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## Malaria Control and Household Resource Allocation in Ido-Local Government, Nigeria

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### Abstract

In a bid to contribute to the knowledge base needed for effective malaria control, this research work examined the control of malaria among rural households and the impact it has on the allocation of household resources in Ido-Local Government Area (LGA) of Oyo State. The research was carried out as a descriptive cross-sectional study of randomly selected household heads and health workers in Ido-LGA. The Health Belief Model was adopted to predict health behaviours and explain behavioural responses to treatment through adequate allocation of household resources. It involved the use of semi-structured questionnaire and in-depth interview guide. 250 households were interviewed using semi-structured questionnaires, while 7 in-depth interviews were done. The quantitative data were analyzed using the Statistical Package for Social Science (SPSS), frequency distribution, cross tabulation; chi-square and regression analysis. The study found that households' knowledge about malaria has generally improved over time with 98% of the respondents attributing the incidence of malaria to mosquito bites. Nevertheless, there are still misconceptions among some households about the causes of malaria and relatively low levels of knowledge of the symptoms of severe malaria. These misconceptions certainly have implications for household's malaria preventive behaviours and practices. 91.6% of the households regarded malaria as a dangerous disease that can kill.

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However, because of lack of adequate finance for proper medical consultation and treatment, households prefer self-medication and local herbs for treatment of malaria. They use traditional medicine alongside modern medicine. More so, households use more of private hospitals and the services of traditional healers than healthcare centre in cases of severe malaria because, in most government units, opening hours were short and drugs were not often available. The type of health facility used was also found to determine the type of preventive measures used. The use of preventive methods is generally low, with several households using more of noncommercial methods of prevention than the commercial methods of prevention.

**Keywords:** Malaria control; Household; Resource allocation; Poverty

## **1. Introduction**

Malaria is the world's most widespread infectious disease. It affects 3.3 billion people, or half of the world's population, in 106 countries and territories. According to the World Health Organization (WHO), an estimate of 216 million cases of malaria occurred in 2010 worldwide while, 81% of these occurred in the African region. There were also 655,000 malaria deaths worldwide, 91% of which was in the African Region.[1]

In Nigeria, Malaria is a major public health problem where it accounts for more cases and deaths than any other country in the world. Malaria is a risk for 97% of Nigeria's population. The remaining 3% of the population live in the malaria free highlands. There is an estimated 100 million malaria cases with over 300,000 deaths per year in Nigeria. It contributes to an estimated 11% of maternal mortality. Malaria is also the single most important cause of illnesses and deaths of Nigerian children especially in rural areas where effective case management and prevention are compromised by delayed recognition of the disease and poor treatment decisions, poor access to integrated malaria vector control and therapeutic intervention strategies [2].

Malaria not only poses a high risk to health, it has implications for the development of household members, communities and the nation at large. The recurring costs of infection in prevalent areas place a burden on households as peoples' ability and capacity to work, earn income and save for the families are reduced due to sickness or care-giving activities.

Despite prevention and control efforts, it can be said to be the first of the conditions causing most illnesses and deaths in Nigeria especially among rural dwellers. Most of the efforts geared toward malaria control have failed owing to inadequate information on the economic and social behavior of households (allocation of household resources) in seeking treatment for malaria or in finding ways to avoid the disease. Consequently, incentives to encourage households to engage in malaria control strategies have not been properly designed and implemented. These problems are further compounded by corruption (in all spheres that do not support the course of ending malaria), policy inconsistency, ignorance accruing from the dearth of public enlightenment on preventive and treatment measures, the impoverished conditions of people and the failing drug distribution systems/structures in public sectors, through which malaria control products and services are delivered to the populace. As a result, the availability and usage of these products and services are very limited, especially in rural areas.

This research work is therefore designed to investigate the perceptions of households on malaria; bring to limelight the awareness of rural households about malaria control measures and the factors that affect households' resource allocation for malaria control with a view to exposing areas of possible interventions.

