

Possession, attitudes, and perceptions of insecticide-treated bed nets among pregnant women in a post conflict district in Northern Uganda.

Abstract

Background

The use of insecticide-treated bed nets (ITNs) is one of the main strategies to control malaria in Uganda. The Uganda's Ministry of Health had set a target of 50% of households to be covered with ITNs by the year 2007. This study aims at determining possession, attitudes, perceptions and usage of ITN among pregnant women who were living in internally displaced persons' (IDP) camps in Gulu district.

Methods

A cross sectional study conducted in 20 randomly selected IDP camps in Aswa and Omoro counties, Gulu district, Northern Uganda. Probability proportion to size cluster sampling technique was used to determine the numbers of expectant mothers in the selected camps. Consecutive sampling method was used by moving to the next nearest household until the required numbers of respondents were generated from each camp. Data was collected using well designed pretested questionnaires. The questionnaires were administered by trained research assistants who were fluent in the local language (Acholi).

Results

ITN possession: 42% of respondents (95% CI 1.54 – 1.61) possessed ITN. 98% of the respondents reported that it was good to use ITN. 97% of the respondents perceive ITN as being effective at preventing mosquitoes bites which transmit malaria. 96% of the respondents who owned ITN were willing to continue using ITNs. Factors associated with ITN possession were; Having attended antenatal services (aOR 1.92, 95% CI 1.24 – 2.98, P-value 0.004); Having attained formal education (aOR 1.55, 95% CI 1.03 - 2.35, P-value 0.036); Willingness to buy ITN (aOR 1.98, 95% CI 1.22 – 3.21, P-value 0.006) and Willingness to recommend ITN use to others (aOR 3.77, 95% CI 1.12 – 12.77, P-value 0.033).

Conclusion

Majority of the respondents had positive attitudes and perceptions towards ITN use. However, more than half of the respondents lacked ITN which is below the target set by Uganda Ministry of Health. Therefore government and other stakeholders should scale up

free ITN distributions among the vulnerable groups if the Ministry of Health and the Roll Back Malaria Global Partnership Target is to be achieved.

Keywords: ITN, Possession, attitude, perception, pregnant women, post conflicts, internally displaced persons camps.

Introduction

Background

Malaria is endemic in Uganda and constitutes a major public health challenges. An estimated 7.9 million malaria cases were reported in 2008 [1]. Surveillance reports show that proportionate mortality ratio (PMR) due to malaria for all ages has increased progressively from 20.2% in 1988 to 32.1% in 2004 [2]. Malaria infection during pregnancy is a major cause of maternal anaemia, abortion, stillbirth, intrauterine growth retardation and low birth weight, an important risk factor for neonatal and infant mortality [3 – 5]. An estimated 75,000–200,000 infant deaths annually were associated with malaria infection during pregnancy [5].

Use of insecticide treated mosquito nets (ITNs) is an effective strategy for preventing malaria in children and pregnant women [6]. Currently in Uganda, ITN use is one of the mainstay strategies for malaria control amongst others strategies like indoor residual spraying, Intermittent Presumptive Treatment (IPT) and case detection and management [1]. In 2001, the African heads of state met in Abuja and set a target of 60% ITNs coverage among the vulnerable group of children and pregnant women [7]. While the Roll Back Malaria global strategic plan (2005 – 2015) had set a target of 80% universal coverage of ITN among people at risk for malaria [8], the Ministry of Health Uganda, had set a target of 50% of ITN coverage among the vulnerable groups especially pregnant women and children under 5 years by the year 2007 [1]. There has been promising signs of rapid scaling-up of ITNs coverage in many African countries [9]. However, the target set by the Ministry of Health, Uganda was not met as noted in annual health sector performance report of 2007 [1].

