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Assessment of Out-Of-Pocket Expenditure on Malaria Treatment in Adamawa State Specialist Hospital Yola

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Abstract. This study investigates the impact of malaria on household out-of-pocket expenditure at Specialist Hospital Yola in Nigeria. A cross-sectional study was conducted with a population of 1,500 and a random sample of 316. The study employed ANOVA and Multiple regression analysis to assess the relationship between various variables. The findings revealed that there exists a significant relationship between out-of-pocket spending and strained household finances, while regression analysis showed that malaria significantly affects household out-of-pocket expenditure. This study recommends prioritising policies to increase income levels, exploring avenues for government support, promoting financial literacy among affected households, and implementing targeted interventions to improve income and financial protection for vulnerable households. Addressing these issues is essential to alleviate the financial burden of healthcare expenses on households in Nigeria.

1. Introduction

The progress towards achieving universal health care (UHC) in Nigeria has been slow because a significant number of the populace are bearing the high out-of-pocket (OOP) health expenditures, mainly due to the insufficient government expenditure on the healthcare sector (WHO, 2021; Onoka, Hanson, & Hanefeld, 2014; Onoka et al., 2013). Similarly, attaining universal health coverage (UHC) is increasingly becoming difficult because of the increasing poverty level of the citizenry, primarily because of the system-wide inequities that result from the lack of financial protection for the health care needs of most Nigerians (WHO, 2021; Okpani & Abimbola, 2015).

Although over the year's government has made concerted efforts to provide healthcare services by maintaining the infrastructure, providing basic medical support improving staff salaries, etc. However, on different occasions, households have to shoulder 'out-of-pocket expenditure' (OOP) for some of the services provided. The OOP expenses cut across medical and non-medical expenditures. The medical costs may include consultation fees, investigations, drugs, and surgical procedures, to mention but a few. Similarly, the non-medical expenses include hospital bed charges, feeding, and ambulance services, etc. The OOP expenditure is considered the spending directly borne by an individual or household for the cost of accessing and utilizing healthcare services without a third party (insurer of state). It is regarded as one of the most inequitable forms of health financing because it acts as a barrier for the vulnerable to access quality healthcare services, and thus a precursor to poverty and resulting in health inequity among the populace (WHO, 2021; Onah & Govender, 2014; Okpani & Abimbola, 2015).

It suffices to say that, OOP on healthcare services is a significant barrier to individuals' and families' health-seeking behavior. It can be said that, due to adequate precautionary saving by households due to often lack financial protection to access quality healthcare services. Sometimes, a household borrows or sells assets to meet the expenditure. In extreme cases, individual and family spending exceeds the proportion of household income or ability to pay with resultant

catastrophes setting in (WHO, 2021; Onah & Govender, 2014; Okpani & Abimbola, 2015). See Figure 1, which shows growing out-of-pocket expenses over a while in Nigeria.

This has led to a number of households experiencing difficulties in accessing Medicare which may not be unconnected to the high cost of OOP expenses which necessitated this study with a view to finding the relationship between malaria treatment and out-of-pocket expenses.

2. Literature

2.1 The Economic Cost of Malaria

Liu (2018) examined the health and financial benefits for households from averting malaria with the application of extended cost-effectiveness analysis methods. The result of the study shows that Rolling out the RTS,S/AS01 vaccine in Zambia within one birth cohort would avert an estimated 670 deaths for children under five years of age, and prevent approximately US$1.0 million of OOP expenditure, both largely concentrated among the poorer households. Vaccination also was expected to prevent about 4,400 associated cases of catastrophic expenditure among households in all income quintiles, excluding the highest. The estimated cost of the program would be US$9 million per birth cohort. Equally, Adjagba et al (2019) examined the Economic cost of malaria in four countries in sub-Saharan Africa: A comparative analysis with the use of community-based and healthcare facility-based studies. The findings of the study revealed that total household costs were highest in Ghana and lowest in Uganda. Health systems costs are significantly higher in Nigeria. As opposed to the three other countries, indirect costs in Ghana are lower than direct costs. It was found that in general richer households tended to spend more on treating OPD and IPD cases in the four countries and a majority of Ghana respondents were insured (67%) while in the three other countries, out-of-pocket spending was high (from different sources), followed by subsidies from social institutions.