## **2. Materials and Methods**

### **2.1 Study Area**

Ido-Local Government (LG) areas is said to be one of the largest in Oyo State. The Local Government headquarters is at Ido, situated along Ibadan-Eruwa road (Latitude 7° 26'N and Longitude 3° 30'E). The projected population for the LGA for 2006 is 137,592 based on the 1996 estimated population (104,087) by the National Population Commission [3]. This study area is located in between the humid and sub-humid tropical climate. The mean annual rainfall ranges from 1,117.1 to 1,693.3 mm. The annual temperature ranges from an average minimum of 24.6 °C to average maximum of 31.5 °C. It experiences annual flood, and there are intense farming activities in area. These are the main factors which create a suitable environment for breeding of mosquitoes. The problem of malaria is further aggravated by the intensive population movement from different local areas to the headquarters. Hence, the research work was conducted at Ido-LG.

### **2.2 The study population**

The study populace comprised 17 areas which includes; Akufo, Araromi, Akinhemi, Idi-Orogbo, Ile-Titun, Adio, Ajibade, Aasani, Alajata, Onigbinde, Elesin-Funfun, Olokogboro, Akindele, Adaba, Aba-Oni, Orisunbare-Elesu among others. Those interviewed were Household Heads (HH), Chief Nursing Officers/Matrons (CNO) heading each government health facilities, Patent Medicine vendor and Trado/Faith Healers (FH) within this locality.

### **2.3 Sample Size and Sampling Procedure**

Firstly, Ido local government was purposefully selected as the study area. Then the political delineation/wards in the local government were listed as sampling frame where simple random sampling was adopted to select two-third (8) out of the twelve (12) politically/administratively recognised wards that comprise the Ido local government area. In addition, from each ward, the sample was drawn from communities selected purposively bearing in mind among other factors, their accessibility and proximity to major roads.

The selection of households for the administration of the pre-prepared questionnaires was also purposive. For instance, in villages with only two or three households, these were all used for the study. In houses where there were more than one household heads the first person identified as a household head that was willing to assist the researcher in filling the questionnaire was asked. In all, the study involved 250 samples of households that are residents of Idolocal government area. A total 7 in-depth interview was conducted involving three Chief Nursing Officers, two traditional health practitioners, a village health worker and a village chemist.

### **2.4 Questionnaires Survey**

In order to carry out the research work, questionnaire and In-depths interviews were drawn for this target group in such a way as to utilize their indigenous knowledge/native intelligence. A purposive survey of respondents was done using questionnaires targeting two hundred and fifty (250) respondents. Seven (7) In-depth interviews (IDIs) were conducted. All interviews were electronically recorded to avoid loss of information.

### ***2.5 Methods of Data Collection***

Structured and systematically drawn questionnaires as In-depth personal interviews were data collection instruments. The survey questionnaire was designed for the household heads and interview guides for the key informants in the different wards/communities. The questionnaire was designed in such a way that the Household Heads responded to a set of questions that relate to knowledge of causes of malaria, the total expected household incomes, amount allocated to malaria prevention and treatment in the family, etc. While In-depth interview sessions were conducted with the Chief Nursing Officers in the wards/primary health centres, Traditional Healers, a village health worker and a patent medicine vendor. Data were collected and statistically analysed.

### ***2.6 Statistical Analysis***

The statistical package used for the analyses was SPSS. Important variables and categories were generated and used to measure the relationship between these variables. Simple frequency, cross-tabulations and correlation were found adequate and used to test the significance and direction of relationships among variables. The qualitative data on the other hand was analysed manually through descriptive analysis of the content of the interviews.

### ***2.7 Limitations of the Study***

The major limitations of this study included the high rate of illiteracy in the study area and their cynicism on researches that promote modern/foreign knowledge. In virtually all the households visited, household members could neither read nor write. This was a major challenge to data collection since the researcher had to read and interpret the questionnaire to them till they understood. Similarly, cultural/traditional values are held in very high regard in some of the villages visited. In some of the households visited, female heads did not grant audience to the researcher claiming that such act will be tantamount to disrespect in the absence of male household heads. Some of them also believed that one should not list/number ones children nor give account of one's income or spending especially on food and healthcare, in that way declining from participating.