32 The poor bear the highest burden of malaria as they are at higher risk of becoming infected
33 with malaria because they live in dwellings that offer little protection from mosquitoes [10].
34 As a result of the appalling life situation in the post-conflict internally displaced persons'
35 (IDP) camps, it was necessary to conduct the study to determine ITN possession, attitude
36 and perception among pregnant women in Gulu district IDP camps.

37

38 **Methods**

39 **Study area**

40 We conducted a cross-sectional study using quantitative data collection technique in IDP
41 camps in Gulu district from March 3 to 19, 2009. Gulu district is one of the districts affected
42 by the armed insurgency in northern Uganda since 1986. As of 2005, nearly 90% of the
43 population had relocated to camps [11]. The district has a municipality and two counties
44 (Aswa and Omoro). The district had 31 IDP camps [12] made up of grass-thatched huts or
45 tents provided by non-governmental organizations. There were 10,888 pregnancies [13]
46 from July 2007 to June 2008 in Gulu district IDP camps.

47

48 **Sampling and Sample size**

49 We used the modified Kish and Leslie formula of 1965 with a 95% confidence level, a
50 precision of 5%, an estimated proportion of the pregnant women having ITN at 50%
51 (proportion is unknown) and a conservative design effect of 2 to cater for intra-cluster
52 variability [14] to estimate sample size. The calculated sample size was 769 pregnant
53 mothers. We selected twenty (20) IDP camps using simple random sampling as clusters for
54 survey with ten (10) IDP camps in each County. The names of the IDP camps in each
55 county were written on pieces of paper. The pieces of paper were folded and put inside a
56 non transparent polythene bag for each county. The pieces of paper with the IDP camp
57 name on them were then picked once at a time without replacement from the polythene bag
58 until the names of the 10 IDP camps in each of the two counties were generated. We used

59 probability proportional to size cluster sampling method to determine the numbers of
60 pregnant women to be interviewed per IDP camp. We divided the population of pregnant
61 women in each of the IDP camps to be surveyed by the total number of pregnant women in
62 all the clusters, and multiplied by the sample size (769) to get the number of pregnant
63 women to be interviewed per IDP camp. In each of the IDP camps, we first determined the
64 centre of the camp, then spun a bottle on the ground and the direction of movement was
65 where the bottle top faced. All the households in that direction were counted and given
66 numbers. Corresponding numbers were written on pieces of paper which were folded and
67 placed in a non transparent polythene bag. A piece of paper was then picked blindly from the
68 non transparent polythene bag to determine the starting household. We then interviewed
69 769 pregnant women using consecutive sampling methods by moving to the next nearest
70 household. Our inclusion criteria were pregnant women who were residents of the 20
71 selected IDP camps and present on the interview date after administering a written informed
72 consent to participate in the study. The exclusion criteria were pregnant women who were
73 seriously sick or were in labour. The study was approved by the Faculty of Medicine
74 Research and Ethics Committee, Makerere University Kampala. The research and ethics
75 committee also granted permission to study pregnant women less than 18 years old as
76 emancipated minors.

77 **Data collection, management and analysis**

78 Data was collected using questionnaires which were administered by trained research
79 assistants who were fluent in the local language (Acholi). The questionnaire was translated
80 into Acholi with the help of an expert linguistic and back translated into English and pretested
81 before administering to the study population. The collected data was entered into Epidata
82 version 3.1 cleaned, edited and exported to STATA 11 for analysis. We calculated 95%
83 confidence interval (CI) for factors associated with ITN possession and any p-value < 0.05
84 was taken as statistically significant. Any factor with p-value ≤ 0.2 at bivariate analysis was

85 taken for multivariate analysis. Continuous variables were summarised using means and
86 categorical variables were displayed into tables for general description.

87 **Results**

88 **Socio-demographic characteristics of the respondents**

89 A total of 769 pregnant women were interviewed with their ages ranging from 14 to 45 years
90 with a mean age of 25.3 years. Of these, 70% had primary education, 62% were cohabiting
91 and 84% of the respondents were multigravidae. Table 1 summarises the socio-
92 demographic characteristics of the respondents.