On the other hand, Mikkelsen-Lopez et al (2013) analyze the implications of health provider compliance on out-of-pocket expenditure during care-seeking for fever in South East Tanzania. The study employed ACT stock data for the period 2009-2011. The findings of the study revealed that Irrespective of ACT stock-outs, more than half (58%) of respondents sought initial care in the public sector, the remainder seeking care in the private sector where expenditure was higher by 19%. Over half (54%) of respondents who went to the public sector reported incidences of non-compliant behavior by the attending health worker (e.g. charging those who were eligible for free service or referring patients to the private sector despite ACT stock), which increased household expenditure per fever episode from USD0.14 to USD1.76. ACT stock-outs were considered to be the result of non-compliant behavior of others in the health system and increased household expenditure by 21%; however, we lacked sufficient statistical power to confirm this finding.

In addition, Chuma, Thiede, and Molyneux (2006) determine the rethinking the economic costs of malaria at the household level: Evidence from applying a new analytical framework in rural Kenya with the applications of Cross-sectional surveys in a wet and dry season provides data on treatment-seeking, cost-burdens and coping strategies. The findings of the study show that Mean direct cost burdens were 7.1% and 5.9% of total household expenditure in the wet and dry seasons respectively. Case study data revealed no clear relationship between cost burdens and vulnerability status at the end of the year. Most important was the household vulnerability status at the outset. Households reporting major malaria episodes and other shocks before the study descended further into poverty over the year. Wealthier households were better able to cope

Sicuri et al (2013) investigated the economic costs of malaria in children in three sub-Saharan countries: Ghana, Tanzania and Kenya, with the use of health systems and household costs previously estimated, were integrated with costs associated with co-morbidities, complications and productivity losses due to death. The result of the study shows that Household and health system costs per malaria episode ranged from approximately US$ 5 for noncomplicated malaria in Tanzania to US$ 288 for cerebral malaria with neurological sequelae in Kenya. On average, up to 55% of these costs in Ghana and Tanzania and 70% in Kenya were assumed by the household, and of these costs, 46% in Ghana and 85% in Tanzania and Kenya were indirect costs. Expected values of potential future earnings (in thousands) lost due to premature death of children aged 0–1 and 1–4 years were US$ 11.8 and US$ 13.8 in Ghana, US$ 6.9 and US$ 8.1 in Tanzania, and US$ 7.6 and US$ 8.9 in Kenya, respectively. The expected treatment costs per episode per child ranged from a minimum of US$ 1.29 for children aged 2–11 months in Tanzania to a maximum of US$ 22.9 for children aged 0–24 months in Kenya. The total annual costs (in millions) were estimated at US$ 37.8, US$ 131.9 and US$ 109.0 nationwide in Ghana, Tanzania and Kenya and included average treatment costs per

case of US$ 11.99, US$ 6.79 and US$ 20.54, respectively.

Onoka, et al (2013) examined The Economic Burden of Malaria on Households and the Health System in Enugu State Southeast Nigeria, with the application of the cross-sectional method. The findings of the study indicate that over half of the households (57.6%) had an episode of malaria within one month of the date of the interview. The average household expenditure per case was 12.57US$ and 23.20US$ for OPD and IPD respectively. Indirect consumer costs of treatment were higher than direct consumer medical costs. From a health system perspective, the recurrent provider costs per case were 30.42 US$ and 48.02 US$ for OPD and IPD while non-recurrent provider costs were 133.07US$ and 1857.15US$ for OPD and IPD. The mode of payment was mainly through out-of-pocket spending (OOPS).

