IS RELIGIOUS AFFILIATION INFLUENCING PREVENTION AND TREATMENT OF MALARIA AMONG CHILDREN IN UGANDA?

BY

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Abstract

The malaria burden is greatest among young children under five years who have not yet developed enough resistance to the disease and pregnant women who have reduced immunity. The cornerstone of malaria control across Africa has been early detection, diagnosis and treatment through primary health care services that offer anti-malarial treatment to young children with fever starting at home. However, much as information available indicates that the majority of malaria fevers are treated outside the formal health facilities, the way the treatment is done is often incorrect or even dangerous. The purpose of this paper is to establish the determinants of prevention and treatment practices of malaria among children under five years in Uganda. The study is based on the data collected in a survey on the Support to the Health Sector Strategic Plan Program of Uganda in 2004. A total of 2,044 caretakers of children under five years from households were included in the study.

The dependent variable in the study was health seeking behavior comprising two components namely prevention and treatment of malaria among children under five years. These two components of the variable were associated and related to selected background factors to investigate differentials among caregivers in regard to their age, level of education, household size, religion, average monthly expenditure on medical care and distance to the nearest health facility as well as the prevention practices used. The

The Findings of the study indicate a significant effect of religion(particularly Islam and those belonging to other sects besides Protestant and Catholic) of the caregiver, expenditure on medical care and household size on both prevention and treatment of malaria among children under five years.

To alleviate the continued spread of malaria among children, the Government of Uganda ought to involve opinion leaders like religious leaders in scaling up the fight as well as having a policy on recommended family size

Background

Malaria is a very serious health problem and currently poses the most significant threat to the health of the population and it is the single most important cause of death and poverty in sub Saharan Africa (Sachs and Malaney 2002). The current global trends show that 350–500 million people contract malaria annually and over one million die each year from the disease. Around 60% of the cases of clinical malaria and over 90% of the deaths occur in Sub- Saharan Africa (WHO 2005).

Malaria endemicity in the World is distributed in three zones. The first zone is stable endemic malaria in many parts of Central, East and West Africa, Papua New Guinea, Solomon Islands and Vanuatu. In these areas, the disease is common and occurs with sufficient frequency that some level of immunity develops. Secondly, unstable malaria takes place in parts of Southern Africa, Central Asia and America, highland and desert fringe areas, some urban areas, plantations and irrigation schemes. The third zone comprises areas free of malaria namely parts of Southern and North Africa, Seychelles, Ethiopian and Eritrean highlands and Transcaucasia (WHO/UNICEF 2003).

Temperature and humidity have a direct effect on the longevity of the mosquito that transmits malaria. Temperatures from approximately 21° to 32°C and a relative humidity of at least 60% are most conducive for maintenance of transmission. Altitude is also significant in determining the distribution of malaria and its seasonal impact on many regions of the world. In Africa, for example, altitudes above 1,000-1,500 meters high are considered safe from malaria. However, it must be cautioned that with continuing global climate changes, these figures may change in future.

