NetMark Baseline Survey on Insecticide Treated Materials (ITMs): Cross-National Summary of Findings

July 2001

NetMark Baseline Survey on Insecticide-Treated Materials (ITMs): Cross-National Summary of Findings is a publication of the NetMark Project. NetMark is supported by the U.S. Agency for International Development under Cooperative Agreement No.HRN-A-00-99-00016-00 and managed by the Academy for Educational Development. The opinions expressed here are those of the authors and do not necessarily reflect the views of the U.S. Agency for International Development or the Academy for Educational Development.

CONTENTS

TABLES

ACKNOWLEDGEMENTS

The country studies cited in this report were conducted by the NetMark Project of the Academy for Educational Development (AED). The United States Agency for International Development (USAID) provided funding for this research. Research International (RI) was contracted to implement the research and manage the data.

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LIST OF ACRONYMS

AED	**Academy for Educational Development**
ITMs	**Insecticide treated materials**
ITNs	**Insecticide treated nets**
RI	**Research International**
SES	**Socio-economic status**
USAID	**United States Agency for International Development**
USD	**U.S. Dollars**
WRA	**Women of reproductive age**

EXECUTIVE SUMMARY

PURPOSE: Compare 5 countries on indicators related to:

- 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: Five countries – Nigeria, Senegal, Zambia, Uganda, and Mozambique – each with a sample of 1000 households drawn from 5 sites representing the geo-ethnic diversity of each country. 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: October-November 2000

STUDY FINDINGS:

Knowledge and beliefs about malaria, mosquitoes, and nets

- Recognition of the term "malaria" (or "paludisme" in Senegal or "paludismo" in Mozambique") was very high, ranging from 86%-100%. Although the majority of those who recognized the term knew that mosquitoes cause malaria (77%-92%), a much smaller percentage (21%-42%) knew that mosquitoes are the *only* cause of malaria. General knowledge of symptoms was good: 62%-89% mentioned "fever" and 29%-47% mentioned "chills/shivering", a symptom of fever; most named other symptoms that are also manifestations of malaria. Very few (1%-6%), however, mentioned convulsions, a symptom of severe malaria. Knowledge of vulnerable groups was moderate to high: Children under five and pregnant women were named by 55%-86% of respondents as the groups most susceptible to getting a serious case of malaria.
- Exposure to malaria-prevention information varied greatly, ranging from a low of 40% in Nigeria to a high of 91% in Senegal. Of those who had seen/heard information, most had received information via the radio, health facilities, and neighbors/friends. In Nigeria, a particularly high percentage of respondents (18%) got information from non-professional sources of information (friends, neighbors or relatives).
- Almost all respondents (92%-100%) perceived advantages for a child under five sleeping under a mosquito net. Most commonly mentioned were "avoid getting bitten by mosquitoes," "avoid getting malaria," and "sleep better."
- Those citing disadvantages for a child under five sleeping under a mosquito net ranged from a low of 15% in Mozambique and Senegal to a high of 68% in Nigeria. The most commonly mentioned disadvantages were "it is hot sleeping under a net," "child may suffocate," "child may get caught/trapped."
- The majority of respondents (82%-95%) perceived advantages for a child under five sleeping under a *treated* net. The most commonly mentioned were "kills mosquitoes," "repels mosquitoes away from the net," "works better against mosquitoes than an untreated net," "better at preventing malaria," and "child is more protected."

- Those citing disadvantages for a child under five sleeping under a *treated* net, ranged from a low of 18% in Mozambique to a high of 66% in Uganda. The most commonly mentioned disadvantages were concerns about the safety of the chemical: "smell is bad," "the chemical is dangerous," or even that the "chemical can kill the child."
- The majority of respondents (77%-93%) perceived advantages for a pregnant woman sleeping under a *treated* net. Advantages had to do with the greater efficacy of a treated net: "kills mosquitoes," "repels mosquitoes away from the net," "works better against mosquitoes than an untreated net," "is better at preventing malaria," and "the pregnant woman is more protected."
- The proportion citing disadvantages for a pregnant woman sleeping under a treated net ranged from a low of 22% in Mozambique to 65% in Nigeria. The most commonly mentioned disadvantages had to do with safety and smell issues: "chemical is dangerous," " smell is bad," "might make woman nauseated/vomit."

Access to nets

- Nets were available through different commercial and non-commercial outlets. Open-air markets, as well as general shops, were reported to be the nearest places respondents said they could purchase a net.
- The average time to get to the nearest place of purchase ranged widely between countries. Access appeared best in Senegal where almost half (47%) said they would get to the nearest place on foot in an average of 13 minutes. From 4% (Nigeria) to 28% (Mozambique) did not know a place where they could obtain a net.

Net ownership and characteristics of nets owned

- The proportion of households owning at least one mosquito net ranged from a low of 12% in Nigeria to a high of 34% in Senegal and Uganda. Those owning more than one net ranged from 25%-52%. (These figures may be higher than the national average, given that some of the sample sites have active net promotion projects.) Ownership was higher in urban than in rural areas in Zambia, Mozambique, and Uganda; equal in Nigeria; and higher in rural than urban areas in Senegal. Households of higher the socio-economic status were more likely than households of lower socio-economic status to own a net in all countries, except Senegal where the reverse was true.
- Nets were obtained primarily through the commercial sector in all five countries. Non-commercial sources accounted for a sizable portion of nets in Zambia (28%). Over half of all nets owned by households in all countries were acquired within the last three years.
- In Nigeria, Senegal, Zambia, and Uganda, households reported paying an average of 4.92-5.48USD per net. In Mozambique households reported paying 11USD (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 of nets. In Senegal and Nigeria, tailor-made (non-manufactured) nets comprised 19%-38% of nets owned.
- One of the most common net sizes owned were double. Single-size nets were fairly common in Nigeria and Uganda and king-size nets in Senegal and Mozambique. The most common shapes in Nigeria and Senegal were rectangular. In Zambia, Uganda, and Mozambique most were round/conical.
- The great majority of nets (69%-94%) had been washed. At least half (50%-77%) of nets that had been washed, were washed at least once a month and at least one fourth (26%-53%) were washed at least every two weeks.

Net treatment

- Awareness of treating nets was moderate in Zambia and Senegal (51%-70%), low in Mozambique and Uganda (28%) and lowest in Nigeria (7%). Few households owned a treated net (0%-11%). Zero- 35% of nets were ever treated, with the highest percentage found in Zambia and the lowest in Nigeria. On average, those nets had been treated/re-treated 1.7-2.7 times and were last treated 4-6 months ago. Treatment was obtained mostly from non-commercial sources, such as projects, clinics or gifts. The average price of treatment ranged from .74-1.73USD.