## **3. Results and Discussion**

### ***3.1 Socio-demographic Characteristics of the Respondents***

The Socio-demographic characteristics of the respondents are shown in Table 1. Among the 250 respondents that were selected, 66.8 per cent were male while females constituted 33.2 per cent with a mean age of 46.4 years. The results showed that majority of the household heads were males mostly in their prime years. About 30 per

cent of the household heads were within the age range of 35-44 years, 29.2 per cent were aged 45-55 years while 26.8 percent were 55 years and above. This means that the majority of the respondents are within their productive years, born in the information age and who must have countless experiences with the menace of mosquitoes and malaria and survived.

The table also revealed that 32 per cent of the respondents had secondary school education (27.2 per cent had primary education, 16 per cent tertiary education and, 24.8 per cent had no education). This shows that a large proportion of the respondents have one form of education or the other. The section on marital status revealed that majority of the respondents (80 per cent) were married and living with their spouses, while 13.2 per cent were single; this shows the percentage of the households where adults members were interviewed in the absence of household heads.

The distribution of the respondents' occupation revealed that none of the respondents were schooling, while only 1.6 of them was unemployed. The results on the table revealed that the highest proportions of the respondents were artisans (36.8); farmers (33.2), professionals (4.8) and traders (3.6). 10.4 per cent of the respondents were involved in other activities not specified in the questionnaire.

**3.2 Average Total Income Available to the Households Monthly**

Figure 1 shows a pie chart of the percentage frequency of the average total income available to the households of respondents per month. This was necessary to justify the socio-economic status of these respondents. This information provided ideas about possible behavioural patterns (malaria prevention and treatment) and general lifestyles expected from the respondents.

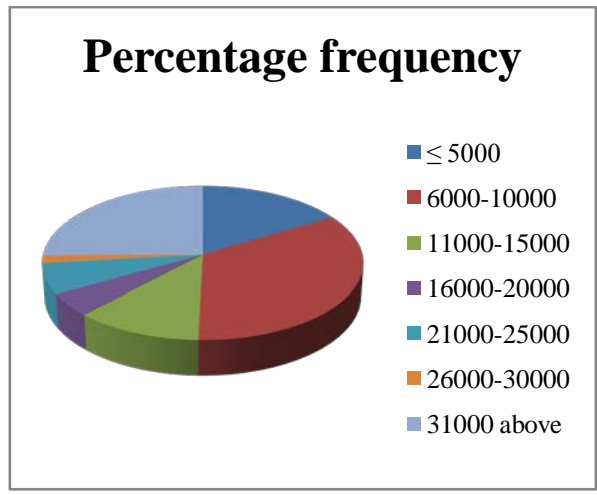


Fig. 1: Average income vs. % frequency

From the Figure, 16.4% of the respondents had a total income of ≤ 5000 naira monthly. A large number of the respondents (34.0%) affirmed 6000-10,000 naira constituting the largest category of monthly income. At a point in the increment of the levels of income, there was a decrease in the number of households that fell into those levels. For instance, when income ranged between 11,000-15,000 naira, the percentage of families, dropped to

11.6%. Between 16,000 and 20,000 naira, it further dropped to 4.8%. It however revealed an increase (6.4%) for income ranging between 21,000-25,000 naira. This was followed by a fall to 1.6% for income between 26,000-30,000 naira and an increase to 25.2 for average monthly income of 31,000 and beyond.

**Table1: Frequency Distribution of Respondents by Socio-demographic Characteristics (N= 250)**

<b>Characteristics</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Age (in years)</b>		
15-24	4	1.6
25-34	31	12.4
35-44	75	30.0
45-55	73	29.2
56 and above	67	26.8
<b>Sex</b>		
Male	167	66.8
Female	83	33.2
<b>Educational Level</b>		
None	62	24.8
Primary	68	27.2
Secondary	80	32.0
Tertiary	40	16.0
<b>Marital Status</b>		
Single	33	13.2
Married	200	80.0
Widowed	8	3.2
Separated	9	3.6
<b>Religion</b>		
Christianity	98	39.2
Islamic	152	60.8
Traditional	0	0.0
<b>Occupational Activities</b>		
Farming	83	33.2
Trading	9	3.6
Artisan	92	36.8
Professional	12	4.8
Schooling	0	0.0
Home management	0	0.0
Unemployed	4	1.6
Civil service	24	9.6
Others (specify)	26	10.4

**Source; Field Survey, 2011**

### **3.3 Perception of Respondents on Malaria**

Figure 2 shows the percentage frequency distribution of households' awareness of the cause of malaria.

