

# Investigating payment coping mechanisms used for the treatment of uncomplicated malaria to different socio-economic groups in Nigeria.

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## Abstract

**Background:** Given the enormous economic burden of malaria in Nigeria and in sub-Saharan Africa, it is important to determine how different population groups cope with payment for malaria treatment. This paper provides new information about the differences in household coping mechanisms for expenditures on malaria treatment.

**Methods:** The study was undertaken in two communities in Southeast Nigeria. A total of 200 exit interviews were conducted with patients and their care givers after consultation and treatment for malaria. The methods that were used to cope with payments for malaria treatment expenditures were determined. The coping mechanisms were disaggregated by socio-economic status (SES).

**Results:** The average expenditure to treat malaria was \$22.9, which was all incurred through out-of-pocket payments. Some households used more than one coping method but none reported using health insurance. It was found that use of household savings (79.5%) followed by reduction in other household expenses (22.5%) were the most common coping methods. The reduction of other household expenses was significantly more prevalent with the average (Q4) SES group ( $p < 0.05$ ).

**Conclusion:** People used different coping strategies to take care of their malaria expenditures, which are mostly paid out-of-pocket. The average socio-economic household had to forego other basic household expenditures in order to cope with malaria illness; otherwise there were no other significant differences in the coping mechanisms across the different SES groups. This could be indicative of the catastrophic nature of malaria treatment expenditures. Interventions that will reduce the burden of malaria expenditures on all households, within the context of Universal Health Coverage are needed so as to decrease the economic burden of malaria on households.

**Key words:** malaria, coping, household, expenditures, payments, socio-economic status.

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## Introduction

In Nigeria, at least 50% of the population have at least one episode of malaria annually resulting in high productivity losses.<sup>1</sup> Almost 50% of the total economic burden of illnesses in malaria holo-endemic countries is attributable only to malaria.<sup>2</sup> In Nigeria, a study that examined the economic burden of malaria found a mean cost of 20 USD per episode of malaria.<sup>3,4</sup> The costs of malaria are not only felt at the time of illness: the implications arising from spending on treatment and loss of income can spread over a year or longer and households incur costs in their attempts to raise money for treatment and/or to minimise potential income losses.<sup>5</sup> This is compounded by the lack of financial risk protection mechanisms against malaria treatment expenditures for most of the Nigerian population.

Out-of-pocket spending (OOPS) is the major payment mechanism for malaria and all other healthcare in Nigeria.<sup>6</sup> OOPS for healthcare increased with the introduction of user fees in the health sector and like most African countries, Nigeria introduced user fees as a mode of financing government health services within the framework of the Bamako Initiative revolving drug funds.<sup>7</sup> Some studies have shown that OOPS for malaria and other common public health illnesses can lead to catastrophic spending, especially for the poorest households.<sup>8,9</sup>

Health care costs, as in the case of malaria, pose a barrier to seeking health care and can be a major cause of indebtedness and impoverishment to many households, especially in most developing countries.<sup>10-12</sup> Such households are often required to make adjustments in their daily budgets, foregoing 'less urgent' needs (like food or education) in order to finance health care.<sup>5</sup> Where adjustments in budgets are inadequate, households adopt other strategies such as selling assets, borrowing or seeking treatment from cheaper alternatives at the expense of good quality.<sup>5,13</sup> Some households practice labour substitution as a way of dealing with indirect costs where the primary care-giver is substituted with a household member who does not attract any income.<sup>13</sup>

Different diseases impose varying levels of economic burden on households depending on their duration and severity, which affects the coping strategies that are used by households. Strategies adopted by households to mobilize cash resources to pay for medical care suggest that many households have difficulties in paying user fees even for minor illnesses.<sup>3</sup> Hence, payment of large medical fees may affect a household's other expenditure decisions and in extreme cases may trigger a vicious cycle of asset depletion and impoverishment.<sup>14</sup>