Appropriate use

- In net-owning households, about 48%-53% of children under age five slept under a net (treated or untreated) the prior night, representing 9-25% of all children in the households in the sample. Only 1%-17% of these children slept under a *treated* net the prior night, representing 0%-6% of all children in the households in the sample.
- The number of women of reproductive age (WRA) in net-owning households who slept under a net (treated or untreated) the prior night ranged from 42%-67%, representing 6%-23% of the total number of women of reproductive age in the households in the sample. Only 0%-15% of WRA slept under a *treated* net the prior night, representing 0%-5% of WRA in the households in the total sample. Eighteen percent (18%) – 69% of pregnant women in net-owning households slept under a net the prior night, representing 4%-21% of pregnant women in the households in the total sample. Only 0%-17% in net-owning households slept under a treated net the prior night, representing 0%-6% of all pregnant women in the sample households (note: denominators very small for pregnant women).
- For those household members who did sleep under mosquito nets, the average number of months per year they slept under nets was 6 -10.

Consumer mosquito net preferences

- The majority of respondents in all countries except Nigeria preferred round/conical shaped nets but rectangular nets were also liked. In Nigeria, the majority preferred rectangular nets. Consumers in all countries preferred large nets, either king or double-sized.
- Most respondents preferred light-colored nets. In general, respondents disliked dark colored nets.

Awareness and use of other mosquito control products

- Mosquito nets were the mosquito control product consumers were most aware of in Zambia, Mozambique, and Uganda. In Nigeria and Senegal, consumers were most aware of coils and aerosols. Aside from nets, the most frequently used products were coils and aerosols. Use of aerosols was higher in urban than in rural areas. Use of coils was higher in rural than in urban areas everywhere but Zambia.
- Mosquito coils were purchased relatively frequently among the 25-62% of households that had purchased them in the last 12 months prior to the interview, with over one-fourth (26%) of respondents having purchased them within the last week. Coils were generally purchased in open-air markets, kiosks, and from street vendors in Nigeria and Mozambique. In Senegal and Uganda, coils were generally purchased from general shops. Aerosols were generally purchased through open-air markets and kiosks in Nigeria; general shops and supermarkets in Senegal, Zambia, and Uganda; and open-air markets and street vendors in Mozambique.

Perceptions of mosquito control attributes, products, and brands

- Consumers in all countries wanted a mosquito control product that kills mosquitoes and reduces malaria. Nets, compared to aerosols or coils, were rated more positively on many insect control attributes, in all countries, except Nigeria. Aerosols were most strongly associated with killing mosquitoes and other insects.
- Brand awareness was highest for “Mobil” in Nigeria, “Yotox” in Senegal, “Target” in Zambia, “Doom” in Uganda, and “Baygon” in Mozambique.

PROGRAM/PRODUCT IMPLICATIONS:

There are many very favorable aspects for ITM promotion in all countries surveyed, as well as some important barriers to overcome.

Favorable factors include:

- high awareness of malaria and general understanding of how it is transmitted
- adequate levels of knowledge of vulnerable groups in Uganda and Senegal
- moderate to high exposure to information on avoiding malaria in all countries, except Nigeria
- common use and relatively frequent purchase of other mosquito control products (aerosols, coils) in Senegal and Nigeria
- high awareness of mosquito nets as an insect control method and highly favorable attitudes toward mosquito nets compared to other insect control products
- a net culture that is already being established (moderate level of net ownership and recent acquisition of nets) in all countries, except Nigeria
- commercial sector already primary source for net purchase
- moderate levels of net use by children under five in households who own nets
- already moderate level of ITM awareness in two countries – Senegal and Zambia
- strong valuing of the product attributes that ITMs deliver
- high level of perceived advantages of *treated* net use in all countries; relatively low levels of perceived disadvantages in all countries except Nigeria and Uganda

Main barriers to overcome for ITM promotion are:

- misperceptions about the causes of malaria
- only moderate levels of knowledge of vulnerable groups in Zambia, Nigeria, and Mozambique
- inadequate exposure to malaria prevention messages in Nigeria
- moderate levels of perceived disadvantages of net use by children under five in Nigeria and Uganda
- moderate levels of perceived disadvantages of *treated* net use by vulnerable groups, particularly in Nigeria and Uganda
- concerns regarding the safety and potential adverse health effects of treated nets, particularly with regard to young children and pregnant women
- dislike of nets or perception that they are unnecessary in Senegal and Nigeria
- perceived high cost of nets
- lack of strong branding of nets
- limited access to nets in all countries, except Senegal
- lack of variety in net size, shape, and color
- lack of even a nascent "net culture" in Nigeria
- very marginal availability of insecticide treatments through commercial sector
- low levels of ITM awareness in Uganda, Mozambique, and Nigeria
- inadequate use of ITMs by young children and pregnant women; use only part of the year
- low rates of net treatment/retreatment

SECTION 1
INTRODUCTION

1.1 BACKGROUND

This report is a summary of findings from NetMark household surveys on mosquito nets and insecticide treatments for nets conducted in five African countries: Nigeria, Senegal, Zambia, Uganda, and Mozambique.

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. 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, but the efficacy of these products in preventing malaria remains unknown.

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 the AED, the U.S. government, The Malaria Consortium of the London School of Hygiene and Tropical Medicine and 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, IMPLEMENTATION, AND SAMPLE

Objectives

As part of a comprehensive research agenda that includes both market and behavioral research, NetMark conducted household surveys in Nigeria, Senegal, Zambia, Uganda, and Mozambique to serve as evaluation baselines. The surveys produced a wealth of data useful to the public health community as well as to the private sector on topics related to insecticide treated nets. This cross-national summary report does not cover all topics addressed in the individual country reports[1] but provides data across the five countries on the essential findings from the surveys:

[1] Individual country reports, along with other NetMark formative qualitative research, and the research instruments are available from the NetMark Project and the NetMark website: http://www.netmarkafrica.org/

- 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

Implementation

The research was designed by NetMark and carried out with the Africa offices of Research International (RI). To maximize comparability of data, the same instrument translated into different languages was used in each of the five countries. The surveys were administered in all five countries more or less simultaneously, during October and November of the year 2000. The timing of the rainy season differs by country and region, and was likely to affect net use patterns. In Nigeria, the timing of the study meant that the data were collected near the end of the rainy season in the Southern sites and just after the rains in the North. In Senegal the data were collected during the end of the rainy season. In Uganda, they were collected during the rainy season. In Zambia and Mozambique the data were collected at the end of the dry season/beginning of the rainy season.