Furthermore, Jimoh, Sofola, Petu and Okorosobo (2007) examined the economic burden of malaria in Nigeria using the willingness to pay approach in which the Willingness To Pay (WTP) approach was used in the study. The result of the study shows that households would be prepared to pay an average of about Naira 1,112 (USD 9.3) per month for the treatment of malaria. This is about Naira 427 (USD 3.6) in excess of the average expenditure they currently make on malaria treatment per month. Similarly, households are willing to pay on average a sum of Naira 7,324 (USD 61) per month for the control of malaria. Again, this is an excess of about Naira 2,715 (USD 22.6) over the cost they currently bear (protection, treatment and indirect costs), and it represents households' average valuation of their intangible costs of malaria illness. This amount represents about Naira 611.7 (USD 5.1) per head per month and Naira 7,340 (USD 61.2) per year. For a country with a population of about 120 million, this translates to about Naira 880,801 million per annum representing about 12.0 per cent of Gross Domestic Product. Hence, the malaria burden in Nigeria is enormous and has a devastating impact on economic growth.

On the other hand, a study by Akazili, Aikins, and Binka (2007) examined the Malaria treatment in Northern Ghana and found that, indirect cost accounts for 71 per cent of the total cost of a malaria episode. While the cost of malaria care is estimated at 1 per cent of the income of the rich, it is 34 per cent of the poor households' income, suggesting that the burden of malaria is higher for poorer households. To reduce the cost of malaria to households, it is assumed that these variables directly or indirectly influence the attitude, subjective norm, perceived behavioral control, and behavioral intention of individuals about seeking quality healthcare services when they get sick. Although the environment has a significant role in shaping the lives of the populace, it is a fact that people from different countries have different social backgrounds, cultures, beliefs, and attitudes. Thus, the attitudes, subjective norms, and perceived behavioral controls of these people on whether to get quality health care services and get well will also differ. It is believed that the educational status of caregivers is a strong factor towards the utilization of health care services and getting well. The educated people in society understand the benefits of health care better than those who are not educated. However, irrespective of the level of education of individuals or households, OOP sometimes deter them from seeking quality healthcare services from health facilities. Similarly, the understanding of the younger population of health-seeking is positive when compared with the older ones. However, in the case of OOP, it is assumed that age has little or no role to play, considering the impact that comes with it (NDHS, 2018). Again, the income status of the family, which is often linked up with the educational background and employment status, has positive effects on the household's attitude, subjective norm, perceived behavioral control, and intent to health-seeking behavior (NDHS, 2018). Similarly, high-income households have a better chance of accessing better-quality services (Awusi, Anyanwu, & Okeleke, 2009; Onah, Ikeako, & Iloabachie, 2006). However, the stressors that come with OOP expenditure often put pressure on working-class families, irrespective of their income level.

3. Methodology

The study was carried out using primary data with a sample size of 316. The study used analysis of variance (ANOVA) in hypothesis testing. The statistical analysis is used in epidemiologic studies examining whether the two sample means sufficiently differ. The ANOVA compares more than two sample means; however, when it is used to compare only two sample means, it is similar to running a t-test (NB: the t-test, under the null hypothesis, compares two means of independent samples whether they significantly differ). ANOVA is considered a parametric test because it assumes that the populations involved in a study have a normal distribution (Armitage and Berry, 1994). As ANOVA compares the variance (or variation) between the data samples, if the variations are much larger, the means of the different samples will not be the same.

Equally, multiple regression was the statistical technique was used to analyze the relationship

between a single dependent and several independent variables. The regression formula is given as Y= B0+B1X1+B2X2+B3X3……..BnXn.
Where Y is the dependent variable and X1….Xn are the independent variables and Bo is the slope parameter.

4. Results and Discussions

The ANOVA result, as shown in Table 1, is for a regression analysis with the dependent variable "direct outpatient malaria medical cost" and three predictor variables: "health insurance," "health status," and "family size." The ANOVA results show the sum of squares (Regression) of 0.237, representing the variation in the dependent variable explained by the predictor variables, degrees of freedom (df) 3, and F-statistic 3.332 with a low p-value 0.020 less than the common significance level of 0.05 (alpha = 0.05); this indicates that the regression model is statistically significant. It suggests that the model is significant, and there is a significant relationship between the predictor variables (health insurance, health status, family size) and the dependent variable "direct outpatient malaria medical cost." The analysis examines the relationship between predictor variables and healthcare costs (Cohen, Cohen, West, and Aiken, 2013).

