Household Expenditure on Treatment of Presumptive Malaria in a Rural Community of North-western Nigeria.

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ABSTRACT
Background
Malaria is endemic in Nigeria and there is a vicious cycle between it and poverty. It contributes towards poverty, while poverty influences the risk of its infection. Majority of Nigerians, 70%, live in rural areas, below poverty line. They earn less than $1.25 a day. Subsistence farming is their main occupation. The cost of malaria treatment represents a significant portion of their income.

Objective
This study was conducted to assess the direct cost of presumptive malaria treatment on households in Gimba Village of Soba Local Government Area of Kaduna State, Nigeria.

Methodology
A cross-sectional descriptive study conducted during community diagnosis posting of final year medical students of Ahmadu Bello University, Zaria in July 2012. An interviewer- administered questionnaire was used to collect data from household heads.

Results
Most of the respondents (69.7%) were farmers. A large proportion of the respondents (47.3%) earned between N10,000.00 to N20,000.00. monthly. The average household size was 6 while the average number of presumptive malaria cases per household per year was 13. On average, the direct cost of presumptive malaria treatment alone, consumes 4.9 % of the annual income of household heads.
There was a statistically significant association between cost of treatment and place of seeking treatment (p <0.001).

Conclusion
The direct cost of presumptive malaria treatment alone consumed a large proportion of the meagre annual income of households in the study area. For effective malaria control in Nigeria, free or subsidized malaria treatment and rural health insurance scheme are recommended.

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Introduction

Malaria is commonly referred to as a disease of poverty and is mainly found in the poorest regions of the world.[1-2] There is a vicious cycle between malaria and poverty: malaria contributes towards poverty, while poverty influences the risk of malaria infection. Poor people are at particular risk of malaria because they are less likely to purchase preventive measures and to seek prompt effective

treatment.[2-5] It can lead to increasing levels of vulnerability and poverty for households that are unable to cope with the financial cost of its treatment. Thus, it could hinder economic development in a community. It is endemic throughout Nigeria where it is a serious public health problem.

Majority of Nigerians, 70%, live in rural areas where subsistence farming and livestock rearing is their main occupation[6] Most of them live below poverty line, earning less than $1.25 a day.[7] In most rural Nigerian communities, out-of-pocket payment for health care is the only available form of Health Care Financing. Health insurance schemes are not available. Rural dwellers therefore bear the cost of malaria treatment.[8]

Malaria treatment has both direct and indirect costs.[9] The direct cost includes all cash expenditure on seeking malaria treatment by patients and their caretakers. It includes cash expenditure on special food, transportation, medical supplies, non-medical supplies and services like laboratory investigations.

Cost of malaria treatment can be analysed either from a macro-economic or micro-economic perspective.[10] The macro-economic analysis is through the evaluation of national control programmes in relation to national product. On the other hand, micro-economic analysis considers the impact of malaria on individuals and households. Macro-economic cost data can aid in health planning and cost effectiveness analysis while microeconomic costs data are useful in assessing the ability of individuals and households to afford health care services.

This study was conducted to assess the direct cost of presumptive malaria treatment on households in Gimba Village, an agrarian rural community in Soba Local Government Area of Kaduna State, Nigeria.

Household heads were financially responsible for treatment of presumptive malaria in their respective households. The cost of treating malaria represents a significant portion of the income of poor households.[11-13] For example, in Ghana, the average cost of malaria treatment per patient was US $ 2.71 while in rural Ethiopia it was $1.60 .[14-15] Some households incur catastrophic expenditure on malaria treatment.[16-17] Catastrophic costs due to malaria treatment refer to households spending more than a stated percentage threshold of their income (or non-food expenditure) on malaria treatment. Several authors have defined a threshold of 10% of household income as catastrophic.[18-20] Catastrophic health expenditure depletes household income and contributes to the vicious cycle of poverty and disease. It forces poor households to reduce other basic expenses such as food, shelter, or their children's education.[21]

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In other words, it forces household members to cut their consumption of other minimum needs, triggers productive asset sales or high levels of debt, and leads to impoverishment. Also, it adversely affects the health seeking behavior of poor households, forcing them to access less than the required amount of treatment or cheap, inappropriate treatment. However, it is worth noting that this 10% figure is somewhat arbitrary because it may not be catastrophic for high-income households that can cut back on luxuries or for resilient households that can mobilize assets to pay for treatment.[12]

Nigeria receives donor support for malaria control. Global Fund is currently its largest funding partner. Through the Global Fund, SFH (Society for Family Health) supports the distribution of two LLIN per

household and the provision of subsidized ACTs to the private sector under the AMFm (Affordable Medicines Facility – malaria) pilot program. SFH is the private sector principal recipient that is allowed to import AMFm-subsidized ACTs which it subsequently sells directly to wholesalers in the states. It also sets up a network of about 120 retailers per state who sell the ACTs at the AMFm target prices.[22]

Methodology

A cross-sectional descriptive study was conducted as part of a Community Diagnosis field practical experience for final year medical students of Ahmadu Bello University, Zaria, from 25th June 2012 to 20th July 2012.