Sample

The target sample in each country was 1000 households drawn from five sites selected to represent the geo-ethnic diversity of each country. In each site, the target sample was 200: 80 respondents from the site's urban center, 60 from households within 100 kilometers from the urban center, and 60 from households 100-200 kilometers from the urban center. The actual sample attained is shown in Table 1. A fuller description of the sampling procedure is found in the Appendix.

Respondents were women of reproductive age (age 15-49) who were mothers or guardians of children under five years of age. 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. Table 2 provides descriptive information on respondents and households in the sample.

Table 1: Sample size, by country and site

Site	Total	Urban	Rural 100 km from Urban	Rural 200 km from Urban
Nigeria				
Lagos	200	80	60	60
Ibadan	200	80	60	60
Nsukka	200	80	60	60
Maiduguri	200	80	60	60
Kano	199	79	60	60
TOTAL	**999**	**399**	**300**	**300**
Senegal				
Dakar	205	85	60	60
Thies	199	80	60	59
St.Louis	201	80	60	61
Kaolack	198	79	60	59
Tambacounda	197	76	61	60
TOTAL	**1000**	**400**	**301**	**299**
Zambia				
Lusaka	211	90	60	61
Kitwe	184	73	58	53
Mansa	200	80	60	60
Choma	200	80	60	60
Kaoma	205	81	60	64
TOTAL	**1000**	**404**	**298**	**298**
Uganda				
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**
Mozambique				
Maputo	204	81	63	60
Beira	199	79	60	60
Quelimane	200	80	60	60
Tete	199	80	59	60
Nampula	197	80	58	59
TOTAL	**999**	**400**	**300**	**299**
TOTALS	**4998**	**2008**	**1466**	**1524**

Table 2: Characteristics of respondents and households

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**
BASE	999	399	600	1000	400	600	1000	404	596	1000	405	595	999	400	599
Characteristics of respondents															
% ever attended school															
Yes	74.4	82.7	68.8	53.3	68.8	43.0	92.2	95.8	89.8	88.7	93.1	85.7	75.5	88.0	67.1
No	25.5	17.3	31	46.7	31.3	57.0	7.8	4.2	10.2	11.3	6.9	14.3	24.5	12.0	32.9
Mean yrs. of schooling	9.3	10.2	8.6	7.2	7.8	6.6	7.6	8.7	6.8	8.8	9.7	8.2	6.3	7.5	5.3
Household composition															
Mean number of household members per household	4.8	4.8	4.8	7.8	7.0	8.0	5.9	6.0	5.8	4.7	4.5	4.9	5.7	5.7	5.7
Mean number of WRA per household	1.1	1.2	1.1	1.9	1.9	1.9	1.5	1.6	1.3	1.2	1.2	1.2	1.6	1.7	1.5
Mean number of pregnant women per household	0.1	0.08	0.1	0.12	0.11	0.13	0.08	0.06	0.08	0.13	0.13	0.13	0.17	0.18	0.16
Mean number of children under age 5 per household	1.6	1.5	1.7	2.0	1.9	2.0	1.7	1.7	1.7	1.6	1.5	1.6	1.6	1.7	1.7
% of households with electricity	80	93	71	63	88	46	24	54	3	33	65	10	37	63	19
SES[2]															
1 LOW	19.5	5.3	29	20.0	4.5	30.3	20.0	6.9	28.9	19.9	5.5	29.9	19.9	4.3	30.4
2	20.4	11	26.7	20.0	11.3	25.8	19.6	9.2	26.7	20.4	7.5	29.4	20	9.5	27
3	20.1	17.3	22	20.0	17.3	21.8	20.4	9.7	27.7	19.5	12.9	24.2	20	20.3	19.9
4	20.0	27.8	14.8	20.0	27.3	15.2	20.0	29.2	13.8	19.9	30.4	12.8	20.1	26.8	15.7
5 HIGH	19.9	38.6	7.5	20.0	39.8	6.8	20.0	45.0	3.0	19.9	23.8	3.7	19.9	39.3	7

[2] A five point index of socio-economic status (SES) was calculated as follows: A list of socio-economic descriptors used to produce the SES segmentation for each country. Several categorical variables were re-coded to become pseudo-ordinal variables, and categories that were judged to be equivalent in terms of SES were recoded to increase the frequency of responses. Principal component analysis was used to extract the main, single factor, which accounted for the largest amount of variance in the data. Using the factor scores from the principal components 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.

1.3 ORGANIZATION OF THE REPORT AND TABLES

This report presents findings grouped into seven main areas: (1) knowledge and beliefs about malaria, mosquitoes, and nets; (2) access to nets; (3) net ownership and characteristics of nets owned; (4) mosquito net treatment; (5) appropriate use of nets; (6) consumer mosquito net preferences; and (7) use of 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 the key tables from the individual country reports as a data resource, and statements summarizing the main results accompany each table. The tables in the individual country reports were broken down by site, location, urban-rural, and for some variables by socioeconomic status (SES); for purposes of clarity, however, the tables in this report are limited to comparisons by country, urban-rural, and in select cases SES.

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 in absolute numbers.

SECTION 2
KNOWLEDGE AND BELIEFS ABOUT MALARIA, MOSQUITOES, AND NETS

2.1 GENERAL KNOWLEDGE OF MALARIA

- Respondents were asked whether they had heard of the "malaria" (or "paludisme" in Senegal or "paludismo" in Mozambique) in order to determine the extent to which the term could be used in promotional efforts. Recognition of a common term was generally very high, ranging from 86% in Senegal to virtually 100% in Zambia and Uganda. In countries where recognition was less than universal, rates were consistently lower in rural than in urban areas.
- Respondents who had heard of malaria were asked what the symptoms were, with multiple responses permitted. In all countries, fever was the most common symptom named, as well as other manifestations of fever such as chills/shivering, and body/joint aches. Nausea or vomiting was also commonly mentioned in Senegal, Zambia, and Uganda. Convulsions, a symptom of severe malaria was mentioned by few respondents: from 1% in Nigeria to 6% in Uganda.
- Those who had heard of malaria were asked what causes malaria. Multiple responses were permitted. The majority of respondents in all countries named mosquitoes as a cause of malaria (ranging from 77% in Mozambique to 92% in Uganda). However, only a minority knew that mosquitoes are the only cause of malaria (ranging from 21% in Uganda to 42% in Zambia). Most-commonly named causes other than mosquitoes were dirty surroundings, drinking dirty water, being in the rain, living around standing water, and getting hot/overexposed to the sun.
- The survey sought to determine respondents' knowledge of groups most vulnerable to getting a serious case of malaria. A respondent was categorized as "knowing vulnerable groups" if she selected both the child under five and the pregnant woman among pictures of five family members. Knowledge of vulnerable groups was highest in Senegal (86%) and lowest in Nigeria (55%). Knowledge was slightly higher in urban than in rural areas.

