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Socioeconomic Factors, Knowledge Gaps, and Mass Drug Administration Compliance in *Bancroftian Filariasis* in Akum, Cameroon

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ABSTRACT

Background:

Lymphatic filariasis (LF) remains a neglected tropical disease affecting vulnerable populations in sub-Saharan Africa. Understanding the interplay of socioeconomic determinants, knowledge, and preventive behaviors is essential for guiding elimination programs.

Methodology/Principal Findings:

A cross-sectional study in Akum, Cameroon, included 34 participants aged 15–50 years. Peripheral blood samples were examined for *Wuchereria bancrofti* microfilariae. Sociodemographic, behavioral, and mass drug administration (MDA) variables were collected via structured questionnaires. Five participants (14.7%) tested positive. Infection clustered among rural residents (80%), farmers (60%), participants with primary education (60%), and non-users of insecticide-treated bed nets (80%). Knowledge regarding disease transmission was universally poor. Although 80% reported prior ivermectin intake, none understood its purpose. Fisher's exact tests showed no statistically significant associations ($p > 0.05$), largely due to small sample size.

Conclusions/Significance:

Persistent infection and knowledge gaps highlight ongoing challenges for LF elimination in Akum. Targeted health education, community sensitization, and follow-up during MDA campaigns are critical to improving compliance and reducing transmission.

Keywords : *Lymphatic filariasis, Wuchereria bancrofti, MDA compliance, Socioeconomic determinants, Cameroon, Neglected tropical diseases*

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1. INTRODUCTION

Global Context

Lymphatic filariasis (LF) is a parasitic disease caused predominantly by *Wuchereria bancrofti*, transmitted by mosquitoes of the genera *Anopheles*, *Culex*, *Aedes*, and *Mansonia* (CDC, 2022). LF affects over 50 million people globally, causing chronic lymphedema, elephantiasis, hydrocele, and severe socioeconomic burden (Ottesen, 2006).

The WHO Global Programme to Eliminate Lymphatic Filariasis (GPELF) relies primarily on mass drug administration (MDA) with ivermectin, diethylcarbamazine, and albendazole (WHO, 2023). Success depends on high population coverage, compliance, and integration with vector control measures.

LF in Cameroon

Cameroon remains endemic, with prevalence varying by ecological zone. Rural communities, where farming and stagnant water promote vector breeding, are particularly vulnerable (Boussinesq et al., 2015). Previous mapping surveys indicated up to 4% circulating filarial antigen prevalence in certain districts, yet microfilarial prevalence data remain limited (Hugues et al., 2015).

Rationale

Effective LF elimination requires understanding the socioeconomic and behavioral determinants of infection, community knowledge, and compliance with MDA. This study investigates these factors among residents of Akum, Cameroon

2. MATERIALS & METHODS

Study Design

A cross-sectional descriptive study was conducted over four weeks in early 2026 and

participants were recruited consecutively from Akum health facilities.

Population and Sampling

Participants eligible for this study were aged 15–50 years and had lived in the community for at least 12 months. This study also excluded individuals who received anti-filarial treatment in the preceding six months. The final sample included 34 participants.

Data Collection

1. **Sociodemographic and Behavioral Data:** This study made use of structured questionnaires which captured age, sex, marital status, residence, occupation, education, ITN use, proximity of bushes/stagnant water, and MDA participation.
2. **Laboratory Procedures:** Night peripheral blood samples were collected via finger-prick from the study participants. Thick blood film smears were prepared, stained with Giemsa, and examined under the microscopy for microfilariae detection.

Statistical Analysis

- **Software:** SPSS v25 was used for descriptive statistics, contingency tables, and regression analyses.

3. RESULTS & DISCUSSION

Across the study participants who took part in this study, the mean age was 32 years with a standard deviation of 9.4. Table.1. illustrates the demographic characteristics of the study participant. An evaluation of infectivity revealed participants from rural areas to be 3 times more likely to develop an infection in comparison to individuals from urban areas. This can be seen in table.2. below

Table.1. Demographic distribution of the study participants

Variable	Attribute	Frequency	Percentage
Gender	Male	16	47
	Female	18	53
Residence	Rural	19	56
	Urban	15	44
Occupation	Farmer	5	15
	Other	29	85
Education	Primary	5	15
	Secondary and above	29	85

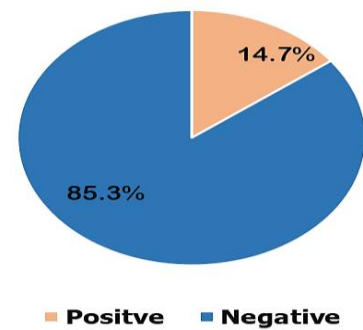


Figure 1. Prevalence

Table.2. Variation of the infection in rural and urban areas

Variable	Results		P-Value	95% CI	RR
	Positive	Negative			
Rural	4	14	0.68	0.050 - 0.311	3.16
Urban	1	15			
Total	5	29			

Table.3. Socioeconomic and Behavioral Characteristics of Infected Participants

Variable	Positive (n=5)	%
Occupation: Farming	3	60
Education: Primary	3	60
Residence: Rural	4	80
Non-use of ITNs	4	80
Prior MDA intake	4	80
Understanding of MDA	0	0
Knowledge of disease	0	0

Due to small sample size, post-hoc statistical power was <40%, limiting the detection of significant associations.

Vector Ecology

Rural environments with stagnant water and dense vegetation favor vector proliferation. Farmers working outdoors at peak mosquito activity hours are at higher risk

Prevalence and Socioeconomic Factors

The 14.7% prevalence indicates persistent infection in Akum. Rural residence, farming, and low education were overrepresented among infected participants, consistent with ecological and occupational exposure theories (Sherchand et al., 2013; Boussinesq et al., 2015).

Socioeconomic Determinants

Knowledge Gaps and MDA Compliance

Poor awareness of disease transmission and MDA purpose undermines elimination efforts. While 80% of the study participants reported prior ivermectin intake, none understood its protective role. Adverse reactions without follow-up counseling discouraged full compliance, highlighting a gap in program delivery.

Public Health Implications

- **MDA Programs:** Require enhanced community sensitization, follow-up for adverse events, and health education.
- **Vector Control:** ITN distribution and environmental management are essential.
- **Policy:** Strengthen integration of behavioral, ecological, and socioeconomic considerations into national LF elimination strategies.

Limitations

- Small sample size, limiting statistical significance
- Microscopy-only diagnosis; antigen-based methods may detect more cases
- Cross-sectional design precludes causal inference

4. CONCLUSION

Socioeconomic vulnerability, poor knowledge, and suboptimal MDA compliance contribute to persistent *Wuchereria bancrofti* transmission in Akum. Targeted education, improved MDA follow-up, and vector control are critical to achieving elimination.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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