The study was conducted in Gimba community, a rural settlement in Soba Local Government area of Kaduna state, North-western Nigeria. The village has a total population of 4,160 people and one health facility.[23] Malaria is endemic in this community, which has a total of 686 households. All the 686 household heads in the community were interviewed (total population study).

Data was collected by final year medical students using a structured interviewer administered questionnaire in which respondents were asked about their socio-demographic profiles; number of presumptive malaria cases per household per year and the direct cost of treating the malaria cases.

Repeated visits for questionnaire administration were conducted to households where the head was not met at first or previous visit. The questionnaire was pretested on 42 randomly selected Household heads in Yakasai Village, a community with similar characteristics with the study area.

Appropriate entry permission to conduct the study was sought from Soba Local Government Area, Kaduna State and from Gimba community leaders. An informed verbal consent was given by the respondents. Ethical clearance for the study was obtained from Ahmadu Bello University Teaching Hospital's ethical committee.

After the data collection, all completed questionnaires were checked properly for any error and edited. The data obtained were cleaned and analyzed using Statistical Package for Social Sciences software (SPSS), version 19. Results are presented in tabular form.

Results

A total of six hundred and eighty six (686) questionnaires were returned within the period of the study, giving a response rate of 100%. The ages of the respondents ranged from 15 to above 92 years.

As shown in table I, 32.1% of the respondents were aged between 30 to 39 years. Most of the respondents (69.7%) were farmers; had only Quranic education (57%); had only one wife (56.1%) and between one to five children (54.2%). A large proportion of the respondents (47.3%) earned between N10,000.00 to N20,000.00. monthly.

As shown in Table II, majority of the households (60.6%) had more than 10 cases of presumptive malaria within the past twelve months. The average number of presumptive malaria cases per household per year was 13 cases. Cases of presumptive malaria were highest among under five children (47.4%), followed by housewives (26.5%). Majority of the households (73%) treated their last cases of presumptive malaria at patent medicine shops. Most of the households (52.9%) spent between N300 and N500 to treat their last cases of presumptive malaria. The three major reasons

Table I: Socio-demographic profile of respondents

Variable	Frequency(n=686)	Percent (%)
Age (years)		
<20	6	0.9
20 - 29	162	23.6
30 - 39	220	32.1
40 - 49	158	23
50 - 59	80	11.7
60 - 69	36	5.2
70 - 99	24	3.5
Level of Education		
None	9	1.3
Quranic	391	57
Informal	16	2.3
Primary	108	15.8
Secondary	111	16.2
Tertiary	51	7.4
Number of wives		
One	385	56.1
Two	251	36.6
Three	35	5.1
Four	10	1.5
None	5	0.7
Number of children fathered		
None	54	7.9
1 - 5	372	54.2
6 - 10	171	24.9
11 - 20	75	10.9
21 - 30	12	1.8
31 and above	2	0.3
Monthly Income In thousand Naira		
<10	325	47.4
10 - 20	252	36.7
21 - 30	54	7.9
31 - 40	22	3.2
41 - 50	19	2.8
51 - 60	6	0.9
61 - 70	3	0.4
70	5	0.7
Occupation		
None	11	1.6
Farming	478	69.7
Petty trading	59	8.6
Artisan	68	9.9
Businessman	18	2.6
Civil servant	52	7.6
Marital Status		
Single	3	0.4
Married	678	98.9
Divorced	3	0.4
Widowed	2	0.3

N155=US $1

TABLE II: Cost of Household presumptive malaria treatment and related issues

Variable	Frequency(N=686)	Percentage (%)
Number of presumptive malaria cases per household In the past 12 months		
1 -5 cases	78	11.4
6 - 10 cases	192	28.0
>10 cases	416	60.6
Affected person during last episode		
Under five	325	47.4
House wife	182	26.5
Household head	96	14
Youth	67	9.8
Relation	14	2
All member of family	2	0.3
Place of treatment		
Village clinic	152	22.2
Chemist	501	73
Others	33	4.8
Cost of treatment in naira		
<N300	143	20.8
N300-N500	363	52.9
N501- N1000	134	19.5
>N1000	46	6.7
Reasons for not going to health facility for treatment		
Lack of money	295	55.2
Prefer chemist shop	177	33.1
Unfriendly Health Workers	122	2.9
Poor services at health facility	81	1.3
Services are expensive	165	3.9
Prefer Traditional medicine	98	1.4
Others	18	2.2
Total	686	100