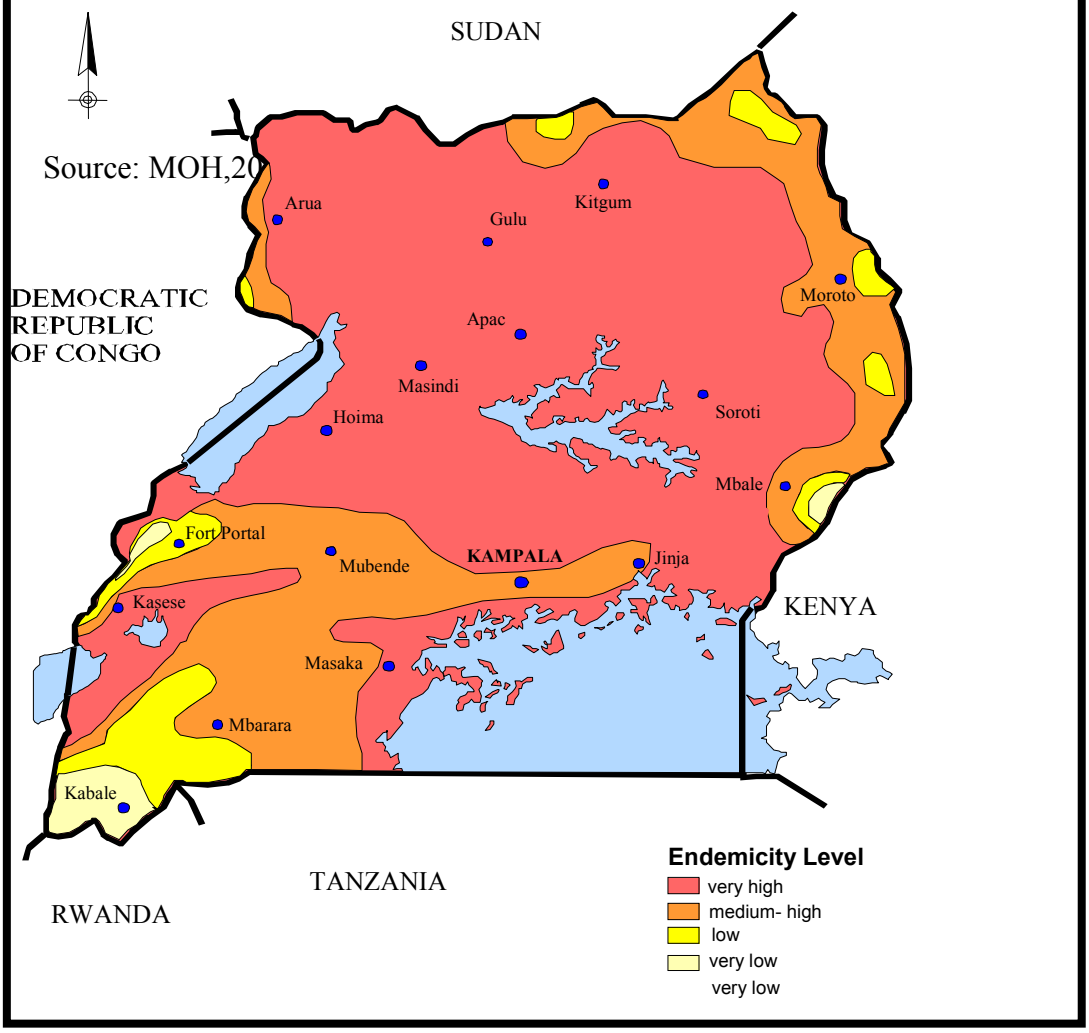
The burden of malaria is greatest among young children under five years who have not yet developed enough resistance to the disease and pregnant women who have reduced immunity. The Africa malaria report of 2003 shows that one in every five childhood deaths is caused by malaria (WHO/UNICEF 2003). According to WHO (2005), an African child dies of malaria every thirty seconds and at least one million infants and children under five years in sub-Saharan Africa die each year from the mosquito-borne disease. Gallup and Sachs (2001) reported that malaria and poverty in Africa are intimately connected and that eliminating malaria elsewhere has usually resulted in substantial economic growth. It is estimated that due to malaria, Africa loses up to US$ 2 billion per annum.

Malaria is a major contributor to poverty because it causes loss of days of gainful work for the patient and the caretakers. in addition to the actual expenditures on treatment and nursing. Expenditure on preventive measures against malaria and on treatment and nursing of patients of the disease is very high. Individuals and house-holds meet most of this cost.

MALARIA IN UGANDA

As can be seen in Figure 1, malaria is a big problem in Uganda accounting for more illnesses and deaths than any other single disease. It is responsible for 25-40% of outpatient attendance, 20% of admissions, and 9-14% of deaths of inpatients in health facilities (UBOS and MACRO International, 2006

Figure 1: Malaria Endemicity in UGANDA



The groups most vulnerable to malaria are: pregnant women, children aged less than five years, people living with HIV/AIDS and travelers from areas with little or no malaria transmission to areas with high malaria transmission. Statistics indicates that 70,000 to 110,000 child deaths due to malaria occur annually and with acute disease, a child may die within 24 hours.