The choice of a coping strategy will depend on a household's asset base and the ability to transform assets into cash.<sup>15</sup> While such strategies may meet the short-term goal of paying for treatment and minimizing costs, adopting these strategies can add to the overall burden by depleting households' resources, and making them more vulnerable to future impacts of illness and other shocks.<sup>15</sup> In the process, households become 'chronically' poor and get into a medical 'poverty trap', a situation that makes it impossible for them to move out of poverty.<sup>5,16</sup> It has also been found that these payments are regressive to poor households as they

pay more.<sup>17</sup> When coping strategies are constrained, the consequences have been ignoring disease and not seeking treatment at all or indiscriminate use of drugs prescribed by quacks.<sup>11,18</sup> These can potentially result in much higher costs at the final end point. It may be that the acute nature of malaria makes it difficult to ignore as it is the commonest illness suffered by respondents in another study in southeast Nigeria and contributed the highest costs compared to other illnesses.<sup>18</sup>

Households in Nigeria have been reported to have used many coping strategies such as use of own money, use of savings, borrowing or selling of household assets for malaria treatment.<sup>8</sup> Other mechanisms include deferring payment, community solidarity (someone else pays) or exempted from treatment.<sup>18</sup> However more information is needed on coping strategies in Nigeria, especially as the country develops its plans to achieve universal health coverage (UHC).

This paper presents new information about how households cope with payment for malaria treatment in Nigeria. It also explores how these mechanisms differ among various socio-economic groups. This information will be useful for policymakers in the development of strategies that will assist households in coping with treatment costs due to malaria and achieve UHC.

## Methodology

### Study area

The study sites were Achi and Oji-river rural communities in Enugu State, Southeast Nigeria. The state runs a free Maternal and Child Healthcare (MCH) programme targeted towards the reduction in the incidence of malaria in children under 5 years and pregnant women. Despite this free treatment, households still incur a significant cost burden of treatment due to frequent drug stock-outs in the public health facilities or lack of implementation of the policy.<sup>19</sup>

Achi and Oji-river communities have an estimated population of 46,112 and 14,026 respectively. There are 12 health facilities in Achi- 10 public and 2 private while Oji has 4 health facilities-2 public health facilities and 2 private. There are a number of patent medicine stores in each of the study communities and itinerant drug providers also visit the community on the major market days and numerous herbalists and other unortho-

dox healthcare providers (not using western medicine). The main occupations are petty trading and subsistence farming.<sup>19</sup>

The two communities are malaria holo-endemic with an average malaria incidence rate of 15%.<sup>19</sup> The major malaria vector is *Anopheles gambiae*, while *Plasmodium falciparum* causes more than 90% of all malaria infections.

#### Sampling technique, sample size and data collection

Patient exit interviews were used to collect information from patients and their caregivers leaving health facilities after consultation and treatment for malaria. Six health facilities (1 secondary public hospital, 4 primary healthcare centres and a mission hospital) were purposively selected based on their geographic region and patient load. These include the public hospital which serves as the district hospital with a major focus of referral, four health centres and a mission hospital.

A total of 200 exit interviews were administered to caregivers of children that had been diagnosed with malaria after consultation and treatment. A proportionate sampling technique was used to assign the number of exit interviews carried out in the respective health facilities, based on their patient load. Caregivers of children who had been diagnosed with malaria after consultation and treatment upon exiting the facility were interviewed using pre-tested questionnaires that were administered by trained field workers. The purpose of the study was explained to the respondents and written consent was obtained before the interviews were carried out.

Information was collected on demographic characteristics of the respondents, the amount of cost incurred for visiting and receiving treatment at the facility, loss of income due to the time spent in giving care to the child and the mechanisms employed in coping with these payments. The treatment costs included those that were incurred before attending the facility and

those that were incurred at the facility. Information was also collected on household asset ownership and per capita monthly food expenditure to enable classification of respondents into socio-economic groups.

