NetMark Baseline Survey on Insecticide Treated Materials (ITMs) in Uganda

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A number of individuals participated in the development, conduct, and/or analysis and report writing of this research. Dr. Carol Baume provided overall technical direction for the study and the report. Dr. Silvia Holschneider and Dr. Nancy Nachbar led the pilot fieldwork in Zambia. Dr. Silvia Holschneider took the lead role in coordinating the data analysis. Dr. Holschneider and Dr. Halima Mwenesi took the lead role in report writing. Mr. Joe Boniaszczuk was in charge of interviewer training, organization of the fieldwork, and data entry and management.

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ACRONYMS

AED	**Academy for Educational Development**
ITMs	**Insecticide treated materials**
ITNs	**Insecticide treated nets**
RI	**Research International**
SES	**Socio-economic status**
UNICEF	**United Nations' Children's Fund**
USAID	**United States Agency for International Development**
USD	**U.S. Dollars**
WHO	**World Health Organization**
WRA	**Women of reproductive age**

MAP OF UGANDA

EXECUTIVE SUMMARY

PURPOSE: Provide baseline measures of

- Knowledge and beliefs about mosquitoes and malaria
- Beliefs and attitudes about use of treated and untreated mosquito nets
- Access, affordability, and ownership of mosquito nets
- Net treatment practices
- Use of nets and treated nets by vulnerable groups: children under five, pregnant women, and women of reproductive age
- Consumer preferences regarding mosquito nets
- Usage and attitudes regarding other mosquito control products

METHODOLOGY: Survey

SAMPLE: 1000 Ugandan households from 5 sites: Kampala, Masaka, Soroti, Hoima and Mbarara. Target sample in each site was 200: 80 respondents from urban households, 60 from households within 100km, and 60 from households 100-200 km from the urban center. Respondents were women aged 15-49 who were mothers/guardians of children under five years of age.

DATA COLLECTION: November 2000

STUDY FINDINGS:

Knowledge and beliefs about malaria and mosquitoes

Recognition of the English term "malaria" was nearly universal. Knowledge of symptoms and vulnerable groups was good. However, knowledge of mosquitoes as the only cause of malaria was poor. Exposure to information about malaria prevention was good and came mainly from the radio.

- Virtually all respondents (99.6%) reported having heard of the English term "malaria." Seventy-one percent (71%) mentioned fever as a main symptom of malaria and many also mentioned other symptoms that are also manifestations of malaria; however, only 6% mentioned convulsions, a symptom of severe malaria. Most (80%) knew that children under five and pregnant women are most susceptible to getting a serious case of malaria. Although the vast majority of those who recognized the term knew that mosquitoes cause malaria (92%), only 21% knew that mosquitoes are the *only* cause of malaria.

- Most (81%) respondents said they had received information about avoiding the disease in the last 12 months. The majority had heard information from the radio. Other common sources were health staff (45%) and non-professional sources such as neighbors and friends (45%).

Perceived advantages and disadvantages of net use by vulnerable groups

Levels of perceived advantages of net use by vulnerable groups—children under five and pregnant women—were extremely high. Nets were seen as providing good protection against mosquitoes and malaria. *Treated* nets were seen as especially effective, with the added advantage of being better at preventing malaria and killing and repelling mosquitoes. The disadvantages cited of a child under five sleeping under a net related mostly to concerns about suffocation and entrapment. Respondents cited disadvantages of *treated* nets, voicing concerns about the safety of the chemical and its smell.

- Virtually all respondents (99.8%) perceived advantages for a child under five sleeping under a mosquito net. Most commonly mentioned were "avoid getting bitten by mosquitoes"(81%) and "avoid getting malaria" (62%).

- About one-third (32%) of respondents cited no disadvantage for a child under five sleeping under a mosquito net. The most commonly-mentioned disadvantages were "it is hot sleeping under a net" (24%), "child may suffocate" (23%), and "child might get caught/trapped" (21%).

- Almost all respondents (93%) named advantages for a child under five sleeping under a *treated* net. The most commonly mentioned were "kills mosquitoes" (48%), "is better at preventing malaria" (46%), "works better against mosquitoes than an untreated net" (40%), "repels mosquitoes away from net" (30%), and "child is more protected" (24%).
- One-third (34%) did not mention any disadvantage of a child sleeping under a *treated* net. The most commonly mentioned disadvantages were that the "chemical is dangerous" (33%), "causes irritation/cough/ or other illness"(30%), "smell of the chemical is bad" (21%), and that the "chemical could kill a child" (15%).
- The vast majority of respondents (91%) perceived advantages for a pregnant woman sleeping under a *treated* net. The most commonly mentioned were "is better at preventing malaria" (50%), "kills mosquitoes" (39%), "works better against mosquitoes than a net that has not been treated" (33%), "pregnant woman is more protected" (30%), and that it "repels mosquitoes away from the net" (22%).
- Twenty-eight percent (28%) did not cite any disadvantage for a pregnant woman sleeping under a *treated* net. The most commonly mentioned disadvantages were that the smell of the chemical is dangerous and could kill fetus or cause miscarriage (38%) and that the chemical "smell is bad" (37%) and "might make woman nauseated/vomit" (37%).

Access to mosquito nets

Nets are available primarily from commercial outlets, which are reasonably accessible to urban dwellers but fairly far from rural dwellers.

- About half (53%) of respondents reported that the general shop was the nearest place where they could buy mosquito nets and another 18% said the closest place was an open-air market. Five percent (5%) said nets were unavailable or they did not know where they could obtain one.
- To get to the nearest place where a net could be obtained, respondents would travel principally by foot (45%), local taxi (32%) or bus (8%). The median amount of time for urban residents traveling on foot was 19 minutes, compared with 38 minutes for urban residents. For those taking a local taxi, the median number of minutes required was 22 minutes for urban residents and 57 minutes for rural residents.

Mosquito net ownership, treatment, and use

Net ownership varied considerably by site. Non-owners said that the main reason they did not own was cost. Children under five and pregnant women are favored for net use, although rates of use are low. Nets were not used year-round. Awareness of treatment of nets with insecticide was low and few people treated their nets. Treatments had been obtained from both commercial and non-commercial sources.

- One-third (34%) of households reported owning at least one mosquito net and half (51%) of these households owned more than one mosquito net. Net ownership was lowest in the Masaka site (19%) and highest in the Soroti site (44%). Households of higher socio-economic status and those located in urban areas were more likely than others to own a net. The majority of respondents from non-net-owning households (86%) said that they did not own a net because they did not have enough money.
- Only (29%) of households had heard of treating mosquito nets with insecticide solution. Only 4% of households owned a treated net; 12% of nets owned had been treated. On average, these nets had been treated/re-treated 2 times and were last treated 4.3 months ago. Treatments were obtained both from non-commercial and commercial sources, most commonly projects (24%), clinics (18%), general shops (16%), and pharmacy (9%). Most consumers (73%) did not know what product was used to treat the net. Those from higher SES households were more likely to be aware of net treatment and also more likely to have a treated net.
- About 75% of children under five in net-owning households slept under a net (treated or untreated) the prior night, representing 25% of all children in the households in the sample. Only 9% of these children slept under a *treated* net the prior night representing 3% of all children in the sample.
- Two-thirds (67%) of women of reproductive age (WRA) in net-owning households slept under a net (treated or untreated) the prior night, representing 23% of the total number of reproductive age in the household sample. Only 7% slept under a *treated* net the prior night representing 3% of WRA in the household total sample. Sixty-nine percent (69%) of pregnant women in net-owning households slept under a net the prior night, representing 21% of pregnant women in the households in the total sample. Only 5% of pregnant women in net-owning households slept under a *treated* net, representing 2% of all pregnant women in the sample. (The denominators for pregnant women, however, were very small.)
- Among net-owning households, the average number of months per year nets were used was 9.9.
- The typical pattern is for two or three people to sleep under a large net.

Characteristics of nets owned

Most nets had been obtained from commercial sources and had been acquired within the past 3 years. Almost all were rectangular or round/conical shaped and either double or single sized. Nets were commonly unbranded products; most consumers were unaware of the brand. The price of nets varied considerably. About three-fourths of the nets were reportedly washed at least once a month.

- About half (48%) of the nets owned were purchased in a general shop, 13% in a market, 8% from a street vendor and 7% from a textile shop. Higher SES households purchased their nets from formal commercial sources, whereas lower SES households were more likely to obtain their nets from informal commercial sources. Two-thirds (67%) had been acquired within the past 3 years.
- Households reported paying an average of USD 5.48 per net (conversion based on the exchange rate for the dollar on the date of data collection).

- Owners did not know the brand name for the majority (81%) of their nets. Twelve percent (12%) were reported to be the PowerNet brand; 7% were tailor-made (non-manufactured) nets.
- The most common net sizes owned were double (52%) and single (39%). The most common shapes were round/conical (53%) and rectangular (43%).
- The great majority of nets (94%) had been washed. About three-fourths (77%) of washed nets were reportedly washed at least once a month with 37% of nets reportedly washed at least every two weeks. Most treated nets were reported to have been washed 1-4 times since last treatment.

Consumer mosquito net preferences

Households, whether net-owning or not, liked round/conical and rectangular-shaped nets. They preferred large sizes and light colors.

- Forty-five percent (45%) of respondents preferred round/conical nets and 39% preferred rectangular nets. Preferred net sizes were double (56%) and king (22%).
- Forty-seven percent (47%) of respondents preferred white nets; 13% light blue; and 12% pink. Fifty-nine percent (59%) disliked black nets; 32% dark green nets; 26% dark blue nets; and 19% disliked white nets.

Awareness, use, and price of mosquito control products

Mosquito nets, aerosol insecticides, and coils were the mosquito products that consumers were most aware of. Use and frequency of purchase of insecticides and coils was relatively low.

- Awareness (unprompted) of mosquito control products was highest for mosquito nets (89%), aerosol insecticides (68%), and mosquito coils (65%). About 37% used coils and 37% used aerosol insecticides. (These use figures may be low, given that "use" was asked only of those who indicated unprompted that they were aware of a given product.) Use of aerosols was higher in urban areas whereas use of coils was similar both urban and rural areas.
- Nearly half (47%) of households that had purchased mosquito coils in the 12 months prior to the interview did so within the last 7 days. Three-fourths (72%) of households that had purchased aerosols in the 12 months prior to the interview did so within the last month. Coils were purchased mostly in general shops (68%), as were aerosols (66%). The average reported prices were USD 1.53 for a 300-350 ml can of insecticide and USD 0.09 for a single mosquito coil.

Perceptions of mosquito control attributes, products, and brands

Consumers wanted a mosquito control product that kills mosquitoes, reduces malaria, and keeps mosquitoes away while sleeping. Among all insect control products, nets were rated most highly on every positive mosquito control attribute except "killing mosquitoes and other insects." Consumers were most aware of Doom brand and associated it with the attributes of insect control products they value.

- On a scale of 1-7, respondents said that the most important attributes of mosquito control products were "kills mosquitoes" (5.86), "reduces malaria" (5.7), "keeps away mosquitoes while sleeping" (5.68), and "keeps away mosquitoes for a long time" (5.38) and "is safe to use around children" (5.34).
- Respondents rated mosquito nets more highly than all other insect control products on the majority of insect control product attributes including, is safe to use around children (76%), "keeps mosquitoes away while sleeping" (75%), "reduces malaria" (69%), "is good value for money" (60%), "is a high quality effective brand" (59%), "is a long-term solution to mosquito problems" (55%), and "keeps mosquitoes away for a long time" (51%). Sprays/aerosols were considered to be the best products to kill mosquitoes (84%) and to kill other insects other than mosquitoes (76%).
- Brand awareness was highest for Doom (94%) and moderate for other brands. Respondents associated the Doom brand with positive insect control attributes that they value.

PROGRAM/PRODUCT IMPLICATIONS:

The overall setting for ITM promotion and sales is favorable, but efforts are needed to overcome negative perceptions of nets and insecticide treatments and to increase awareness of ITMs.

The favorable factors for ITM promotion and malaria prevention in Uganda include:

- Nearly universal recognition of the term "malaria"; very good knowledge of malaria symptoms and those most vulnerable; good general understanding of how malaria is transmitted
- Highly favorable attitudes toward mosquito nets compared with other insect control products
- Moderately high levels of net ownership and beginnings of a "net culture"
- Very high level of perceived advantages of net use
- Preferential net use by vulnerable groups in households that own nets

The main barriers to overcome for ITM promotion include:

- perceived high cost of nets
- limited access to nets in rural areas
- lack of variety in net size, shape, and color
- concerns regarding the safety and potential adverse effects of treated nets, particularly with regard to young children and pregnant women
- low availability of insecticides through the commercial sector
- lack of strong branding of nets and insecticide treatments;
- low levels of awareness of net treatments and its benefits and inadequate net treatment practices

SECTION 1
INTRODUCTION

1.1 BACKGROUND

The Problem of Malaria

Malaria is a growing health problem in Africa. Each year, 300-500 million people worldwide suffer from the disease, with 9 out of 10 cases occurring in sub-Saharan Africa (WHO, 1998). Malaria kills at least 1 million people each year and the vast majority of deaths occur among children less than five years of age. In Africa, one out of twenty children is likely to die of a malaria-related illness before his fifth birthday (WHO, 1999). Pregnant women are also particularly susceptible to the disease. Malaria during pregnancy causes severe anemia, miscarriages, stillbirths, and maternal deaths, and may account for up to 40% of preventable low birth weight among newborns in endemic areas (Brabin, 1991; UNICEF, 1999). Malaria places a staggering economic burden on already strained national economies and on struggling families. The disease cost sub-Saharan African nations more than USD 2 billion in 1997 (WHO, 1998) and has slowed economic growth in Africa by up to 1.3% each year (Gallup & Sachs, 2000). In addition, malaria reduces human work capacity and productivity, and affects social development indicators such as child health and school attendance (Global Forum for Health Research, 2000).

Consistent use of mosquito nets and curtains that have been treated with insecticide—insecticide treated materials, or ITMs—has been proven effective in reducing malaria. Current data indicate that ITM use can prevent 19% of child deaths from all causes, with some country-specific studies in Africa suggesting that as much as 42% of all-cause mortality among children under-five can be averted. Additionally, malaria morbidity in children under five has been shown to decrease by as much as 21-72% when ITMs are used (Lengeler, 1998).

To date, however, few families in Africa have mosquito nets and there has been little consumer marketing and distribution of ITMs in most African countries. Where they have been marketed (e.g., Tanzania and The Gambia), their supply has been limited and often donor-organized and subsidized. Currently, many households use other anti-mosquito measures such as coils and aerosol sprays to prevent nuisance biting, but the efficacy of these products in preventing malaria remains unknown.

NetMark

NetMark is a United States Agency for International Development (USAID)-funded effort to promote the use of ITMs to prevent malaria in sub-Saharan Africa through the formation of public-private partnerships. Managed and carried out by the Academy for Educational Development (AED), the NetMark partnership includes, in addition to AED, the U.S. government, The Malaria Consortium of the London School of Hygiene and Tropical Medicine & the Liverpool School of Tropical Medicine, The Johns Hopkins School of Hygiene and Public Health, and Group Africa. The primary goal of NetMark is to develop a sustainable market for ITMs, especially mosquito nets (bednets), in target countries in Africa. The main objectives of the project are to increase the proportion of households that own ITMs, increase nightly use of treated nets, especially by those most vulnerable to malaria (pregnant women and children under five years of age); and increase the proportion of net owners who regularly retreat their nets with insecticide.

1.2 SURVEY OBJECTIVES, SAMPLE, AND IMPLEMENTATION

Objectives

As part of a comprehensive research agenda that includes both market and behavioral research, NetMark conducted a household survey in Nigeria, Zambia, Uganda, Senegal, and Mozambique to serve as an evaluation baseline. The baseline survey was to provide quantitative information useful to the public health community as well as to the private sector. Specifically, the objectives of the survey were to provide data on:

- Knowledge and beliefs about mosquitoes and malaria
- Beliefs and attitudes about use of treated and untreated mosquito nets
- Access, affordability, and ownership of mosquito nets
- Net treatment practices
- Use of nets and treated nets by vulnerable groups: children under five, pregnant women, and women of reproductive age
- Consumer preferences regarding mosquito nets
- Usage and attitudes regarding other mosquito control products

In addition, the baseline survey information will supplement the NetMark qualitative research findings to inform the development of insecticide and net products and to design regional promotional campaigns encouraging the purchase and correct use of these products.

The same instrument was used in each of the five countries in order to ensure comparability of data. This document reports on findings from Uganda. Reports on the other four countries are available from NetMark.

Sample

This survey was conducted among 1000 households in Uganda with women aged 15-49 who were mothers or guardians of children under five years of age. The sample of mothers/guardians was drawn from 5 sites: Kampala, Masaka, Soroti, Hoima, Mbarara. In each site, the target sample was 200: 80 respondents from the urban center, 60 from households within 100 kilometers from the urban center, and 60 from rural households 100-200 kilometers from the urban center. The actual sample distribution attained is shown in Table 1.

Table 1: Distribution of sample among sites

Site	Total	Urban	Rural 100 km from Urban	Rural 200 km from Urban
Kampala	200	80	60	60
Masaka	200	80	59	61
Soroti	211	80	68	63
Hoima	197	82	33	82
Mbarara	192	83	47	62
TOTAL	1000	405	267	328

A multistage sampling procedure was used to select the respondents participating in the survey, as follows.

1- Selection of primary sampling units: Purposive sampling was used to select five sites across the country that reflected the geo-ethnic diversity of the population.[1] (See Table2.)

[1] Because of the insecure situation in the north, the far northern region of Uganda was not included in the study.

2- Selection of sampling points: Within each of the five sites, 20 sampling points (villages or urban neighborhoods) were randomly selected from electoral lists using quota sampling: 8 from within the city ("urban"); 6 from within 100 kilometer radius from the city ("near rural"); and 6 from within a 100-200 kilometer radius from the city ("far rural"). This stratification scheme was designed to meet the purposes of the evaluation. Since a key objective of NetMark is to increase access to ITMs across the socio-economic spectrum, it was essential to include urban centers with the potential to be reached by product distribution systems, as well as include households located at varying distances from the urban center.

3- Selection of households: Ten interviews were conducted per sampling point, each in a different household. For each sampling point, a starting point (a fixed landmark or address) and the direction from which to start the data collection were chosen. Interviewers were instructed to go to the starting point and walk in the chosen direction until they located a residence with a qualified respondent. After a successful interview, interviewers were instructed to skip five residences (or less if residences were far apart) and seek another qualified respondent.

4- Selection of eligible respondents: An eligible respondent for the evaluation was a female 15-49 years old who was the parent or guardian of a child under five years old, i.e., aged 0-4. Females aged 15-49 were selected to maximize the sample size for calculating the proportion of females of reproductive age sleeping under a net. Similarly, only those women who had a child under five were included, to maximize the sample size for calculating the proportion of children under five sleeping under a net.

This sampling procedure was designed to meet the purposes of this study. In the interest of cross-national comparability, the procedure was standardized across all five countries surveyed. In Uganda, the sampling strategy resulted in an urban-rural breakdown that approximates the national proportions: this sample consisted of 40% urban and 60% rural households. There are no recent census data available for Uganda[2], but the Uganda Demographic and Health Survey (DHS) of 1995 showed an urban-rural split of 33% and 67% respectively. It is likely that the proportion of urban households is somewhat greater now than in 1995.