Prevention strategies have been found to be the most effective methods of malaria control in endemic areas of the tropics and sub-tropics. The use of Insecticide-treated nets (ITNs) to prevent malaria is one of the key strategies of Uganda's Malaria Control Strategic Plan

(MOH 2002-2005). Home-based management of fever (HBMF) is a key strategy for improving malaria case management and treatment in Uganda. By making affordable, appropriate treatment available to children suffering from malaria, morbidity and deaths related to the disease in the country can be significantly reduced.

The overall objective of this paper is to establish the determinants of prevention and treatment practices of malaria among children under five years in Uganda. Specifically, the paper investigates the economic and socio-demographic factors that influence the use of ITNs among children under five and-malaria treatment of the same children.

Methodology

The paper used data previously collected in 2004 by Ministry of Health in the SHSSPP (Support to the Health Sector Strategic Plan) survey. In this survey, information on the characteristics of the caretakers was collected as well as treatment actions and health conditions of children under five in these households.

The SHSSPP baseline survey was implemented in 9 northern and northeastern districts out of Uganda's 80 districts. The study aimed at addressing the key health problems that have been identified in the National Minimum Health Care Package (NMHCP) in each of the 9 districts namely Bugiri ,Kapchorwa ,Katakwi, Soroti, Kaberamaido, Adjumani , Apac, Yumbe and Lira. The program selected those districts because they are more disadvantaged than the rest of the country. According to the 2000/2001 UDHS, the northern region, where most of the program districts are located, had some of the most unfavorable health indicators in the country.

The study population comprised of 2,044 caretakers in households with children below five years between May and July 2004. The study focused on caretakers rather than children because the decision to take treatment and use ITNs is not made by the children but by their caretakers. The inclusion criteria for this study was: children between 12 months and 60 months who had ever suffered from presumptive malaria, their care takers aged between 15 and 54 years and households owning ITNs.

The dependent variable is health seeking behavior comprising two components namely prevention and treatment of malaria among children under five years. For independent variables, caregivers in households were asked to state their age in completed years, level of education, household size, religion, average monthly expenditure on medical care and distance to the nearest health facility as well as the prevention practices used to protect their children against malaria.

In the SHSSP questionnaire, caregivers were asked whether they sought advice or treatment for the malaria fever, where they sought treatment, whether the child was given any medicines and after how long and whether they were able to identify symptoms that would cause a caregiver to take a child to a health facility right away in case of severe illness. The caregivers were also asked about who made decisions on whether a seriously ill child should be taken for medical treatment as well as the prevention practices used. In regards to malaria prevention, the caretakers were asked whether the child always slept under a mosquito net, how long ago the net was bought, whether it was soaked or dipped in insecticides and the type of net used.

Data was analysed using STATA version 9.0 statistical software package. Frequencies and descriptive statistics were generated for age, sex, level of education, residence, household size, average monthly household expenditure on healthcare, religion and distance to the nearest Government health facility.

Bivariate analysis was used to establish the relationship between malaria treatment and use of ITNs and each of the independent variables. Statistical significance of the association between the dependent and independent variables was interpreted using the Pearson Chi-square test, whose level of association of a value is fixed at 0.05.

At multivariate level, the binary logistic regression was used to identify those factors that are influential in determining early prevention and treatment of malaria among children under five years since the dependent variable is binary.

The binary logistic regression model is stated as:

$$\log\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + ...\beta_k x_k$$

Where p = probability of managing malaria

1-p = probability of not managing malaria

x_i is the independent variable

β_i is the unknown estimated coefficients

i=1,2,3……..k

Since the logistic regression model is widely used to analyse data with dichotomous dependent variables (Hanushek and Dobson 1979), it was considered a perfect model to use in this study because the dependent variable is dichotomous in nature. This method allows for maximum likelihood even when there is a single response to category, reduces the amount of computation required and directly estimates the probability of an event occurring, hence considered commendable for this study.

It was necessary to create dummy variables to use the selected demographic and enabling variables of this study in the logistic regression model. All variables that had several categories were regrouped to facilitate easy processing of the results. For each of the mentioned independent variables, one of the original categories was assigned the value of 0 and was taken to be the reference category in the analysis. This reference category was the one expected to have a minimal likelihood of the event of use of mosquito nets or seeking malaria treatment occurring. The probability of a caretaker using a mosquito net or not using a net were analysed in relation to the selected reference category. The rest of the categories were assigned dummy variables taking on the value of 1 for the respective categories and 0 for the reference category.