93

94 **ITN possession and use by respondents**

95 Slightly less than half of the pregnant women (42%) had at least an ITN of which 72% were
96 given by the health facilities. Most of the pregnant women (85%) who owned at least an ITN
97 had a high compliance of use in the last one week before the survey. Table 2 summarises
98 the results for ITN possession and use by respondents

99

100 **Bivariate results for socio-demographic characteristics associated with ITN** 101 **possession**

102 Factors associated with ITN possession at the Bivariate level were; no formal education (OR
103 0.61, 95%CI 0.44 – 0.86 and P-value 0.004), no antenatal visit (OR 0.51, 95%CI 0.37 – 0.71
104 and P-value 0.000), not having any form of business (OR 0.58, 95%CI 0.40 – 0.83 and P-
105 value 0.003), being single, widowed or divorced (OR 0.19, 95%CI 0.09 – 0.42 and P-value
106 0.000), pregnancy of 6 months and above (OR 1.50, 95%CI 1.12 – 2.01 and P-value 0.007)
107 and household income in the 4th quartile (OR 1.78, CI 1.17 - 2.72 and P-value 0.006). Table
108 3 summarises the Bivariate results for socio-demographic characteristics associated with
109 ITN possession.

110

111 **Multivariate logistic regression analysis of predictors of ITN possession**

112 Factors associated with ITN possession were; Having attended antenatal services (aOR
113 1.92, 95% CI 1.24 – 2.98, P-value 0.004); Having attained formal education (aOR 1.55, 95%
114 CI 1.03 - 2.35, P-value 0.036); Willingness to buy ITN (aOR 1.98, 95% CI 1.22 – 3.21, P-
115 value 0.006) and Willingness to recommend ITN use to others (aOR 3.77, 95% CI 1.12 –
116 12.77, P-value 0.033). Table 4 summarises the logistic regression results for the predictor of
117 ITN possession among pregnant women in Gulu district IDP camps.

118

119 **Respondents' perception and attitude towards ITNs**

120 Majority of the respondents (98%) said it was good to use ITNs and up to 95% of the
121 pregnant women reported the benefit of using ITNs as they prevented malaria transmission.
122 Majority of pregnant women (97%) perceived ITNs as effective at preventing mosquito bites
123 and most respondents (96%) who possessed ITNs were willing to continue using them.
124 About half of the pregnant women (51%) were not willing to buy ITNs and most of them
125 (88%) cited lack of money. Table 5 summarises the results for respondents' perception and
126 attitude towards ITNs.

127

128 **Bivariate results for attitude and perception associated with ITN**

129 Factors associated with attitude and perception of ITN were; Not knowing whether ITN is
130 effective at preventing mosquito bites (OR 0.61, 95% CI 0.44 – 0.86, P-value 0.004);
131 Willingness to buy ITN (OR 2.39, 95% CI 1.77 - 3.24, P-value 0.000); Willingness to
132 recommend ITN use to others (OR 5.01, 95% CI 1.72 – 14.63, P-value 0.001). Table 6
133 summarises the bivariate results for attitude and perception of ITN.

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138 **Discussion**

139 **ITN possession and use**

140 Our study showed that ITN possession was low at only 42% among pregnant women in post
141 conflict IDP camps in Gulu district. That was quite below the target set by Ministry of Health
142 of 50% ITN coverage among the vulnerable group by the year 2007 [1], the Roll Back
143 malaria global partnership of 60% ITN coverage among vulnerable groups by 2005 [15] and
144 the Roll Back Malaria global strategic plan (2005 – 2015) of 80% coverage among the
145 population [8]. The Uganda Demographic and Health Survey of 2006 indicates that 34% of
146 households had ITN. The report further reveals that 41.8% of IDP households had ITNs.
147 However, only 20.9% of the pregnant women had slept under their ITN the night prior to the
148 survey [16].