Table 3: Recognition of term "malaria"/ "paludisme"/"paludismo"
Among all respondents

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	999	399	600	1000	400	600	1000	404	596	1000	405	595	999	400	599
Yes	93.9	98.5	90.8	85.5	93.3	80.3	99.7	99.8	99.7	99.6	100	99.3	95.3	98.5	93.2
No	6.1	1.5	9.2	14.5	6.8	19.7	0.3	0.2	0.3	0.4	0	0.7	4.7	1.5	6.8

Table 4: Perceived symptoms of malaria
Among respondents who have heard of malaria (multiple responses possible)

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	938	393	545	855	373	482	997	403	594	996	405	591	952	394	558
Fever	61.9	63.6	60.7	88.9	90.1	88.0	78.7	81.6	76.8	71.4	70.4	72.1	68.4	73.6	64.7
Chills/shivering	29.0	27.0	60.7	32.0	33.2	31.1	46.7	44.9	48.0	39.2	40	38.6	34.7	38.3	32.1
Headache	50.6	53.7	48.4	45.5	50.9	41.3	42.3	39.0	44.6	38.4	41.2	36.4	51.6	49.5	53.0
Body/joint ache	16.5	15.8	17.1	28.3	33.5	24.3	23.1	21.8	23.9	25.8	28.9	23.7	30.5	32.0	29.4
Weakness	35.9	31.6	39.1	20.4	23.9	17.6	17.1	19.1	15.7	31.3	32.1	30.8	26.3	29.7	23.8
Nausea/vomiting	8.6	8.9	8.4	51.8	50.9	52.5	53.1	53.6	52.7	48.8	48.6	48.9	14.8	17.3	13.1
Diarrhea	2.5	2.5	2.4	8.1	8.3	7.9	20.2	22.6	18.5	21.3	20.7	21.7	13.3	13.7	13.1
Convulsions	1.0	0.5	1.3	3.6	3.3	3.9	3.4	2.5	4.0	5.8	4.9	6.4	2.7	3.6	2.2

Table 5: Perceived causes of malaria
Among respondents who have heard of malaria (multiple responses possible)

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	938	393	545	855	373	482	997	403	594	996	405	591	952	394	558
Mosquitoes	80.5	82.4	79.1	88.1	90.3	86.3	81.1	85.6	78.1	91.6	93.1	90.5	76.5	84	71.1
Being in the rain	5.1	4.6	5.5	12.5	14.5	11	5.9	4.7	6.7	20.2	18	21.7	12.8	15.7	10.8
Getting cold	4.5	4.1	4.8	1.4	1.3	1.5	9.6	6.9	11.4	11.9	11.9	12	4.9	5.3	4.7
Getting hot/sun overexposure	29.9	24.4	33.8	17.3	21.7	13.9	2.9	3.2	2.7	12.4	8.9	14.9	6	8.4	4.3
Drinking dirty water	14.5	16.8	12.8	1.8	1.1	2.3	18.5	19.1	18	30.3	31.1	29.8	4.8	5.6	4.3
Eating cold or dirty food	5.4	6.9	4.4	4.3	3.2	5.2	5.9	5	6.6	15.9	15.1	16.4	2.9	3	2.9
Overwork	19.1	14.2	22.6	0	0	0	0.7	0.7	0.7	5.8	5.7	5.9	1.3	1.3	1.3
God/Allah	2.8	1.8	3.5	2.3	1.6	2.9	0.2	0.2	0.2	1.8	1.7	1.9	0.9	1	0.9
Another person with malaria	1.1	0.8	1.3	5.0	7.2	3.3	0.8	0.5	1	12.8	14.6	11.5	3.7	6.1	2
Dirty surroundings	18.0	21.4	15.6	28.9	26.3	30.9	13.3	10.4	15.3	32.2	32.1	32.3	21.6	23.4	20.4
Standing water	4.7	4.6	4.8	19.9	21.2	18.9	6.9	6.7	7.1	14.6	15.1	14.2	18.0	23.9	13.8
Other	4.8	5.6	4.2	7.9	9.3	6.3	9.2	7.4	10.4	5.4	3.1	6.9	0.7	0	1.4
Don't know	3.2	4.1	2.6	3.5	2.1	4.6	7.6	5.7	8.9	2.0	2.0	2.0	17.2	10.4	22.0

Table 6: Knowledge of cause of malaria and vulnerable groups
Among respondents who have heard of malaria

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	938	393	545	855	373	482	997	403	594	996	405	591	952	394	558
Know only mosquitoes cause malaria (%)	28.5	28.5	28.4	28.4	26.5	29.9	41.8	46.9	38.4	21.2	23.2	19.8	30.0	31.5	29.0
Know vulnerable groups (%)	55.3	60.8	51.4	86.4	89.3	84.2	62.5	69.2	57.9	80.3	81.7	79.4	58.3	59.9	57.2

2.2 EXPOSURE TO INFORMATION ON AVOIDING MALARIA

To obtain a general idea of the extent to which people are currently being exposed to 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.

- Exposure to malaria-prevention information varied considerably, from a low of 40% in Nigeria to a high of 91% in Senegal. There were no large differences in exposure between urban or rural sites.
- Most respondents had received information via the radio, health facilities, and neighbors/friends. Nigeria had the highest proportion of respondents (18%) who had heard something about malaria prevention *only* from non-professional sources such as friends and neighbors.

