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Prevalence and Sociodemographic Determinants of *Bancroftian Filariasis* in a Semi-Urban Community in Bamenda, Cameroon : A Cross-Sectional Study

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ABSTRACT

Background:
Lymphatic filariasis (LF), caused predominantly by *Wuchereria bancrofti*, is a neglected tropical disease that continues to impose significant morbidity in sub-Saharan Africa. Despite ongoing elimination programs coordinated by the World Health Organization (WHO), persistent transmission occurs in endemic regions of Cameroon. Understanding local prevalence and demographic risk factors is essential for targeted interventions.

Methodology/Principal_Findings:
A cross-sectional study was conducted in Bamenda, Cameroon, involving 34 participants aged 14–50 years. Night peripheral blood samples were collected and examined using Giemsa-stained thick blood films for microfilariae detection. Sociodemographic factors, including age, sex, residence, occupation, and education, were assessed via structured questionnaires. Descriptive statistics, chi-square tests, and multivariable logistic regression were performed. The overall prevalence of microfilaremia was 14.7% (5/34; 95% CI: 5.0–31.1%). Logistic regression showed higher odds of infection in males (AOR = 1.58; 95% CI: 0.21–11.8), rural residents (AOR = 3.46; 95% CI: 0.31–38.5), and participants aged 20–25 years (AOR = 4.12; 95% CI: 0.36–47.6), although associations were not statistically significant ($p > 0.05$). Epidemiological trends suggest demographic clustering of infection.

Conclusions/Significance:
Bancroftian filariasis persists in the study area, particularly among rural populations and young adults. Strengthened mass drug administration (MDA), targeted vector control, and expanded surveillance using antigen-based rapid diagnostic kits are recommended.

Keywords : *Prevalence, Sociodemographic Determinants, Bancroftian Filariasis, Wuchereria bancrofti, Lymphatic Filariasis, Cameroon*

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1. INTRODUCTION

Global and Regional Context

Lymphatic filariasis (LF) is a mosquito-borne parasitic disease caused primarily by *Wuchereria bancrofti*, accounting for over 90% of global infections. Mosquito vectors include *Anopheles*, *Culex*, *Aedes*, and *Mansonia* species, whose breeding habitats vary by ecology and season (CDC, 2022). Chronic LF results in lymphedema, hydrocele, and elephantiasis, causing permanent disability, social exclusion, and economic burden (Ottesen et al., 1997).

The WHO launched the Global Programme to Eliminate Lymphatic Filariasis (GPELF) in 2000, aiming to eliminate transmission through mass drug administration (MDA) with albendazole and ivermectin or diethylcarbamazine (DEC) (WHO, 2023). Although significant progress has been made, persistent infection hotspots remain in West and Central Africa, including Cameroon (Boussinesq et al., 2015).

Lymphatic Filariasis in Cameroon

Cameroon's LF prevalence varies geographically, with rural districts exhibiting higher endemicity due to favorable vector breeding sites such as stagnant water, irrigated farms, and dense vegetation (Hugues et al., 2015). Previous surveys using circulating filarial antigen (CFA) tests reported prevalence up to 4% in some districts, but local microfilaremia data are limited (Hugues et al., 2015).

Rationale and Study Objectives

Despite national elimination efforts, localized epidemiological data are essential to identify persistent transmission foci and tailor interventions. The present study aimed to:

1. Determine the prevalence of *Wuchereria bancrofti* microfilaremia in a semi-urban community in Bamenda.
2. Identify sociodemographic and behavioral risk factors associated with infection.
3. Apply multivariable logistic regression to quantify the strength of associations.

3. MATERIALS & METHODS

Study Design

A hospital- and community-based cross-sectional study was conducted from January to February 2026 in Bamenda, Northwest Cameroon. The study adhered to STROBE guidelines for observational studies (von Elm et al., 2007).

Study Area and Population

Bamenda is a semi-urban region with a population density of approximately 600 inhabitants/km^2, tropical climate, and seasonal rainfall creating breeding grounds for mosquito vectors. Residents aged 14–50 years, living in the area for at least 12 months, were eligible. Exclusion criteria included recent anti-filarial treatment (<6 months) and refusal to consent.

Sample Size

A total of 34 participants were recruited using consecutive sampling. Though small, this sample provides preliminary evidence for prevalence and demographic clustering.

Data Collection

1. **Sociodemographic Data:** Structured questionnaires captured age, sex, marital status, residence (rural/urban), occupation, education level, MDA participation, use of insecticide-treated bed nets (ITNs), and environmental exposure (bushes near houses).
2. **Blood Sampling:** Night peripheral blood samples (10 pm–2 am) were collected via sterile lancet. Thick blood smears were

prepared, stained with 10% Giemsa, and examined under ×10 and ×40 magnification for microfilariae.

Statistical Analysis

Data were analyzed in SPSS v25.

- **Descriptive statistics:** Frequencies, percentages, means, and standard deviations.
- **Bivariate analysis:** Chi-square or Fisher's exact tests for categorical variables.
- **Multivariable logistic regression:** Outcome = infection status (1 = positive, 0 = negative). Covariates included age group, sex, residence, occupation, and education. Adjusted odds ratios (AOR) with 95% confidence intervals were reported.