149 The majority of the ITNs owned by the respondents were freely distributed from health
150 facilities hence the need to stock up ITNs at all the health facilities so that pregnant women
151 who go for their first antenatal visits are given. Other studies also indicated that majority of
152 ITNs owned by respondents were given through mass campaign [17]. The respondents who
153 did not possess ITNs gave various reasons for not possessing them key among them being
154 failure to receive ITN from the health centres where they had gone for antenatal visit. These
155 could have been due to stock out of ITN from the health facilities. Similar result was reported
156 in another study in which the main reason given for not owning a net by pregnant women
157 was lack of access to nets [18].

158 In Uganda, Ministry of Health has designed two strategies for ITN distributions [1]. The first
159 one is going to scale which needs fast distribution and high proportion of population reached.
160 The main distribution mechanism was through mass campaigns or community distribution by
161 public sector and civil society targeting households with children under five and or the poor.
162 The second component is replacement which needs sustainable long term distribution
163 mechanisms. Here, the health facility-based distribution targeted to pregnant women was
164 being used [1]. It is evident that these strategies have not helped much in improving ITN

165 possession by pregnant women who were living in the IDP camps. It is a well known fact that
166 the majority of pregnant women in the camps had at least attended antenatal services once
167 or were multigravidae. By virtue of their attendance should have given them a guaranteed
168 access to ITN if the strategies were working properly. Therefore, there is need to redesign
169 strategies to ensure that ITN possession by pregnant women is increased.

170 The majority of respondents who owned at least an ITN had high compliance with ITN use in
171 the last one week prior to the survey. This was a surprise since the study was conducted in
172 the dry season when temperature would go very high. This could be because the pregnant
173 women valued the protective benefit of ITN. Other studies done in Nigeria indicated that ITN
174 use by pregnant women were low [19, 20]. While a study done in Ghana showed that
175 compliance with ITN use was high during the wet and cool season, but lower in the hot and
176 dry season [21].

177 Most of the ITN owned by respondents were washed four times and above without being
178 retreated with only a few had them retreated. ITN retreatment helps in restoring the
179 protective value of ITN as the chemical will be potent enough to kill or repel mosquitoes.
180 Similar result was reported in a study done in Luwero district in central Uganda where only
181 about half of pregnant women reported a net re-treatment with an insecticide within the last 6
182 months [22]. It is evidence that ITN retreatment service is lacking in Uganda. Given this
183 constraint, there is need to adopt long lasting insecticide nets (LLINs) which provide effective
184 insecticides for at least three years compared with ITN which require retreatment after every
185 6 – 12 months [23].

186

187 **Perception and attitude towards ITN**

188 Most of the respondents reported that it was good to sleep under ITN while a few stated that
189 it was not good to sleep under ITN. The following benefits were revealed by the majority of
190 respondents who agreed that it was good to sleep under ITNs; since they prevent mosquito
191 bites that quite often are irritating and above all prevent one from catching malaria and bites

192 from other insects (bed bugs, cockroaches and other crawling insects) and provide warmth
193 during cold weather. Other studies also showed that pregnant women who associated bed
194 net with beneficial value were more likely to use them [24]. Respondents who think that it
195 was not good to sleep under ITNs gave the following reasons; ITNs being hot at night, not
196 being aware whether ITNs are good and getting malaria despite sleeping under ITN. A study
197 by Binka *et al* showed that the most common reasons for non-use of net were hot weather,
198 absence of the owner of net, a leaking roof and an absence of mosquitoes [21]. While a
199 study conducted in Mbarara district in Uganda indicates that there were doubts about bed
200 net efficacy in preventing malaria. The barriers that were expressed for bed nets use were
201 difficulty to keep free from holes, being inconvenient by increasing heat and sweating,
202 causing suffocation and difficulty in buying nets for large family [25]. Other studies indicated
203 that participants used bed nets when mosquitoes were plentiful and keep them away in the
204 dry season [25, 26].