Table 7: Exposure to information on avoiding malaria
Among respondents who have heard of malaria

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	938	393	545	855	373	482	997	403	594	996	405	591	952	394	558
Yes	39.9	44.8	36.3	91.3	92.5	90.5	58.0	59.3	57.1	81.3	82.2	80.7	61.1	64.7	58.6
No	60.1	55.2	63.7	8.7	7.5	9.5	42.0	40.7	42.9	18.7	17.8	19.3	38.9	35.3	41.4

Table 8: 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)

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**
BASE	374	176	198	781	345	436	578	239	339	810	333	477	582	255	327
Radio	25.9	28.4	23.7	69.4	69.3	69.5	21.3	30.5	14.7	74.9	82.3	69.8	58.8	70.6	49.5
Television	20.6	33	9.6	52	69	38.5	14.9	30.1	4.1	6.3	11.4	2.7	14.6	27.1	4.9
Newspaper/magazine	5.1	7.4	3	2.6	4.1	1.4	0.7	1.7	0	8.8	10.8	7.3	5	9.4	1.5
Staff at shop/ pharmacy/market	4.0	4	4	0.5	0.6	0.5	0.3	0.4	0.3	5.1	4.5	5.5	3.1	2.7	3.4
Poster/notice at shop/ pharmacy/market	3.7	4.5	3	1.5	1.4	1.6	1.7	1.7	1.8	7.8	6.3	8.8	8.1	11.8	5.2
Health staff/personnel	36.6	36.4	36.9	35.7	33	37.8	61.6	46	72.6	45.2	46.5	44.2	30.1	22.7	35.8
Poster/notice at health facility	10.7	12.5	9.1	13.8	10.7	16.3	8.8	8.4	9.1	16.9	18.3	15.9	39.2	38	40.1
Church/mosque	1.1	0	2	0.4	0.3	0.5	0.3	0.4	0.3	10.9	10.5	11.1	0.9	0.4	1.2
School	2.9	3.4	2.5	2.2	2.6	1.8	1.0	0.8	1.2	1.9	1.5	2.1	5.8	7.8	4.3
Drama Group	1.3	2.8	0	2.4	2.6	2.3	0.5	0.4	0.6	1.7	1.5	1.9	4.3	6.3	2.8
Friends/Neighbors/ Relatives	32.9	23.3	41.4	28.9	20	36	22.5	24.7	20.9	45.0	39.6	48.8	28.7	29.8	27.8
Other	0.3	0.6	0	1.9	2.6	1.4	0.7	0	1.2	1.4	0.3	2.3	0.2	0	0.3
Don't Know	2.4	2.8	2	0.4	0.6	0.2	0.7	0	1.2	1	0.6	1.3	1.4	1.2	1.5

Table 9: Exposure to information from “non-professional” and “professional” sources

Among respondents who have seen/heard information about malaria in the 12 months prior to the interview

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**
BASE	374	176	198	781	345	436	578	239	339	810	333	477	582	155	327
“Non-professional” sources only	18.2	11.4	24.2	5.0	2.9	6.7	13.7	16.7	11.5	3.6	2.1	4.6	4.8	2.7	6.4
“Non-professional” and “professional” sources	14.7	11.9	17.2	23.9	17.1	29.4	8.8	7.9	9.4	41.4	37.2	44.2	23.9	27.1	21.4
“Professional” sources only	64.7	73.9	56.6	70.7	79.4	63.8	76.8	75.3	77.9	54.1	60.1	49.9	69.9	69.0	70.6
Don’t know	2.4	2.8	2.0	0.4	0.6	0.2	0.7	0	1.2	1.0	0.6	1.3	1.4	1.2	1.5

2.3 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.

- In every country, a far greater proportion of respondents cited advantages than disadvantages for sleeping under a mosquito net for a child under five: The proportion of respondents who cited advantages ranged from 92% in Mozambique to 100% in Uganda. The most-commonly mentioned advantages were "avoid getting bitten by mosquitoes," "avoid getting malaria," and "sleep better." There were also some other key advantages that were more salient for certain countries than others (e.g., "don't get bothered by other insects" in Senegal and "gives warmth" in Uganda).

  There were large differences among countries in the proportion of respondents citing disadvantages for sleeping under a mosquito net for a child under five, ranging from 15% in Mozambique and Senegal to 68% in Nigeria and Uganda. The main perceived disadvantages of a child sleeping under a mosquito net were "it is hot sleeping under a net," "child may suffocate," and "child may get caught/trapped." Fear of suffocation/entrapment was particularly high in Uganda. The perception of nets as being hot was especially high in Nigeria and Uganda.
- Almost all respondents cited advantages for a child under five sleeping under a *treated* net. The proportion of respondents who cited advantages for a child under five sleeping under a *treated* net ranged from 82% in Mozambique to 95% in Nigeria. The main advantages cited for use of a *treated* net by a child under five had to do with its greater efficacy than an untreated net: "kills mosquitoes," "repels mosquitoes away from the net," "works better against mosquitoes than an untreated net," "better at preventing malaria," and "child is more protected."

  Fewer respondents cited disadvantages of a child under five sleeping under a *treated* net, ranging from 18% in Mozambique to 66% in Uganda. The most commonly mentioned disadvantages had to do with concerns about the safety and smell of the chemical: "chemical is dangerous," "smell is bad," or even that the "chemical can kill the child." Safety concerns were especially prominent in Uganda and Nigeria and were lowest in Mozambique.
- Treated nets were also seen as advantageous for pregnant women. The proportion of respondents who cited advantages for a pregnant woman sleeping under a treated net ranged from 77% in Zambia to 93% in Nigeria. The main advantages cited for use of a treated net by a pregnant woman again had to do with its ability to "kill mosquitoes," "repel mosquitoes away from the net," the perception that it "works better against mosquitoes than an untreated net," is "better at preventing malaria," and that "pregnant woman is more protected."

  Fewer cited disadvantages of a pregnant woman sleeping under a *treated* net, ranging from 22% in Mozambique to 65% in Nigeria. Again, the most commonly mentioned disadvantages had to do with concerns about the safety of the chemical and its smell: "chemical is dangerous," that the "smell is bad" and that it "might make woman nauseated/vomit." Concerns about safety and illness were highest in Uganda and Nigeria and lowest in Senegal and Mozambique.
- There were no large differences between urban and rural respondents in most of the advantages and disadvantages mentioned.

