

Demand for Malaria Prevention and Treatment among Households in the Federal Capital Territory, Nigeria

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ABSTRACT

Background: In Nigeria, malaria remains a public health concern, necessitating the examination of household spending on treatment and prevention. Despite various initiatives, Nigeria still has high malaria-related mortality, prompting this study to clarify the link between household demand for malaria treatment and prevention. The dependent variable is yearly malaria-related spending with independent variables are education, head of household income, age, environmental factor, spouse's income and cost of prevention/treatment

Method: Using primary and secondary data, this cross-sectional study gathered information through household observations and structured questionnaires. Of 400 samples distributed, 381 were completed and returned, focusing on household background and the demand for malaria treatment and prevention products.

Results: The logit regression model analyzed the potential associations among variables such as age, household head income, spouse's income, education, environmental factors, and malaria occurrence. It found that education and household head income were statistically significant at a p-value of 0.05, indicating a meaningful relationship with malaria incidence. No multicollinearity was detected among the variables.

Conclusion: The study titled "Demand for Malaria Prevention and Treatment Among Households in the Federal Capital Territory, Nigeria" found that household income and education significantly influence spending on malaria prevention and treatment. These findings underscore the critical role of both education and economic capacity in shaping households' efforts to combat malaria, emphasizing the need for policies that enhance these factors to improve malaria prevention and treatment outcomes.

Keywords: Malaria, Nigeria, Household demand, public health, Rollback Back Malaria, donors

INTRODUCTION

Malaria remains a critical global health issue, particularly in malaria-endemic regions like Nigeria. In 2019, an estimated 229 million malaria cases were reported worldwide, resulting in approximately 409,000 deaths. The most vulnerable demographic was children under five, accounting for 67% (roughly 274,000) of all malaria-related fatalities (World Health Organization [WHO], 2020). The African Region bears the greatest burden, representing 94% of global malaria cases and deaths, with Nigeria leading in malaria mortality, contributing 23% of all global malaria deaths. Other high-burden countries include the Democratic Republic of the Congo (11%), Tanzania (5%), Burkina Faso (4%), Mozambique (4%), and Niger (4%) (WHO, 2020; WHO, 2021).

In response to this heavy burden, the WHO launched the Roll Back Malaria (RBM) initiative in 1998, which focused on regions with high transmission rates, particularly in sub-Saharan Africa (Goodman, Coleman, & Mills, 2002). The initiative's momentum led to the African Summit on Roll Back Malaria in Abuja, Nigeria, in 2000, where 44 African countries committed to the Abuja Declaration—a pledge to reduce malaria mortality by 50% by 2010, marking a significant convergence of political and institutional support (WHO, 2000; RBM Partnership to End Malaria, 2020).

Recent efforts include the WHO's Global Technical Strategy for Malaria 2016–2030, which aims to reduce malaria incidence and mortality by at least 90% by 2030. This strategy highlights critical interventions like

insecticide-treated nets (ITNs), indoor residual spraying (IRS), seasonal malaria chemoprevention, and rapid diagnostic testing, which are especially vital in high-burden countries like Nigeria (WHO, 2021; RBM Partnership to End Malaria, 2022). Nigeria's commitment to these goals is essential for meeting global targets and mitigating malaria-related health disparities (WHO, 2022).

In Nigeria, malaria prevention and treatment strategies, such as ITNs and IRS, have been implemented nationwide, showing effectiveness in reducing transmission (WHO, 2021). However, prevention gaps remain, especially in lower-endemic regions and among populations exposed to malaria outside regular sleeping hours (Gatton et al., 2013; WHO, 2021).

Nigeria bears a substantial share of the malaria burden, with the WHO's 2020 World Malaria Report estimating that the country accounts for more than 27% of global malaria cases and 23% of malaria-related deaths (WHO, 2020). This high prevalence drives significant healthcare demands, as households continually seek treatment and preventative options (National Malaria Elimination Programme, 2019). Despite a scale-up in ITNs and IRS, socio-economic and environmental factors continue to shape accessibility and efficacy, influencing malaria incidence on a household level (Aregbeshola & Khan, 2021).

Treatment for uncomplicated malaria in Nigeria primarily involves Artemisinin-based combination therapies (ACTs), as recommended by the WHO (WHO, 2015). For severe malaria cases, more intensive therapies, such as intravenous or intramuscular parenteral antimalarials, are employed (Federal Ministry of Health, Nigeria, 2021). However, treatment-seeking behaviors are diverse across the country, often influenced by socio-economic factors, cultural beliefs, and access to healthcare services, which shape how and when individuals seek malaria treatment (Onwujekwe et al., 2018).

Preventive measures are crucial in malaria control. For instance, intermittent preventive treatment in pregnancy (IPTp) is widely implemented to protect pregnant women from malaria-related complications (Desai et al., 2007; WHO, 2020). Seasonal malaria chemoprevention (SMC) is another key measure, targeting children under five during high transmission seasons to reduce both morbidity and mortality (WHO, 2012; Clarke et al., 2017). These strategies are integral to Nigeria's efforts in managing malaria, particularly in regions with high transmission rates.