RESULTS

Table 1 shows the percent distribution of selected socio-demographic characteristics of the respondents. The table indicates that in the study there were 51% males and 49% females. The excess of males over women in the sample is probably a reflection of a patriarchal society of Uganda with most households headed by men who are more willing to be interviewed than women. The age distribution shows that the majority of the caretakers were aged 15-24 years (35%) which is expected because it is more of the young than old age groups who have pregnant wives and young children.

Table 1 further displays that the majority of the caretakers resided in rural areas (92%) which is not surprising since the population of Uganda is predominantly rural (85%). Residence is expected to influence treatment seeking practices of caretakers because caretakers residing in urban areas are more likely to get information on treatment and prevention of malaria than the rural residents.

The distribution of household members aged 15 and over by highest level of education shows that 46% of the caretakers had attended primary level followed by 33% who had never been to school while 21% had education beyond primary level. The results in Table 1 indicate that a large proportion of households in this study had less than 4 people (48%) followed by those with between 5 and 9 members (47%) and only 6% of the households had at least 10 people. Lastly, table shows that the majority of the caretakers of children were Protestants (43%) followed by the Catholics (33%) with a small proportion of Muslims (13%). Some 12% belonged to other religious denominations including the born-again churches and Seventh Day Adventists.

Knowledge about causes of malaria fever

Table 2 gives results on the children's caretakers' knowledge on causes of malaria fever. It is showed by the table that although most caretakers (92%) knew that malaria was transmitted by mosquitoes, there was some proportion of caretakers (8%) who had misconceptions about the causes of malaria. Some respondents reported that malaria was caused by eating mangoes and others mentioned eating maize as the cause, the reason being that malaria is more common during the season when these crops and fruits are also abundant.

Differentials in use of mosquito nets by respondents background characteristics

Results in Table 3 indicate that religion was highly significantly associated with the use of mosquito nets. Other significant factors were place of residence and average monthly expenditure on medical care. The place of residence plays a significant role in determining use of mosquito nets in a household. Rashed *et al.*, (2000) reported that urban residence can be accompanied by potentially protective socio-economic factors against malaria risk such as education and income. For that reason, it is not surprising to note that among urban dwellers, 44% always used mosquito nets for their children compared to those residing in rural areas (34%).

Socio-demographic factors of caregivers who sought treatment when their children had malaria

Table 4 gives a cross tabulation of seeking treatment with selected socio-demographic factors. The table shows that approximately 86% of the females sought treatment for their children when they fell sick compared to 85% among the male respondents. With such a

small difference between the sexes, there was no significant association between sex of the care taker and seeking treatment (p=0.396). This is an unexpected result because most studies focus only on the mother of the sick child, while the male spouse is left out.
In the table, seeking of treatment ranged from 84% for care takers with primary education to 90% for those with at least secondary education. The level of education of the caretaker was found to have no significant association with seeking treatment for a child suffering from malaria (p=0.331). This could be attributed to awareness raising campaigns by the Ministry of Health on prompt and timely treatment of malaria cases within 24 hours which have covered most communities regardless of person's education. Similarly, there was no significance noted between seeking treatment for malaria and other background factors.

Treatment seeking behavior by males in the households

The results in Table 5 show significant association by male ownership of T.V (p=0.013). The ownership of T.V reflects wealth in a home compared to non ownership of T.V indicating poverty. This implies that men without T.V at home seek treatment for their sick children more significantly than men without T.Vs at home. Another significant variable of the males was religious affiliation, at p= 0.0190.

Predictors of use of mosquito nets

Binary logistic regression was applied to the data and the results are in Table 6. In Table 6, religion particularly Islam and other religion besides Protestant and Catholic turned out to be an important variable in explaining mosquito net use among caregivers with children under five years. The results in the table indicate that Muslim caretakers had increased odds of using mosquito nets than the Catholic care takers (OR=2.144,

p=0.000). Those from other religions also had increased odds of using mosquito nets (OR=1.487, p=0.050) than Catholic respondents.