In other ways, however, the sampling procedure devised for this study may have resulted in a sample that differs from a true national random sample (which was neither desirable nor feasible in this case):

a) Net promotion activities in or near the study sites may have resulted in net ownership rates that are higher than those that would have been obtained by a true national random sample. Since 1997, malaria interventions have been included in the Uganda Essential Health Package. As part of a move to decentralize the health system, districts bear the main responsibility for implementing malaria control activities. There are numerous small net promotion activities in collaboration with non-governmental organization in most districts in the country. For example, in Soroti, Hoima and Masaka, there are small-scale projects that have been running for between three to four years. They provide free or subsidized nets and treatments to communities in selected areas of the districts. The extent to which the net activities in the districts included in this study are typical of other districts in Uganda is not known.

b) Only households with children under five were included, and the extent to which these households differ from other households with respect to the variables measured is not known.

c) Only women of reproductive age were selected as respondents. Responses from men or from older women may differ from those of the women in the sample.

[2] The latest census data available are from 1991.

Table 2: Study sites, location and main ethnic/language groups

Site	Province/District	Ethnic group/language
Kampala	Central	Baganda/Luganda, English
Masaka	Central	Baganda/Luganda, English
Soroti	Eastern	Iteso/Teso, Kiswahili
Hoima	Western	Banyoro/Rutero
Mbarara	Western	Banyankole/Runyankole

Implementation

The research was carried out by NetMark and the Africa offices of Research International (RI). NetMark staff developed the survey instrument (survey) based on project qualitative research and a review of existing instruments on ITMs; subsequently, the draft was reviewed by colleagues from RI as well as from collaborating institutions and countries. NetMark and RI jointly conducted nearly a week of instrument pre-testing in Zambia in September 2000. With very minor modifications, the same instrument was used in all five countries surveyed. In October, RI trained local Ugandan data collectors, and thereafter managed the implementation of the survey. The data were collected during November 2000.

To maximize comparability of data, the surveys were administered in all five countries (Nigeria, Senegal, Zambia, Uganda, and Mozambique) more or less simultaneously, during October and November of the year 2000. It should be noted, however, that the timing of the rainy season differs by country, and is likely to affect net use patterns. In Uganda, the timing of the study meant that the data were collected during the rainy season.

1.3 ORGANIZATION OF THE REPORT AND TABLES

After describing the sample, this report presents findings grouped into three main areas: (1) knowledge and beliefs about mosquitoes and malaria; (2) mosquito nets; and (3) other mosquito control products. Implications of the findings are discussed in the final section.

This report attempts to present a large amount of data in a standard and accessible way. It includes a complete set of tables to serve as a data resource, and each table is accompanied by statements summarizing the main results. Each of the five country reports contains the same set of tables, for purposes of comparability.

In most of the tables in this report, data are broken down in several ways:

- By **site**: the five primary sampling areas (i.e. Kampala, Masaka, Soroti, Hoima, Mbarara), each of which includes both urban and rural areas.

- By **location**: a refined urban-rural breakdown, which distinguishes between respondents in Kampala proper, those in the four other urban centers, those living in "near rural" areas (within 100 km from the urban center) and those living in "far rural" areas (100-200 km from the urban center).

- By **urban-rural**: all urban respondents across sites compared with all rural (both "near rural" and "far rural") respondents across sites.

Some variables are also broken down by socio-economic status (SES). A description of the variables in the SES scale and of the procedure used to develop the scale is found in Section 2, which follows.

Results are presented in percentages, unless otherwise stated. Each table indicates whether percentages are based on the entire sample or on a sub-group. Base figures (denominators) are given as absolute numbers.

SECTION 2
CHARACTERISTICS OF RESPONDENTS AND HOUSEHOLDS

This section provides descriptive information on respondents and households in the sample. It also provides information on socio-economic status (SES) variables, which were combined to create a five point SES scale.

The SES scale was calculated as follows: Categorical variables were re-coded to become pseudo-ordinal variables, and categories that were judged to be equivalent in terms of SES were combined to increase the frequency of responses. Principal component analysis was used to extract the main, single factor that accounted for the largest amount of variance in the data. Using the factor scores from the principal component analysis, respondents were divided into 10 groups based on the deciles of the factor scores. To assure adequate cell sizes, these ten groups were collapsed into a five-point scale. So that each SES level has approximately 20% of the sample in it. In this scale, "1" indicates the lowest SES group and "5" indicates the highest.

2.1 CHARACTERISTICS OF RESPONDENTS

Table 3: Characteristics of respondents
Among all respondents

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	200	200	211	197	192	80	325	267	328	405	595
Age of Respondent												
15-19	4.7	11	5	1.4	3	3.1	10	4.3	4.9	3.7	5.4	4.2
20-29	56.1	55	60	54.5	56.9	54.2	53.8	63.4	53.2	51.8	61.5	52.4
30-39	31.8	30	21.5	38.4	35.5	33.3	30	27.4	35.2	33.8	27.9	34.5
40-49	7.4	4	13.5	5.7	4.6	9.4	6.3	4.9	6.7	10.7	5.2	8.9
Education Level of Respondent (yrs)												
0	11.4	12	7.5	19.4	4.1	13.5	11.3	5.8	13.9	14.9	6.9	14.5
1-5	14.3	5	15.5	19.9	14.2	16.7	2.5	11.1	20.2	15.5	9.4	17.6
6-12	59.6	63	58.5	48.3	70.6	58.3	66.3	60.9	55.8	59.8	62	58
13+	14.6	19.5	18.5	12.3	11.2	11.5	20	22.2	10.1	9.5	21.7	9.7
Mean (among those w/schooling)	8.83	9.71	8.94	8.29	8.65	8.54	9.9	9.69	8.15	8.18	9.73	8.16
Language of Interview												
English	27.8	49	12.5	43.6	21.3	10.9	50	31.4	22.8	22.9	35.1	22.9
Luganda	29.7	44.5	86.5	0.9	10.7	6.3	43.8	24.3	32.2	29.6	28.1	30.8
Teso/Lesogo	11.2	4.5	0	48.3	0	0.5	1.3	7.4	15.4	14	6.2	14.6
Lago	0.5	0	0	1.9	0	0.5	0	0	0	1.5	0	0.8
Runyakole/Rutoro	30.8	2	1	5.2	68	81.8	5	36.9	29.6	32	30.6	30.9

2.2 CHARACTERISTICS OF HOUSEHOLDS

Table 4: Household composition

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	200	200	211	197	192	80	325	267	328	405	595
Number of household members per household (mean)	4.74	4.04	4.78	5.38	4.78	4.7	3.72	4.7	5.06	4.78	4.5	4.9
Number of women of reproductive age per household (mean)	1.22	1.25	1.16	1.18	1.18	1.32	1.2	1.23	1.19	1.23	1.23	1.21
Number of children under age 5 per household (mean)	1.57	1.39	1.65	1.56	1.71	1.53	1.42	1.57	1.64	1.55	1.54	1.59

Table 5: Age distribution of household members

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	4742	808	955	1135	942	902	298	1526	1351	1567	1824	2918
0 -<1 years	1.9	4.1	1.7	2.4	1.4	0.1	3	1.6	2.4	1.5	1.8	2
1 -<2 years	4.6	5.1	4.7	3.1	4.2	6.4	6.4	4.8	4.4	4.3	5.1	4.3
2 -<3 years	7.1	6.1	7.4	6	9.1	7.2	7.4	8.3	6.5	6.6	8.1	6.5
3 -<4 years	7.3	8.3	7.2	6.2	8.2	7.2	9.7	6.9	6.8	7.7	7.4	7.3
4 -<5 years	7.7	7.9	9.2	6.7	6.7	8.2	8.7	7	7.8	8	7.3	8
5 – 14 years	26.2	15.6	30.2	33.1	25.4	23.9	14.4	27.1	28.8	25.4	25.0	27.0
15-49 years	43.0	48.6	38.8	40.6	43.3	44.9	48.3	42.7	40.5	44.4	43.6	42.6
50+ years	2.1	4.3	0.7	2	1.7	2	2	1.6	2.7	2	1.6	2.4

2.3 SOCIO-ECONOMIC CHARACTERISTICS

Table 6: SES indicators

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	200	200	211	197	192	80	325	267	328	405	595
Employment of main wage earner												
Regular	30.1	35	27.5	37.9	23.4	26	50	43.4	20.2	20.1	44.7	20.2
Seasonal	26.1	20.5	23	23.7	26.9	37	23.8	14.5	32.2	33.2	16.3	32.8
Casual	39	34	49.5	31.3	47.2	33.3	21.3	40.3	41.2	40.2	36.5	40.7
Main wage earner's yrs. of schooling												
0	5.1	10	4	6.6	0.5	4.2	10	1.2	6.4	6.7	3	6.6
1-5	5.9	1.5	4.5	5.7	6.6	11.5	0	4.9	6.7	7.6	4	7.2
6-12	43.3	35.5	40.5	41.2	51.8	47.9	31.3	37.5	45.7	50	36.3	48.1
13+	27.5	27	26	32.2	29.4	22.4	38.8	41.5	17.6	18.9	41	18.3
Don't Know	18.2	26	25	14.2	11.7	14.1	20	14.8	23.6	16.8	15.8	19.8
Household Items												
Electricity	32.5	42.5	34	28.9	22.8	34.4	76.3	62.2	13.5	7.9	64.9	10.4
A radio	85.6	91	94	72.5	85.3	85.9	90	93.5	82.8	79	92.8	80.7
A television	14.8	24	22	11.8	5.1	10.9	51.3	27.1	3	3.4	31.9	3.2
A telephone/Cell phone	6.9	11	12	3.8	3.6	4.2	22.5	11.7	2.2	2.1	13.8	2.2
A refrigerator	6.5	12	10	4.7	2	3.6	26.3	11.1	1.1	1.5	14.1	1.3
A bicycle	47.7	32	45	75.8	55.8	27.6	3.8	45.5	50.9	57.9	37.3	54.8
A motorcycle	7.2	4.5	7.5	7.6	12.2	4.2	5	11.4	5.2	5.2	10.1	5.2
A car or truck	4.7	6.5	7.5	2.8	2.5	4.2	13.8	8.3	1.5	1.5	9.4	1.5
An animal-drawn plough	1.5	0	0	7.1	0	0	0	0	1.9	3	0	2.5
Windows with mosquito screens	10.7	18.5	3.5	11.8	14.7	4.7	28.8	13.5	7.1	6.4	16.5	6.7

Table 6: SES indicators (continued)

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	200	200	211	197	192	80	325	267	328	405	595
Energy source for cooking												
Electricity	1.4	2.5	3.5	0.5	0	0.5	6.3	2.5	0.4	0	3.2	0.2
LPG/natural gas	0	0	0	0	0	0	0	0	0	0	0	0
Coal, lignite	0	0	0	0	0	0	0	0	0	0	0	0
Charcoal	48.8	62	43.5	37.4	49.2	52.6	92.5	77.2	27	27.7	80.2	27.4
Firewood, straw	49.6	34.5	53	62.1	50.8	46.9	0	20.3	72.7	72	16.3	72.3
Dung	0.1	0.5	0	0	0	0	0	0	0	0.3	0	0.2
Source of drinking water												
Piped water												
Piped into home or plot	6.1	6.5	5	10	1	7.8	16.3	14.2	0.7	0	14.6	0.3
Public tap	21.6	34	27	7.6	2.5	38	70	41.8	4.1	4	47.4	4
Well water												
Well in residence/plot	4.7	4.5	6	0	7.1	6.3	1.3	1.5	8.2	5.8	1.5	6.9
Public shallow well	22.3	17	43.5	16.6	10.2	24.5	2.5	8	35.2	30.8	6.9	32.8
Public bore hole	32.3	28	17	58.3	46.2	9.9	1.3	20.9	40.4	44.5	17	42.7
Surface water												
Spring	10.5	10	0	6.6	29.9	6.3	8.8	12.9	9.4	9.5	12.1	9.4
River/stream	1.7	0	0.5	0.5	2	5.7	0	0.3	0	4.9	0.2	2.7
Pond/lake	0.3	0	0.5	0.5	0	0.5	0	0	1.1	0	0	0.5
Tanker truck	0.2	0	0	0	1	0	0	0	0	0.6	0	0.3
Rainwater	0.2	0	0.5	0	0	0.5	0	0.3	0.4	0	0.2	0.2
Bottled water	0.1	0	0	0	0	0.5	0	0	0.4	0	0	0.2
Other												
Well at neighbor's plot	0	0	0	0	0	0	0	0	0	0	0	0
Neighbor's tap	0	0	0	0	0	0	0	0	0	0	0	0
Sanitation Facility												
Flush toilet												
Own flush toilet	3.9	2.5	4.5	10.9	0	1	6.3	9.8	0.7	0	9.1	0.3
Shared flush toilet	2.4	1	1	8.1	0	1.6	2.5	6.8	0	0	5.9	0
Pit toilet/latrine												
Traditional pit latrine	65.9	56.5	80.5	50.7	82.7	59.9	42.5	49.8	73.8	81.1	48.4	77.8
Ventilated improved pit latrine	23.1	38	13.5	11.8	16.8	36.5	48.8	32.3	16.5	13.1	35.6	14.6
No facility/bush/field	4.4	2	0.5	18	0	0.5	0	0.3	9	5.8	0.2	7.2
Main material on floor												
Natural floor												
Earth/sand	26.8	30.5	33.5	8.1	29.4	33.9	5	12.9	30.7	42.7	11.4	37.3
Dung	11.3	1.5	0	46.4	5.6	0.5	0	3.1	21	14.3	2.5	17.3
Rudimentary floor												
Wood planks	0.1	0	0	0	0	0.5	0	0	0.4	0	0	0.2
Palm/bamboo	0.5	0	0	0.9	0	1.6	0	0	1.1	0.6	0	0.8
Finished floor												
Parquet or polished wood	0.1	0	0	0	0	0.5	0	0	0.4	0	0	0.2
Vinyl of asphalt strips	3.8	6	0	3.8	0	9.4	7.5	7.7	1.5	0.9	7.7	1.2
Ceramic tiles	0.4	0.5	0.5	0.5	0	0.5	1.3	0.9	0	0	1	0
Cement	55.3	57.5	65	40.3	63.5	51	77.5	73.5	43.8	41.2	74.3	42.4
Carpet (not loose or scattered)	1.3	3.5	0	0	1.5	1.6	8.8	1.2	0.4	0.3	2.7	0.3

Table 7: Distribution of SES levels

	Total	Site					Location				Urban/Rural	
SES levels	%	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	200	200	211	197	192	80	325	267	328	405	595
1 (N=199) LOW	19.9	6.0	14.0	39.5	19.8	19.8	1.3	6.5	27.0	32.2	5.5	29.9
2 (N=204)	20.4	22.2	28.0	14.9	18.8	18.8	1.3	8.9	30.4	28.5	7.5	29.4
3 (N=195)	19.5	21.7	15.5	13.0	30.5	17.7	7.5	14.2	24.4	23.9	12.9	24.2
4 (N=199)	19.9	23.1	19.0	10.5	23.9	23.9	33.8	29.7	13.5	12.3	30.4	12.8
5 (N=199) HIGH	19.9	27.2	23.5	22.2	7.1	19.8	56.3	40.8	4.5	3.1	23.8	3.7

SECTION 3
KNOWLEDGE AND BELIEFS ABOUT MALARIA AND MOSQUITOES

The study sought to find out whether respondents had heard of the English term "malaria," what their level of knowledge about the symptoms and causes were, whether they knew which groups were most vulnerable to severe malaria and whether they had received any information on avoiding malaria within the past year. Respondents were also asked when they are most bothered by mosquitoes.

3.1 RECOGNITION OF TERM "MALARIA"

Respondents were asked whether they had heard of the English term "malaria" in order to find out the extent to which the term can be used in promotion activities. Use of a single term around which promotion activities could take place would be important in building common understanding of the term and illness.

- Recognition of the term was nearly universal: virtually all respondents (99.6%) reported having heard of the English term "malaria."

Table 8: Recognition of English term "malaria"
Among all respondents

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	200	200	211	197	192	80	325	267	328	405	595
Yes	99.6	100	98	100	100	100	100	100	100	98.8	100	99.3
No	0.4	0	2	0	0	0	0	0	0	1.2	0	0.7

3.2 PERCEIVED SYMPTOMS AND CAUSES OF MALARIA

Malaria can exhibit a diverse set of symptoms, but fever is common to all symptomatic cases. In order to determine the extent to which respondent perceptions of malaria coincide with the biomedical concepts of the illness, respondents were asked what the symptoms and causes of malaria were.

- The great majority of respondents mentioned fever or its manifestations: 71% mentioned "fever/hot body"; 39% "feeling cold/chills"; 38% "headache"; and 26% "body aches/joint pain". Other common symptoms of malaria were also mentioned: "nausea or vomiting"(49%); "loss of appetite" (41%); "weakness" (31%); "diarrhea" (21%). Only 6% mentioned "convulsions/fits," a symptom of severe malaria.
- The vast majority of respondents who had heard of malaria knew that mosquitoes cause malaria (92%). However, 21% named *only* mosquitoes as the cause; 70% erroneously believed that there were additional causes of malaria as well, and 6% thought malaria was caused *only* by factors other than mosquitoes. The main misperceptions were that malaria is caused by "dirty surroundings" (32%), "drinking dirty water" (30%), and "being in the rain" (20%). Thirteen percent (13%) thought that one could catch malaria from "another person with malaria."