Advantages of sleeping under a mosquito net for child under five

Table 10: Perceived advantages of sleeping under a mosquito net for child under five
Among all respondents (multiple responses possible)

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	999	399	600	1000	400	600	1000	404	596	1000	405	595	999	265	734
Avoid getting bitten by mosquitoes	78.5	79.9	77.5	88.9	85.5	91.2	87.2	87.9	86.7	80.6	79	81.7	73.5	77.7	71.9
Avoid getting "malaria"	25.3	28.8	23	17.8	25.5	12.7	52.2	51.5	52.7	34.6	42.2	29.4	56.5	66.8	52.7
Avoid getting [local term for malaria]	5.8	2.8	7.8	22.5	22.8	22.3	0.9	0.7	1	27.7	21.2	32.1	2.4	1.1	2.9
Don't get bothered by other insects	8.9	8.8	9	45.5	45	45.8	24.4	24.5	24.3	17.4	20.0	15.6	15.1	17.4	14.3
Sleep better	18.5	17	19.5	39.0	43.3	36.2	21.9	22.3	21.6	20.1	21.7	19.0	28.4	24.5	29.8
Gives warmth	5.3	3.8	6.3	2.4	1.0	3.3	3.4	1.7	4.5	22.2	21.2	22.9	0.2	0	0.3
Protects against dust/dirt	5.6	7	4.7	8.9	7.5	9.8	3.8	3	4.4	7.3	5.9	8.2	4	4.9	3.7
Gives privacy	4.2	5	3.7	0.6	0.5	0.7	0.5	0.5	0.5	7.1	8.6	6.1	4.6	6.4	4
Saves money/time because child not sick	4.7	5.8	4	3.4	1.5	4.7	2.8	2.5	3	14.7	12.3	16.3	4.3	4.9	4.1
Is an economical/lasting solution	2.8	3	2.7	0.6	0.5	0.7	3.1	2.5	3.5	8.0	7.9	8.1	3.2	2.3	3.5
Other	0.3	0.5	0.2	3.2	1.2	3.6	4.0	4.5	3.7	2.6	3.8	1.9	0	0	0
None	0.4	0.5	0.3	0	0	0	0.8	1.2	0.5	0	0	0	0	0	0
Don't Know	1.5	1	1.8	1.0	0.8	1.2	0.7	1	0.5	1.0	0	0.3	8.3	4.5	9.7

Disadvantages of sleeping under a mosquito net for a child under five

Table 11: Perceived disadvantages of sleeping under a mosquito net for child under five
Among all respondents (multiple responses possible)

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	999	399	600	1000	400	600	1000	404	596	1000	405	595	999	400	599
Hot sleeping under a net	26.5	25.3	27.3	2.5	1.5	3.2	2.5	3.7	1.7	24.0	26.9	22	3.5	6.0	1.8
Mosquitoes can still bite through the net	4.5	3	5.5	0.7	0.3	1	1.8	2.5	1.3	10.5	10.1	10.8	0.9	1.0	0.8
Mosquitoes can still get in the net	5.3	4.3	6.0	1.2	0.8	1.5	1.5	2	1.2	8.7	9.9	7.9	2.1	3.8	1
Mosquitoes still make noise	4.1	4.5	3.8	0.1	0	0.2	1.2	0.7	1.5	7.9	5.2	9.7	3.7	8.0	0.8
Difficult/inconvenient if child has to get up in the night	10.7	13.0	9.2	1.8	1.5	2	2.7	3.7	2	17.4	17.8	17.1	1.6	2.5	1
Takes time to tuck in the net	3.2	3.3	3.2	0.9	0.8	1	0.2	0.2	0.2	9.3	6.2	11.4	2.8	4.3	1.8
Not enough air under the net	9.9	9.5	10.2	1.1	1.5	0.8	3.1	4.7	2	9.0	8.9	9.1	0.4	0.3	0.5
Child might suffocate	8.3	11.8	6.0	3.1	3.8	2.7	5.6	7.9	4	23.3	30.4	18.5	2.3	3.0	1.8
Child may tear net	8.2	9.0	7.7	1.2	1.8	0.8	0.7	0.7	0.7	6.0	6.2	5.9	1.9	3.5	0.8
Child might get caught/trapped	4.9	4.5	5.2	5.2	5.0	5.3	5.3	6.4	4.5	21.4	24	19.7	1.8	2.8	1.2
Child will get used to net and won't be able to sleep without it	3.2	4.3	2.5	0.4	0	0.7	0.3	0	0.5	3.4	3.5	3.4	1.7	3.0	0.8
Too expensive	6.6	6.3	6.8	1.1	0.3	1.7	1.8	1.0	2.3	13.7	10.6	15.8	2.0	2.8	1.5
Other	1.1	1.5	0.8	0.4	0.5	0.4	1.0	0.5	1.3	2.0	2.4	1.6	0.1	0	0.2
None	17.9	17.3	18.3	80.1	82.3	78.7	68.9	63.6	72.5	19.0	16.3	20.8	42.7	45.3	41.1
Don't Know	13.7	10.8	15.7	4.5	4	4.8	12.2	12.6	11.9	12.5	11.9	12.9	42.3	33.8	48.1

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

Table 12: Perceived advantages of sleeping under a treated mosquito net for child under five
Among all respondents (multiple responses possible)

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	999	399	600	1000	400	600	1000	404	596	1000	405	595	999	400	599
Works better against mosquitoes than an untreated net	39.2	40.9	38.2	33	33	33	23.7	27.5	21.1	40.1	37.8	41.7	33.4	40.3	28.9
Kills mosquitoes	47.6	46.4	48.5	41.6	40.8	42.2	40.8	38.6	42.3	48.3	50.6	46.7	48.3	50	47.2
Repels mosquitoes away from net	19.6	18	20.7	41.8	39.3	43.5	32.3	34.7	30.7	29.9	37.5	24.7	26.5	28.5	25.2
Kills/repels other insects or pests	8.3	9	7.8	27.9	33.3	24.3	29.6	30.9	28.7	17.9	18.3	17.6	13.2	14.5	12.4
Is better at preventing "malaria"	16.9	21.1	14.2	13.4	17.5	10.7	34.0	37.9	31.4	24.8	30.1	21.2	27.2	28.3	26.5
Is better at preventing [local term for malaria]	3.0	2.3	3.5	13.4	14	13	0.5	0.5	0.5	20.8	18.8	22.2	1.4	0.5	2
Child is more protected	13.1	13.5	12.8	23.7	31.8	18.3	17.7	18.3	17.3	24.4	19.5	27.7	20.2	21.8	19.2
Save more money/time because child is not sick	4.3	4.8	4.0	1.1	0.3	1.7	1.5	1.2	1.7	5.1	5.4	4.9	1.4	1.5	1.3
Other	0.3	0.5	0.2	2.6	1.4	3.4	2.0	1	2.7	0.7	0.4	0.9	0	0	0
None	1.6	1.8	1.5	2.6	2	3	5.0	4.2	5.5	3.4	2	4.4	1.8	2.3	1.5
Don't Know	3.3	4.3	2.7	8.2	4.8	10.5	6.2	4.5	7.4	3.3	2.2	4	16.2	12	19