The 2002/2003 Uganda National Household Survey estimated the average household size in Uganda at 5 persons per household (MOH, 2003). Findings from this study indicated that households with at least 10 people are 38 % less likely to use mosquito nets than their counterparts in households with less than five members (OR=0.523, p=0.025). This means that with a bigger family size, the household expenditure on other basic needs increases and may not find use of ITNs as a priority.

Predictors of Treatment Seeking Behavior

One of the major obstacles to seeking malaria treatment is poverty and inaccurate knowledge about malaria (the belief that malaria is transmitted by things other than mosquitoes). According to the United Nations Children's Fund (UNICEF), "Malaria is truly a disease of poverty. It afflicts primarily the poor who tend to live in malaria prone areas in dwellings that offer few, if any, barriers against mosquitoes" (UNICEF 2005). Sachs and Malaney (2002) argue that "as a rule of thumb, where malaria prospers most, human societies have prospered least. The extent of the correlation suggests that malaria and poverty are intimately related."

The study findings in Table 7 again show that religious affiliation particularly those from other religions besides Moslems and Protestants had reduced odds of seeking malaria

treatment for their children when they fell sick than the Catholics (OR=0.326 and P=0.027).

Another interesting result of Table 7 is the relationship between monthly medical expenditure and seeking treatment which turned out significant. The results in the table indicate that households spending at least 15,000shs on medical care have increased odds of seeking treatment for their children (OR= 1.920, p=0.024). This concurs with study findings by Mugisha et al. (2002) that people with higher incomes are more likely to seek treatment from health facilities as a result of ease of geographical and monetary access unlike those with lower incomes.

DISCUSSION

It was unexpected to find that religious affiliation (being a Moslem and belonging to other sects) influences prevention and treatment of malaria among children. Religious bodies influence exposure to and treatment of malaria since the community listens and believes religious leaders more than other groups. Of the religious communities, it is not surprising that Moslems listen to their leaders more than any other religious groups, because they are more strict with their religion and tend to believe their leaders more than other groups do. This meant that they had a higher chance of using mosquito nets.

RECOMMENDATIONS

Against this background and findings, it is recommended that Uganda and other African Governments should use opinion leaders in scaling up the campaign to prevent and treat malaria. At the same time, more research is needed to investigate the religious affiliation factor in predicting prevention and treatment of malaria among children, so that policy makers, planners and programme managers can use the factor to promote prevention and treatment of the disease.

Furthermore, Governments should also put in place a policy that encourages smaller and manageable family sizes in households.

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TABLES:

Table 1: Percent distribution of selected Socio-demographic characteristics of the respondents

Background characteristics	Frequency	Percent
Age groups		
15-24	711	34.8
25-34	648	31.7
35-44	426	20.8
45-54	259	12.7
Total	**2,044**	**100.0**
Sex		
Male	1,052	51.5
Female	992	48.5
Total	**2,044**	**100.0**
Place of Residence		
Urban	161	7.9
Rural	1,876	92.1
Total	**2,037**	**100.0**
Highest level of education		
None	672	32.9
Primary	945	46.2
Secondary+	427	20.9
Total	**2,044**	**100.0**
Distance to health facility(kms)		
0-2km	621	30.4
3-4 km	528	25.8
At least 5km	895	43.8
Total	**2,044**	**100.0**
Household size		
1-4 people	907	47.6
5-9 people	889	46.6
At least 10 people	11	5.8
Total	**1,907**	**100.0**
Average monthly expenditure on medical care		
Less than Ugshs15,000	1,228	74.8
At least Ugshs 15,000	816	25.2
Total	**2,044**	**100.0**
Religion		
Catholic	665	32.5
Protestant	871	42.6
Muslim	262	12.9
Other	246	12.0
Total	**2,044**	**100.0**

Table 2: Distribution of knowledge about causes of malaria fever

Causes of malaria	Frequency	Percent
Mosquitoes	1,611	92.0
Maize and mangoes	22	1.26
Others	122	7.0
Total	1,755	100.0

Table 3: Differentials in use of mosquito nets by respondents background characteristics