Table 9: Perceived symptoms of malaria

Among respondents who have heard of malaria (multiple responses possible)

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	996	200	196	211	197	192	80	325	267	324	405	591
Fever	71.4	56.5	70.4	78.7	70.6	80.7	52.5	74.8	72.3	71.9	70.4	72.1
Chills/shivering	39.2	40	37.2	41.7	30.5	46.4	41.3	39.7	35.2	41.4	40	38.6
Cough	10.8	7	5.6	16.6	14.7	9.9	3.8	10.5	8.2	15.1	9.1	12
Headache	38.4	23	33.2	46.4	49.2	39.6	30	44	36	36.7	41.2	36.4
Nausea or vomiting	48.8	61.5	27	48.3	59.9	46.9	67.5	44	44.9	52.2	48.6	48.9
Diarrhea	21.3	18	20.9	21.8	21.3	24.5	18.8	21.2	18.4	24.4	20.7	21.7
Dizziness	9.5	10.5	10.7	8.1	10.7	7.8	15	8	11.2	8.3	9.4	9.6
Loss of appetite	40.7	42	39.3	36	53.3	32.8	41.3	41.5	40.8	39.5	41.5	40.1
Body ache or joint pain	25.8	26	15.8	28.4	30.5	28.1	31.3	28.3	24.3	23.1	28.9	23.7
Pale eyes or palms	17.4	12	15.8	14.7	23.4	21.4	6.3	18.8	23.6	13.6	16.3	18.1
Convulsions/fits	5.8	11.5	1	3.3	8.6	4.7	6.3	4.6	6.4	6.5	4.9	6.4
Weakness	31.3	47.5	37.8	22.7	28.9	19.8	47.5	28.3	30.7	30.9	32.1	30.8
Rash	3.9	3.5	2	4.3	7.1	2.6	0	3.4	6	3.7	2.7	4.7
Other:												
Sleepiness	0.2	0.5	0	0	0	0.5	1.3	0	0	0.3	0.2	0.2
Change in skin color	0.2	0	0.5	0.5	0	0	0	0.6	0	0	0.5	0
Dehydration/thirsty	0.2	1	0	0	0	0	2.5	0	0	0	0.5	0
Sore/dry/pale mouth or lips	0.1	0	0	0	0	0.5	0	0	0	0.3	0	0.2
Sneezing/running nose/cold	0.1	0	0	0	0.5	0	0	0.3	0	0	0.2	0
Weight loss	0.1	0.5	0	0	0	0	0	0	0.4	0	0	0.2
Constipation	0.1	0.5	0	0	0	0	1.3	0	0	0	0.2	0
Eye problems	0.5	0.5	0	1.9	0	0	1.3	0.6	0.4	0.3	0.7	0.3
Unhappy/crying child	0.5	0	0	2.4	0	0	0	1.2	0.4	0	1	0.2
Yellow urine	0.4	0	0	0.5	1.5	0	0	0.6	0.4	0.3	0.5	0.3
Other	0.3	0.5	0	0.5	0	0.5	1.3	0	0	0.6	0.2	0.3
Don't Know	0.5	2.5	0	0	0	0	1.3	0	0.7	0.6	0.2	0.7

Table 10: Perceived causes of malaria

Among respondents who have heard of malaria (multiple responses possible)

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	996	200	196	211	197	192	80	325	267	324	405	591
Mosquitoes	91.6	89	97.4	91.9	87.8	91.7	92.5	93.2	93.6	88	93.1	90.5
Being in the rain	20.2	25	22.4	14.7	21.3	17.7	23.8	16.6	21	22.2	18	21.7
Getting cold	11.9	10.5	3.1	28	13.7	3.1	8.8	12.6	12.4	11.7	11.9	12
Getting hot/sun overexposure	12.4	15.5	8.2	14.7	20.3	3.1	10	8.6	15.4	14.5	8.9	14.9
Drinking dirty water	30.3	23.5	36.2	16.6	51.3	25	27.5	32	26.2	32.7	31.1	29.8
Eating cold or dirty food	15.9	7	18.4	13.3	37.6	3.1	7.5	16.9	13.9	18.5	15.1	16.4
Overwork	5.8	8	1	4.3	13.7	2.1	6.3	5.5	4.1	7.4	5.7	5.9
God/Allah	1.8	0.5	4.6	0	3.6	0.5	0	2.2	1.1	2.5	1.7	1.9
Another person with malaria	12.8	17.5	15.3	6.6	22.8	1.6	23.8	12.3	11.2	11.7	14.6	11.5
Dirty surroundings	32.2	38	34.7	18	54.3	16.7	38.8	30.5	32.2	32.4	32.1	32.3
Standing water	14.6	16.5	17.9	7.1	12.7	19.3	18.8	14.2	15.7	13	15.1	14.2
Other:												
Drinking unchlorinated/unboiled water	1.1	0.5	0	0	0.5	4.7	0	1.2	0.7	1.5	1	1.2
Bad diet	0.7	0	0.5	0.5	2	0.5	0	0.3	0.7	1.2	0.2	1
Being bitten by other insects/pests	0.7	1.5	1	0.5	0.5	0	0	0.3	1.1	0.9	0.2	1
Cow/spoiled milk/yogurt	0.6	0	0	1.4	0	1.6	0	0	1.1	0.9	0	1
Flies	0.5	0	0	1.4	0	1	0	0	0.7	0.9	0	0.8
Bad hygiene	0.2	0	0	0.9	0	0	0	0.6	0	0	0.5	0
Travelling/changing environment	0.2	0	0	0	1	0	0	0	0.4	0.3	0	0.3
Weather	0.1	0	0	0	0.5	0	0	0	0	0.3	0	0.2
Unripe fruit/vegetables	0.1	0	0	0	0	0.5	0	0	0	0.3	0	0.2
Seasons (winter,maize,harvesting, change of, rainy)	0.1	0	0	0	0.5	0	0	0	0	0.3	0	0.2
Other	1.1	0	0.5	0.9	2.5	1.6	0	1.5	1.5	0.6	1.2	1
Don't Know	2.0	3	0	1.9	0.5	4.7	1.3	2.2	2.2	1.9	2	2

Table 11: Knowledge that mosquitoes are the only cause of malaria
Among respondents who have heard of malaria

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	996	200	196	211	197	192	80	325	267	324	405	591
Mosquitoes only	21.2	19.0	18.4	29.9	3.0	35.4	25.0	22.8	24.0	16.4	23.2	19.8
Mosquitoes and other causes	70.4	70.0	79.1	62.1	84.8	56.3	67.5	70.5	69.7	71.6	69.9	70.7
Other causes only	6.4	8.0	2.6	6.2	11.7	3.6	6.3	4.6	4.1	10.2	4.9	7.4
Don't know	2.0	3.0	0.0	1.9	0.5	4.7	1.3	2.2	2.2	1.9	2.0	2.0

3.3 KNOWLEDGE OF VULNERABLE GROUPS

In order to measure knowledge of vulnerable groups—children under five and pregnant women—respondents who recognized the term malaria were shown a page with drawings of five household members: a man, a woman (not pregnant), a pregnant woman, a child of age 3, and a child of age 6. They were asked to select the person most vulnerable to a serious case of malaria and to then select, among the remaining, who else is most vulnerable.

- Most respondents (80%) selected the two correct drawings: those of the young child and the pregnant woman.
- Knowledge of vulnerable groups was fairly similar in urban (82%) and rural areas (79%). There was, however, variation by site, with knowledge being highest in the Hoima site (87%) and lowest in the Kampala site (73%).
- Twenty percent (20%) included in their selection a household member who was not among the most vulnerable: 15% selected a child of 6 years; 2% the non-pregnant woman; and 1% selected the man.

Table 12: Selection of vulnerable groups
Among respondents who have heard of malaria (multiple responses possible)

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	996	200	196	211	197	192	80	325	267	324	405	591
Man	1.3	2.0	0	1.9	2.5	0	2.5	1.5	0.4	1.5	1.7	1.0
Woman	1.7	0.5	1.0	1.9	3.6	1.6	0	2.2	1.5	1.9	1.7	1.7
Pregnant woman	82.5	77.5	81.1	82.5	88.8	82.8	81.3	84.3	82	81.5	83.7	81.7
Child of 6 years	15.1	20.0	16.8	14.7	7.1	16.7	16.3	12.6	16.9	15.7	13.3	16.2
Child of 3 years	97.0	94.0	98.5	98.1	97.0	97.4	95.0	97.2	97.8	96.6	96.8	97.1

Table 13: Knowledge of vulnerable groups
Among respondents who have heard of malaria

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	996	200	196	211	197	192	80	325	267	324	405	591
Know vulnerable groups (pregnant woman and child under 5)	80.3	73	80.6	80.6	87.3	80.2	77.5	82.8	80.5	78.4	81.7	79.4
Does not know vulnerable groups	19.7	27	19.4	19.4	12.7	19.8	22.5	17.2	19.5	21.6	18.3	20.6

3.4 EXPOSURE TO INFORMATION ON AVOIDING MALARIA

In order to obtain a general idea of the extent to which people are currently being given information about preventing malaria, respondents who had heard of "malaria" were asked whether they had received any information about preventing malaria in the past year. Those who had heard something were asked where they heard it.

- The vast majority of respondents (81%) who had heard of malaria reported that they had received information about avoiding malaria in the past 12 months. There was virtually no variation by site or by urban-rural location.
- Of those respondents who had heard of malaria, most (96%) had heard information about preventing the disease from a "professional"source, primarily the mass media and health personnel. Seventy-five percent (75%) mentioned having heard information about avoiding the disease on the radio; 45% heard from personnel in health facilities and 17% had seen a poster at a health facility; 11% heard information from their church or mosque; and 6% from TV. A large minority of respondents (45%) said they had heard something from non-professional sources such as neighbors or friends.
- Urban respondents were somewhat more likely than rural ones to have heard something about malaria prevention on the radio (82% vs. 70%) and TV (11% vs. 3%). Personal networks were more common sources of malaria information in rural areas than in urban areas: "friends/neighbors/relatives" was mentioned as a source by 49% of rural respondents, compared with 39% of urban respondents. However, about the same proportion of urban as rural residents (45%) had heard something about malaria from health personnel.

Table 14: Exposure to information on avoiding malaria
Among respondents who have heard of malaria

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	996	200	196	211	197	192	80	325	267	324	405	591
Yes	81.3	84	82.7	73.5	85.3	81.8	82.5	82.2	79.8	81.5	82.2	80.7
No	18.7	16	17.3	26.5	14.7	18.2	17.5	17.8	20.2	18.5	17.8	19.3

Table 15: Exposure to information on avoiding malaria, by source
Among respondents who have seen/heard information about malaria in the 12 months prior to the interview (multiple responses possible)

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	810	168	162	155	168	157	66	267	213	264	333	477
Radio	74.9	82.7	74.7	55.5	81	79.6	81.8	82.4	73.7	66.7	82.3	69.8
Television	6.3	6.5	9.9	2.6	6	6.4	13.6	10.9	3.3	2.3	11.4	2.7
News paper/magazine	8.8	3.6	9.3	5.8	15.5	9.6	4.5	12.4	4.2	9.8	10.8	7.3
Staff at shop/pharmacy/market	5.1	8.9	5.6	2.6	7.7	0	6.1	4.1	5.6	5.3	4.5	5.5
Poster/notice at shop/pharmacy/ market	7.8	10.1	6.2	0.6	17.9	3.2	10.6	5.2	10.8	7.2	6.3	8.8
Health staff/personnel	45.2	40.5	35.2	56.1	49.4	45.2	36.4	49.1	44.1	44.3	46.5	44.2
Poster/notice at health facility	16.9	20.8	8.6	10.3	29.2	14.6	21.2	17.6	10.8	20.1	18.3	15.9
Church/mosque	10.9	4.8	3.1	6.5	31.5	7.6	4.5	12	10.8	11.4	10.5	11.1
School	1.9	0.6	0.6	2.6	3.6	1.9	0	1.9	1.4	2.7	1.5	2.1
Drama Group	1.7	2.4	1.9	0	3	1.3	0	1.9	1.4	2.3	1.5	1.9
Friends/Neighbors/Relatives	45.0	65.5	35.8	40.6	57.1	24.2	62.1	34.1	46	51.1	39.6	48.8
Organizations	1.3	0	0.6	3.2	2.4	0.6	0	0.4	2.8	1.5	0.3	2.1
Other												
Civil servants	0.1	0	0	0	0	0.6	0	0	0.5	0	0	0.2
Don't Know	1	0.6	0	1.9	0.6	1.9	1.5	0.4	1.4	1.1	0.6	1.3

Table 16: Exposure to information from "non-professional" and "professional" sources
Among respondents who have heard of malaria

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	810	168	162	155	168	157	66	267	213	264	333	477
"Non-professional" sources only	3.6	1.8	7.4	7.1	0	1.9	3.0	1.9	3.8	5.3	2.1	4.6
"Non-professional" and "professional" sources	41.4	63.7	28.4	33.5	56.5	22.3	59.1	31.8	42.3	45.8	37.2	44.2
"Professional" sources only	54.1	33.9	64.2	57.4	42.9	73.9	36.4	65.9	52.6	47.7	60.1	49.9
Don't know	1.0	.6	0	1.9	.6	1.9	1.5	.4	1.4	1.1	.6	1.3

3.5 MOSQUITO BITING PATTERNS

- When asked what time(s) of the day mosquitoes bite them the most, the vast majority of respondents (81%) said at night when they are sleeping, and 69% said in the evening or night before sleeping.

Table 17: Time of day when mosquitoes bother or bite the most
Among all respondents (multiple responses possible)

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	200	200	211	197	192	80	325	267	328	405	595
Morning	4.6	2	5	7.1	5.6	3.1	2.5	4.9	3.4	5.8	4.4	4.7
Afternoon	1.3	0.5	0.5	0.9	4.6	0	0	1.2	1.5	1.5	1	1.5
Evening or night before sleeping	68.8	59	64	83.4	72.6	64.1	67.5	69.2	68.2	69.2	68.9	68.7
At night when you are sleeping	80.6	77.5	79.5	91.5	78.2	75.5	78.8	85.2	76.8	79.6	84	78.3
All day long	3.3	1	0	3.3	10.7	1.6	0	4.3	4.9	1.8	3.5	3.2

SECTION 4
MOSQUITO NETS

4.1 PERCEIVED ADVANTAGES AND DISADVANTAGES OF NET USE BY VULNERABLE GROUPS

Children under five and pregnant women are most vulnerable to getting a serious case of malaria, and a key measure of the success of NetMark will be whether it achieves gains in the proportions of these vulnerable groups regularly sleeping under a treated net. All respondents, whether net owners or not, were asked what advantages and disadvantages they saw in a child under five sleeping under a net, in a child under five sleeping under a *treated* net, and in a pregnant woman sleeping under a *treated* net. NetMark qualitative research showed that perceived advantages/disadvantages for children under five and for pregnant women differed; therefore each of those groups was asked about separately. Further, questions about advantages/disadvantages of "sleeping under a net" were separated from the questions about "sleeping under a treated net" since qualitative research showed that the perceived benefits of and barriers to sleeping under a net were different from those for sleeping under an insecticide-treated net. Responses were unprompted and multiple responses were accepted.

Since many people may not have heard of sleeping under a treated net, it was necessary to introduce the concept before asking for a reaction to it. Before being asked about perceptions of sleeping under a treated net, each respondent was told that a treated net was one that had been dipped in or sprayed with insecticide. Then the questions about advantages and disadvantages were asked.

Given that perceptions may differ among those who are familiar with using nets and those who are not, in the tables that follow, the data for the "advantages and disadvantages" questions are further broken down by net owners and non-owners.

Advantages of sleeping under a mosquito net for child under five

- Virtually all respondents (99.8%) named at least one advantage for a child under five sleeping under a mosquito net.
- The most commonly mentioned advantage of a child under five sleeping under a mosquito net was to "avoid getting bitten by mosquitoes" (81%) and "avoid getting malaria" (62%) (using either the word "malaria" or a local term for the illness). Other advantages frequently mentioned were "gives warmth" (22%), "sleep better" (20%), "don't get bothered by other insects/pests" (17%).
- Almost one-fourth (23%) mentioned economical benefits: that the net saved money because the child was not sick (15%) or that the net was a long-lasting or economical solution to mosquito/malaria problems (8%). Respondents in Masaka and Hoima were most likely to mention these advantages (36% and 30%, respectively).
- There was little difference between net owners and non-owners in advantages mentioned.

Table 18: Perceived advantages of sleeping under a mosquito net for child under five
Among all respondents (multiple responses possible)

		Site					Location				Urban/Rural		Net Ownership	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far rural	Total Urban	Total Rural	Net owners	Non-owners
BASE	1000	200	200	211	197	192	80	325	267	328	405	595	340	660
Avoid getting bitten by mosquitoes	80.6	73.5	76	84.4	81.7	87.5	76.3	79.7	81.3	82	79	81.7	80.6	80.6
Avoid getting "malaria"	34.6	37.0	36.0	43.1	28.9	27.1	51.3	40	27.3	31.1	42.2	29.4	44.1	29.7
Avoid getting [local term for malaria]	27.7	25.0	40.0	22.3	39.6	11.5	16.3	22.5	33.0	31.4	21.2	32.1	19.4	32.0
Don't get bothered by other insects/ pests	17.4	12.0	10.0	17.1	24.4	24.0	8.8	22.8	17.2	14.3	20.0	15.6	20.3	15.9
Sleep better	20.1	23	23.5	22.3	21.3	9.9	12.5	24.0	19.1	18.9	21.7	19.0	17.9	21.2
Warmer/gives warmth	22.2	12.0	6.5	21.8	46.7	24.5	13.8	23.1	21.7	23.8	21.2	22.9	26.2	20.2
Protects against dust/dirt	7.3	7.5	3.0	8.5	9.1	8.3	2.5	6.8	10.1	6.7	5.9	8.2	6.5	7.7
Gives privacy	7.1	8.5	4.0	4.3	15.7	3.1	12.5	7.7	5.6	6.4	8.6	6.1	7.9	6.7
Saves money/time because child not sick	14.7	16.0	24.0	12.8	16.8	3.6	15.0	11.7	20.6	12.8	12.3	16.3	12.1	16.1
Is an economical/lasting solution	8.0	6.5	12	2.8	13.2	5.7	11.3	7.1	6.4	9.5	7.9	8.1	9.7	7.1
Other	2.4	1.0	0.5	4.7	4.0	1.5	0	3.6	3.0	1.2	2.9	1.9	2.4	4.0
Don't Know	0.2	0.5	0	0	0	0.5	0	0	0	0.6	0	0.3	0.3	0.2

Disadvantages of sleeping under a mosquito net for child under five

- About one-third (32%) of respondents did not cite any disadvantage ("none" or "don't know any") of a child under five sleeping under a mosquito net: 19% said there were no disadvantages; 13% said that they did not know of a disadvantage.
- In addition to the perception that nets are hot (24%), the most frequently mentioned disadvantages had to do with concerns about safety and inconvenience: "child might suffocate" (23%); child might get caught/trapped" (21%) and "difficult/inconvenient if child has to get up at night" (17%). About 20% mentioned that mosquitoes can still bite through the net (11%) or get inside (9%) — disadvantages that would be resolved by insecticide treatment.
- There were urban-rural differences in mention of "child might suffocate," with 30% of urban respondents and 18% of rural areas mentioning suffocation.
- Fourteen percent (14%) said that a disadvantage was that nets were expensive, with differences between net owners and non-owners: 5% of net owners and 18% of non-owners mentioned that nets were expensive or unaffordable.

Table 19: Perceived disadvantages of sleeping under a mosquito net for child under five
Among all respondents (multiple responses possible)

		Site					Location				Urban/Rural		Net Ownership	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far rural	Total Urban	Total Rural	Net owners	Non-owners
BASE	1000	200	200	211	197	192	80	325	267	328	405	595	340	660
It is hot sleeping under a net	24.0	27	8	24.2	45.7	15.1	22.5	28	19.1	24.4	26.9	22	30	20.9
Mosquitoes can still bite through the net	10.5	18	2	7.6	23.9	1	13.8	9.2	11.2	10.4	10.1	10.8	10.9	10.3
Mosquitoes can still get in	8.7	11.5	3.5	6.6	20.3	1.6	13.8	8.9	7.1	8.5	9.9	7.9	8.2	8.9
Mosquitoes still make noise	7.9	9.5	5.5	1.9	16.8	6.3	3.8	5.5	8.2	11	5.2	9.7	8.5	7.6
It is difficult/inconvenient if child has to get up at night	17.4	20	11	7.6	24.9	24.5	11.3	19.4	18	16.5	17.8	17.1	16.8	17.7
It takes time to tuck in the net each night	9.3	17.5	2	4.3	13.7	9.4	6.3	6.2	15.4	8.2	6.2	11.4	6.8	10.6
There is not enough air under the net	9.0	11	3	11.8	14.2	4.7	15	7.4	8.6	9.5	8.9	9.1	9.1	8.9
Child might suffocate	23.3	31	17.5	12.8	32.5	23.4	43.8	27.1	12.7	23.2	30.4	18.5	27.4	21.2
Child may tear net	6.0	6	5.5	5.7	9.6	3.1	8.8	5.5	4.5	7	6.2	5.9	5.9	6.1
Child might get caught/trapped	21.4	30	15	10.4	25.4	27.1	37.5	20.6	16.1	22.6	24	19.7	23.2	20.5
Child will get used to net and won't be able to sleep w/o it	3.4	0.5	1.5	1.4	10.2	3.6	0	4.3	5.6	1.5	3.5	3.4	3.2	3.5
Too expensive/can't afford net	13.7	19.5	10.5	8.1	19.8	10.9	15	9.5	16.9	14.9	10.6	15.8	5	18.2
Other	2.0	0	5	4.7	2.5	2.0	0	3.0	1.4	1.8	2.4	1.6	3.6	1.3
None	19.0	11.5	18.5	33.6	8.1	22.4	11.3	17.5	20.2	21.3	16.3	20.8	17.6	19.7
Don't Know	12.5	6	29	8.1	7.6	12	5	13.5	16.5	10.1	11.9	12.9	10.6	13.5

Advantages of sleeping under a *treated* net for child under five

- The vast majority of respondents (93%) named at least one advantage for a child under five sleeping under a *treated* net.
- Most advantages cited for a child under five sleeping under a *treated* net had to do with its greater efficacy: "kills mosquitoes" (48%), "works better against mosquitoes than an untreated net" (40%), "repels mosquitoes away from net" (30%), "is better at preventing malaria" (using either the term "malaria" or a local term for the illness) (46%), and "child is more protected" (24%).
- There was a greater tendency for urban residents and for net owners to mention the advantage of repelling mosquitoes from the net; otherwise, there were no large differences between urban and rural respondents, or net-owners or non-owners on advantages mentioned.