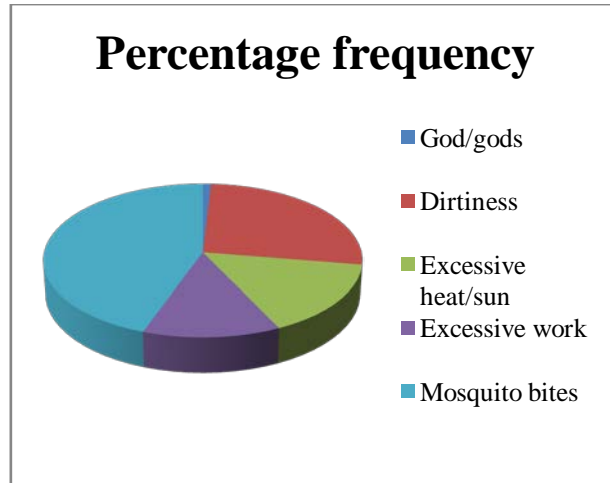


Fig. 2: Cause of Malaria vs. % frequency

The figure shows that majority of the respondents (98%) were aware that mosquito bites cause malaria, only few of them (2%) claimed malaria is caused by God/gods. This percentage of the research population is ignorant of what causes malaria. It is important to note that all the respondents believed that malaria is caused not only by mosquito bites, but by other factors like excessive work, dirtiness, sun and so on. This means that their knowledge of mosquito bites being the cause of malaria is merely an addition to their perception on malaria. Their attribution of the cause of malaria to factors other than mosquito bites is erroneous and shows that their level of awareness of the cause of malaria is low.

### 3.4 Awareness of Malaria Symptoms

The symptoms of malaria include among many others, flulike fever, chills, muscle ache, headache, nausea, vomiting, cough, diarrhea, jaundice, shock, coma and seizures. Figure 3 showed the percentage frequency of respondents' awareness of the symptoms of malaria.

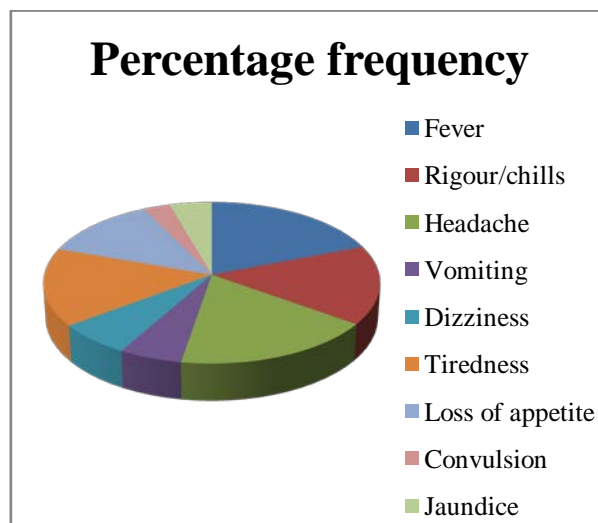


Fig. 3: Respondents awareness of malaria Symptom vs. % frequency

From the figure, fever was known by most of the respondents to be a symptom of malaria (96.4%). 80% believed that malaria can manifest in chills/rigour. 89.6% believed the symptom of malaria is headache while 28% saw vomiting as a symptom of malaria, 33.2% saw dizziness as symptom of malaria. Tiredness and loss of appetite were considered to be symptoms of malaria by a large proportion of the respondents with 78.8% and 62.4%, respectively, Convulsion and jaundice were believed by the minority of them as cause of symptoms of malaria (14.4% and 22.4%). None of the respondents claimed to know any other symptoms.

### **3.5 Frequency Distribution of Respondents' Awareness of the Malaria Severity**

Figure 4 revealed that the perception of the bulk of the respondents (91.6%) is that malaria kills while 8.4% of them believed that malaria do not kill.