Table 1: ANOVA Analysis.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
	.174a	0.03	0.021	0.154	0.03	3.332	3	319	0.02

a Predictors: (Constant), healthinsurance, healthstatus, familysize

Source: *Field Survey, 2023.*

Thus, the null hypothesis is rejected because of a significant relationship between the specified predictor variables and the dependent variable. This relationship aligns with the principles of TPB, HBM, and TRA, illustrating how these predictor variables collectively influence attitudes, subjective norms, and perceived behavioural control related to healthcare costs for outpatient malaria treatment (Glanz, Rimer, & Viswanath, 2008; Rosenstock, 1966; Ajzen & Fishbein, 1980; Janz & Becker, 1984).

The above results in Table 1 show a significant relationship between household insurance; household income and family. These results are also in line with the findings (The World Bank Nigeria, 2021). Therefore, one can argue that an increase in government health insurance provision, and expenditure will go a long way in reducing household's expenditure on health (The World Bank in Nigeria, 2020).

Between 2004 and 2018, the expenditure on health for Nigeria recorded an average annual growth rate of 8.21%; there was a substantial increase in the expenditure from 6,040 million US dollars to 16,405 million US dollars in 2018. One of the factors resulting in the increase of OOP expenditure among the citizenry is the lack of effective government policy on social health insurance. While the social health insurance scheme in Nigeria has seen improvements over time, the figures paint a sobering picture. As of 2018, social health insurance accounted for a mere 0.8% of the current health expenditure (The World Bank in Nigeria, 2021).

However, it has been identified that a reduction in health insurance coverage will have a negative impact on health provision and expenditure on households. This is seen between 2004 and 2018, this figure declined from 2.3% to 0.4%. It is lamentable that despite the devaluation of Nigeria's currency, the Naira, from N174/Dollar in 2016 to N380/Dollar in 2018, government expenditure on health per capita remained stagnant at 12 US dollars from 2004 to 2018. Similarly, Nigeria's government expenditure on health per capita based on PPP was 35 US dollars in 2018. Further look at Nigeria's private expenditure on health as a share of total health expenditure dropped from 77.9% in 2017 to 77.3 % in 2018 (The World Bank in Nigeria, 2021).

4.1 Regression Analysis

Table 9 shows the coefficients from a multiple regression analysis with the dependent variable "gender" and three predictor variables: "healthinsurance," "govtsupport," and "supportextent." The regression analysis results indicate that the predictors "healthinsurance," "govtsupport," and "supportextent" have statistically significant effects on the dependent variable "gender." The standardized coefficients allow you to compare the relative importance of the

predictors in predicting “gender,” with “healthinsurance” having the most significant impact (negative), followed by “supportextent” (positive) and “govtsupport” (positive) having smaller impacts.

Table 2: Regression Analysis.
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
		B	SE	Beta			Lower Bound	Upper Bound
1	(Constant)	1.563	0.258		6.046	0	1.054	2.071
	Malaria	0.548	0.054	0.441	-4.229	0	-0.333	-0.122

a Dependent Variable: household out-of-pocket expenditure
Source: Field Survey, 2023.

The multiple regression analysis results from Table 2 have the dependent variable ": household out-of-pocket expenditure " and three independent variables: "malaria." The model summary starts with "Coefficients," which means that it presents the coefficients of the regression model the coefficient for " malaria" is -0.548. The standardized coefficient (Beta) is -0.441. The t-statistic for "healthinsurance" is -4.229. The p-value associated with "healthinsurance" is 0, which means it is statistically significant. The 95% confidence interval for the "healthinsurance" coefficient ranges from -0.333 to -0.122.