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

Table 13: Perceived disadvantages of sleeping under a treated mosquito net for child under five
Among all respondents (multiple responses possible)

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	999	399	600	1000	400	600	1000	404	596	1000	405	595	999	400	599
Insecticide is not effective	2.4	2.5	2.3	0.4	0.5	0.3	0.7	0.5	0.8	4.8	4.7	4.9	1	2	0.3
Smell is bad	16.7	16.5	16.8	9.6	10.8	8.8	7.0	5.9	7.7	21.1	18.8	22.7	7.2	9.5	5.7
Causes irritation/cough	12.6	13.3	12.2	4.7	6.3	3.7	9.9	11.6	8.7	12.3	13.6	11.4	4.5	7.3	2.7
Causes other illness	10.5	8.5	11.8	2.5	2	2.8	8.8	10.1	7.9	17.4	22.2	14.1	2.1	3.8	1
Child might chew/suck net	5.9	6.8	5.3	4.3	4.5	4.2	10.3	11.6	9.4	21.0	20.5	21.3	4.1	7.5	1.8
Chemical is dangerous	17.5	21.1	15.2	11.3	13.8	9.7	13.4	15.1	12.2	32.8	35.8	30.8	5	6.8	3.8
Chemical can kill child	8.5	8.8	8.3	1	0.8	1.2	9.2	8.7	9.6	15.4	15.6	15.3	3.8	5.3	2.8
Treated net can't be washed	8.0	8.3	7.8	0.2	0	0.3	0.1	0.2	0	3.5	3.5	3.5	1.3	2.5	0.5
Treated net gets dirty	1.8	3.0	1.0	1.5	0.3	1.8	0	0	0	2.1	2.7	1.7	0.5	1	0.2
Other	2.0	3.3	1.2	0.3	0	0.5	1.8	1.7	1.8	2.5	2.8	2.1	0.2	0	0.4
None	17.5	18.0	17.2	57.5	61.8	54.7	48.4	47	49.3	16.4	16	16.6	33.6	33.5	33.7
Don't Know	21.0	15.8	24.5	18.3	11	23.2	15.3	14.6	15.8	18.0	13.6	21	48.1	40.3	53.4

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

Table 14: Perceived advantages of sleeping under a treated mosquito net for pregnant woman
Among all respondents (multiple responses possible)

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	999	399	600	1000	400	600	1000	404	596	1000	405	595	999	400	599
Works better against mosquitoes than untreated net	38.1	35.8	39.7	25.2	21.8	27.5	20.4	24.0	18.0	32.8	33.3	32.4	33	38.5	29.4
Kills mosquitoes	44.2	40.1	47	35.2	32.5	37	27.0	24.3	28.9	39.4	40.7	38.5	44.3	48.3	41.7
Repels mosquitoes away from net	19.1	18.5	19.5	36.5	31.3	40	26.1	27.2	25.3	21.9	23.5	20.8	23.6	27.3	21.2
Kills/repels other insects or pests	6.9	8.8	5.7	21.8	25.5	19.3	17.5	18.6	16.8	12.4	14.1	11.3	12.3	12.5	12.2
Is better at preventing malaria	14.1	18.8	11	13.6	18.3	10.5	38.9	41.1	37.4	24.5	31.1	20	28.3	28	28.5
Is better at preventing [local name for malaria]	3.9	3	4.5	17.1	17	17.2	0.2	0	0.3	25.9	23	27.9	2	0.5	3
Is better at preventing miscarriage/stillbirth	3.2	3.5	3.0	5.1	6.5	4.2	10.4	12.4	9.1	10.8	10.4	11.1	3.3	2.8	3.7
Pregnant woman is more protected	16.5	17.8	15.7	30.4	37.3	25.8	26.3	23.8	28	30.0	30.4	29.7	29.9	35.3	26.4
Save more money/time because pregnant woman is not sick	4.3	4.8	4	2.7	1.5	3.5	1.5	1.2	1.7	7.8	7.2	8.2	1.9	2.5	1.5
Other	0.7	1.3	0.3	0.3	0	0.6	3.6	3.7	3.5	1.0	0.9	1.0	0.1	0	0.2
None	3.0	2.3	3.5	5.2	6.8	4.2	9.3	8.2	10.1	5.7	3.7	7.1	1.1	1	1.2
Don't Know	3.4	5	2.3	9.3	5.8	11.7	9.9	8.7	10.7	3.3	2.2	4	16	12	18.7

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

Table 15: Perceived disadvantages of sleeping under a treated mosquito net for pregnant woman
Among all respondents (multiple responses possible)

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	999	399	600	1000	400	600	1000	404	596	1000	405	595	999	400	599
Insecticide is not effective	2.5	2	2.8	0.1	0	0.2	0.3	0.5	0.2	4.2	4	4.4	0.2	0.5	0
Smell is bad	19.9	21.1	19.2	12.9	15	11.5	14.1	14.4	13.9	36.5	38	35.5	7.3	9.8	5.7
Causes irritation/cough	11.2	12.3	10.5	2.9	3.5	2.5	10.6	12.4	9.4	12.9	13.6	12.4	6.1	7.8	5
Causes other illness	9.9	8.5	10.8	3.2	2	4	8.5	9.9	7.6	15.5	17.8	13.9	2.2	3.3	1.5
Might make woman nauseated/vomit	16.0	18.8	14.2	6.3	7.8	5.3	16.4	15.6	16.9	37.3	39.8	35.6	8.8	14	5.3
Chemical is dangerous	16.6	19.5	14.7	11.9	15	9.8	9.7	8.9	10.2	19.1	20.7	18	6.6	10	4.3
Chemical can kill fetus/cause miscarriage	10.3	8.3	11.7	3.4	2.8	3.8	9.5	9.9	9.2	19.2	18.3	19.8	5.1	6	4.5
Treated net can't be washed	6.1	6.5	5.8	0.3	0.3	0.3	0	0	0	2.5	1.7	3	1.3	2.3	0.7
Treated net gets dirty	1.0	0.8	1.2	0.6	0.3	0.8	0	0	0	2.4	2.7	2.2	0.7	1.3	0.3
Other	2.2	3.3	1.5	1.6	1.3	1.3	3.3	4.5	2.5	4.8	5.1	4.6	0.2	0	0.4
None	16.1	14.3	17.3	55.2	59.5	52.3	45.3	44.8	45.6	14.6	14.8	14.5	31.8	31	32.4
Don't Know	18.6	16.5	20	18.0	9.3	23.8	15.0	12.6	16.6	13.4	9.1	16.3	46.1	38	51.6

SECTION 3
ACCESS TO NETS

Improving access to nets 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.