Table 20: Perceived advantages of sleeping under a treated mosquito net for child under five
Among all respondents (multiple responses possible)

		Site					Location				Urban/Rural		Net Ownership	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far rural	Total Urban	Total Rural	Net owners	Non-owners
BASE	1000	200	200	211	197	192	80	325	267	328	405	595	340	660
Works better against mosquitoes than an untreated net	40.1	34	33	56.4	54.8	20.8	28.8	40	43.1	40.5	37.8	41.7	46.5	36.8
Kills mosquitoes	48.3	23	74.5	46.9	56.3	40.6	27.5	56.3	42.3	50.3	50.6	46.7	42.6	51.2
Repels mosquitoes away from net	29.9	39.5	16	37	32.5	24	48.8	34.8	24	25.3	37.5	24.7	38.5	25.5
Kills/repels other insects or pests	17.9	20.5	11	16.6	22.8	18.8	16.3	18.8	16.5	18.6	18.3	17.6	18.2	17.7
Is better at preventing "malaria"	24.8	31	29.5	18	23.4	22.4	37.5	28.3	19.5	22.6	30.1	21.2	32.4	20.9
Is better at preventing [local term for malaria]	20.8	22	29.5	15.2	31.5	5.7	13.8	20	21.7	22.6	18.8	22.2	12.1	25.3
Child is more protected	24.4	34	21	24.6	32.5	9.4	26.3	17.8	28.8	26.8	19.5	27.7	22.4	25.5
Save more money/time because child is not sick	5.1	2.5	10.5	4.3	7.1	1	1.3	6.5	5.6	4.3	5.4	4.9	5.6	4.8
Other	0.7	0.5	0	1.0	2.0	0	0	0.6	1.1	0.6	0.4	0.9	0.6	0.8
None	3.4	1.5	0.5	0.5	0	15.1	1.3	2.2	5.2	3.7	2	4.4	2.1	4.1
Don't Know	3.3	2	1.5	4.3	3	5.7	0	2.8	4.9	3.4	2.2	4	1.5	4.2

Disadvantages of sleeping under a *treated* net for child under five

- One third (34%) of respondents did not cite any disadvantage ("none" or "don't know any") of a child under five sleeping under a *treated* net: 16% said there were no disadvantages; 18% said that they did not know of a disadvantage.
- The most commonly mentioned disadvantages had to do with concerns about the safety of the chemical: "chemical is dangerous" (33%), "chemical can kill child" (15%), "child might chew/suck net (21%), "causes irritation/cough" (12%) and "causes other illness" (17%). Respondents also mentioned that the "smell is bad" (21%).

Table 21: Perceived disadvantages of sleeping under a treated mosquito net for child under five
Among all respondents (multiple responses possible)

		Site					Location				Urban/Rural		Net Ownership	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far rural	Total Urban	Total Rural	Net owners	Non-owners
BASE	1000	200	200	211	197	192	80	325	267	328	405	595	340	660
Insecticide is not effective	4.8	0.5	6.5	1.9	14.2	1	0	5.8	5.6	4.3	4.7	4.9	4.1	5.2
Smell is bad	21.1	26.5	9.5	19.4	25.4	25	21.3	18.2	22.8	22.6	18.8	22.7	23.2	20
Causes irritation/cough	12.3	11	4.5	9	22.8	14.6	12.5	13.8	9.7	12.8	13.6	11.4	14.4	11.2
Causes other illness	17.4	17.5	10.5	15.2	18.3	26	22.5	22.2	16.9	11.9	22.2	14.1	20.6	15.8
Child might chew/suck net	21.0	32	11.5	9.5	32.5	20.3	31.3	17.8	21.3	21.3	20.5	21.3	20.3	21.4
Chemical is dangerous	32.8	46	30.5	16.6	28.4	43.8	56.3	30.8	27	33.8	35.8	30.8	32.9	32.7
Chemical can kill child	15.4	16.5	8	10	15.2	28.1	16.3	15.4	17.2	13.7	15.6	15.3	15.3	15.5
Treated net can't be washed	3.5	3	2.5	1.9	8.1	2.1	2.5	3.7	4.5	2.7	3.5	3.5	2.4	4.1
Treated net gets dirty	2.1	2.5	0	0	8.1	0	1.3	3.1	1.9	1.5	2.7	1.7	1.8	2.3
Other														
Too hot under net	1.0	2	1	1.9	0	0	0	0.6	1.5	1.2	0.5	1.3	1.2	0.9
Expensive	0.5	0	0.5	0.9	0.5	0.5	0	1.5	0	0	1.2	0	0.6	0.5
Might suffocate/difficult to breathe/breath in contaminated air	0.4	1	0	0.9	0	0	1.3	0.6	0	0.3	0.7	0.2	0.6	0.3
Gets less fresh air	0.2	1	0	0	0	0	1.3	0	0	0.3	0.2	0.2	0.3	0.2
Fever	0.1	0	0	0.5	0	0	0	0	0.4	0	0	0.2	0.3	0
May have side effects	0.1	0.5	0	0	0	0	0	0	0.4	0	0	0.2	0	0.2
Chemicals can cause diarrhea/vomiting	0.1	0.5	0	0	0	0	1.3	0	0	0	0.2	0	0	0.2
Other	0.1	0	0	0	0.5	0	0	0.3	0	0	0.2	0	0.3	0
None	16.4	11	16.5	24.6	14.7	14.6	5	18.8	15.7	17.4	16	16.6	16.8	16.2
Don't Know	18.0	7	28	24.6	19.3	10.4	5	15.7	22.8	19.5	13.6	21	13.2	20.5

Advantages of sleeping under a *treated* net for pregnant women

- The vast majority of respondents (91%) named at least one advantage for a pregnant woman sleeping under a *treated* net.
- The most commonly mentioned advantages for a pregnant woman sleeping under a *treated* net had to do with its greater protective effect: "is better at preventing malaria" (using either the term "malaria" or a local term for the illness) (50%); "kills mosquitoes" (39%), "works better against mosquitoes than a net that has not been treated" (33%), "pregnant woman is more protected" (30%) and "repels mosquitoes away from the net" (22%).
- There were no large differences between urban and rural respondents in any of the advantages mentioned but a much higher percentage of net-owners than non-owners mentioned the advantage of a *treated* net "kills/repels other insects and pests" (30% vs. 18%) and "is better at preventing malaria" (45% vs. 33%).

Table 22: Perceived advantages of sleeping under a treated mosquito net for pregnant woman
Among all respondents (multiple responses possible)

		Site					Location				Urban/Rural		Net Ownership	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far rural	Total Urban	Total Rural	Net owners	Non-owners
BASE	1000	200	200	211	197	192	80	325	267	328	405	595	340	660
Works better against mosquitoes than net that has not been treated	32.8	31.5	29.5	48.3	44.2	8.9	27.5	34.8	36	29.6	33.3	32.4	35.6	31.4
Kills mosquitoes	39.4	17	60.5	39.3	46.2	33.9	20	45.8	37.8	39	40.7	38.5	35.0	41.7
Repels mosquitoes away from net	21.9	34.5	6.5	28.4	27.9	11.5	32.5	21.2	20.6	21	23.5	20.8	30.3	17.6
Kills/repels other insects or pests	12.4	14.5	7	10.4	23.9	6.3	15	13.8	10.1	12.2	14.1	11.3	16.2	10.5
Is better at preventing "malaria"	24.5	29	33.5	26.5	16.8	16.1	36.3	29.8	20.2	19.8	31.1	20	29.1	22.1
Is better at preventing [local name for malaria]	25.9	28.5	40.5	14.7	33.5	12.5	25	22.5	28.1	27.7	23	27.9	17.4	30.3
Is better at preventing miscarriage/stillbirth	10.8	16	1	4.7	20.8	12	17.5	8.6	7.9	13.7	10.4	11.1	12.1	10.2
Pregnant woman is more protected	30.0	40	28	29.4	37.1	15.1	38.8	28.3	30.3	29.3	30.4	29.7	29.4	30.3
Save more money/time because pregnant woman is not sick	7.8	6.5	15.5	5.7	9.6	1.6	5	7.7	9.4	7.3	7.2	8.2	7.4	8
Other	1.0	1.5	0	0.9	2.5	0	0	1.2	1.5	0.6	0.9	1.0	1.5	0.8
None	5.7	1.5	1	0.5	0	26.6	0	4.6	7.5	6.7	3.7	7.1	1.8	7.7
Don't Know	3.3	3	3	4.7	3	2.6	0	2.8	5.6	2.7	2.2	4	2.4	3.8

Disadvantages of sleeping under a *treated* net for pregnant women

- Twenty-eight percent (28%) did not cite any disadvantage ("none" or "don't know any") of a pregnant woman sleeping under a *treated* net: 15% said that there were no disadvantages; 13% said that they did not know of a disadvantage.
- The most commonly mentioned disadvantages had to do with safety and smell concerns. These were: "might make woman nauseated/vomit" (37%), "smell is bad" (37%), "chemical is dangerous" (19%), "chemical can kill fetus/cause miscarriage" (19%). Others disadvantages were "causes other illness" (16%) and "causes irritation/cough" (13%).
- The perceived disadvantages were fairly equally distributed among urban and rural locations and among net-owners and non-owners.

Table 23: Perceived disadvantages of sleeping under a mosquito net for pregnant woman
Among all respondents (multiple responses possible)

		Site					Location				Urban/Rural		Net Ownership	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far rural	Total Urban	Total Rural	Net owners	Non-owners
BASE	1000	200	200	211	197	192	80	325	267	328	405	595	340	660
Insecticide is not effective	4.2	1	4	1.4	13.7	1	1.3	4.6	4.9	4	4	4.4	4.1	4.2
Smell is bad	36.5	44.5	22	41.2	33.5	41.1	46.3	36	35.6	35.4	38	35.5	40.3	34.5
Causes irritation/cough	12.9	14	1.5	8.5	25.4	15.6	7.5	15.1	13.9	11.3	13.6	12.4	12.1	13.3
Causes other illness	15.5	11.5	4.5	14.2	23.4	24.5	8.8	20	16.1	12.2	17.8	13.9	20	13.2
Might make woman nauseated/vomit	37.3	46.5	28	21.8	43.1	48.4	40	39.7	36	35.4	39.8	35.6	37.9	37
Chemical is dangerous	19.1	22.5	19.5	10.9	17.8	25.5	32.5	17.8	15.4	20.1	20.7	18	18.5	19.4
Chemical can kill fetus/cause miscarriage	19.2	19	6	13.3	25.4	33.3	20	17.8	21.7	18.3	18.3	19.8	19.7	18.9
Treated net can't be washed	2.5	5	0.5	1.4	4.6	1	2.5	1.5	5.2	1.2	1.7	3	1.5	3
Treated net gets dirty	2.4	0.5	0	0.5	11.2	0	0	3.4	2.6	1.8	2.7	2.2	3.2	2
Other:														
Too hot under net	2.5	6	1.5	1.4	3	0.5	1.3	2.8	1.9	3	2.5	2.5	3.5	2
Might suffocate/difficult to breathe/breath in contaminated air	1	0.5	2	2.4	0	0	1.3	1.5	0.7	0.6	1.5	0.7	1.5	0.8
Causes fainting/dizziness	0.4	1.5	0	0	0	0.5	3.8	0	0	0.3	0.7	0.2	1.2	0
Gets less fresh air	0.3	1	0	0.5	0	0	1.3	0	0.7	0	0.2	0.3	0.9	0
May have side effects	0.3	0	0	0	1	0.5	0	0	0.4	0.6	0	0.5	0.6	0.2
Chemicals can kill pregnant woman	0.1	0.5	0	0	0	0	0	0	0.4	0	0	0.2	0	0.2
Be expensive	0.1	0	0	0.5	0	0	0	0.3	0	0	0.2	0	0	0.2
Other	0.1	0	0	0	0.5	0	0	0	0	0.3	0	0.2	0	0.2
None	14.6	9	18	19.4	13.2	13	6.3	16.9	14.6	14.3	14.8	14.5	14.7	14.5
Don't Know	13.4	7	20	18	17.3	4.2	5	10.2	16.5	16.2	9.1	16.3	9.1	15.6

4.2 ACCESS TO MOSQUITO NETS

Improving access to ITMs is a primary objective of the NetMark partnership, as access is a pre-requisite for ownership. All respondents, whether a net owner or not, were asked where the nearest place was where they could purchase a net. They were also asked what mode of transport they would take to get there, and how long it would take to get there.

- The nearest places respondents reported that they could buy mosquito nets were general shop (53%) and open air/structured market (18%). A greater percentage of urban (62%) than rural (47%) respondents mentioned general shops as the nearest place. Open-air market was a more common close source for rural respondents (25%) than for urban respondents (8%). Those most likely to say that nets were unavailable or that they did not know where a net could be purchased resided in the Mbarara site (9%) or in far rural areas (9%).
- Forty-five percent (45%) of the respondents reported they would go by foot to get to the nearest place they could purchase a mosquito net, and that the median amount of time by it would take on foot was 25 minutes. Rural dwellers needed a longer time by foot (38 minutes) than urban residents (19 minutes). Another 32% said they would go by car/local taxi, and that it would take a median of 44 minutes to arrive. Rural dwellers reported longer car/local taxi rides (57 minutes) than urban dwellers (22 minutes).

Table 24: Nearest place household can purchase mosquito nets
Among all households

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	200	200	211	197	192	80	325	267	328	405	595
Not available	3.1	7	3.5	0.5	0	4.7	0	0.6	4.5	5.2	0.5	4.9
Open air/structured market	18.1	16	12	36.5	6.1	18.8	18.8	5.5	27.3	22.9	8.1	24.9
Local kiosk	1.1	2.5	1.5	0	1.5	0	0	0.3	0.4	2.7	0.2	1.7
Street/table top vendor	1.7	4.5	0	1.4	0.5	2.1	6.3	0.3	1.9	1.8	1.5	1.8
General/Indian Shop	52.9	57	48.5	49.3	60.4	49.5	51.3	64.3	44.6	48.8	61.7	46.9
Textile/clothes shop/bedding shop	9.8	1	15	6.2	21.3	5.7	1.3	13.8	9.4	8.2	11.4	8.7
Wholesaler	4	3.5	5.5	1.4	6.6	3.1	3.8	4.6	4.5	3	4.4	3.7
Pharmacy/chemist	0.5	0	0	0	0.5	2.1	0	0.6	0.4	0.6	0.5	0.5
Drug store	0.1	0	0.5	0	0	0	0	0	0.4	0	0	0.2
Supermarket	2.2	0	5	2.4	0	3.6	0	4.9	1.5	0.6	4	1
Mini-mart	0.1	0.5	0	0	0	0	1.3	0	0	0	0.2	0
Project (e.g. NGO)	0.2	0	1	0	0	0	0	0	0	0.6	0	0.3
Clinic/hospital	2.1	0.5	4	1.9	3	1	1.3	1.5	3	2.1	1.5	2.5
Other:												
Hawkers/moving kiosk	2.3	6.5	0	0	0	5.2	16.3	2.2	1.1	0	4.9	0.5
Organizations	0.1	0	0.5	0	0	0	0	0.3	0	0	0.2	0
Don't Know	1.6	0.5	3	0.5	0	4.2	0	0.9	0.7	3.4	0.7	2.2

Table 25: Mode of transport to get to nearest place where net purchase can be made
Among households that know of the nearest place where they can purchase a mosquito net

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	953	185	187	209	197	175	80	320	253	300	400	553
By foot/walk	45.4	58.4	38.5	55	34	40.6	62.5	52.8	42.3	35.7	54.8	38.7
By bus	7.7	2.2	1.6	6.7	12.2	16	1.3	0.9	4.3	19.3	1	12.5
By car	31.7	36.8	45.5	7.7	45.2	25.1	33.8	24.1	38.7	33.3	26	35.8
By boat	0.1	0	0	0	0.5	0	0	0	0	0.3	0	0.2
Other:												
By bicycle	8.6	1.6	2.7	29.7	5.1	1.1	0	7.2	9.9	11.3	5.8	10.7
Motorcycle (Boda-Boda)	4.4	0	10.7	0.5	3	8.6	0	11.3	2.4	0	9	1.1
Delivered to door/hawkers	1.7	0.5	1.1	0	0	7.4	1.3	3.4	2.4	0	3	0.7

Table 26: Length of time it takes by foot to get to nearest place where net could be purchased
Among respondents who would travel by foot to get to nearest place

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	432	108	71	115	67	71	50	168	107	107	218	214
Mean no. of minutes	40.54	28.2	28.31	50.67	33.06	60.79	17.3	25.26	51.55	64.35	23.52	58.04
Standard Deviation	49.15	24.31	24.18	68.1	21.45	64.68	12.11	22.43	62.92	60.95	20.85	62.11
Median value	24.87	18.33	19.75	18.77	26.56	29.32	9.89	22.46	27.92	47.5	19.35	37.9
Don't Know	1.4	5.6	0	0	0	0	6	0	1.9	0.9	1.4	1.4

Table 27: Length of time it takes by car/local taxi to get to nearest place where net could be purchased
Among respondents who would travel by car to get to nearest place

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	290	68	80	15	88	39	27	75	96	92	102	188
Mean no. of minutes	55.63	56.65	44.92	113.2	57.93	48.51	35.7	24.73	67.04	75.09	27.64	70.98
Standard Deviation	42.86	49.33	34.93	60.35	32.77	41.95	18.8	12.5	35.52	53.62	15.13	45.34
Median value	44.22	51	32.75	110	51	29.38	31.25	19.72	57.08	54.48	22.14	56.79

4.3 AFFORDABILITY OF MOSQUITO NETS

One of the objectives of NetMark is to make ITMs more affordable. Affordability of ITMs is being monitored in several ways, mostly via other NetMark-sponsored studies. "Willingness to pay" information was gathered as part of market research conducted by Research International; and data on price of nets is being monitored using periodic retail audits and manufacturers' sales data.