#### Data analysis

Demographic variables were analysed using means (continuous variables) and percentages (categorical variables) and presented in tables. Payment coping mechanisms were summarized in percentages by households and socioeconomic status and significance testing across the socio-economic status (SES) groups carried out using chi-squared tests and equity ratio calculation. The variables for the coping mechanisms include use of savings, cutting down on other household expenses, borrowing, donations from friends and relatives, selling assets, employer and health insurance.

Principal components analysis was undertaken to generate a socioeconomic status (SES) index based on per capita food expenditure and household asset ownership. The SES index was divided into quintiles: Q1 = poorest; Q2 = very poor; Q3 = poor; Q4 = average; and Q5 = least poor. The relationship of each coping mechanism with SES was computed and chi-square for trend determined. Also, equity ratios (Q1/Q5) were calculated for payment coping strategies.

#### Ethical approval

Ethical clearance was obtained for the study from the Ethics Review Board, University of Nigeria. Each respondent gave a signed informed consent.

Note: 154.06 Naira = 1USD (CBN, Nigeria exchange rate 2010)

#### Results

Table 1 shows that majority of respondents were females (62.0%) and the mean age was 38 years. Their main occupation was petty trading (38.5%). Almost a tenth of the respondents were unemployed. The households were equally distributed across five socio-economic quintiles.

**Table 1: Socio-demographic characteristics of respondents (N=200)**

Variable	Measurement
<b>Sex: n (%)</b>	
Female	124 (62.0)
Male	76 (38.0)
<b>Age (years): mean (SD)</b>	38 (6.16)
<b>Main Occupation: n (%)</b>	
Petty trading/Artisan	77 (38.5)
Subsistence farmer	45 (22.5)
Self-employed in a small to medium scale enterprise	27 (13.5)
Government worker	23 (11.5)
Employed in the Private sector	2 (1.0)
Self-employed in a large scale enterprise	3 (1.5)
Others	4 (2.0)
Unemployed	18 (9.0)

#### Malaria treatment costs

Table 2 shows the summary of costs incurred in treating one episode of malaria. The total cost was \$22.90

and expenditures were incurred on direct medical cost and transportation. The indirect costs (loss of income) contributed the majority of the total cost followed by the direct medical costs.

**Table 2. Summary of malaria treatment costs.**

Variable	Mean Cost (US \$)
<b>Direct Medical Costs (Cost at facility + Cost before facility)</b>	6.15
<b>Direct Non-Medical Costs (Transport cost)</b>	0.78
<b>Indirect Medical Costs (Income loss)</b>	15.97
<b>Total Cost</b>	22.90

#### Payment coping strategies

Table 3 shows that the use of household savings was the most common method of payment and coping with malaria treatment (79.5%) followed by cutting down on

other household expenses (22.5%). Selling of household assets was least used and no household used any form of health insurance. All payments were by out-of-pocket spending (OOPS).

**Table 3: Payment coping strategies used by the consumers.**

*Payment coping strategies	n (%)
Savings	159 (79.5)
Cutting down on other expenses	45 (22.5)
Borrowing	11 (5.5)
Donations from Friends and relatives	2 (1.0)
Selling assets	1 (0.5)
Employer	1 (0.5)
Health insurance	0 (0.0)

\* There are multiple responses

Table 4 shows the disaggregation of coping strategies by SES. It shows that only the strategy of cutting down on other household expenses was statistically significant across the socio-economic quintiles, but the distribution was non-monotonic with the average (Q4) SES group cutting down on other expenses more than the other SES groups.

