases, health-seeking behavior was relatively high, and 71.1% of these households went to a health facility, while 28.9% did not pursue any formal care.

Looking at where individuals first sought care, public clinics were the most common first point of care utilizing 41.6% of the total first points of care, while private clinics made up 19.5% of these first points of care. A smaller proportion of respondents sought care first from a pharmacy (6.4%) or traditional healer (12.4%) demonstrating reliance on both formal and informal health systems. To highlight the gap in seeking care, 20.1% of households impacted by NTDs claimed that they did not seek care, presenting potential costs, accessibility or simply not knowing were barriers to receiving timely treatment.

This suggests both a continued reliance upon public health facilities and, even though there is relatively high health-seeking behaviour, gaps in care-seeking that leave a sizeable portion of NTD cases untreated.

Table 3. Economic Impact of NTDs

Variable	Mean	SD
Direct medical cost per episode (₦)	5,420	1,215
Direct non-medical cost per episode (₦)	4,430	1,062
Total direct cost (₦)	9,850	2,138
Workdays lost (per patient)	6.4	2.1
Caregiver days lost	3.2	1.4
Income loss (₦)	14,650	4,289

The direct and indirect economic costs of NTDs to households in UngwanRukuba were high. The mean total direct cost was ₦9,850, which included ₦5,429 for medical costs and ₦4,431 for non-medical costs (transport travel, food etc.). The cost of accessing treatment for patients in UngwanRukuba was not limited to just treatment costs, but also included ancillary costs associated with accessing care.

In addition to direct costs, there were direct productivity losses for patients. On average, patients had a loss of 6.4 workdays per episode, while for a caregiver there was an average loss of 3.2 workdays. This demonstrates the economic loss is realised not just by patients, but also for any assisting household member. The income loss was considerable, with an average of ₦14,650 per episode, which represented for many households a considerable portion of monthly income for many households.

The above highlights that NTDs not only mean direct economic hardship, but also indirect opportunity costs. These health costs intruded upon income generating opportunities, exposing vulnerable households to greater economic hardship.

Table 4. Household Financial Burden

Variable	Frequency	Percentage (%)
Catastrophic health spending	207	28.7
Borrowed money	142	19.6
Sold assets	96	13.3
Reduced food consumption	81	11.2
Withdrew children from school	27	3.7

The economic strain of NTDs on UngwanRukuba households was apparent along several dimensions. Over one-quarter of households (28.7%) incurred catastrophic levels of health expenditure, such that the cost of treating NTDs tended to exceed their ability to pay. Coping strategies were common, with almost one in every five households (19.6%) borrowing money in order to pay for healthcare. Asset disposal was also witnessed, with 13.3% of households having to sell property or items in order to access healthcare expenses.

Other strategies included curtailing basic consumption, with 11.2% of families cutting food spending, hence sacrificing nutrition and overall health. In the worst cases, 3.7% of families withdrew children from school as a way of realigning limited resources. This points to how NTDs not just place direct health-related costs but also lead to long-term socioeconomic outcomes that reinforce poverty and vulnerability cycles.

Table 5. Educational and Social Impact

Variable	Frequency	Percentage (%)
Children missing school	228	31.5
Reported academic decline	90	12.4
Household reported stigma	179	24.8
Reduced community participation	155	21.4

The social and educational effects of NTDs in UngwanRukuba were significant. Nearly one-third of afflicted households (31.5%) mentioned that children stayed home from school because of illness or caring for someone, and 12.4% observed a decrease in academic achievement associated with these absences. These observations indicate that NTDs have adverse effects on children's continuity of education and long-term human capital formation.

Aside from education, psychosocial impacts were also salient. Almost one-quarter of households (24.8%) had experienced stigma due to NTDs, indicative of how disease states can drive marginalization and discrimination. Furthermore, 21.4% of households also showed decreased engagement in community activities, implying that NTDs limit social participation and hamper social cohesion. Combined, these effects prove that NTDs' impacts are not limited to health and economic levels, affecting educational outcomes and integration into society.