This household survey contains two supplementary measures of affordability. On the assumption that actual price paid is a good indicator of affordability, respondents were asked how much they paid for each net owned. Data on price of nets is found in "Characteristics of Nets Owned" (Section 4.5). Respondents from households without nets were asked why they did not own any nets. "Cost/can't afford" is one response category, serving as a measure of the extent to which respondents perceive nets to be too expensive. Data on this question are found at the end of the next section on "Mosquito net ownership".

4.4 MOSQUITO NET OWNERSHIP

One of the main topics of interest is net ownership or "coverage"—both the extent of coverage and pattern of coverage in terms of household characteristics such as socio-economic status and location. Respondents were asked if their household owned any mosquito nets, and, if so, how many. "Net" refers to any type or shape of net except baby nets (small umbrella-type nets that only fit an infant). Respondents from households without nets were asked why they did not own a net.

Ownership patterns

- One-third (34%) of households reported owning at least one mosquito net.
- There was great variation by site in the proportion of households that owned mosquito nets, ranging from 19% in the Masaka site to 44% in Soroti site.
- Ownership was higher in urban (47%) than rural (25%) locations, and ownership decreased with distance from the urban center.
- There was a direct positive linear relationship between net ownership and SES: the higher the SES, the more likely a household was to own a net.
- About half (51%) of households owned more than one net: 35% owned two nets, and 16% owned three or more nets.
- A somewhat greater proportion of urban (56%) than rural (45%) households owned more than one net.

Table 28: Household ownership of mosquito nets
Among all households

		Site					Location				Urban/Rural		Socio-Economic Status				
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	1000	200	200	211	197	192	80	325	267	328	405	595	199	204	195	199	199
Yes	34.0	40.0	19.0	43.6	37.6	29.2	62.5	43.7	28.1	22.3	47.4	24.9	9.0	17.2	30.8	47.2	66.8
No	66.0	60.0	81.0	56.4	62.4	70.8	37.5	56.3	71.9	77.7	52.6	75.1	91.0	82.8	69.2	52.8	33.2

Table 29: Number of mosquito nets owned
Among households owning mosquito nets

		Site					Location				Urban/Rural		Socio-Economic Status				
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	340	80	38	92	74	56	50	142	75	73	192	148	18	35	60	94	133
1	49.1	57.5	71.1	37	39.2	55.4	56	40.1	56	54.8	44.3	55.4	44.4	60	61.7	52.1	39.1
2	34.7	33.8	26.3	39.1	39.2	28.6	34	42.3	22.7	32.9	40.1	27.7	33.3	28.6	26.7	29.8	43.6
3	10.9	6.3	2.6	14.1	14.9	12.5	6	10.6	17.3	8.2	9.4	12.8	16.7	5.7	8.3	14.9	9.8
4	3.5	2.5	0	6.5	4.1	1.8	4	3.5	4	2.7	3.6	3.4	5.6	5.7	3.3	2.1	3.8
5 +	1.8	0	0	3.3	2.7	1.8	0	3.5	0	1.4	2.6	0.7	0	0	0	1.1	3.8
Mean	1.76	1.54	1.32	2.03	1.95	1.66	1.58	1.92	1.69	1.63	1.83	1.66	1.83	1.57	1.53	1.7	1.93
Std Dev.	0.98	0.73	0.53	1.14	1.08	0.9	0.78	1.11	0.9	0.86	1.04	0.88	0.92	0.85	0.79	0.88	1.12

Reasons for non-ownership

- The majority (86%) of respondents from non-net owning households reported that a reason why they don't own any mosquito nets is because they "don't have any/enough money."
- A higher percentage of rural (88%) than urban (79%) households reported lack of money as a reason for non-ownership.
- Nine percent (9%) reported that nets "are not available/don't know where to get them." A total of 7% said they did not need or did not like nets.

Table 30: Reasons why households do not own any mosquito nets
Among households that do not own mosquito nets (multiple responses possible)

		Site					Location				Urban/Rural		Socio-Economic Status				
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	660	120	162	119	123	136	30	183	192	255	213	447	181	169	135	105	66
Don't have any/ enough money	85.5	73.3	84.6	98.3	87.8	83.8	66.7	81.4	88.5	88.3	79.3	88.4	88.4	88.2	87.4	83.8	60.6
Not available/don't know where to buy	9.1	9.2	17.3	1.7	2.4	11.8	3.3	3.3	10.9	12.5	3.3	11.9	9.9	9.5	7.4	8.6	10.6
Don't like them	3.6	3.3	1.9	1.7	2.4	8.8	6.7	7.7	2.1	1.6	7.5	1.8	0.6	1.8	3.7	3.8	15.2
Don't need them	3.5	4.2	1.9	5	4.1	2.9	3.3	3.3	3.1	3.9	3.3	3.6	5	0.6	5.2	2.9	3
Nets won't fit on sleeping space	3.9	12.5	3.1	1.7	2.4	0.7	20	2.7	2.6	3.9	5.2	3.4	3.9	4.7	1.5	4.8	6.1
Not enough air/ Too hot	1.1	2.5	1.2	1.7	0	0	6.7	1.6	0	0.8	2.3	0.4	0.6	0	0	2.9	4.5
Not ready to buy yet/ will buy in rainy season	0.8	0	1.9	1.7	0	0	0	1.6	0.5	0.4	1.4	0.4	0.6	0	0.7	0	4.5
Not aware/never thought about	0.5	0.8	0.6	0	0.8	0	0	0.5	0.5	0.4	0.5	0.4	0	1.2	0.7	0	0
Not used to nets/ inconvenient	0.3	0	0	0	0	1.5	0	0.5	0	0.4	0.5	0.2	0	0	1.5	0	0
It is damaged/worn out	0.3	0	0	0	1.6	0	0	0.5	0.5	0	0.5	0.2	1.1	0	0	0	0
Plan to but haven't bought one yet	0.2	0	0	0	0.8	0	0	0	0	0.4	0	0.2	0	0	0	1	0
Too small/need for whole household	0.2	0	0	0	0.8	0	0	0	0	0.4	0	0.2	0	0	0	1	0
Use/prefer another form of protection	0.2	0	0	0	0	0.7	0	0.5	0	0	0.5	0	0	0	0	0	1.5
Don't Know	1.1	0.8	3.1	0	0	0.7	0	0.5	1.6	1.2	0.5	1.3	0	1.8	2.2	0	1.5

4.5 CHARACTERISTICS OF NETS OWNED

Respondents in net-owning households were asked, for each net owned, where the net was obtained, when the net was acquired, and what brand, size, shape and price it was. They were also asked how often, if at all, the net was washed, since effectiveness of the treatment diminishes with washing, and frequency of washing will affect decisions about insecticide treatment formulations and decisions about educational messages

Where nets were obtained

- Net-owning households obtained their nets from formal and informal commercial sources: 48% of nets were purchased in a general shop, 13% in a market, 8% from street vendors, and 7% from a textile shop. A higher percentage of nets were bought in general shops in urban areas (57%) as compared to rural areas (35%), whereas a higher percentage of nets were bought in open-air markets in rural areas (20%) than in urban areas (7%).
- Few (6%) nets were reportedly obtained from non-commercial outlets such as clinics or projects; the proportion of nets from non-commercial sources was highest in the Hoima site (11%) and in far rural areas (13%). Overall, 4% of nets had been received as gifts, although gift nets were much more common in the Masaka site (16%) than in any other site.
- A higher proportion of nets from higher SES households were purchased from a formal commercial source (fixed store) than those from lower SES households. Lower SES households were more likely to obtain their net(s) from informal commercial sources such as open air markets.

Table 31: Place where net was obtained
Among total number of nets owned

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	586	123	50	181	140	92	79	262	127	118	341	245
Market	12.5	13.8	6	21	7.1	5.4	16.5	4.6	28.3	10.2	7.3	19.6
Kiosk	0.7	0.8	0	0	2.1	0	0	0	0.8	2.5	0	1.6
Street vendor	7.5	23.6	2	2.8	2.9	5.4	26.6	2.3	5.5	8.5	7.9	6.9
General shop	47.6	39.8	38	55.2	42.9	55.4	36.7	63	35.4	33.9	56.9	34.7
Textile shop	6.5	0	14	5.5	12.9	3.3	0	7.3	10.2	5.1	5.6	7.8
Wholesaler	5.8	4.1	8	0	13.6	6.5	2.5	3.8	5.5	12.7	3.5	9
Pharmacy	1.7	0.8	2	0	1.4	6.5	0	0.8	3.9	2.5	0.6	3.3
Drug store	0	0	0	0	0	0	0	0	0	0	0	0
Supermarket	2.6	0	2	4.4	0	6.5	0	5.3	0.8	0	4.1	0.4
Project	2.7	0.8	2	5.5	2.9	0	1.3	4.2	1.6	1.7	3.5	1.6
Clinic	3.2	0	2	1.7	7.9	4.3	0	1.9	1.6	10.2	1.5	5.7
School	0	0	0	0	0	0	0	0	0	0	0	0
Gift	3.8	6.5	16.0	1.1	1.4	2.2	7.6	1.5	3.9	5.9	2.9	4.9
Employer	0	0	0	0	0	0	0	0	0	0	0	0
Other:												
Hawkers/moving kiosk	1.9	3.3	0	1.7	0.7	3.3	5.1	1.5	1.6	0.8	2.3	1.2
Organizations	0.3	0	0	0.6	0.7	0	0	0.4	0	0.8	0.3	0.4
Other	0.2	0	0	0	0.7	0	0	0	0	0.8	0	0.4
Don't Know	2.9	6.5	8	0.6	2.1	1.1	3.8	3.1	0.8	4.2	3.2	2.4

Table 32: Type of source where net was obtained
Among total number of nets owned

		Site					Location				Urban/Rural		Socio-Economic Status				
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	586	123	50	181	140	92	79	262	127	118	341	245	33	55	92	159	247
Informal commercial source	22.5	41.5	8	25.4	12.9	14.1	48.1	8.4	36.2	22	17.6	29.4	63.6	40	16.3	18.9	17.8
Formal commercial source	64.2	44.7	64	65.2	70.7	78.3	39.2	80.2	55.9	54.2	70.7	55.1	33.3	49.1	66.3	68.6	68
Non-commercial source	6.3	0.8	4.0	7.7	11.4	4.3	1.3	6.5	3.1	12.7	5.3	7.8	3	0	10.9	6.9	6.1
Gift	3.8	6.5	16	1.1	1.4	2.2	7.6	1.5	3.9	5.9	2.9	4.9	0	5.5	3.3	2.5	4.9
Other	0.2	0	0	0	0.7	0	0	0	0	0.8	0	0.4	0	0	0	0.6	0
Don't Know	2.9	6.5	8	0.6	2.1	1.1	3.8	3.1	0.8	4.2	3.2	2.4	0	5.5	3.3	1.9	3.2

Age of nets owned

- Two-thirds (67%) of nets owned by households had been acquired within the past 3 years. Nets in the Masaka site tended to be newest, with 84% acquired within the past 3 years.
- Eight percent (8%) of nets were acquired 5 or more years ago.

Table 33: Number of years households have owned their nets
Among total number nets owned

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	586	123	50	181	140	92	79	262	127	118	341	245
0-<1 year	10.4	13.0	8.0	9.9	7.9	13.0	16.5	8.4	12.6	8.5	10.3	10.6
1-<2 years	25.3	26.0	48.0	21.0	21.4	26.1	27.8	29.8	19.7	19.5	29.3	19.6
2-<3 years	31.6	27.6	28.0	31.5	33.6	35.9	25.3	34.0	29.1	33.1	32.0	31.0
3-<4 years	15.7	17.1	12.0	18.8	13.6	13.0	21.5	14.1	12.6	18.6	15.8	15.5
4-<5years	9.0	7.3	4.0	8.3	12.9	9.8	5.1	7.3	12.6	11.9	6.7	12.2
5+ years	7.7	7.3	0	10.5	10.7	2.2	3.8	6.5	12.6	7.6	5.9	10.2
Mean	2.1	2.0	1.6	2.3	2.3	1.9	1.8	2.0	2.3	2.3	2.0	2.3
Don't know	0.3	1.6	0	0	0	0	0	0	0.8	0.8	0	0.8

Brand of nets owned

- Few respondents were aware of the brand of their net(s). Seven percent (7%) of nets owned by households were tailor-made (non-manufactured) and therefore unbranded. Tailor-made nets were most common in Kampala proper (15%).
- Twelve percent (12%) of the nets were reported to be the PowerNet brand, which are sold via social marketing projects (i.e., on a subsidized basis). They were most common in the Kampala (29%) and Soroti (13%) sites.

Table 34: Net brands owned
Among total number of nets owned

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	586	123	50	181	140	92	79	262	127	118	341	245
PowerNet	11.6	29.3	4	12.7	2.9	3.3	21.5	8.4	14.2	9.3	11.4	11.8
RAID	0.3	0	0	1.1	0	0	0	0.4	0	0.8	0.3	0.4
Tailor-made (non-manufactured)	6.5	9.8	6	12.7	0	0	15.2	3.4	10.2	3.4	6.2	6.9
Made in China/Japan/Thailand	0.2	0	0	0	0.7	0	0	0	0	0.8	0	0.4
Other	0.7	0	4	0.6	0	1.1	0	0.8	0	1.7	0.6	0.8
Don't Know	80.7	61	86	72.9	96.4	95.7	63.3	87	75.6	83.9	81.5	79.6

Size and shape of nets owned

- The most common net sizes owned were either double (52%) or single (39%). ("Single" nets include student nets that are used in boarding schools.) Only 4% were king-size.
- Slightly over half of nets owned by households were round/conical (53%) and (43%) were rectangular. Rectangular nets predominated in the Soroti site (70%), and conical nets were found mostly in the Masaka (86%), Mbarara (74%) and Kampala (66%) sites.

Table 35: Size of nets owned
Among total number of nets owned

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	586	123	50	181	140	92	79	262	127	118	341	245
Cot net	2.9	7.3	8	1.1	1.4	0	6.3	2.3	2.4	2.5	3.2	2.4
Single	38.6	37.4	46	36.5	35.7	44.6	38	40.8	33.9	39	40.2	36.3
Double	52.2	52.8	42	51.9	55.7	52.2	53.2	50.4	52.8	55.1	51	53.9
King	4.3	0.8	4	10.5	1.4	1.1	0	5.7	7.1	0.8	4.4	4.1
Don't Know	2.0	1.6	0	0	5.7	2.2	2.5	0.8	3.9	2.5	1.2	3.3

Table 36: Shape of nets owned
Among total number of nets owned

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	586	123	50	181	140	92	79	262	127	118	341	245
Rectangular	42.8	20.3	14	70.2	52.1	20.7	17.7	48.1	49.6	40.7	41.1	45.3
Round/conical	52.9	65.9	86	29.8	45.7	73.9	68.4	50	46.5	55.9	54.3	51
Triangle/pyramid	3.2	10.6	0	0	2.1	3.3	10.1	1.1	3.1	3.4	3.2	3.3
Wedge	0.9	2.4	0	0	0	2.2	2.5	0.8	0.8	0	1.2	0.4
Don't know	0.2	0.8	0	0	0	0	1.3	0	0	0	0.3	0

Cost of nets owned

Respondents were asked what the cost of each net owned was. Note that because of potential problems with recall for older nets, and because of currency devaluations over time, these figures should be taken as very general estimates of cost.

- Households reported paying an average of 9796 Uganda Shillings (USD 5.48) per net (conversion based on the exchange rate for the dollar on the date of the data collection). For 17% of nets, cost could not be recalled or was unknown.
- There was no strong relationship between socio-economic status and price paid.
- Three percent (3%) of nets were reportedly free, with the majority of free nets found in the Masaka site (14%).

Table 37: Average cost of nets owned (Uganda Shilling)
Among total number of nets owned

		Site					Location				Urban/Rural		Socio-Economic Status				
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	586	123	50	181	140	92	79	262	127	118	341	245	33	55	92	159	247
Average price	9796	9061	15357	8979	8709	11883	9186	10217	9986	8922	10031	9475	8267	9046	10086	10001	9956
Std Dev	5982	3186	13395	2956	2316	9792	3266	6333	7837	3208	5908	6081	2565	4642	8540	7505	3695
Trade/Barter (%)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Free (%)	2.7	3.3	14.0	0.6	2.1	1.1	3.8	1.9	1.6	5.1	2.3	3.3	0	3.6	3.3	2.5	2.8
Don't Know (%)	16.7	35.8	30	11	6.4	10.9	34.2	13	16.5	13.6	17.9	15.1	9.1	14.5	13	12.6	22.3

Table 38: Average cost of nets owned (USD)
Among total number of nets owned

		Site					Location				Urban/Rural		Socio-Economic Status				
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	586	123	50	181	140	92	79	262	127	118	341	245	33	55	92	159	247
Average price	5.48	5.07	8.59	5.02	4.87	6.64	5.13	5.71	5.58	4.99	5.61	5.3	4.62	5.06	5.64	5.59	5.57
Std Dev	3.34	1.78	7.49	1.65	1.3	5.47	1.83	3.54	4.38	1.79	3.3	3.4	1.43	2.6	4.77	4.2	2.07
Trade/Barter (%)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Free (%)	2.7	3.3	14	0.6	2.1	1.1	3.8	1.9	1.6	5.1	2.3	3.3	0	3.6	3.3	2.5	2.8
Don't Know (%)	16.7	35.8	30	11	6.4	10.9	34.2	13	16.5	13.6	17.9	15.1	9.1	14.5	13	12.6	22.3

Net washing patterns

- Almost all nets (94%) owned had been washed at least once.
- Nets were washed very often: 77% were reportedly washed at least once a month, with more than one-third (37%) reportedly washed at least every two weeks.

Table 39: Net ever washed
Among total number of nets owned

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	586	123	50	181	140	92	79	262	127	118	341	245
Yes	93.7	83.7	94	96.7	97.1	95.7	82.3	96.9	93.7	94.1	93.5	93.9
No	5.1	13	6	2.2	2.1	4.3	12.7	2.3	6.3	5.1	4.7	5.7
Don't know	1.2	3.3	0	1.1	0.7	0	5.1	0.8	0	0.8	1.8	0.4

Table 40: Net washing frequency
Among nets that had been washed

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	549	103	47	175	136	88	65	254	119	111	319	230
About once a year	2.0	0	8.5	1.7	0	4.5	0	2.8	2.5	0.9	2.2	1.7
About every six months	4.2	5.8	17	2.9	0	4.5	7.7	4.3	0.8	5.4	5	3
About every three months	16.0	31.1	17	6.9	16.9	14.8	35.4	12.2	9.2	20.7	16.9	14.8
About once a month	40.3	34	38.3	45.7	39	39.8	27.7	37.8	48.7	44.1	35.7	46.5
About every two weeks	24.8	16.5	19.1	28.6	35.3	13.6	16.9	28.3	27.7	18	26	23
About once a week	11.7	12.6	0	11.4	8.8	21.6	12.3	12.6	10.1	10.8	12.5	10.4
Not Answered	0.4	0	0	1.1	0	0	0	0.8	0	0	0.6	0
Other	0.7	0	0	1.7	0	1.1	0	1.2	0.8	0	0.9	0.4
Don't know	0	0	0	0	0	0	0	0	0	0	0	0

4.6 MOSQUITO NET TREATMENT

Nets that are treated with an insecticide are much more effective against mosquito bites (and therefore malaria) than untreated nets. The insecticide kills and repels mosquitoes and other insects, even if the net is torn or is not completely tucked in. An ITN also affords some protection for others sleeping in the same room, even if they are not sleeping under the net. Nets that are "pre-treated" (i.e., already have insecticide on them when purchased) are beginning to be available in some areas, but even these nets need to be treated/ re-treated ("post-treated") regularly to remain effective.