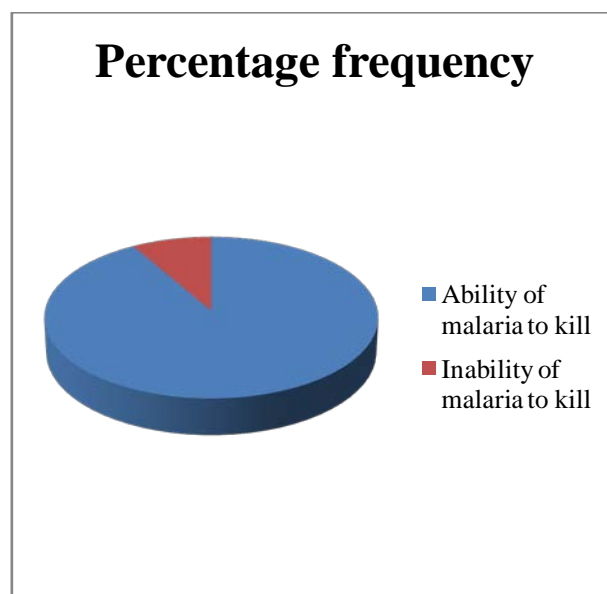


Fig. 4: Awareness of malaria severity vs. % frequency

The belief that malaria can kill however do not reflect in their perceived susceptibility to severe malaria. This means that most of the respondents believed there is no illness that cannot kill; however, they believed they cannot die of malaria. It showed that they believed they cannot have severe malaria.

### **3.6 Chi-square Analysis of respondent's perception on the cause of malaria and amount allocated monthly to malaria control**

A chi-square analysis was done to ascertain the existence of any significant relationship between household's perception on the cause of malaria and the allocation of resources for malaria control (amount allocated monthly for the control of malaria). To achieve this, it is pertinent to give the frequency distribution of households' monthly allocation to malaria control. Figure 5 therefore shows the frequency distribution of amounts allocated for the control of malaria by households in a month.



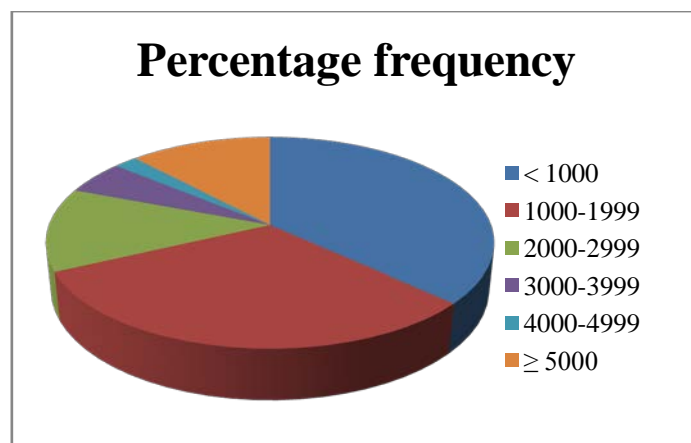


Fig. 5: Monthly allocated amount vs. % frequency

A look at figure shows that 68 per cent of the respondents allotted less than ₦2000 to malaria control in a month. The amount allocated to the control of malaria on the average per month was one thousand, nine hundred and fifty-three naira, forty kobo (₦1953.40).

Table 2 represents the chi-square analysis results. The results showed that the p-values of the model terms were significant, i.e.  $p < 0.05$  between households' perception of God/gods, dirtiness, excessive heat/sun and excessive work as the causes of malaria and their monthly allocation of resources for malaria control.