205 In our study, the majority of the respondents reported that they will continue using their ITN
206 while a few stated otherwise. The reasons given for not continuing using ITN were that ITN
207 causes itching of the eyes, ITN being torn already, the weather still being hot and there was
208 no mosquito at the moment. In other study, pregnant women gave various reasons for not
209 using an ITN during pregnancy or discontinuing use among which were; lack of an ITN,
210 perceived inconvenience of the ITN e.g., hot, bad smell and difficult to tie and perceive
211 absence of mosquitoes [24].

212 Majority of the respondents knew that ITN was factory treated net to kill or repel mosquitoes.
213 This high level of awareness was quite good for public health intervention. This could
214 probably explain why majority of those who owned ITN had high compliance of sleeping
215 under it in the week prior to the survey. Few of the respondents were either not sure or they
216 did not know that their ITN had been factory treated prior to distributions. Almost half of the
217 ITN owned by the respondents had developed holes. These ITN could have developed holes
218 as a result of becoming old which meant it had outlived its usefulness or due to

219 overcrowding in the house that rendered ITN use an impracticable. The IDP houses were
220 small grass thatched huts which made the ITN to be tied at night and removed in the
221 morning to provide space in the house making it a real inconvenience. This would therefore
222 render the ITN to lose its protective values. The mosquitoes would therefore be able to gain
223 access to the pregnant woman who would be sleeping under the net and could transmit
224 malaria parasite to her.

225

226 **Factors associated with ITN Possession**

227 Our study showed that respondents who indicated that they were willing to buy ITN were
228 almost twice more likely to possessed ITN than respondents who were not willing to buy ITN.
229 This could be due to lack of money to purchase an ITN as reported by more than half of the
230 respondents who were not willing to buy ITN. Other studies have reported cost as a
231 hindering factor to ITN ownership and use [27, 28 - 31]. Previous studies have found that
232 free distribution of ITNs has resulted in substantial increase in net coverage compared to
233 subsidies [29, 32]. Therefore, it might be necessary to have free mass distribution of ITNs to
234 achieve the targets of Roll Back Malaria (RBM) as suggested by another study [33]. While
235 another study suggested that free mass distribution of ITN allows for equitable ownership
236 which makes pregnant women more likely to use them regardless of their socio-economic
237 status [34]

238 Respondents who had gone for antenatal visits were almost twice as likely to possess ITN
239 as their counter parts that had not gone for any antenatal visit. During antenatal services,
240 women undergo health education sessions which encourage them to acquire and use ITN.
241 Also, some ITN may be given as incentives to encourage pregnant women to attend
242 antenatal services as indicated by majority who owned ITNs that their main source was
243 health facilities. Other study showed that provision of the LLINs to women free of charge at
244 their first antenatal clinic visit increased the reported use of bed nets dramatically the night
245 before enrolment [35].

246 Our finding indicates that respondents who had formal education were more likely to
247 possess ITN than those who had no formal education. This was most likely due to increased
248 awareness about ITN and its benefits as a result of sensitisation by teachers. Similar result
249 was reported in a review by Singh *et al* [36]. However, another study indicates that education
250 was not associated with ITN ownership [37].

251 Respondents who indicated that they were willing to recommend ITN use to others were
252 almost four times more likely to possessed ITN than their counterparts who were not willing
253 to recommend ITN use to others. These respondents could be aware of ITN benefits and so
254 they want others to get the benefit of ITN use as well. This attitude was good because those
255 respondents who possessed ITN and were recommending its use to others will provide
256 valuable information to others basing on their personal experiences while using ITN. This
257 would in turn unlock the myth associated with ITN use and therefore promote ITN uptake in
258 the society.