The findings from the regression analysis can be related to theoretical assumptions from the Theory of Planned Behaviour (TPB), Theory of Reasoned Action (TRA), and Health Belief Model (HBM) by considering how these theories relate to attitudes, subjective norms, and perceived behavioural control, and how these factors might influence both households out of pocket expenditure and malaria (Glanz, Rimer, & Viswanath, 2008; Rosenstock, 1966; Ajzen & Fishbein, 1980).

Thus, TPB posits that an individual's intention to perform a behavior is influenced by three main factors: attitudes toward the behavior, subjective norms, and perceived behavioral control. In the analysis, "healthinsurance" could be seen as a variable related to perceived behavioral control. The significant negative effect of "healthinsurance" on "gender" might indicate that individuals with health insurance are more likely to seek healthcare due to their perceived control over accessing medical services.

Similarly, TRA, a precursor to TPB, focuses on the influence of attitudes and subjective norms on an individual's intention to perform a behavior. In this context, the negative effect of "healthinsurance" on "gender" might suggest that individuals with health insurance may have more positive attitudes toward healthcare-seeking behavior.

Equally, the HBM focuses on perceived threats to health, perceived benefits, and perceived barriers to engaging in health-related behavior. The presence of "healthinsurance" can be seen as a perceived benefit that may positively influence healthcare-seeking behaviour. This aligns with the finding of a significant negative effect of "healthinsurance" on "gender," it suggests that those with health insurance may be more likely to overcome perceived barriers to seeking healthcare.

The result from the above table is in line with a number of empirical studies, Jimoh, Sofola, Petu and Okorosobo (2007) examined the economic burden of malaria in Nigeria using the willingness to pay approach in which willingness to pay (WTP) approach. The result of the study shows that households are willing to pay an average of about Naira 1,112 (USD 9.3) per month for the treatment of malaria. This is about N427 (USD 3.6) in excess of the average expenditure they currently make on malaria treatment per month. Similarly, households are willing to pay on average a sum of Naira 7,324 (USD 61) per month for the control of malaria. For a country with a population of about 120 million, this translates to about N880,801 million per annum representing about 12.0 per cent of Gross Domestic Product. Hence, the malaria burden in Nigeria is enormous and has a devastating impact on economic growth.

Furthermore, a study by Akazili, Aikins and Binka (2007) examined the Malaria treatment in Northern Ghana shows that, indirect cost accounts for 71 per cent of the total cost of a malaria episode. While the cost of malaria care is estimated at 1 per cent of the income of the rich, it is 34 per cent of the poor households’ income, suggesting that the burden of malaria is higher for poorer households. To reduce the cost of malaria to households. Therefore, based on the empirical results it can be argued that there is a significant relationship between malaria treatment and out-of-pocket expenditure.

5. Conclusion and Recommendations

The results of the ANOVA analysis demonstrated a significant relationship between predictor variables (health insurance, health status, and family size) and out-of-pocket healthcare spending, providing insights into the financial challenges faced by households seeking outpatient malaria treatment. Finally, the multiple regression analysis highlighted the significance of health insurance as a predictor for gender, emphasizing the need to expand health insurance coverage and reduce gender-based disparities in accessing healthcare support. This study provides critical insights into the financial challenges associated with outpatient malaria treatment. It suggests avenues for improving access to healthcare, reducing the economic burden on households, and promoting health equity. The recommendations and findings from this research will likely inform policy decisions and initiatives aimed at mitigating the financial strain on households and improving healthcare access for all.

Based on the research findings, the following recommendations are proposed:

Government Support Expansion: Given the significant impact of direct government support on health insurance coverage, there is a need to expand government initiatives to provide health insurance to a wider population. This could include targeting vulnerable groups, low-income households, and women, who often face disparities in accessing healthcare support.

Policy Interventions: Policymakers should consider implementing policies that protect households from excessive financial strain due to healthcare expenses. These policies may include capping out-of-pocket spending, subsidizing healthcare costs, or creating financial safety nets for vulnerable households.

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