**Table 2: Chi-square analysis of respondent's perception on the causes of malaria and amount allocated monthly to malaria control.**

Causes of malaria	Allocation						X <sup>2</sup> P-value
	< 1000	1000-1999	2000-2999	3000-3999	4000-4999	≥5000	
<b>Gods/ gods</b>							
No	100%	100%	100%	100%	100%	98%	37.41
Yes	0.0%	0.0%	0.0%	0.0%	0.0%	2%	(0.00)*
<b>Dirtiness</b>							
No	51.1%	38.5%	50%	61.5%	0.0%	13.3%	20.13
Yes	48.9%	61.5%	50%	38.5%	100%	86.7%	(0.00)*
<b>Excessive heat/ sun</b>							
No	59.8%	66.7%	62.5%	100%	100%	73.3%	11.83
Yes	40.2%	33.3%	37.5%	0.0%	0.0%	26.7%	(0.03)*
<b>Excessive work</b>							
No	59.8%	79.5%	62.5%	100%	100%	86.7%	20.77
Yes	40.2%	20.5%	37.5%	0.0%	0.0%	13.3%	(0.00)*
<b>Mosquito bites</b>							
No	4.3%	5.1%	0.0%	0.0%	0.0%	0.0%	3.97
Yes	95.7%	94.9%	100%	100%	100%	100%	(0.55)

\*Significant at  $P < 0.05$

This means that the amount allocated by households for the prevention and treatment of malaria is associated with their beliefs in other factors as causes of malaria other than mosquito bites. This is because the table revealed no relationship between their perceptions of mosquito bites as the cause of malaria and the amount allocated to malaria control.

### 3.7 Respondents Knowledge of Malaria Control Measures

Most people check mosquito bites in one way or the other. Respondents' knowledge of malaria control strategies was inferred from their use of malaria preventive measures. Figure 6 shows the distribution along with the source of the preventive measures expressed in percentage frequency. Majority of the households used at least one preventive measure as against 3.2% that took no action to check mosquito bites.

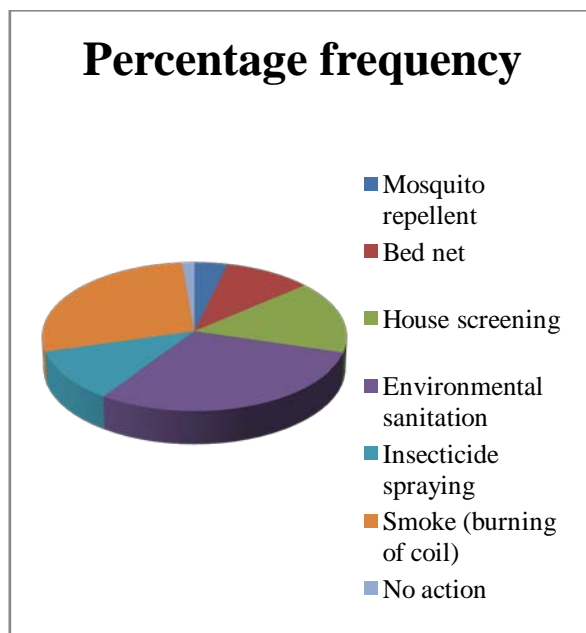


Fig. 6: Source of preventive measure vs. % frequency

It is clear from the figure that the bulk of the households did not use mosquito repellents. This may possibly be because they have no knowledge of its existence. However it is obvious that the most common measures are coil burning (62.8%) and environmental sanitation (67.2%). The figure also reveals that the use of house screening (door nets, window nets) and insecticide spraying was low with 53.6% and 24.8% of usage, respectively. Despite the countless awareness campaign on the relevance of bed nets to controlling malaria, 77.6% of the households did not have bed nets. From this finding, one can say that virtually all the studied households are aware of the strategies to prevent malaria (except mosquito repellents going by the statistics on usage), while, the preferred measures are smoke and environmental sanitation.

A chi-square analysis was done to ascertain the association between level of awareness of the causes of malaria and the forms of malaria preventive measures adopted (Table 3). The analysis revealed a relationship and the model is significant.