In one section of the survey, all respondents were asked if they had heard of treating nets with an insecticide. Later, respondents living in net-owning households were asked whether their nets had ever been treated. For each net treated, respondents were asked how many months it had been since the last treatment, total number of post-treatments, product used to treat the nets, place where it was obtained, and how much it cost. Note that some calculations use the household as the unit of analysis (denominator), and others use nets as the unit of analysis.

- A minority of respondents (29%) had heard of treating mosquito nets with an insecticide. Awareness was highest in Soroti site (40%) and lowest in Kampala site (18%). Awareness of ITNs was somewhat higher in urban areas (34%) than in rural areas (25%). The higher the respondent's SES, the more likely she was to be aware of ITNs.
- A small minority of households (4%) owned a treated net. Households with a treated net were most common in the Soroti site (8%), and households in the highest SES category were much more likely than households in other SES categories to own a treated net (12% versus 0-3%). No household in the lowest SES category owned a treated net.
- Among the total number of nets owned, 12% had ever been treated: 7% had been pre-treated with insecticide before purchase/acquisition and 9% were treated after purchase/acquisition. (Note that some had been both pre-treated and re-treated.) Pre-treated nets were most common in the Mbarara site (14%), and post-treated nets were most common in the Soroti site (18%). The greatest proportion of treated nets was found in the highest SES households (17%); conversely, none of the nets from households in the lowest SES category had ever been treated.
- Among the 55 nets that had been post-treated, the average number of post-treatments was 2. Nets, on average, were last treated 4.3 months ago. There was no distinct relationship between number of treatments and age of net. Most respondents said that their net had been washed 1-4 times since last treated, although 35% could not recall the number of washings since last treatment.

- Treatment was obtained principally from non-commercial sources: 24% from projects, 18% from clinics, and 7% gifts. General shops were the most common formal commercial source (16%); it appears that treatments are not sold in informal commercial outlets such as markets.
- Most respondents (73%) were unaware what product was used to treat the net. There is no discernable relationship between source of treatment and SES because the numbers in each category are too small to permit meaningful calculation.
- Nearly half (47%) of the households did not know the cost of the insecticide treatment used. Those who cited a price reported paying an average of 2021 Uganda Shillings per insecticide treatment (about USD 1.13), but treatment costs were much higher in Mbarara and Kampala (USD 1.54) than in Hoima (USD 0.56), where most treatments were obtained from non-commercial sources. The cost of treatments was much higher in urban areas (USD 1.21) than in rural areas (USD 0.56), where, again, most treatments were obtained from non-commercial sources. There is no discernable relationship between source of treatment and SES because the numbers were very small.

Table 41: Awareness of insecticide treated mosquito nets
Among all respondents

		Site					Location				Urban/Rural		Socio-Economic Status				
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	1000	200	200	211	197	192	80	325	267	328	405	595	199	204	195	199	199
Yes	28.5	18.0	35.5	40.3	25.9	21.9	15	38.2	25.5	24.7	33.6	25.0	18.1	19.1	29.2	31.7	44.7
No	71.0	81.5	64.0	59.2	73.1	78.1	85	61.5	74.2	74.4	66.2	74.3	80.9	79.9	70.3	68.3	55.3
Not Answered	0.5	0.5	0.5	0.5	1.0	0	0	0.3	0.4	0.9	0.2	0.7	1	1	0.5	0	0

Table 42: Household ownership of treated (pre and/or post) mosquito nets
Among all households

		Site					Location				Urban/Rural		Socio-Economic Status				
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	1000	200	200	211	197	192	80	325	267	328	405	595	199	204	195	199	199
Yes	3.8	2	2.5	8.1	2.5	3.6	3.8	7.4	1.9	1.8	6.7	1.8	0	1	3.1	3	12.1
No	96.2	98	97.5	91.9	97.5	96.4	96.3	92.6	98.1	98.2	93.3	98.2	100	99	96.9	97	87.9

Table 43: Nets ever treated (pre and/or post)
Among total number of nets owned

		Site					Location				Urban/Rural		Socio-Economic Status				
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	586	123	50	181	140	92	79	262	127	118	341	245	33	55	92	159	247
Yes	11.6	4.9	16	19.3	3.6	15.2	5.1	17.6	8.7	5.9	4.7	7.3	0	9.1	7.6	8.2	17.4
No	88.4	95.1	84	80.7	96.4	84.8	94.9	82.4	91.3	94.1	85.3	92.7	100	90.9	92.4	91.8	82.6

Table 44: Ownership of pretreated mosquito nets
Among total number of nets owned

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	586	123	50	181	140	92	79	262	127	118	341	245
Yes	6.5	0.8	10	8.3	2.9	14.1	1.3	9.5	4.7	5.1	7.6	4.9
No	69.3	44.7	66	88.4	72.9	60.9	43	73.3	74.8	72	66.3	73.5
Don't know	24.2	54.5	24	3.3	24.3	25	55.7	17.2	20.5	22.9	26.1	21.6

Table 45: Ownership of post-treated mosquito nets
Among total number of nets owned

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	586	123	50	181	140	92	79	262	127	118	341	245
Yes	9.4	4.9	6	17.7	3.6	9.8	5.1	14.1	6.3	5.1	12	5.7
No	87.0	91.1	94	81.8	93.6	78.3	91.1	80.9	93.7	90.7	83.3	92.2
Don't know	3.6	4.1	0	0.6	2.9	12	3.8	5	0	4.2	4.7	2

Table 46: Treatment patterns
Among total number of nets owned

		Site					Location				Urban/Rural		Socio-Economic Status				
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE (all nets)	586	123	50	181	140	92	79	262	127	118	341	245	33	55	92	159	247
Bought untreated and never treated	88.4	95.1	84	80.7	96.4	84.8	94.9	82.4	91.3	94.1	85.3	92.7	100	90.9	92.4	91.8	82.6
Bought pre-treated and never treated	2.2	0	10	1.7	0	5.4	0	3.4	2.4	0.8	2.6	1.6	0	5.5	0	0	4
Bought pre-treated and post-treated	4.3	0.8	0	6.6	2.9	8.7	1.3	6.1	2.4	4.2	5	3.3	0	3.6	3.3	3.1	6.1
Bought untreated and subsequently treated	5.1	4.1	6	11	0.7	1.1	3.8	8	3.9	0.8	7	2.4	0	0	4.3	5	7.3

Table 47: Average number of months since net was last treated
Among nets that were post-treated

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	55	6	3	32	5	9	4	37	8	6	41	14
0 (in last month)	3.6	0	0	6.3	0	0	0	5.4	0	0	4.9	0
1-2	30.9	0	100	28.1	40	33.3	0	24.3	62.5	50	22	57.1
3-4	29.1	33.3	0	37.5	20	11.1	0	32.4	37.5	16.7	29.3	28.6
5-6	9.1	0	0	6.3	0	33.3	0	10.8	0	16.7	9.8	7.1
7-8	3.6	16.7	0	3.1	0	0	25	2.7	0	0	4.9	0
9-10	3.6	0	0	6.3	0	0	0	5.4	0	0	4.9	0
11-12	12.7	0	0	12.5	20	22.2	0	16.2	0	16.7	14.6	7.1
13-18	0	0	0	0	0	0	0	0	0	0	0	0
19-24	0	0	0	0	0	0	0	0	0	0	0	0
25+	0	0	0	0	0	0	0	0	0	0	0	0
Average months ago	4.31	4.33	1	4.25	4.5	5.56	7	4.61	2.5	4.5	4.68	3.36
Don't know	7.3	50	0	0	20	0	75	2.7	0	0	9.8	0

Table 48: Average number of times net was treated since purchase by age of net
Among nets that were post-treated

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
All nets (n=55)	2.16	2.17	2	2	4.75	1.44	2.75	2	1.5	4	2.09	2.33
0 – <1 year (n=7)	1.29	1.67	0	1	0	1	2	1	1	1	1.5	1
1 – <2 years (=21)	1.94	0	2	1.86	2.67	1.5	0	2	1.67	2	2	1.8
2 – <3 years (n=17)	3.00	2.67	2	2.38	11.00	2	3.5	2.33	1.5	11	2.55	4.67
3 – <4 years (n=4)	1.33	0	0	1	0	2	0	1	2	0	1	2
4 – <5 years (n=3)	1.67	0	0	3	0	1	0	1.67	0	0	1.67	0
5+ years (n=3)	3.00	0	0	3	0	0	0	3	0	0	3	0

Table 49: Product used to treat net
Among nets that were post-treated

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	55	6	3	32	5	9	4	37	8	6	41	14
KO Tab	3.6	0	0	0	0	22.2	0	5.4	0	0	4.9	0
Other	23.6	50	0	31.3	0	0	75	27	0	0	31.7	0
Don't Know	72.7	50	100	68.8	100	77.8	25	67.6	100	100	63.4	100

Table 50: Place where insecticide treatment was obtained
Among all nets that were post-treated

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	55	6	3	32	5	9	4	37	8	6	41	14
Market	0	0	0	0	0	0	0	0	0	0	0	0
Kiosk	0	0	0	0	0	0	0	0	0	0	0	0
Street vendor	0	0	0	0	0	0	0	0	0	0	0	0
General shop	16.4	33.3	0	21.9	0	0	50	13.5	0	33.3	17.1	14.3
Textile shop	0	0	0	0	0	0	0	0	0	0	0	0
Wholesaler	0	0	0	0	0	0	0	0	0	0	0	0
Pharmacy	9.1	0	0	0	0	55.6	0	5.4	37.5	0	4.9	21.4
Drug store	0	0	0	0	0	0	0	0	0	0	0	0
Supermarket	7.3	0	0	12.5	0	0	0	10.8	0	0	9.8	0
Project	23.6	0	0	34.4	40	0	0	29.7	0	33.3	26.8	14.3
Clinic	18.2	33.3	0	12.5	20	33.3	0	10.8	50	33.3	9.8	42.9
School	0	0	0	0	0	0	0	0	0	0	0	0
Gift	7.3	0	100	0	0	11.1	0	8.1	12.5	0	7.3	7.1
Employer	0	0	0	0	0	0	0	0	0	0	0	0
Other	7.3	0	0	12.5	0	0	0	10.8	0	0	9.8	0
Don't Know	10.9	33.3	0	6.3	40	0	50	10.8	0	0	14.6	0

Table 51: Type of source where insecticide treatment was obtained
Among all nets that were post-treated

		Site					Location				Urban/Rural		Socio-Economic Status				
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	55	6	3	32	5	9	4	37	8	6	41	14	0	2	7	13	33
Informal commercial source	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Formal commercial source	32.7	33.3	0	34.4	0	55.6	50	29.7	37.5	33.3	31.7	35.7	0	100	42.9	53.8	18.2
Non-commercial source	41.8	33.3	0	46.9	60	33.3	0	40.5	50	66.7	36.6	57.1	0	0	42.9	15.4	54.5
Gift	7.3	0	100	0	0	11.1	0	8.1	12.5	0	7.3	7.1	0	0	14.3	0	9.1
Other	7.3	0	0	12.5	0	0	0	10.8	0	0	9.8	0	0	0	0	0	12.1
Don't Know	10.9	33.3	0	6.3	40	0	50	10.8	0	0	14.6	0	0	0	0	30.8	6.1

Table 52: Cost of insecticide treatment (Ugandan Shilling)
Among nets that were post-treated

		Site					Location				Urban/Rural		Socio-Economic Status				
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	55	6	3	32	5	9	4	37	8	6	41	14	0	2	7	13	33
Mean	2021	2750	0	1823.5	1000	2750	2750	2105	1000	1000	2167	1000	0	0	1750	2000	2062
Std Dev.	827	354	0	809	0	289	354	792	0	0	780	0	0	0	1061	775	873
Trade/barter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Free	9.1	0	100	0	20	11.1	0	8.1	0	33.3	7.3	14.3	0	0	28.6	0	9.1
Don't know	47.3	66.7	0	46.9	60	44.4	50	40.5	75	50	41.5	64.3	0	100	42.9	53.8	42.4

Table 53: Cost of insecticide treatment (USD)
Among nets that were post-treated

		Site					Location				Urban/Rural		Socio-Economic Status				
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
BASE	55	6	3	32	5	9	4	37	8	6	41	14	0	2	7	13	33
Average price	1.13	1.54	0	1.02	0.56	1.54	1.54	1.18	0.56	0.56	1.21	0.56	0	0	0.98	1.12	1.15
Std Dev.	0.46	0.2	0	0.45	0	0.16	0.2	0.44	0	0	0.44	0	0	0	0.59	0.43	0.49
Unknown	56.4	66.7	100	46.9	80	55.6	50	48.6	75	83.3	48.8	78.6	0	100	71.4	53.8	51.5

Table 54: Number of times net washed since last (pre or post) treated
Among all treated nets

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	68	6	8	35	5	14	4	46	11	7	50	18
0	7.4	0	0	14.3	0	0	0	6.5	18.2	0	6	11.1
1-2	25	66.7	37.5	28.6	0	0	75	28.3	9.1	0	32	5.6
3-4	10.3	0	0	8.6	60	7.1	0	8.7	9.1	28.6	8	16.7
5-6	5.9	0	0	0	0	28.6	0	6.5	9.1	0	6	5.6
7-8	1.5	0	0	0	0	7.1	0	2.2	0	0	2	0
9-10	2.9	0	12.5	0	0	7.1	0	2.2	9.1	0	2	5.6
11-12	10.3	0	0	17.1	20	0	0	13	0	14.3	12	5.6
13-18	1.5	0	0	0	0	7.1	0	0	9.1	0	0	5.6
Mean (excluding 0)	5.03	1.5	3.75	4.89	5.5	7.5	1.67	4.79	7.6	6.33	4.48	7.13
Mean (including 0)	4.45	1.5	3.75	3.88	5.5	7.5	1.67	4.32	5.43	6.33	4.09	5.7
Don't know	35.3	33.3	50	31.4	20	42.9	25	32.6	36.4	57.1	32	44.4

4.7 APPROPRIATE USE

Although it is beneficial for any household member to sleep under a net, it is particularly important for those vulnerable to serious cases of malaria—children under five and pregnant women—to do so. This section reports on "appropriate use" of nets by looking at various measures of use by households, children under five, women of reproductive age, and pregnant women. Some of the measures use the household as the denominator (unit of analysis), while others use number of individuals in the vulnerable group as the denominator. Use measures have been calculated to indicate use of any net, and then, specifically, use of a treated net.

The sample was limited to women of reproductive age (WRA)—age 15 to 49—so that net use by WRA could be calculated in addition to net use by pregnant women. The greatest public health impact is achieved when treated nets are used from the beginning of the pregnancy; however, many women do not realize they are pregnant, or do not wish to make their pregnancy public, for several months or more. Therefore, it is advisable for all women of reproductive age to sleep under treated nets nightly.

Overall household use

There were a total of 4742 people in all households sampled and 1578 people in net-owning households sampled.

- Among 1578 people living in net-owning households, 63% had slept under a net the prior night. This represents 21% of all people living in the households sampled.
- Children under five and pregnant women were most likely to sleep under a net (although denominators for pregnant women are very small, making it difficult to draw definite conclusions); adult males were the least likely to sleep under a net.
- A higher proportion of adult females (67%) than adult males (52%) had slept under a net the prior night.

- Only eight percent (8%) of people in net-owning households slept under a *treated* net the prior night, representing 3% of all people living in households sampled.

Use by children under age five

There were 1,361 children under age five in all households and 451 children under age five in net-owning household. (Recall that in order to be included in the sample, a child aged 0-4 had to reside in the household.)

- Among the 451 children under five in net-owning households, 75% had slept under a net the prior night. This represents 25% of all children under five in the sample. Children under five in net-owning households in the Soroti site were most likely to sleep under a net (82%) and those in Kampala the least likely (65%).
- Only 9% of children under five in net-owning households had slept under a *treated* net the prior night, representing 3% of all children under five in the sample.
- Although children over four years of age were less likely than younger children to be placed under a net, there was little variation in net use by age segment for children from birth to four years.
- The proportion of net-owning households where all children under five slept under a net (treated or untreated) the prior night decreased slightly the more children the household had. In 78% of net-owning households with one child, that child ("all children") slept under a net the night prior whereas in only 60% of net-owning households with three or more children, all children slept under a net the prior night.

Use by women of reproductive age and pregnant women

All households had at least one woman of reproductive age, since a criterion for selection was to be a WRA (aged 15-49) responsible for a child under five. The total number of women of reproductive age in the households sampled was 1,219. The number of women of reproductive age residing in net-owning households was 425. The total number of pregnant women in the households sampled was 130 and, of these, 39 were from net-owning households.

- Sixty-seven percent (67%) of WRA in net-owning households slept under a net the prior night. This represents 23% of the WRAs in total sample. Only 7% of WRA in net-owning households slept under a *treated* net the prior night. This represents 3% of WRAs in the total sample.
- Sixty-nine percent (69%) of pregnant women in net-owning households slept under a net the prior night. This represents 21% of pregnant women in the total sample. Only 5% of pregnant women in net-owning households slept under a *treated* net the prior night. This represents 2% of pregnant women in the total sample. (The denominators for pregnant women, however, were very small.)

General patterns

- Some nets had not been used the prior night: 8% of king-size nets; 7% of double-size nets; and 12% of single nets.
- Among nets used, the average number of people sleeping under nets decreased as the size of the net decreased: king (2.52), double (2.01), and single (1.65).
- The average number of months that people in the household slept under mosquito nets was 9.9 per year.