A study conducted in Nigeria in 2022 assessed how well families adhere to malaria prevention and treatment practices, focusing on factors such as the use of insecticide-treated nets (ITNs) and compliance with antimalarial medications. Research across selected rural and urban households in Ondo State revealed that, although awareness of preventive measures was generally high, adherence levels varied. The study found widespread ITN ownership but noted that consistent use was sometimes compromised by issues like discomfort in hot weather, misconceptions about malaria transmission, and competing health beliefs. Furthermore, adherence to prescribed treatments was influenced by factors such as the proximity of healthcare facilities, treatment costs, and perceived illness severity.

These findings underscore the importance of sustained health education efforts and localized community programs to address adherence challenges, especially in rural areas where barriers like healthcare access and health literacy gaps are more prominent (Adebayo et al., 2022).

Significance of the Study

Understanding the demand for malaria prevention and treatment among households is essential for shaping effective public health policies and interventions. This study investigates the influence of household income, education, and other socio-economic factors on malaria-related healthcare decisions. By identifying the primary drivers of demand for malaria prevention and treatment products, the research aims to support more targeted health campaigns and optimized resource allocation to defeat malaria.

Inclusion and Exclusion Criteria:

The study included households within the Federal Capital Territory (FCT), Nigeria, that reported at least one

instance of malaria in the past year. Households were excluded if they had not experienced a malaria episode or if they had incomplete data regarding their malaria prevention and treatment behaviors.

MATERIALS AND METHODS

This research draws on both primary and secondary data to offer insights into the factors influencing household demand for malaria-related health commodities, further contributing to the existing body of knowledge on malaria prevention and control. Primary data was gathered through structured observation and a questionnaire, which collected information on household demand for malaria prevention and treatment. This included household identification, housing characteristics, and malaria prophylaxis needs. If the head of the household was unavailable, another member was interviewed. Additional observational data captured details on waste management, sanitation, hygiene practices, water sources, and water storage methods within households.

Secondary data was collected by thoroughly reviewing existing research and publications on malaria. This literature review provided valuable insights that informed the study's context, supported its objectives, and enriched the analysis presented within the research document. Relevant findings were integrated throughout the study to ensure a comprehensive understanding of the malaria landscape.

Ethical Consideration

The study's design and implementation adhered to ethical guidelines. During data collection, participants were fully informed of the study's purpose and voluntarily provided consent, ensuring respect for their autonomy. Additionally, measures were taken to protect participants' privacy, confidentiality, and anonymity throughout the study.

Sampling Technique

Three sampling procedures were employed in this study: proportional stratified sampling, purposive sampling, and simple random sampling. Proportional stratified sampling involves dividing the sample among different strata in a way that improves survey accuracy. In this study, the sample size was proportionally allocated across the AMAC, Bwari, and Gwagwalada Area Councils, representing semi-urban, urban, and peri-urban/rural zones, respectively, which meet the criteria for different types of human settlements.

Sample Size and Study Area

Of the 400 questionnaires distributed to interview subjects across the three area councils in the Federal Capital Territory (FCT), 381 were completed, returned, and analyzed for this study. These councils—Abuja Municipal Area Council (AMAC), Gwagwalada, and Bwari—are part of the six area councils in the FCT, Abuja, Nigeria. Established in 1976, the FCT is centrally located within the country and covers an area of approximately 300 miles (480 kilometers).

Study Design

The research employed a cross-sectional survey, gathering data from participants at a single point in time. This survey instrument collected demographic and characteristic data, including variables such as age, gender, income, education, occupation, place of residence, and ethnicity. These variables provide a snapshot of the population, allowing for analysis of associations between demographics and other characteristics in the context of the study.

Data Collection

The data collection process used a structured, interview-based questionnaire along with field observations to gather detailed information from households in Abuja Municipal Area Council, Gwagwalada, and Bwari Area Councils. The primary focus was to assess demand for malaria prevention and treatment among selected households in these regions, while also collecting data on environmental factors contributing to this demand. The study aimed to evaluate the impact of malaria prevention and treatment needs on households within the

Federal Capital Territory.

Model Specification

The logit model was used in this study to obtain reliable estimates from qualitative data, as it provides a good fit for binary or categorical outcomes.

(Yearly amount of money spent on malaria prevention and treatment)_i

$$= \beta_0 + \beta_1(\text{education})_i + \beta_2(\text{cost of malaria prevention and treatment})_i$$

$$+ \beta_3(\text{head of household income})_i + \beta_4(\text{environmental factors})_i$$

$$+ \beta_5(\text{head of household age})_i + \beta_6(\text{income of spouse})_i + \varepsilon_i, i = 1, 2 \dots n$$

where ε_i is the error term

β_i is the regression coefficients

Hypotheses

H₀: There is no statistically significant relationship between the yearly amount of money spent on malaria prevention and treatment and proxies for malaria prevention and treatment

H₁: There is statistically significant relationship between the yearly amount of money spent on malaria prevention and treatment and proxies for malaria prevention and treatment

Data Analysis

Table 1.1: Logit Regression Model

Attitude to malaria	Freq.	Percent
Negative	223	58.53
Positive	158	41.47
Total	381	100.00

Source: Author's Computations, using SPSS-20 and STATA-14

Table 1.1 illustrates the respondents' attitudes toward malaria prevention and treatment. Positive attitudes include adherence to preventive measures such as sleeping under treated nets, netting windows, and clearing grass around houses. However, negative attitudes indicate a lack of adherence to these measures. Specifically, 223 respondents (58.53%) exhibited negative attitudes, while 158 (41.47%) demonstrated positive attitudes toward malaria prevention and treatment.