**Table 4: Socio-economic differences in payment coping mechanisms.**

SES n (%)	Savings n (%)	Cutting down on other expenses n (%)	Borrowing n (%)	Donations from friends/Relatives n (%)	Selling assets n (%)	Employer n (%)
Most poor	35 (87.5)	6(15)	4 (10.0)	1(2.5)	0 (0.0)	0 (0.0)
Very poor	31 (77.5)	9(22.5)	2 (5.0)	0 (0.0)	0 (0.0)	1(2.5)
Poor	33 (82.5)	6 (15.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Average	26 (65.0)	16 (40.0)	2 (5.0)	1(2.5)	1(2.5)	0 (0.0)
Least poor	34 (85.0)	8 (20.0)	3 (7.5)	0 (0.0)	0 (0.0)	0 (0.0)
X <sup>2</sup> (p value)	7.79 (0.10)	9.75 (0.04)	4.23 (0.35)	N/A	4.02 (0.40)	4.02 (0.40)
Equity Ratio (Q1 :Q5)	1.03	0.75	1.33	N/A	N/A	N/A

### Discussion

In the absence of financial risk protection mechanisms in the study area, it was found that payments for malaria treatment were made wholly through out-of-pocket spending (OOPS) and consumers used different strategies to cope with the treatment expenditures. The most common method of coping employed by households

is the use of their savings followed by cutting down on other household expenditure. In coping with costs, households resort to their savings, borrowing, solicit funds from friends and relations, incur further opportunity cost by cutting down on other family expenses. A few sell their assets. None of these strategies are sustainable with repeated episodes of malaria as seen in this area.<sup>20</sup>

Cutting down on other household expenses was found to significantly occur more in the average households. Understandably they may be cutting down on luxury items which the poorest households may not have been able to afford even without illnesses to pay for. It has also been shown that wealthier households have more assets to convert to cash to buffer against malaria payments and hence cope better.<sup>15</sup>

The finding that the coping strategies, especially the use of savings were equally used by all SES groups potentially increases the economic burden of malaria on the poorest SES groups. Hence this trend is regressive to these households and have been seen in other studies in southeast Nigeria and in Malawi.<sup>18,21</sup> In rural Kenya, households rarely had enough cash to pay for treatment and had to mobilize additional resources and some poor and vulnerable households had limited assets which constrained their coping strategies.<sup>5</sup> A similar scenario was found across seven other countries in east and central Africa (DRC, Rwanda, Uganda, Ethiopia, Tanzania, Burundi and Sudan) where all households struggled to pay for healthcare but the poor households were particularly disadvantaged.<sup>11</sup>

No household used any form of health insurance as a coping mechanism. Lack of any financial risk protection at the point of accessing treatment leaves households vulnerable and having to resort to other mechanisms as seen in this study. Other consequences may be reduction in access to quality healthcare, not seeking treatment at all or patronizing quacks and long-term poverty.<sup>16</sup> Publicly financed health services have not reached the poor in many developing countries, increasing the necessity of many people using OOPS for healthcare<sup>11,22</sup>, further impoverishing the poor. Lack of or poor coverage is a common feature in developing countries.<sup>17,23</sup> However, some African countries; Rwanda, Mali and Ghana are using the community based health insurance (CBHI) scheme to move towards universal coverage.<sup>24</sup>

A qualitative component of this study could have been incorporated in the study design to complement the findings, however, this will form a basis for further research in this field. Labour substitution in the household as a coping mechanism was also not ascertained in this study and this may have overestimated the indirect costs of malaria treatment.

### Conclusion

Households used different coping strategies to take care of their malaria expenditures, which are mostly paid out-of-pocket. There were generally no differences in coping mechanisms across the different SES groups, with the exception of the finding that average households more than other households had to forego other basic household expenditures. This could be indicative of the catastrophic nature of malaria treatment expenditures. Interventions that will reduce the burden of malaria expenditures on all households, within the context of Universal Health Coverage are needed so as to decrease the economic burden of malaria on households.

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### Authors

OO, BU and AA conceptualized the study. OO, BU carried out the study. OO, EE and BU took part in the analysis. EE and OO wrote the first draft. All authors revised the final draft and agreed on it.

### Competing Interests

The authors declare no competing interests.

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