259

260 **Conclusion**

261 More than half of the respondents did not possess ITN which was quite below the target set
262 by the Roll Back Malaria Global Partnership and the Ministry of Health Uganda. Most of the
263 respondents who did not possess an ITN stated that they were not given during their
264 antenatal visits to the health facilities. Therefore government and other stakeholders must
265 scale up free ITN distributions among the vulnerable groups if the Ministry of Health and the
266 Roll Back Malaria Global Partnership Target is to be achieved. Economic empowerment of
267 pregnant women would make them able to purchase ITN as it has been shown that
268 respondents who were not willing to buy an ITN were almost two times less likely to possess
269 an ITN.

270 ITN retreatment services were low among pregnant women in the IDP camps. Therefore,
271 there is need to adopt other form of nets like LLINs which has insecticide in them that can
272 last for three years.

273 **Competing interests**

274 The authors declare that they have no competing interests.

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Tables

Table 1: Socio-demographic characteristics of respondents

Variable	Frequencies	Percentage
	n	(%)
<i>Age</i>		
14 – 25	423	55
26 – 45	346	45
<i>Level of Education</i>		
No Formal education	198	26
Primary	541	70
Secondary	026	04
Tertiary	002	00
<i>Marital Status</i>		
Married	232	30
Single	058	08
Cohabiting	477	62
Divorced	001	00
Widowed	001	00
<i>Gravidity</i>		
Multigravidae	648	84
Primigravidae	121	16
<i>Gestation Age in months</i>		
1 – 5 months	341	45
6 – 10 months	420	55
Have gone for antenatal visit		
Yes	511	67
No	255	33
Having experience child death immediately after birth		
Yes	105	16
No	534	84
Have ever experience miscarriage		
Yes	126	16
No	639	84
Having some business		
Yes	147	19
No	620	81
Having salary paying job		
Yes	007	01
No	761	99
Household monthly income		
1 st Quartile (0.00 to 5,000 Shillings)	529	69
2 nd Quartile (5,001 to 10,000 Shillings)	077	10
3 rd Quartile (10,001 to 29,999 Shillings)	056	07
4 th Quartile (30,000 to 500,000 Shillings)	107	14

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392 Table 2: ITN possession and pattern of use by pregnant women

Variables	Frequencies (n)	Percentage (%)
<i>Owning an ITN</i>		
Yes	324	42
No	445	58
<i>Sources of ITN</i>		
Given by Health Centre	233	72
Given by NGO	041	13
Bought it Myself	041	13
Others	008	02
<i>Numbers of ITN owned</i>		
2 or more ITN	082	11
1 ITN	242	31
No ITN	445	58
<i>ITN usage in the last one week before the survey</i>		
Low Compliance (1 – 2 Times)	023	07
Moderate Compliance (3 – 4 Times)	024	08
High compliance (5 Times and above)	265	85
<i>ITN washed</i>		
No	062	19
Yes	262	81
<i>Numbers of time ITN washed after acquiring without retreating</i>		
1 Time	029	11
2 Times	049	19
3 Times	044	17
4 Times and above	140	52
<i>ITN retreatment</i>		
Yes	039	12
No	285	88
<i>Reasons for not having ITN</i>		
I have given to children	006	01
No reason	013	03
I have not gone for antenatal visit	024	06
Burnt	038	09
Not bought	042	10
ITN is old and can not be use	059	14
ITN torn which can not be mended	087	20
Not given from health centres	164	38

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403 Table 3: Bivariate results for socio-demographic characteristics and possession of ITNs