Table 1.2: Result of Logit Model Regression

Attitude	Coef.	Prob.	Std. Err.	Z	P>z	[95% Conf. Interval]
Age	-.0128399	0.49	.0145833	-0.88	0.379	[-.0414227, .0157429]
Education	.0865419	0.52	.1138717	0.76	0.447	[-.1366426, .3097263]
Income	.1779824	0.54	.0897423	1.98	0.047	[-.0020906, .3538742]
Spouse income	-.0625648	0.48	.0911795	-0.69	0.493	[-.2412734, .1161438]
Cost of malaria	-.1603109	0.46	.176571	-0.91	0.364	[-.5063837, .185762]
Public tap	-2.21183	0.09	.2860652	-7.73	0.000	[-2.772508, -1.651153]

Well at home	-2.682891	0.06	.4034045	-6.65	0.000	-3.473549	-1.892232
_cons	.7786643	0.857	.8634216	0.90	0.367	-.9136109	2.470939
a. Dependent Variable: The total amount of money spends on the malaria prevention and treatment yearly							

(Significant level, $\alpha=0.05$)

The Logit model in Table 1.2 provides insights into the various factors influencing respondents' attitudes toward malaria prevention and treatment. Age (-0.0128): A negative coefficient suggests that older respondents are less likely to be vulnerable to malaria, aligning with the null hypothesis. This could imply that older individuals perceive themselves as less at risk or have had previous exposure, making them less concerned about malaria prevention. The probability of infection for adults is 0.49, indicating that adults are somewhat likely to be infected, but preventive measures play a crucial role.

Education (0.0865): A positive coefficient shows that education is significant in influencing demand for malaria prevention and treatment, rejecting the null hypothesis. The probability of demand for malaria services increases to 0.52 with higher education, suggesting that more educated individuals are more likely to seek and adhere to malaria prevention measures.

Income (0.1779): Income also plays a significant role in healthcare service consumption, rejecting the null hypothesis. With a probability of 0.54, higher income increases demand for malaria prevention and treatment. This suggests that wealthier individuals are more likely to afford and seek preventive care. Spouse Income (-0.0625): The negative coefficient indicates that spouse income has little to no effect on the demand for malaria services. The probability is 0.48, suggesting that the income of a spouse does not significantly affect malaria prevention and treatment decisions.

Cost (-0.1603): The cost variable shows a negligible effect on demand with a probability of 0.46, which is not statistically significant. This suggests that the cost of malaria services does not significantly deter demand, possibly because individuals recognize the severe health risks of untreated malaria and are willing to invest in treatment despite cost barriers.

Environmental Factors: Well Water (-2.2118) and Sanitary Conditions (-2.6828): Both variables have negative coefficients, indicating no significant impact on the demand for malaria prevention and treatment. The probabilities for both are 0.09 and 0.06, respectively, which are not statistically significant. This suggests that environmental factors like water sources and sanitation may not be perceived as immediate threats to malaria infection, despite their known importance in malaria prevention.

In summary, while age, spouse income, and environmental factors show insignificant impacts on demand for malaria services, education, income, and general cost influence demand positively. This aligns with the broader understanding that education and financial resources are key determinants in healthcare-seeking behavior, particularly for malaria prevention and treatment.

CONCLUSION

This study has empirically investigated the impact of demand for malaria prevention and treatment among household in the Federal Capital Territory of Nigeria. The results of the study of logit regression model indicated that the head of households' income and education are significant to the total amount of money spend on malaria prevention and treatment by a household yearly at the 0.05 significant while the rest of the variables were not significant. Stakeholders, including the government at all levels, civil society organizations, development partners, donor agencies, communities, households, and individuals, all have roles and responsibilities to implement the policy recommendations in a bid to reduce mosquito bites that cause malaria infectious diseases and reduce malaria treatment to a bearable level.

RECOMMENDATIONS

When conducting spare study, same research can be considered both inside and outside the study place.

Optimizing the allocation of health resources towards malaria prevention at the federal, state, and local government levels will be beneficial for health professionals, researchers, policy makers, and decision makers, particularly those in the ministry of health.

In malaria endemic areas, it is crucial for nonprofit organizations, civil society groups, and community-based organizations to optimize options for malaria prevention and treatment among the responders.

In high-malaria endemic areas, the study's adaptability will help households and individuals develop attitudes and behaviors that are congruent with malaria prevention and control measures in order to reduce frequencies of treatment.

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Conflict of interest: The authors have no competing interests existed

Data availability: The data use will be made available upon request

Contributions by authors: Daniel Abraham and Alabi Seleem Babajide made significant contributions to the study and other aspect of the work was handled by A. A. Daniel

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