**Table 3: Chi-square Analysis of Responses on Causes of Malaria and Malaria Control Measures**

<i>Causes of Malaria (Yes/No Responses)</i>	<i>Control/Preventive Measures (Yes/No Responses)</i>						
	<b>Mosquitoes Repellents</b>	<b>Bed Nets</b>	<b>House Screening</b>	<b>Environmental Sanitation</b>	<b>Insecticides Spraying</b>	<b>Smokes</b>	<b>No Action</b>
<b>Gods/gods</b>	55.64 (0.00)*	1.47 (0.23)	9.23 (0.00)*	2.49 (0.12)	15.47 (0.00)*	3.02 (0.08)	0.17 (0.68)
<b>Dirtyness</b>	4.96 (0.03)*	22.64 (0.00)*	0.19 (0.67)	9.96 (0.00)*	8.88 (0.00)*	0.06 (0.80)	11.41 (0.00)*
<b>Excessive heat/sun</b>	11.39 (0.00)*	2.19 (0.14)	0.99 (0.32)	0.41 (0.53)	7.13 (0.01)*	0.64 (0.42)	4.11 (0.04)*
<b>Excessive work</b>	8.74 (0.00)*	0.70 (0.41)	1.11 (0.29)	0.63 (0.43)	2.81 (0.09)	0.47 (0.50)	2.08 (0.15)
<b>Mosquito bites</b>	18.59 (0.00)*	2.39 (0.12)	4.57 (0.03)*	16.93 (0.00)*	2.73 (0.10)	0.58 (0.45)	0.27 (0.60)

\*Significant at  $P < 0.05$ 

The table also shows that relationship exists between the ascription of the cause of malaria to God/gods and the use of mosquito repellent, house screening, and insecticides spraying as control measures of malaria. On a whole, these findings revealed that households' perception on the cause of malaria has significant association with measures they adopt for malaria control. It determines how malaria is controlled.

### 3.8 Multiple Linear Regression Analysis

Table 4 shows a regression analysis done to show the influence of socio-demographic variables (age, income level, educational attainment, religious affiliation and occupational grouping) on household resource allocation for malaria control (preventive measures). From the result, it can be seen that it is only Age, Occupation and Income level that influenced the allocation of household resource for malaria control ( $p < 0.05$ ). Inference from the result reveals that the older the respondents, the better the control measure for malaria, the higher the income level, the better the control measure adopted. Also, the better the occupation, the better the household resource allocation for malaria control.

This implies that more household resources are allocated for the prevention of malaria as the age of household head increases, with more productive occupation and higher earnings. On a whole, allocation of household resources for preventive measures was significantly influenced by the age of household heads, the occupation and income available to the household.

**Table 4: Multiple Linear Regression Analysis of the Influence of Respondents' Socio-demographic Variables on Malaria Control**

Model	Coefficients <sup>a</sup>			T	Sig.
	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta		
(Constant)	.749	.548		1.365	.173
Age of respondents	.018	.007	.164	2.551	.011
Education	-.062	.092	-.050	-.672	.502
Religion	-.036	.169	-.014	-.215	.830
Occupation	.090	.035	.194	2.534	.012
Income available per month (N)	.121	.039	.217	3.085	.002

a. Dependent Variable: Preventive Measures

### 3.9 Chi-square Analysis of Responses on Income and Malaria preventive Measures

Table 5 shows that there is significant relationship between income and the use of Mosquito Repellent, Bed Nets, House Screening, Environmental Sanitation, Insecticides spraying, Smokes and No Action as control measures for malaria (p-value<0.05). This means that the usage of malaria preventive measures is often affected by the income level of households. Low incomes translate into poor living standards, hence poverty. Most of the respondents were poor, little wonder why their experience with mosquito was high.

**Table 5: Chi-square analysis of responses on income and malaria preventive measures**

Malaria Preventive Measures	Income							X <sup>2</sup> P-value
	1000-5000	6000-10,000	11,000-15,000	16,000-20,000	21,000-25,000	26,000-30,000	30,000+	
Mosquito Repellent								
No	100%	90.6%	100%	100%	100%	100%	79.4%	21.72
Yes	0.0%	9.4%	0.0%	0.0%	0.0%	0.0%	20.6	(0.00)*
Bed Nets								
No	90.2%	78.8%	60%	100%	100%	100%	60.3%	25.15
Yes	9.8%	21.2%	31%	0.0%	0.0%	0.0%	39.7%	(0.00)*
House screening								
No	80.5%	69.4%	41.4%	100%	100%	100%	46.0%	44.25
Yes	19.5%	30.6%	58.6%	0.0%	0.0%	0.0%	54.0%	(0.00)*