	Frequency	Have an ITN		OR	95% CI	P-Value
Variable	N	Yes	No			
<i>Age group</i>						
14 – 25	418	184	234	1.00		
26 – 45	345	138	207	0.85	0.63 - 1.13	0.264
<i>Have formal education</i>						
Yes	569	258	311	1.00		
No	196	066	130	0.61	0.44 - 0.86	0.004
<i>Antenatal visit</i>						
Yes	511	243	268	1.00		
No	255	081	174	0.51	0.37 - 0.71	0.000
<i>Experience of child death immediately after birth</i>						
Yes	105	049	056	1.00		
No	534	226	308	0.84	0.55 - 1.28	0.412
<i>Experience of miscarriage</i>						
Yes	126	057	069	1.00		
No	639	266	373	0.86	0.59 - 1.27	0.453
<i>Having some business</i>						
Yes	147	078	069	1.00		
No	620	246	374	0.58	0.40 - 0.83	0.003
<i>Having Salary Paying job</i>						
Yes	007	003	004	1.00		
No	761	322	439	0.97	0.22 - 4.39	0.974
<i>Household monthly income</i>						
1 st Quartile (0.00 to 5,000 Shillings)	529	211	318	1.00		
2 nd Quartile (5,001 to 10,000 Shillings)	077	034	043	1.19	0.74 - 1.93	0.476
3 rd Quartile (10,001 to 29,999 Shillings)	056	021	035	0.90	0.51 - 1.60	0.729
4 th Quartile (30,000 to 500,000 Shillings)	107	058	049	1.78	1.17 - 2.72	0.006
<i>Gravidity</i>						
Primigravidae	126	048	078	1.00		
Multigravidae	641	276	365	0.81	0.55 - 1.21	0.303
<i>Marital Status</i>						
Married/Cohabiting	708	316	392	1.00		
Single/Widow/Divorce	059	008	051	0.19	0.09 - 0.42	0.000
<i>Months of pregnancy</i>						
1 - 5 Months	341	125	216	1.00		
6 - 10 Months	420	195	225	1.50	1.12 - 2.01	0.007

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406 Table 4: Logistic regression analysis of socio-demographic predictors of ITN possession

Variables	Crude OR	95% CI	P-Value	Adjusted OR	95% CI	P-value
Having some business	1.57	1.07 – 2.31	0.022	1.57	0.96 – 2.57	0.072
Have attended Antenatal service	1.92	1.38 – 2.68	0.000	1.92	1.24 – 2.98	0.004
Have formal education	1.55	1.09 – 2.22	0.015	1.55	1.03 - 2.35	0.036
<i>Willingness to buy ITN</i>	1.98	1.45 – 2.69	0.000	1.98	1.22 – 3.21	0.006
Willing to recommend ITN use to others	3.77	1.27 – 11.24	0.017	3.77	1.12 – 12.77	0.033

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450 Table 5: Respondents' perception and attitude towards ITNs

Variables	Frequency	Percentage
	n	%
<i>Is it Good to use ITN</i>		
No	013	02
Yes	740	98
<i>Reasons for not being good to sleep under ITN</i>		
Hot at night	007	54
I do not know if it is good	005	38
I still get malaria even if I sleep under ITN	001	08
<i>Benefits of using ITN</i>		
Others	036	05
Prevent Malaria transmission	689	95
<i>ITN effective at preventing mosquito bites</i>		
No	019	03
Yes	742	97
<i>Will you continue using ITN</i>		
No	012	04
Yes	301	96
<i>Reasons for not continuing ITN use</i>		
Causes itching of the eyes	001	08
Is torn	001	08
Still hot	004	34
No mosquitoes at the moment	006	42
<i>Knew whether their ITN was treated</i>		
Not sure	039	12
No	044	14
Yes	241	74
<i>Willingness to buy ITN</i>		
Yes	374	49
No	382	51
<i>Reasons for not willing to buy ITN</i>		
Others	012	03
Still have ITN	034	09
No money	330	88
<i>ITN developing holes</i>		
Yes	149	46
No	175	54
<i>Willingness to recommend ITN use to others</i>		
Yes	728	96
No	30	04

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454 Table 6: Bivariate results for Attitude and Perception associated with ITN possession