Discussion

This research brings to the fore the considerable socioeconomic impact of NTDs in UngwanRukuba, Jos, Nigeria. More than two-fifths of households interviewed had at least one NTD case in the last year, in line with national data, which reports enduring endemicity in northern Nigeria in spite of continued control measures [10]. The observation reinforces the low efficacy of current interventions in peri-urban and semi-rural settings where gaps in coverage and lack of access to preventive care are obstacles. Households bore a significant financial cost.

The direct per-episode cost (₦9,850) accounted for a large proportion of household monthly expenditure, with a high proportion of households entering the catastrophic health expenditure threshold [11]. Costs involved both medical and non-medical services, indicating that the financial pressure went beyond treatment in the clinic to transport, food, and other care-related payments. Indirect costs were also significant, with caregivers and patients losing almost ten workdays per episode, which was very similar to the findings in similar communities in sub-Saharan Africa [12]. This loss in productivity is especially important in UngwanRukuba, where livelihoods are largely based on informal work and daily wages.

The research also identifies serious educational impacts of NTDs. Approximately one in three affected families indicated that children skipped school because of illness or caregiving duty, resulting in interrupted learning and long-term human capital corrosion [13]. The disruption reinforces intergenerational patterns of poverty, as affected household children have fewer opportunities for future income generation. Social exclusion and stigma came as a further burden.

Respondents explained fewer participation in religious and community activities and decreased social support. This corroborates earlier research that stated NTDs are not only biomedical conditions but also social circumstances aggravating vulnerability and marginalization [14]. Stigma, therefore, has to be tackled through culturally adapted interventions coupled with biomedical interventions.

The strong correlation between income levels, education, and catastrophic expenditure underscores the structural disparities driving NTD vulnerability. Lower-income and less-educated households are more apt to experience the crunch of catastrophic spending, further exacerbating socioeconomic inequalities [15]. This observation underlines the necessity for policy that bridges disease prevention with provisions for financial risk protection.

Based on these observations, multisectoral approaches must be implemented to minimize the socioeconomic burden of NTDs. Strengthening of the health system to enhance access to affordable care, increasing the reach and impact of mass drug administration (MDA), and incorporating social protection interventions like conditional cash transfers or community health insurance schemes may all together reduce the household-level burden [16]. Furthermore, stigma reduction campaigns and community engagement approaches need to be given priority to ensure inclusivity and resilience among the affected households.

Conclusion

NTDs in UngwanRukuba have a multifaceted impact on households that encompasses economic, productivity, educational and psychosocial outcomes. These burdens continue to exist through control programs; therefore, it is vital to address both the medical and social economic burdens associated with NTDs through integrated approaches. Policies that enhance health systems, include more people with NTDs in MDA, and social protection would be indispensable towards halting the cycle of disease and poverty in vulnerable communities in Nigeria.

Take-Home Message

Neglected Tropical Diseases (NTDs) are still a significant public health and socio-economic burden in UngwanRukuba, Jos. They inflict illnesses on the population, and can incur costs, lost productivity, educational disruption or social stigma to households or families. To address these burdens requires integrated approaches that combine effective disease control, financial protection and community-based interventions. Without these integrated approaches, cycles of poverty and vulnerability associated with NTDs will continue.

Authors' Contribution

SHU-ACHET Daniel Gimbason designed the study, methodology, and made data collection contributions. The data analysis, interpretation, and manuscript drafting was coordinated by Dr. Stephen Monday. Prof. (Dr.) Daniel MairafiGimbason gave general supervision, critical revisions, and approval of the research design. Amina Elisha Atikinpan assisted in data curation, literature review, and figure and table preparation. Ruby S. Gibson assisted with writing, editing, and final manuscript formatting for publication. All authors read and approved the final manuscript, and agreed to be held responsible for the work.

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Conflict of Interest

The authors declare that they have no relationships that could be viewed as a potential conflict of interest in the research, the interpretation of data, authorship of the article, or the publication of the research. Specifically, the authors have not received financial support, materials or gifts from an organisation, government agency or business entity that might reasonably be judged to result in such a conflict of interest.

All decisions about study design, data collection, data analysis, data interpretation, and the writing of the manuscript were made by the authors of this research report. The authors have no proprietary interests or intellectual property that may have been perceived as a source of bias in terms of prevailing outcomes or conclusions. The authors declare their commitment to transparency and objectivity and intend to ensure that all reporting was ethical and follows international publication standards.

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