Significance level: $p < 0.05$. Model fit was assessed with Hosmer–Lemeshow test and Nagelkerke R^2.

4. RESULTS & DISCUSSION

A total of 34 participants took part in this study with an age range of 14–50 years, mean = 32 ± 9.4 years. Majority of the study participants 52.9% were females with 55.9% of the study participants coming from rural areas. These are illustrated in table.1. below.

The prevalence Bancroftian Filariasis as illustrated in fig.1. above was 14.7%. The observed prevalence of 14.7% is higher than the 4% reported in prior Cameroonian surveys (Hugues et al., 2015), suggesting focal transmission. Differences may be due to sampling method, small size, or local ecological factors conducive to vector breeding

The observed prevalence of 14.7% is higher than the 4% reported in prior Cameroonian surveys (Hugues et al., 2015), suggesting focal transmission. Differences may be due to sampling method, small size, or local ecological factors conducive to vector breeding

Demographic Determinants

A Higher prevalence was observed among young adults and aligns with increased outdoor exposure. Across the study participants, males showed higher odds of infection, consistent with occupational risk. It was also observed that rural residents exhibited higher infection rates, reflecting environmental exposure

Socioeconomic and Behavioral Factors

Low educational attainment, farming occupation, lack of ITN use, and proximity to bushes/stagnant water increased risk. Poor MDA knowledge limited drug adherence, consistent with findings from India and West Africa (Showkat *et al*., 2007; Mohammad *et al*., 2014). Farmers and individuals with primary-level education were overrepresented among infected participants, non the less, the knowledge of LF transmission was poor: all 5 participants were unaware that mosquitoes are vectors.

. Implications for Elimination Programs

- Strengthen MDA through community sensitization and follow-up.
- Distribute ITNs and promote consistent usage.
- Introduce rapid antigen-based diagnostic kits for improved surveillance.
- Prioritize young adults and rural populations for interventions.

Limitations

- Small sample size limits statistical power.
- Microscopy may underestimate prevalence compared to antigen-based detection.
- Study design cannot establish causality.

Table.1. Participant Characteristics

Variables	Attributes	Frequency	Percentage	Mean	St.D
Age group	14–19	5	14.7	32	±9.4
	20–25	14	41.2		
	26–30	7	20.6		
	31–35	3	8.8		
	36–40	4	11.8		
	40–50	1	2.9		
Sex	Male	16	47.1		
	Female	18	52.9		
Residence	Rural	19	55.9		
	Urban	15	44.1		
Marital Status	Single	23	67.6		
	Married	11	32.4		

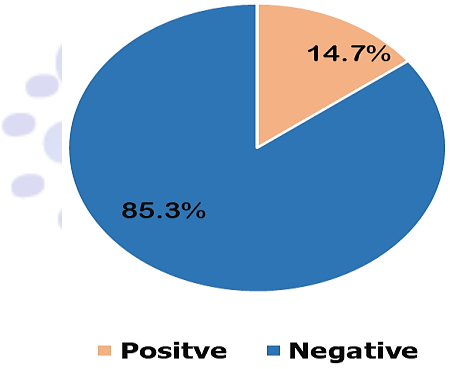

Figure.1. Prevalence of *Bancroftian Filariasis*

Table.2. Distribution by Age

Age group	N	Positive	Prevalence (%)
14–19	5	0	0.0
20–25	14	4	28.6
26–30	7	0	0.0
31–35	3	1	33.3
36–40	4	0	0.0
40–50	1	0	0.0

Fisher's exact test p = 0.09.

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Table.3. Distribution by Sex and Residence

Variable	Attribute	Positive(%)	RR	95% CI	P-Value
Sex	Male	3(18.8%)	1.69	0.33–8.49	0.68
	Female	2(11.1%)			
Residence	Rural	4(21.1%)	3.16	0.39–25.6	0.36
	Urban	1(6.7%)			

Table.4. Multivariable Logistic Regression

Variable	AOR	95% CI	p-value
Male vs Female	1.58	0.21–11.8	0.66
Age 20–25 years	4.12	0.36–47.6	0.26
Rural residence	3.46	0.31–38.5	0.31

Table .4. revealed Age 20–25 and rural residence to be associated with higher odds of infection, although results lacked statistical significance due to small sample size. **Model Diagnostics:** −2 Log Likelihood = 25.8, Nagelkerke R^2 = 0.28, Hosmer–Lemeshow p = 0.72.

Table.5. Environmental, Behavioral Factors, MDA Participation and Knowledge

Variables	Attributes	Frequency(%)
Use ITNs	Yes	1(20%)
	No	4(80%)
Lived near bushes	Yes	4(80%)
	No	1(20%)
Received ivermectin previously	Yes	4(80%)
	No	1(20%)
allergic reactions, resulting in incomplete MDA compliance	Yes	2(40%)
	No	3(60%)
Know mosquitoes are vectors	Yes	0(0%)
	No	5(100%)

5. CONCLUSION

Bancroftian filariasis remains endemic in Bamenda. Rural residence, young adulthood, male gender, farming, low education, and poor MDA knowledge were associated with higher infection odds. Intensified elimination strategies are urgently needed.

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CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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