	Frequency	Have an ITN		OR	95% CI	P-Value
Variable	n	Yes	No			
<i>Is it Good to use ITN</i>						
Yes	740	318	422	1.00		
No	13	004	009	0.59	0.18 - 1.94	0.378
<i>ITN effective at preventing mosquito bites</i>						
Yes	742	312	430	1.00		
No	019	009	010	0.61	0.44 - 0.86	0.004
<i>Willingness to buy ITN</i>						
No	382	123	259	1.00		
Yes	374	268	175	2.39	1.77 - 3.24	0.000
<i>Willing to recommend ITN use to others</i>						
No	30	004	026	1.00		
Yes	728	317	411	5.01	1.72 – 14.63	0.001

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488 **List of IDP Camps in Gulu District as of June 2008 and Clusters**

Camp Name	County NAME	Sub-county NAME	Parish NAME	Popn (2008) Individuals	Women of child bearing age (15 – 49 years) (23% of the population)	Women expected to become pregnant (5% of the population)	IDP Camps Selected	Proportion of pregnant women selected in each IDP camp for survey
Oroko	Aswa	Palaro		3,439	791	40	Yes	28
Palaro	Aswa	Palaro	Labworomor	7,435	1710	86	Yes	60
Cet Kana	Aswa	Bungatira	Atiaba	1,272	293	15	No	
Koro-abili	Omoro	Koro	Pageya	7,316	1683	84	Yes	59
Corner Agula	Omoro	Lalogi	Lukwor	2,567	590	30	Yes	21
Paicho	Aswa	Paicho	Kal-Umu	6,525	1501	75	Yes	52
Monroc	Aswa	Bungatira		2,304	530	26	Yes	18
Cwero	Aswa	Paicho	Pagik	3,966	912	46	Yes	32
Acet	Omoro	Odek	Binya	13,383	3078	154	Yes	108
Patiko-Ajulu	Aswa	Patiko	Kal	5,873	1351	68	Yes	48
Lugore	Aswa	Palaro	Owalo	2,155	496	25	No	
Lukodi	Aswa	Bungatira		1,215	279	14	No	
Adak	Omoro	Lalogi	Lukwir	1,915	440	22	No	
Te-tugu	Omoro	Koro	Lapainat West	5,636	1296	65	Yes	45
Palenga	Omoro	Bobi	Palenga	4,756	1094	55	Yes	38
Atoo Hill	Aswa	Paicho	Kal-Umu	1,064	245	12	Yes	8
Alokolum	Omoro	Ongako	Alokolum	4,061	934	47	Yes	33
Awach	Aswa	Awach	Paduny	4,747	1092	55	Yes	38
Odek	Omoro	Odek	Binya	1,488	342	17	No	
Coope	Aswa	Bungatira	Agonga	4,451	1024	51	Yes	36
Awere (Gulu)	Omoro	Odek	Lamola	1,766	406	20	No	
Dino	Omoro	Odek	Palaro	1,474	339	17	Yes	12
Unyama	Aswa	Paicho	Pakwelo	5,058	1163	58	Yes	41
Lalogi	Omoro	Lalogi	Gem	3,264	751	38	No	
Okwir	Omoro	Bobi		150	35	2	No	
Opit	Omoro	Lalogi	Parwec	4,951	1139	57	Yes	40
Ongako	Omoro	Ongako	Kal	2,710	623	31	Yes	22
Bobi	Omoro	Bobi	Paidwe	1,813	417	21	No	
Omel Apem	Aswa	Paicho	Omel	353	81	4	No	
Awoo	Omoro	Lakwana	Parak	3,780	869	43	Yes	30
Minakulu	Omoro	Bobi	Palwo	3,450	794	40	No	
TOTAL	31			114,187	26263	1098		769

489 Source: IDP camps and population were based on UNHCR data as of 28th July, 2008.

490 Population of women of reproductive age and expected pregnancies were based on

491 Ministry of health statistical abstract of 2008/9