Table 55: Proportions of household members who slept under a net last night
Among specific household members

	Household members in net-owning households			Household members in all households		
	BASE	% sleeping under any net (n)	% sleeping under treated net (n)	BASE	% sleeping under any net (n)	% sleeping under treated net (n)
ALL	1578	62.5% (987)	7.5% (119)	4742	20.8% (987)	2.5% (119)
Adults (age 15+)						
Males	286	52.1% (149)	5.2% (15)	893	16.7% (149)	1.7% (15)
Females	434	66.6% (289)	7.1% (31)	1244	23.2% (289)	2.5% (31)
Females ages 15-49	425	66.8% (284)	7.1% (30)	1219	23.3% (284)	2.5% (30)
Pregnant women	39	69.2% (27)	5.1% (2)	130	20.8% (27)	1.5% (2)
Older children (ages 5-14)						
Males	206	48.5% (100)	7.3% (15)	618	16.2% (100)	2.4% (15)
Females	201	56.2% (113)	8.0% (16)	626	18.1% (113)	2.6% (16)
Younger children (ages 0-4)						
ALL	451	74.5% (336)	9.3% (42)	1361	24.7% (336)	3.1% (42)
Males	221	70.1% (155)	7.7% (17)	672	23.1% (155)	2.5% (17)
Females	230	78.7% (181)	10.9% (25)	689	26.3% (181)	3.6% (25)
Age 0 - <1	29	72.4% (21)	27.6% (8)	90	23.3% (21)	8.9% (8)
Age 1 - <2	90	86.7% (78)	11.1% (10)	219	35.6% (78)	4.6% (10)
Age 2 - <3	105	75.2% (79)	3.8% (4)	339	23.3% (79)	1.2% (4)
Age 3 - <4	112	73.2% (82)	8.0% (9)	348	23.6% (82)	2.6% (9)
Age 4 - <5	115	66.1% (76)	9.6% (11)	365	20.8% (76)	3.0% (11)

Table 56: Proportions of vulnerable groups who slept under a net last night
Among persons most vulnerable to severe malaria

		Site					Location				Urban/Rural		Socio-Economic Status				
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural	1	2	3	4	5
Children (0-4)																	
Any net (n=336)	74.5	64.6	68	81.7	77.7	75.6	63.5	78.5	80.6	67.7	74.7	74.3	72	83	74.1	71.8	74.6
Treated net (n=42)	9.3	5.1	14	13.5	3.2	12.2	6.3	14	5.8	6.1	12	5.9	0	4.3	8.2	5.1	15.3
Females (15-49)																	
Any net (n=284)	66.8	61	59.6	67.3	75.3	67.6	62.3	64.5	77.5	64.1	63.9	70.7	77.3	64.3	73.2	69	62.1
Treated net (n=30)	7.1	4	6.4	13.6	2.1	8.5	3.3	10.4	6.7	3.3	8.6	5	0	4.8	4.2	5.2	10.9
Pregnant Women																	
Any net (n=27)	69.2	77.8	50	77.8	63.6	75	100	64.7	71.4	63.6	71.4	66.7	100	33.3	42.9	81.8	75
Treated net (n=2)	5.1	11.1	0	0	9.1	0	0	5.9	14.3	0	4.8	5.6	0	0	0	9.1	6.3

Table 57: Proportion of net-owning households in which none, some, or all children under five slept under a net last night
Among net-owning households with children under age five

	% Sleeping under any net			% Sleeping under treated net		
	None	Some	All	None	Some	All
Number of net-owning households with 1, 2 or 3+ children under age 5						
1 (n=179)	22.3	---	77.7	93.3	---	6.7
2 (n=136)	15.4	29.4	55.1	89.7	3.7	6.6
3+ (n=25)	8.0	32.0	60.0	76.0	12.0	12.0

Table 58: Mean number of people sleeping under a net, by net size
Among household members sleeping under specific size nets

	Size of net		
	King	Double	Single
BASE	25	306	226
None (%)	8.0	7.2	11.9
Mean (excluding zero)	2.52	2.01	1.65
Standard deviation	1.16	0.70	0.69
Median value	1.93	1.50	1.09

Table 59: Number of months per year people in household sleep under a net
Among net-owning households

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	340	80	38	92	74	56	50	142	75	73	192	148
Mean no. of months	9.9	10.49	10.03	10.81	8.64	9.11	10.62	9.86	10.3	9.12	10.06	9.7
Standard deviation	2.85	2.52	2.92	2.67	3.08	2.5	2.55	2.8	2.6	3.19	2.75	2.96
None	0.6	1.3	0	0	1.4	0	0	0.7	1.3	0	0.5	0.7

4.8 CONSUMER MOSQUITO NET PREFERENCES

The prior section described the characteristics of nets owned, which is to a large extent a reflection of types of nets currently available. This section reports on the characteristics of nets that consumers *prefer*. Questions on net preferences were asked of all respondents, whether or not the household owned a net. The information in this section will be used to develop nets with features that consumers want.

Net shape and size preferences

- Forty-five percent (45%) of respondents preferred round/conical nets, and 39% preferred rectangular nets. Fewer respondents preferred triangle/pyramid (8%) or wedge (6%) shaped nets.
- Consumers preferred large nets: 56% of the respondents preferred double-size nets and 22% preferred king-size nets for their households. Only 19% preferred single-size nets and 2% cot nets.

Table 60: Net shape preferences
Among all respondents

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	200	200	211	197	192	80	325	267	328	405	595
Rectangular	39.4	27.5	28.5	61.6	44.2	33.9	27.5	44.3	35.6	40.5	41	38.3
Round/conical	44.7	41	52.5	35.1	47.7	47.9	48.8	42.2	48.3	43.3	43.5	45.5
Triangle/pyramid	8.1	19	8	0.9	4.6	8.3	12.5	6.5	6.7	9.8	7.7	8.4
Wedge	5.9	10	10.5	0.9	3.6	4.7	8.8	5.2	7.1	4.9	5.9	5.9
Any other	0.7	1.5	0	1.4	0	0.5	1.3	0.3	0.7	0.9	0.5	0.8
No preference	1.2	1	0.5	0	0	4.7	1.3	1.5	1.5	0.6	1.5	1

Table 61: Net size preferences
Among all respondents

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	200	200	211	197	192	80	325	267	328	405	595
Cot-net	2.3	2.5	1	2.4	5.1	0.5	2.5	1.8	2.6	2.4	2	2.5
Single	19.3	23.5	37	15.6	7.1	13	20	15.7	18.7	23.2	16.5	21.2
Double	55.9	59	48	54.5	60.9	57.3	58.8	53.8	57.3	56.1	54.8	56.6
King	22.1	14.5	14	27.5	26.9	27.6	17.5	28	21.3	18	25.9	19.5
No preference	0.4	0.5	0	0	0	1.6	1.3	0.6	0	0.3	0.7	0.2

Net color preferences

- Respondents preferred light-colored nets. The net colors preferred most by respondents were white (47%), light blue (13%) and pink (12%). At the same time, 19% said they disliked white nets.
- Dark-colored nets are disliked. Over half (59%) of respondents reported disliking black nets, 32% disliked dark green nets, and 26% disliked dark blue nets.

Table 62: Net color preferences
Among all respondents

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	200	200	211	197	192	80	325	267	328	405	595
White	46.9	61.5	53.5	31.3	49.7	39.1	67.5	47.7	45.7	42.1	51.6	43.7
Light blue	13.0	9	15.5	13.3	9.1	18.2	8.8	16	11.2	12.5	14.6	11.9
Dark blue	8.5	4	6.5	14.7	5.6	11.5	3.8	7.7	8.6	10.4	6.9	9.6
Light green	9.4	7.5	10	10	12.2	7.3	7.5	8.3	10.1	10.4	8.1	10.3
Dark green	3.3	0.5	2.5	8.5	1.5	3.1	0	2.2	4.9	4	1.7	4.4
Pink	12.2	12	8	11.4	15.2	14.6	10	14.5	9.7	12.5	13.6	11.3
Black	6.3	4	4	10.9	6.6	5.7	0	3.4	9.7	7.9	2.7	8.7
No preference/don't know	0.4	1.5	0	0	0	0.5	2.5	0.3	0	0.3	0.7	0.2

Table 63: Net color dislikes
Among all respondents (multiple responses possible)

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	200	200	211	197	192	80	325	267	328	405	595
White	18.9	10.5	13	41.7	14.2	13.5	7.5	15.7	24	20.7	14.1	22.2
Light blue	5.8	8	1.5	4.7	5.6	9.4	7.5	4.6	6.4	6.1	5.2	6.2
Dark blue	25.8	29.5	33.5	17.1	24.4	25	35	29.2	19.9	25	30.4	22.7
Light green	12.9	10	4.5	13.3	21.3	15.6	12.5	17.2	10.9	10.4	16.3	10.6
Dark green	32.4	38	27	22.7	31.5	43.8	52.5	43.1	22.5	25	44.9	23.9
Pink	14.0	15.5	12	11.8	18.3	12.5	17.5	14.5	14.2	12.5	15.1	13.3
Black	58.8	57	67.5	49.3	64	56.8	65	64.6	48.7	59.8	64.7	54.8
None/don't know	9.3	19	12	4.3	0.5	10.9	12.5	4.6	14.6	8.8	6.2	11.4

SECTION 5
OTHER MOSQUITO CONTROL PRODUCTS

In order to understand the role of nets in the larger context of mosquito control products, respondents were asked what mosquito control methods they knew of and used, what attributes of mosquito control they valued the most, and what products and brands they associated with various attributes. This information will be particularly useful for the private sector as it seeks to meet consumer needs.

5.1 AWARENESS OF MOSQUITO CONTROL PRODUCTS AND METHODS

- The commercial insect control product respondents were most aware of (unprompted mention) was the mosquito net (89%), with 4% specifically mentioning a treated net. Other commonly-mentioned products were aerosol insecticides (68%) and mosquito coils (65%). No respondent mentioned repellants.
- Mention of mosquito nets (nets or treated nets) was highest in Soroti and Hoima (both 95%) and lowest in Masaka (77%).
- Respondents also mentioned non-commercial methods of mosquito control: "keep surroundings clean" (47%) and "close windows and doors" (43%).

Table 64: Awareness of mosquito control products and methods
Among all respondents (multiple responses possible)

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	200	200	211	197	192	80	325	267	328	405	595
COMMERCIAL PRODUCTS												
Sleep under a mosquito net (untreated or unspecified)	85.1	86.0	70.0	93.4	91.9	83.9	86.3	88.0	86.1	81.1	87.7	83.4
Sleep under an insecticide treated mosquito net	4.0	4.0	7.0	1.9	3.0	4.2	5.0	4.9	2.6	4	4.9	3.4
Use mosquito coils	64.7	71.5	64.5	70.6	73.6	42.2	63.8	60.9	64.4	68.9	61.5	66.9
Use aerosol insecticide	67.7	71.0	53.5	56.4	82.2	76.6	77.5	76.9	65.9	57.6	77.0	61.3
Use commercial mosquito repellent on body	0	0	0	0	0	0	0	0	0	0	0	0
Use flit gun/spray gun (that you fill yourself)	1.5	1.5	5.0	0	1.0	0	0	0.3	2.6	2.1	0.2	2.4
Have mosquito screens/nets in windows/doors	11.4	10	19	0	19.3	9.4	3.8	13.2	12.4	10.7	11.4	11.4
Other :												
Incense sticks	0.5	0	0	0	0	2.6	0	0.9	0	0.6	0.7	0.3
Non-aerosol Insecticide	0.3	0	0	0.9	0.5	0	0	0.6	0	0.3	0.5	0.2
Other	0.2	0.5	0	0	0.5	0	0	0.3	0	0.3	0.2	0.2
NON-COMMERCIAL METHODS												
Close windows and doors	43.2	29	54	31.8	43.7	58.9	31.3	46.5	44.9	41.5	43.5	43
Keep surroundings clean	46.7	41.5	34	42.2	56.9	59.9	37.5	50.5	50.2	42.4	47.9	45.9
Other non-commercial method (Unspecified)	12.6	4	17.5	13.3	10.2	18.2	1.3	14.2	11.2	14.9	11.6	13.3

5.2 USE OF COMMERCIAL MOSQUITO CONTROL PRODUCTS

If a respondent was aware of a given mosquito control method, she was asked whether she had used that method in the prior year. Note that these figures may be lower than actual use, given that "use" was asked only of those who indicated that they were aware of a given product, and level of use was calculated using total number of respondents as the base. Note also that data on use of nets is covered in Section 4; only other mosquito control products are covered here.

- The commercial mosquito control products respondents most often reported having used in the last 12 months were mosquito coils (37%) and aerosol insecticides (37%).
- Virtually no other commercial product was used. (See Section 4 for data on net use).
- Use of aerosols was higher in urban areas (51%) than rural areas (28%), but use of coils did not differ by urban or rural sites.

Table 65: Use of commercial mosquito control products
Among all respondents (Multiple responses possible)

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	200	200	211	197	192	80	325	267	328	405	595
Use mosquito coils	36.5	50.5	26.5	43.6	37.6	23.4	50	32.6	35.6	37.8	36	36.8
Use aerosol insecticide	37.4	38	19	29.4	58.9	42.7	52.5	51.1	29.2	26.8	51.4	27.9
Use flit gun/spray gun (that you fill yourself)	0.3	0	1.5	0	0	0	0	0	0.4	0.6	0	0.5
Have mosquito screens/nets in windows/doors	4.5	5.5	6.5	0	8.6	2.1	1.3	6.5	5.6	2.4	5.4	3.9
Other commercial method	0.8	0	0	0.9	1	2.1	0	1.8	0	0.6	1.5	0.3
Other:												
Non-aerosol Insecticide	0.2	0	0	0.5	0.5	0	0	0.3	0	0.3	0.2	0.2
Incense sticks	0.4	0	0	0	0	2.1	0	0.9	0	0.3	0.7	0.2
Other	0.1	0	0	0	0.5	0	0	0.3	0	0	0.2	0

5.3 FREQUENCY, LOCATION, AND PRICE OF COIL, INSECTICIDE AEROSOL, AND REPELLANT PURCHASES

Coils

- Coils were purchased fairly frequently: Of the 37% of households that had purchased mosquito coils in the last 12 months, 47% reported that they bought them within the last week. Frequency of purchase within the last week was somewhat higher in urban (56%) than in rural (41%) areas.
- The average reported price paid for a single mosquito coil was USD 0.09 with little difference between urban and rural sites.
- Of the 37% of households that had purchased coils in the last 12 months, 68% purchased them in a general shop, 15% from a kiosk, and 8% from open-air markets.

Table 66: Frequency of mosquito coil purchase
Among households that used mosquito coils in the 12 months before the interview

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	365	101	53	92	74	45	40	106	95	124	146	219
Today or yesterday	15.9	13.9	9.4	14.1	27.0	13.3	20.0	17.9	11.6	16.1	18.5	14.2
Within the last7 days	31.0	26.7	22.6	35.9	29.7	42.2	32.5	39.6	32.6	21.8	37.7	26.5
Within the last month	26.8	31.7	32.1	22.8	20.3	28.9	17.5	24.5	35.8	25	22.6	29.7
Within the last 3 months	12.6	10.9	26.4	10.9	6.8	13.3	15.0	9.4	8.4	17.7	11.0	13.7
More than 3 months ago	9.9	12.9	7.5	14.1	8.1	0	10.0	7.5	8.4	12.9	8.2	11.0
Don't know	3.8	4.0	1.9	2.2	8.1	2.2	5.0	0.9	3.2	6.5	2.1	5.0

Table 67: Average price of single mosquito coil (USD)
Among households that bought a single mosquito coil

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	110	28	13	28	21	20	9	35	30	36	44	66
Average price	0.09	0.09	0.07	0.06	0.10	0.14	0.09	0.11	0.07	0.08	0.11	0.08
Standard Deviation	0.13	0.03	0.01	0.02	0.05	0.3	0.02	0.23	0.02	0.04	0.2	0.04
Median value	0.06	0.07	0.06	0.05	0.09	0.05	0.08	0.06	0.07	0.06	0.06	0.06
Don't Know	0	0	0	0	0	0	0	0	0	0	0	0

Table 68: Place where mosquito coils were purchased
Among households that used mosquito coils in the 12 months before the interview

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	365	101	53	92	74	45	40	106	95	124	146	219
Market	8.2	12.9	1.9	16.3	0	2.2	12.5	1.9	8.4	12.1	4.8	10.5
Kiosk	15.3	17.8	20.8	9.8	13.5	17.8	30	16	15.8	9.7	19.9	12.3
Street vendor	1.4	4	0	1.1	0	0	5	0	1.1	1.6	1.4	1.4
General shop	67.7	62.4	71.7	68.5	66.2	75.6	47.5	75.5	67.4	67.7	67.8	67.6
Wholesaler	1.9	1	1.9	0	6.8	0	0	0.9	1.1	4	0.7	2.7
Pharmacy	0.3	0	0	0	0	2.2	0	0	1.1	0	0	0.5
Drugstore	0	0	0	0	0	0	0	0	0	0	0	0
Supermarket	1.4	2	0	3.3	0	0	5	2.8	0	0	3.4	0
Mini-mart	0	0	0	0	0	0	0	0	0	0	0	0
Other:												
Retailers	1.4	0	0	0	6.8	0	0	0.9	1.1	2.4	0.7	1.8
Other	0.3	0	0	1.1	0	0	0	0	1.1	0	0	0.5
Don't Know	2.2	0	3.8	0	6.8	2.2	0	1.9	3.2	2.4	1.4	2.7

Aerosols

- Of the 37% of households that had purchased aerosols in the last 12 months, 72% had purchased them in the last month or less. Frequency of purchase was similar in urban and rural areas.
- The average reported price paid for a 180-220 ml can of aerosol insecticide was USD 1.63. The average reported price paid for a 300-350 ml can of aerosol insecticide was USD 1.53.
- The majority of households that had purchased aerosols purchased them from formal commercial outlets: a general shop (66%), a "wholesaler" (12%), or a supermarket (7%). Aerosols were not commonly purchased in non-formal outlets such as markets (4%), kiosks (3%), and street vendors (2%).

Table 69: Frequency of aerosol insecticide purchase
Among households that used aerosol insecticides in the 12 months before the interview

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	374	76	38	62	116	82	42	166	78	88	208	166
Today or yesterday	3.5	2.6	0	1.6	6	3.7	4.8	2.4	1.3	6.8	2.9	4.2
Within the last7days	27.5	15.8	23.7	16.1	39.7	29.3	26.2	28.3	23.1	28.4	27.9	25.9
Within the last month	40.6	39.5	42.1	38.7	46.6	34.1	42.9	41.6	39.7	38.6	41.8	39.2
Within the last 3 months	11	17.1	18.4	12.9	5.2	8.5	9.5	11.4	12.8	9.1	11.1	10.8
More than 3 months ago	13.9	15.8	15.8	19.4	2.6	23.2	7.1	13.3	17.9	14.8	12.0	16.3
Don't know	4.0	9.2	0	11.3	0	1.2	9.5	3.0	5.1	2.3	4.3	3.6

Table 70: Average price of 300-350 ml can of aerosol insecticide (USD)
Among households that bought a 300-350 ml can of aerosol insecticide

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	189	40	14	44	55	36	20	95	32	42	115	74
Average price	1.53	1.72	1.43	1.55	1.5	1.41	1.7	1.51	1.55	1.5	1.54	1.52
Standard Deviation	0.44	0.66	0.35	0.43	0.25	0.38	0.63	0.37	0.39	0.51	0.43	0.46
Median value	1.38	1.67	1.31	1.34	1.37	1.34	1.65	1.37	1.59	1.34	1.39	1.37
Don't Know	1.6	7.5	0	0	0	0	5	0	3.1	2.4	0.9	2.7

Table 71: Place where aerosol insecticides were purchased
Among households that used aerosol insecticides in the 12 months before the interview

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	374	76	38	62	116	82	42	166	78	88	208	166
Market	3.7	9.2	0	6.5	0	3.7	7.1	1.2	6.4	4.5	2.4	5.4
Kiosk	2.9	6.6	5.3	0	2.6	1.2	2.4	0	5.1	6.8	0.5	6
Street vendor	2.1	6.6	0	3.2	0.9	0	9.5	1.8	1.3	0	3.4	0.6
General shop	66.0	59.2	81.6	69.4	56.9	75.6	54.8	72.3	67.9	58	68.8	62.7
Wholesaler	12.0	5.3	7.9	0	28.4	6.1	4.8	10.8	12.8	17	9.6	15.1
Pharmacy	0	0	0	0	0	0	0	0	0	0	0	0
Drugstore	0.3	0	2.6	0	0	0	0	0	0	1.1	0	0.6
Supermarket	7.2	6.6	0	21	0	11	11.9	12	1.3	1.1	12	1.2
Other:												
Retailers	3.5	0	0	0	11.2	0	0	0.6	3.8	10.2	0.5	7.2
Hawkers	0.5	1.3	0	0	0	1.2	2.4	0.6	0	0	1	0
Don't Know	1.6	5.3	2.6	0	0	1.2	7.1	0.6	1.3	1.1	1.9	1.2

5.4 PERCEPTIONS OF MOSQUITO CONTROL ATTRIBUTES, PRODUCTS, AND BRANDS

Valued attributes of mosquito control products

Respondents were read a list of attributes of mosquito control products and asked to rate, on a scale of 1-7, how important to them various attributes were.