	Used mosquito nets (%)	Did not use mosquito nets (%)
Age groups		
15-24	36.6	63.4
25-34	34.8	65.3
35-44	33.7	66.4
45-54	32.0	68.0
χ^2 **=1.4767 df=3 p=0.688**		
Sex		
Male	34.2	65.8
Female	35.5	64.5
χ^2 **=0.2847 df=1 p=0.594**		
Education level		
None	32.0	68.0
Primary	35.8	64.2
Secondary+	36.9	63.1
χ^2 **=0.3913 df=2 p=0.303**		
Residence		
Urban	43.8	56.2
Rural	34.0	66.0
χ^2 **=4.1369 df=1 p=0.042**		
Distance to health facility		
0-2km	38.5	61.5
3-4km	32.0	68.0
At least 5km	33.9	66.1
χ^2 **=4.1207 df=2 p=0.127**		
Household size		
1- 4 people	38.0	62.0
5-9 people	34.0	66.0
At least 10 people	25.4	74.6
χ^2 **=5.6254 df=2 p=0.060**		

Expenditure on medical care		
Less than Ugshs15,000	36.5	63.5
At least Ugshs15,000	32.1	67.9
χ^2 **=4.3536 df=1 p=0.037**		
Religion		
Catholic	29.8	70.2
Protestant	33.8	66.2
Muslim	46.8	53.2
Other	38.1	61.9
χ^2 **=18.0924 df=3 p=0.000**		

Table 4 Percentages of caregivers who sought treatment when their children had malaria by their socio demographic characteristics.

	Sought treatment %	**Did not seek treatment %**
Age groups		
15-24	87.0	13.0
25-34	84.2	15.8
35-44	85.6	14.4
45-54	87.5	12.5
χ^2 =0.7555 df=3 p=0.860		
Sex		
Male	85.4	14.6
Female	86.4	13.6
χ^2 =0.719 df=1 p=0.396		
Ever attended school		
Yes	86.0	14.1
No	85.7	14.3
χ^2 =0.0045 df=1 p=0.947		
Education level		
None	85.5	14.5
Primary	84.0	16.0
Secondary +	90.0	10.0
χ^2 =2.2131 df=2 p=0.331		
Residence		
Urban	92.6	7.4
Rural	85.6	14.4
χ^2 =1.0378 df=1 p=0.308		
Distance to health facility		
0-2kms	85.9	14.1
3-4kms	88.4	11.6
At least 5 kms	84.4	15.6
χ^2 =1.1749 df=2 p=0.556		
Household size		
1- 4 people	86.0	14.0

5-9 people	86.5	13.5
At least 10 people	86.7	13.3
χ^2 =0.024 df=2 p=0.988		
Expenditure on medical care		
Less than Ugshs 15,000	83.5	16.5
At least Ugshs15,000	88.9	11.1
χ^2 =0.9264 df=1 p=0.336		
Religion		
Catholic	88.1	11.9
Protestant	86.4	13.6
Muslim	76.2	23.8
Other	87.2	12.8
χ^2 =5.7062 df=3 p=0.127		

Table 5: Percentages of males in the households with malaria treatment seeking behavior

	Sought treatment for their sick children	
	YES	NO
Ever attended school		
Yes	83.0	17.0
No	90.7	90.3
χ^2 =2.8324, df=1, p=0.092		
Highest Education Level attained		
None	87.5	12.5
Primary	80.5	19.5
Secondary +	90.2	9.8
χ^2 = 4.0802, df=2, p=0.130		
Decision to take child for treatment		
Respondent	88.4	11.6
Respondents spouse	85.7	14.3
Relative	70.0	30.0
χ^2 =2.7713, df=2, p=0.250		
Distance to facility		
0-2	84.6	15.4
3-4	88.0	12.0
5+	84.3	15.8
χ^2 =0.5776, df=2, p=0.749		
Expenditure on medical treatment		
Less than Ugshs 15,000	83.9	16.1
At least Ugshs 15,000	87.2	12.8
χ^2 =0.1405, df=1, p=0.708		
Religion		
Catholic	90.0	10.0
Protestant	87.7	12.3
Muslim	68.6	31.4
Other	83.7	16.3