$p = 0.07256$

proferred for not treating the malaria at the village's health centre were lack of money (55.2%), preference of patent medicine vendor shops over health facility (33.1%) and cost of hospital treatment was too expensive (30.9%). There was a statistically significant association between cost of treatment and place of seeking treatment (X^2=79.39, df=9, p<0.001). However, the association between cost of treatment and monthly household income was not statistically significant (X^2=63.11, df =12, p = 0.0725). Also, the association between bouts of presumptive malaria per households in the past 12 months and educational level of respondents was not statistically significant(X^2=81.12, df = 7, p = 0.0963).

Discussion

A large proportion of the respondents (60.6%) had no formal education. It is due to the low primary school enrolment in the northern part of Nigeria. For example, as of 1975-1976 when most of the respondents were of primary school age, the proportion of primary school enrolments in the North was just 26.5%, while between 1985-1986, it was 34.3%.[24] This low level of Western education could have contributed to the poor socio-economic status of the respondents such as low monthly income of most of the household heads and large family size. The average number of children per household alone was 4, while the average household size was 6. This puts the average household size in the community above the national figure of 4.6 for rural Nigerian communities.[25]

The average monthly income of household heads was N14,840.53 (U.S $95.7) which translates to an average annual income of N178,086.36. The average cost of treating a case of presumptive malaria was N680 (U.S $4.4). This cost was irrespective of where it was treated, that is, either at the health facility or at patent medicine vendor shops. The cost was purely the amount spent on drugs and laboratory investigations (at health facility). It excludes other direct costs like cost of special food; transportation to health facility and medical/ non-medical supplies since such cost were not incurred in the course of treatment. For example, no transportation cost was incurred because the chemist shops and health facility in the village were within trekable distance in the community.

The average of 13 presumptive malaria cases per household per year is high. The possible explanation for this is the large household size and poor malaria preventive practices, which was documented among other rural dwellers.[26]

Using the average of 13 episodes of presumptive malaria cases per household per year, the average annual household cost of presumptive malaria treatment in the community translates to N8,840 (680 x 13). This amount is 4.9 % of the average annual income of household heads in the community. Thus, going by the 10% threshold definition of catastrophic expenditure, the annual cost of treating presumptive malaria in the community was not catastrophic. The possible explanation for this finding is that the indirect cost of malaria treatment was not included. If included, the level of catastrophe may be higher than computed. In fact, studies have shown that the indirect cost of treating malaria is always higher than the direct cost. [27-28] These reasons could explain why the direct cost of treating malaria in this study was lower than the 28% of annual income obtained in agrarian Malawian households.[29] On the contrary, the finding is higher than the 2.9% obtained by Onwujekwe O.E in South-eastern Nigeria.[30] The possible explanation for this is that North-western Nigeria, where this study was conducted, is poorer than its South-eastern counterpart.25 It is also higher than the 3.3% of annual household income obtained by Rasheed et al in Republic of Benin. [31]

It is worth nothing that for Nigeria, due to the incidence of poverty, with many people living below poverty line, it was suggested that the threshold for assuming catastrophe may be less than 2%.32

The significant association between cost of treatment and place of seeking treatment is a reflection of how low socio-economic class; high cost of malaria treatment, among others, affects heath seeking behaviour of the respondents. A

possible explanation for the lack of association between bouts of malaria and educational level of respondents is that knowledge of malaria and risk perception of malaria (rather than educational level of respondent) determine the uptake of malaria preventive practices.[33-34]

One limitation of the study is that it is a quantitative survey with a long recall period of one year. The number of presumptive malaria cases per year, as mentioned by respondents, might be inaccurate due to poor recall. The same applies to the cost of treatment of presumptive malaria cases within the past one year. A second limitation is that it based on the assumption that a febrile illness was due to malaria (presumptive malaria). This might not be true in all cases.

CONCLUSION

The cost of treating malaria in the community was not catastrophic. However, it was associated with seeking for cheaper malaria treatment from unprofessional patent medicine drug vendors.

For effective malaria control in the country, free treatment of malaria is recommended, especially in rural areas. Other recommendations include subsidy on malaria treatment; rural Health Insurance Schemes and promotion/ implementation of ITN use in rural areas. These will offer financial risk protection from malaria treatment and alleviate the economic consequences of the disease.

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