- Most attributes named were considered important. "Kills mosquitoes" (5.86) was rated as the most important attribute; the next most highly rated were "reduces malaria" (5.70), "keeps away mosquitoes while sleeping" (5.68), "keeps away mosquitoes for a long time" (5.38) and "is safe to use around children" (5.34).

Table 72: Mean rating of mosquito control product attributes
Among all households

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	200	200	211	197	192	80	325	267	328	405	595
Kills mosquitoes	5.86	5.74	5.51	6.41	6.16	5.4	5.95	5.94	5.79	5.8	5.94	5.80
Keeps mosquitoes away for a long time	5.38	5.82	5.22	6.06	4.74	5.03	5.59	5.28	5.57	5.28	5.34	5.41
Keeps mosquitoes away while sleeping	5.68	5.94	5.5	6.14	5.53	5.23	5.91	5.68	5.56	5.71	5.73	5.64
Kills other insects, other than mosquitoes	4.77	5.38	5.29	4.87	4.07	4.20	5.09	4.63	5.09	4.57	4.72	4.80
Is safe to use around children	5.34	5.55	5.07	6.18	5.33	4.47	5.29	5.18	5.49	5.38	5.20	5.43
Is a good value for the money	5.04	5.01	4.74	5.67	5.38	4.34	5.14	5.13	5.20	4.80	5.13	4.98
Is a long-term solution to mosquito problems	5.03	5.09	4.71	6.00	4.54	4.73	5.11	4.95	5.28	4.88	4.99	5.06
Is a high quality and effective brand	4.98	4.39	4.8	5.88	4.75	5.01	4.45	5.12	5.23	4.76	4.99	4.97
Reduces malaria	5.70	5.09	5.39	6.40	5.90	5.70	5.03	5.97	5.42	5.84	5.78	5.65

Association of attributes with mosquito control products

Respondents were read a list of attributes and asked which type(s) of mosquito control product they thought of when they heard each attribute. They could indicate more than one product. (Note that the base is respondents who were aware of a given product when prompted, and the table indicates the percentage of those respondents selecting a given product when a particular attribute was named.)

- Ratings for mosquito nets far exceeded all other products on "safe to use around children"(76%), "keeps mosquitoes away while sleeping" (75%), "reduces malaria" (69%), "is good value for the money" (60%), "is a high quality effective brand" (59%), is a "long-term solution to mosquito problems" (55%), and "keeps mosquitoes away for a long time" (51%). Nets were not associated with killing mosquitoes (7%) or with killing other insects (5%).
- Sprays/aerosols were the product most associated with "kills mosquitoes" (84%) and "kills other insects, other than mosquitoes" (76%).

Table 73: Association of mosquito control products and attributes
Among respondents who are aware of specific mosquito control products

	Mosquito coil	Sprays/ Aerosol	Repellant	Mosquito net	Window/door screens	None	Don't Know
BASE	923	898	100	974	557	1000	1000
Kills mosquitoes	28.2	84.0	9	7.2	1.6	7	6.6
Keeps mosquitoes away for a long time	31.0	31.1	26	50.5	35.9	5.2	5.5
Keeps mosquitoes away while sleeping	36.9	29.6	40	74.6	22.3	0.9	2.3
Kills other insects, other than mosquitoes	15.4	76.4	5.0	3.3	4.1	11.1	10.5
Is safe to use around children	15.9	7.3	23	76.2	33.9	5.6	3.8
Is a good value for the money	18.3	22.4	16.0	59.7	22.8	7.1	8.2
Is a long-term solution to mosquito problems	8.2	13.8	3.0	54.8	35.0	11.8	11.6
Is a high quality/effective brand	7.4	30.3	21.0	59.1	12.0	5.6	13.6
Reduces malaria	28.5	38.6	27	68.6	19.6	5.5	8.0

Awareness of mosquito control brands

Respondents were asked to name the brands of mosquito control products they were aware of, even if they did not use them. After providing their responses, they were shown a card with the name and logo of different brands and were asked to indicate which other brand names, apart from the ones they already mentioned, they were aware of. The following tables show respondent awareness by unprompted, prompted, and total awareness.

- Spontaneous (unprompted) awareness was highest for Doom (72%), Ridsect (23%), and Baygon (18%).
- Additional level of brand name awareness when prompted with a show card was: Ridsect (37%), Baygon (28%) and Doom (22%).
- Total awareness, as calculated by the sum of unprompted and prompted responses, was highest for Doom (94%), Ridsect (59%), and Baygon (46%).
- Awareness of brands was higher in urban than in rural areas.

Table 74: Awareness of mosquito control product brand names, unprompted
Among all respondents (multiple responses possible)

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	200	200	211	197	192	80	325	267	328	405	595
Baygon	17.6	42.0	18.5	2.8	22.3	2.6	51.3	15.1	17.6	11.9	22.2	14.5
Doom	71.5	89.0	90.5	39.3	78.7	61.5	92.5	76	62.2	69.5	79.3	66.2
Off	1.6	7.0	0.5	0	0.5	0	7.5	0.3	2.2	0.9	1.7	1.5
Raid	0.5	1.5	0.5	0	0.5	0	1.3	0.3	0.7	0.3	0.5	0.5
Ridsect	22.5	30.5	17.0	17.1	31.5	16.7	46.3	28.0	16.9	15.9	31.6	16.3
Autan Sensitiv	0.5	1.5	0.5	0	0	0.5	1.3	0.3	0.7	0.3	0.5	0.5
Other	25.7	3.5	25.5	34.6	28.9	35.9	1.3	35.4	25.5	22.3	28.6	23.7

Table 75: Awareness of mosquito control product brand names, prompted
Among all respondents (multiple responses possible)

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	200	200	211	197	192	80	325	267	328	405	595
Baygon	28.3	27.5	49.0	10.9	32.0	22.9	32.5	31.7	23.2	28.0	31.9	25.9
Doom	22.4	9.5	6.0	47.9	18.8	28.6	6.3	20.3	30.0	22.3	17.5	25.7
Off	6.4	20.5	3.0	4.3	1.0	3.1	26.3	4.0	4.5	5.5	8.4	5.0
Raid	4.1	9.5	1.0	2.8	4.6	2.6	13.8	3.4	3.0	3.4	5.4	3.2
Ridsect	36.8	47.0	23.0	32.2	44.7	37.5	31.3	39.1	37.1	35.7	37.5	36.3
Autan Sensitiv	2.6	6	0	1.9	5.1	0	8.8	2.2	1.1	2.7	3.5	2.0

Table 76: Awareness of mosquito control product brand names, total
Among all respondents (multiple responses possible)

		Site					Location				Urban/Rural	
	Total	Kampala	Masaka	Soroti	Hoima	Mbarara	Kampala Urban	Other Urban	Near Rural	Far Rural	Total Urban	Total Rural
BASE	1000	200	200	211	197	192	80	325	267	328	405	595
Baygon	45.9	69.5	67.5	13.7	54.3	25.5	83.8	46.8	40.8	39.9	54.1	40.3
Doom	93.9	98.5	96.5	87.2	97.5	90.1	98.8	96.3	92.1	91.8	96.8	91.9
Off	8.0	27.5	3.5	4.3	1.5	3.1	33.8	4.3	6.7	6.4	10.1	6.6
Raid	4.6	11	1.5	2.8	5.1	2.6	15	3.7	3.7	3.7	5.9	3.7
Ridsect	59.3	77.5	40	49.3	76.1	54.2	77.5	67.1	53.9	51.5	69.1	52.6
Autan Sensitiv	3.1	7.5	0.5	1.9	5.1	0.5	10	2.5	1.9	3	4	2.5

Mosquito control brand name associations

Respondents were read a series of attributes and asked to indicate which brand(s) they associated with the attribute. The following table provides attributes by total (sum of unprompted and prompted) awareness.

- Doom, the most commonly recognized brand, had the highest ratings (total) for all attributes: "kills mosquitoes" (70%), "keeps mosquitoes away while sleeping" (63%), "reduces malaria" (57%), "kills other insects other than mosquitoes" (53%), "keeps mosquitoes away for a long time" (51%), "is a high quality/effective brand" (41%), and "is a good value for the money" (40%). Only Ridsect had one rating similar to Doom on the attribute of "kills other insects other than mosquitoes at 53%.
- All brands were ranked low on "is safe to use around children."

Table 77: Mosquito control product attribute and brand name association, total
Among respondents who were aware (spontaneous and prompted) of specific mosquito control product brand names

	Baygon	Doom	Off	Raid	Ridsect	Autan Sensitiv	None	Don't know
BASE	459	939	80	46	593	31	1000	1000
Kills mosquitoes	53.4	69.6	11.3	13.0	47.0	0	5.3	8.2
Keeps mosquitoes away for a long time	22.9	50.7	7.5	13.0	28.0	0	18.7	12.1
Keeps mosquitoes away while sleeping	26.4	63.2	17.5	8.7	34.6	9.7	15.0	9.5
Kills other insects, other than mosquitoes	50.3	52.6	5.0	13	52.8	3.2	6.7	12.0
Is safe to use around children	14.4	22.9	6.3	4.3	11.3	6.5	44.9	20.6
Is a good value for the money	24.4	39.5	8.8	15.2	31.4	6.5	18.1	19.6
Is a long-term solution to mosquito problems	12.9	24.1	3.8	2.2	15.3	0	36.4	26.6
Is a high quality/effective brand	30.5	41.3	6.3	23.9	29.8	6.5	15.0	18.6
Reduces malaria	35.5	57.3	13.8	15.2	37.1	9.7	15.3	17.7

SECTION 6
PROGRAM/PRODUCT IMPLICATIONS

6.1 GENERAL

The overall setting for ITM promotion and sales is favorable, but efforts are needed to overcome negative perceptions of nets and insecticide treatments and to increase awareness of ITMs.

The favorable factors for ITM promotion and malaria prevention in Uganda include:

- There is nearly universal recognition of the term "malaria"; very good knowledge of malaria symptoms and those most vulnerable; good general understanding of how malaria is transmitted.
- Nets are viewed extremely favorably—much more favorably overall than other insect control products.
- A "net culture" is already being established; over one-third of households already own at least one net, and two-thirds of nets have been acquired in the past three years.
- There is a very high level of perceived advantages of net use for vulnerable groups.
- There is already preferential net use by vulnerable groups in households that own nets.
- There is strong valuing of the product attributes that *insecticide treated nets* deliver (i.e., preventing malaria, killing mosquitoes).

The main barriers to overcome for ITM promotion include:

- There are erroneous beliefs about non-mosquito related causes of malaria.
- Nets are perceived to be expensive.
- There is limited access to nets in rural areas.
- There are some serious concerns regarding the safety and potential adverse effects of treated nets, particularly with regard to young children and pregnant women.
- There is lack of strong branding of nets and insecticide treatments.
- Available nets lack of variety in size, shape, and color; consumer preference do not match what consumers have.
- The level of awareness of net treatments and its benefits is low, as are rates of net treatment.
- Insecticide net treatments are not currently available through the commercial sector.

The majority of findings from this baseline study are consistent with results of NetMark's formative qualitative research in Uganda. The qualitative research report, "NetMark Formative Qualitative Research in Uganda" contains more detailed information on a number of topics discussed here and is available from NetMark.

Specific program and product implications from the baseline study presented in this report are outlined below.

6.2 KNOWLEDGE AND BELIEFS ABOUT MALARIA AND MOSQUITOES

- Recognition of the English term "malaria" was nearly universal, meaning that the term can be used in health promotion activities and will be widely understood. Use of a single term around which educational efforts can build a common understanding will be very important in efforts to promote behavior change. Symptoms associated with "malaria" were generally consonant with the biomedical definition of the term, indicating that identification of the illness is already good, and little time needs to be spent on educating people to recognize signs.
- Despite the fact that a high percentage of respondents knew that mosquitoes cause malaria, many people erroneously believed that there were other causes of malaria as well, especially, living in dirty surroundings or around standing water, drinking dirty water, or being in the rain. Malaria prevention efforts should emphasize that mosquitoes are the *only* cause of malaria, dispel erroneous beliefs about other causes, and stress that environmental efforts (such as reducing amounts of standing water) can help reduce nuisance biting by mosquitoes that do not carry the malaria parasite but do not reduce malaria. It would also be important to point out that night-biting mosquitoes are the ones that transmit malaria.
- Knowledge of the groups most vulnerable to severe cases of malaria was high. Efforts to promote ITM acquisition and proper use can build on the existing knowledge that children *under five* and pregnant women are particularly vulnerable to suffering severe consequences of malaria, and reinforce preferential net use by these groups.
- Exposure to information about malaria prevention was fairly high. Information was being transmitted largely through mass media (especially radio), health facilities and social networks, and is reaching all sites fairly equally. However, increased exposure to malaria prevention messages is still needed in the entire country. A coordinated strategy that provides information from a variety of media and interpersonal sources is likely to be effective.

6.3 MOSQUITO NETS

Perceived advantages and disadvantages of treated/untreated net use by vulnerable groups

- A high proportion of respondents perceived advantages of net use by vulnerable groups — children under five and pregnant women. Promotional efforts designed to achieve nightly or year round net use by these groups can build on respondents' perceptions that nets provide good protection against mosquitoes, other insects, and malaria.
- *Treated* nets were seen as especially effective in providing good protection against mosquitoes and malaria, with the added advantage of killing and repelling mosquitoes. *Treated* nets should be marketed as having these added advantages that consumers already like, as this will be a likely motivator to their use. Since net treatments are not visible, and people do not expect nets to have insecticide properties, it will be important to find strategies for product trials—possibly among opinion leaders—so that consumers see that *treated* nets deliver what they most want in a mosquito control product.
- The main perceived disadvantages of net use were that it is hot sleeping under a net and that a child might suffocate/get caught or trapped. These perceptions should be addressed in promotional activities as well as in product formulation. However, product modification should be addressed in light of any cost increases they would involve.
- Respondents cited stronger disadvantages of *treated* nets, voicing concern about the noxious smell and potential danger of the insecticide to young children and pregnant women. Negative perceptions of treated nets appear to be based on previous experience with aerosols and coils (e.g., smell, irritation, and adverse health

effects), and to some extent previous experience with agricultural insecticides. Since treated nets do not have these characteristics, negative perceptions are likely to be overcome when products are actually used. Promotional strategies should emphasize opportunities for product trial. In addition, IEC messages and product development should take into account consumer concerns about smell and safety. At the same time, since the smell of the insecticide dissipates shortly after treatment, consumers may think that the insecticide is no longer effective; some means should be found to indicate to the consumer that insecticide is present and still effective.

Access to ITMs

- Most consumers in rural areas would have to travel quite far to obtain a net. Almost all nets owned were obtained from the commercial sector, but insecticide treatments for nets were obtained most often from non-commercial sources. Marketing and distribution strategies should emphasize the joint sale of these products. A key challenge will be to make nets and treatments more widely accessible and available by bringing them closer to where people live, with particular attention to rural areas.
- Promotional efforts should provide information on where nets and treatments can be obtained.

Mosquito net ownership, treatment, and appropriate use

- Net ownership in the study was moderately high. The fact that 51% of net-owning households owned more than one net and 67% of household nets were acquired within the past three years shows that active interest in nets is growing. The increasing amount of net promotion appears to be having an impact. Ownership may also be high because of the rather large proportion of single-sized nets which may have been originally purchased as student nets.
- Non-owners, especially those in rural areas, said that the main reason they did not own a net was cost. A key challenge to increasing net ownership will be to make nets more affordable, or seen as reasonably priced when weighed against the cost of multiple cases of malaria. Currently a fairly large proportion of nets is being provided by the commercial sector (e.g., general shops and open-air markets). Commercial nets will need to be priced competitively with those distributed through the public sector or they must be seen as being sufficiently more desirable to warrant paying more for them. Ideally, subsidized nets provided by the public sector would be targeted to low-income groups unable to afford commercial nets.
- Because brands of nets were generally unknown, commercial players will want to develop and market strong brands of nets that are associated with the benefits that consumers want (e.g., kills mosquitoes, reduces malaria, keeps mosquitoes away while sleeping; keeps mosquitoes away for a long time; safe to use around children, etc.).
- Although children under five, women of reproductive age, and pregnant women are more likely than other family members to sleep under a net, intensive effort is needed to encourage all members of these groups to sleep under treated nets on a nightly, year-round basis. The concerns about detrimental effects of the insecticide must be directly addressed by credible sources.
- The concept of treating nets with insecticide was not well known, and net treatment rates were extremely low. It is essential to make treatments available and then promote their use. Promotion can build on respondents' positive reaction to the concept of ITMs, particularly emphasizing the effectiveness of net treatment in killing/repelling mosquitoes and preventing malaria— highly valued attributes of mosquito control products. Again, safety issues must also be addressed. A long-lasting net would help to overcome the challenge of keeping nets treated, but as long as untreated nets are used, re-treatment will be necessary.
- Most nets had been washed, and over three-fourths of washed nets washed at least once a month. Treated nets were reportedly washed 1-4 times since last treatment. Promotional efforts must address how often nets should

be treated/retreated as well as washed in between treatments. Long-lasting treated nets must be able to withstand frequent washing.

- Insecticide treatments for nets were obtained through the public sector on a subsidized basis or through the commercial sector. Brands of insecticide were generally unknown. A key challenge will be to increase involvement of the commercial sector in the production and distribution of net treatment. Strong branding of net treatments that have the attributes that consumers desire is encouraged as well.

Consumer net preferences

- Consumer preferences for net features only partially matched what consumers currently own. Product development should take into consideration consumer preferences for net size (double and king), shape (round/conical and rectangular) and color (generally white, but light blue and pink as well) to raise sales and enhance strength of brand. However, decisions about product features should take into account any cost increases they would involve.

6.4 OTHER MOSQUITO CONTROL PRODUCTS

Awareness of mosquito control products and methods

- While awareness of commercial insect control products — other than mosquito nets — was moderately high, current use of these products and frequency of purchase was low, especially in rural areas. Nets appear to hold a prominent role in household mosquito control. Promotional efforts should emphasize the insecticidal characteristics of treated nets (e.g. killing/repelling mosquitoes and being better at preventing malaria), which are likely to have strong appeal to consumers. In addition, efforts should stress that use of insecticide treated nets is economical in the long run.
- Consumers reported that coils and aerosols were mostly bought in general shops. The fact that a large proportion of commercial insect control products such as coils and aerosols are bought in general shops, as are the majority of nets, shows that the insect control market is not segmented among traders and that nets and ITMs can be sold together with nets in these commercial settings. However, insecticide treatments are not sold in these outlets, and should be.

Perceptions of mosquito control attributes, products, and brands

- The most highly valued attributes that consumers wanted in an insect control product were that it kills mosquitoes and reduces malaria. They also wanted a product that keeps mosquitoes away while sleeping, keeps mosquitoes away for a long time, and is safe to use around children. While consumers rated sprays/aerosols higher than any other product on killing mosquitoes and other insects, mosquito nets were rated highest on the other attributes that consumers valued most. The fact that consumers strongly value the key attributes that ITMs deliver and that nets are already associated with many of these attributes is very positive for ITM promotion and sales. ITM promotion activities should highlight the fact that treated nets kill mosquitoes, kill insects other than mosquitoes, are a long-term solution to the mosquito problem, reduce malaria, and are safe to use around children. Branded nets should stress that they are a high-quality and effective brand.

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