χ^2 =9.900, df=3, p=0.0190		
Residence		
Urban	92.3	7.7
Rural	84.9	15.1
χ^2 =0.5400, df=1, p=0.462		
Ownership of radio		
Yes	89.4	10.6
No	83.6	16.4
χ^2 =1.6054, df=1, p=0.205		
Ownership of a T.V		
Yes	61.5	38.5
No	86.5	13.5
χ^2 =6.1881, df=1, p=0.013		
Read newspapers		
Almost everyday	100.0	0.0
At least once a week	84.0	16.0
Not at all	85.4	14.6
χ^2 =2.3772, df=3, p=0.498		

Table 6: The Logistic regression model Predicting use of mosquito nets

Prevention of malaria	Odds Ratio	Std. Err.	Coef.	Std. Err.	Z	P>|z|
Age						
15-24	0.974	0.195	-0.027	0.200	-0.130	0.894
25-34	0.973	0.194	-0.027	0.200	-0.140	0.892
35-44	0.915	0.193	-0.089	0.211	-0.420	0.673
45-54	1.000					
Sex						
Female	1.113	0.134	0.107	0.120	0.890	0.372
Male	1.000					
Residence						
Urban	1.537	0.363	0.430	0.236	1.820	0.069
Rural	1.000					
Ever attended school						
Attended	1.267	0.240	0.237	0.190	1.250	0.213
Never attended	1.000					
Education level						
Primary	1.015	0.207	0.015	0.204	0.070	0.942
Secondary	1.114	0.243	0.108	0.219	0.490	0.623
None	1.000					
Religion						
Protestant	1.161	0.166	0.150	0.143	1.040	0.297
Muslim	2.144	0.401	0.763	0.187	4.080	0.000

other	1.487	0.301	0.396	0.202	1.960	0.050
Catholic	1.000					
Distance to facility						
0-2 km	1.154	0.169	0.143	0.147	0.980	0.328
3-4 km	0.920	0.136	-0.084	0.148	-0.570	0.571
Atleast 5km	1.000					
Household size						
5-9 people	0.810	0.098	-0.211	0.122	-1.740	0.082
At least 10 people	0.523	0.152	-0.649	0.290	-2.240	0.025
1-4 people	1.000					
Monthly medical expenditure						
At least 15,000 shs	0.780	0.984	-0.224	0.123	-1.820	0.069
0-15,000 shs	1.000					
Constant	0.000		-0.859	0.237	-3.760	0.000

Table 7: The Logistic regression model for seeking treatment

Malaria Treatment	Odds Ratio	Std. Err.	Coef.	Std. Err.	Z	P>|z|
Age						
15-24	0.800	0.433	-0.224	0.542	-0.410	0.680
25-34	0.542	0.288	-0.612	0.532	-1.150	0.250
35-44	0.716	0.407	-0.334	0.569	-0.590	0.557
45-54	1.000					
Sex						
Female	1.300	0.355	0.262	0.273	0.960	0.338
Male	1.000					
Residence						
Urban	1.806	1.435	0.591	0.794	0.740	0.457
Rural	1.000					
Ever attended school						
Attended	0.841	0.390	-0.173	0.464	-0.370	0.709
Never attended	1.000					
Educational level						
Primary	1.100	0.533	0.090	0.487	0.180	0.854
Secondary	1.980	1.040	0.683	0.525	1.300	0.193
None	1.000					
Religion						
Protestant	0.789	0.377	-0.237	0.477	-0.500	0.620
Muslim	0.601	0.264	-0.509	0.438	-1.160	0.246

other	0.326	0.165	-1.120	0.506	-2.210	0.027
Catholic	1.000					
Distance to facility						
0-2km	1.050	0.343	0.049	0.327	0.150	0.882
3-4km	1.492	0.508	0.401	0.340	1.180	0.239
Atleast 5km	1.000					
Householdsize						
5-9 people	0.988	0.276	0.012	0.280	-0.040	0.965
Atleast 10 people	0.978	0.577	0.224	0.590	-0.040	0.970
1-4 people	1.000					
Monthly medical expenditure						
Atleast 15,000shs	1.920	0.554	0.652	0.289	2.26	0.024
0-15,000 shs	1.000					
Constant			2.100	0.690	3.160	