Environment sanitation								
No	48.8%	43.5%	0.0%	66.7%	0.0%	0.0%	27.0%	40.32
Yes	51.2%	56.5%	100.0%	33.3%	100.0%	100.0%	73.0%	(0.00)*
Insecticide spraying								
No	80.5%	94.1%	58.6%	100.0%	75.0%	0.0%	54.0%	52.52
Yes	19.5%	5.9%	41.4%	0.0%	25.0%	100.0%	46.0%	(0.00)*
Smokes (coils)								
No	41.5%	18.8%	41.4%	66.7%	0.0%	100.0%	57.1%	44.24
Yes	58.5%	81.2%	58.6%	33.3%	100.0%	0.0%	42.9%	(0.00)*
No action								
No	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	87.3%	24.53
yes	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.7%	(0.00)*

\*Significant at  $P < 0.05$

### 3.10 Chi-Square Analysis Tests of Health Care Utilization.

Table 6 shows the chi-square analysis for relationship between health care utilization and choice of preventive measures. The analysis showed that among the respondents that reported they were ill, self medication was the only healthcare strategy that had any relationship with the use of mosquito repellents. It also has significant relationship with the use of bed nets, insecticides spray and smokes as preventive measures for malaria. The table also revealed that the use of General hospitals is associated with the use of house screening.

**Table 6: Chi-square Analysis of Health Care Utilization for malaria and choice of Preventive Measure**

Health Care Utilized (Yes/No Responses)	Control/Preventive Measures (Yes/No Responses)						
	Mosquitoes Repellents	Bed Nets	House Screening	Environmental Sanitation	Insecticides Spraying	Smokes	No Action
<b>Self Medication</b>	8.13 (0.00)*	15.24 (0.00)*	3.09 (0.08)	1.15 (0.28)	8.22 (0.00)*	8.22 (0.00)*	-
<b>General Hospital</b>	0.97 (0.33)	0.05 (0.82)	11.70 (0.00)*	0.37 (0.55)	0.04 (0.85)	0.04 (0.85)	-
<b>Private Hospital</b>	1.36 (0.24)	12.47 (0.00)*	0.45 (0.50)	10.03 (0.00)*	8.98 (0.00)*	8.98 (0.00)*	-
<b>Maternity/Health Center</b>	0.88 (0.35)	8.05 (0.01)*	6.21 (0.01)*	4.65 (0.03)*	5.79 (0.02)*	5.79 (0.02)*	-
<b>Chemist</b>	0.55 (0.46)	0.80 (0.37)	1.72 (0.19)	2.90 (0.09)	22.58 (0.00)*	2.03 (0.15)	-
<b>Traditional Healer</b>	1.26 (0.26)	13.94 (0.00)*	8.90 (0.00)*	0.01 (0.94)	0.13 (0.72)	4.67 (0.03)*	-

\*Significant at  $P < 0.05$

There is a significant relationship between the use of private hospitals and the use bed nets, environmental sanitation, insecticides spray and smokes. Relationship also exists between the use of maternity/health center and the use bed nets, house screening, environmental sanitation, insecticides spray and smokes. Moreover, the use of chemists significantly influenced the spraying of insecticides to prevent malaria. On a whole, the patronage of traditional healers influenced the use of bed nets, house screening and smokes as malaria control measures.

#### 4. Conclusion

Malaria remains a global health problem. This research work found that households' knowledge about malaria has generally improved over time with 98% of the respondents attributing the incidence of malaria to mosquito bites. However, there are still misconceptions among some households about the causes of malaria and relatively low levels of knowledge of the symptoms of severe malaria. These misconceptions certainly have implications for household's malaria preventive behaviours and practices. Households distribute resources amongst their members on the basis of the function they perform and the value ascribed to them. Households regard malaria as a dangerous disease that can kill (91.6%). However, because of lack of adequate finance for proper medical consultation and treatment, households prefer self-medication and local herbs for treatment of malaria. They use traditional medicine alongside modern medicine. More so, households use more of private hospitals and the services of traditional healers than healthcare centre in cases of severe malaria because, in most government units, opening hours were short and drugs were not often available. The type of health facility used was also found to determine the type of preventive measures used. The use of preventive methods is generally low, with several households using more of noncommercial methods of prevention than the commercial methods of prevention.

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