- Open-air markets were most often named as the nearest place to buy a mosquito net in Nigeria (92%), Senegal (52%), and Mozambique (39%). General shops were reported to be the nearest place to obtain a net by a plurality of respondents in Uganda (53%) and Zambia (36%). Non-commercial sources (projects, clinic/hospital/health services) were reported to be the nearest place to obtain a net mostly in Senegal (20%) and Zambia (26%). In the other countries, very few respondents cited non-commercial sources as the nearest place to obtain a net. A fairly high number of respondents in Mozambique (28%), Senegal (15%) and Zambia (14%) reported that nets were unavailable or that they did not know where the nearest place they could buy a net was. Those who said that nets were unavailable or did not know where to get them tended to live in rural areas.
- There was wide variation in access to nets (as measured by travel time) by country and by urban-rural residence. Access appeared to be best in Senegal, where almost half of respondents said they could find a net in about 13 minutes by foot. Overall, travel time appeared to be longest in Zambia, where it would require 1-1½ hours to obtain a net, whether on foot or by bus. Across countries, access in urban areas was better than in rural areas, especially where bus travel was involved. The amounts of time, however, for each mode of transportation varied considerably, as reflected in high standard deviations.

Table 16: Nearest place households can purchase mosquito nets
Among all households

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	999	399	600	1000	400	600	1000	404	596	1000	405	595	999	400	599
Open air/structured market	92.3	92.7	92	51.6	52.8	50.8	3.0	4.7	1.8	18.1	8.1	24.9	38.7	48	32.6
Local kiosk	0.3	0.3	0.3	0.2	0.5	0	0.2	0.2	0.2	1.1	0.2	1.7	0.3	0.3	0.3
Street/table top vendor	0.1	0	0.2	0.3	0.8	0	0.6	1.2	0.2	1.7	1.5	1.8	4.1	5	3.5
General shop	0.1	0	0.2	4.2	1.8	5.8	35.6	38.6	33.6	52.9	61.7	46.9	16.4	19.8	14.2
Textile/clothes/bedding shop	0.4	0.3	0.5	5.9	6	5.8	5.3	6.2	4.7	9.8	11.4	8.7	6.4	7.3	5.8
Wholesaler	0.4	0.5	0.3	1.7	2.8	1	8.4	8.4	8.4	4	4.4	3.7	1.6	2	1.3
Pharmacy/chemist	0.3	0.5	0.2	0.5	0.5	0.5	1.3	1.5	1.2	0.5	0.5	0.5	0.4	0.3	0.5
Drug store	0	0	0	0	0	0	0.3	0.7	0	0.1	0	0.2	0.2	0.5	0
Supermarket	1.7	3	0.8	0.1	0	0.2	4.8	6.2	3.9	2.2	4	1	0.8	1.3	0.5
Project (e.g. NGO)	0	0	0	0.7	0.3	1	1.6	1.7	1.5	0.2	0	0.3	0.1	0.3	0
Clinic/hospital/health services	0.2	0.3	0.2	19.2	21	18.0	23.9	17.3	28.4	1.9	1.2	2.4	2.7	0.8	4
Other	0	0	0	1.1	0.8	1.3	1.3	0.6	1.7	2.5	5.3	0.5	0.7	1	0.5
Not available	1.5	1	1.8	7.3	3.8	9.7	7.1	6.7	7.4	3.1	0.5	4.9	18.8	7.8	26.2
Don't Know	2.7	1.5	3.5	7.2	9.3	5.8	6.6	5.7	7.2	1.6	0.7	2.2	8.7	6	10.5

Table 17: Mode of transport and average length of time it takes to get to nearest place where net can be purchased
Among households that know of the nearest place they can purchase a mosquito net and among those who travel by a specific mode of transportation to get to the nearest place

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**
BASE	957	389	568	855	348	507	863	354	509	953	400	553	724	345	379
% travel by foot	17.1	20.8	14.6	46.5	42.2	49.5	55.5	64.7	49.1	45.4	54.8	38.7	65.3	75.7	55.9
BASE	164	81	83	398	147	251	479	229	250	432	218	214	473	261	212
Mean time by foot	21.7	20.27	23.08	13.28	16.88	11.18	58.47	45.54	70.45	40.54	23.52	58.04	31.0	27.13	35.75
Median time by foot	14.04	14.89	11.75	9.55	12.47	9.15	28.43	25.07	42.12	24.87	19.35	37.9	19.75	22.95	16
BASE	957	389	568	855	348	507	863	354	509	953	400	553	724	345	379
% travel by bus	75.7	65.8	82.4	33.1	32.8	33.3	38.4	30.5	43.8	31.7	26	35.8	26.1	18.3	33.2
BASE	724	256	468	283	114	169	331	108	223	290	102	188	189	63	126
Mean time by bus (car/local taxi-Uganda)	56.3	34.68	68.35	40.41	22.25	52.67	75.47	51.15	87.25	55.63	27.64	70.98	73.5	31.11	94.7
Median time by bus (car/local taxi-Uganda)	42.5	26.79	56.7	25.25	16.0	31.4	48.6	27.22	57.4	44.22	22.14	56.79	44.19	27.83	65

SECTION 4
NET OWNERSHIP AND CHARACTERISTICS OF NETS OWNED

4.1 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 characteristics such as household 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.

The national net ownership figures from this study may be somewhat higher than those that might be obtained by a true random sample, since a few sites in each country had net promotion projects in their vicinity. There was wide variation in net ownership rates *within* countries (i.e., by site), and those breakdowns by site can be found in each of the individual country reports. Further, the sample included only households with children under five years of age, and it may be more likely that those households own and use nets.

- The proportion of households owning at least one net varied considerably, from a low of 12% in Nigeria to a high of 34% in both Senegal and Uganda. Urban households were more likely to own a net than rural ones in Zambia (35% vs. 21%), Mozambique (34% vs. 22%), and Uganda (47% vs. 25%). In Senegal, the reverse was true, with 29% of urban households and 37% of rural households owning a net. In Nigeria the proportions were about equal.
- About half of net-owning households in both Senegal (52%) and Uganda (51%) owned more than one net, with an average of 2.1 and 1.8 nets per household, respectively. Thirty-eight percent (38%) of households in Mozambique owned more than one net, with an average of 1.6 nets per household. The lowest proportion of households owning multiple nets was found in Nigeria (25%) and Zambia (28%). The average number of nets owned by net-owning households in those countries was 1.3 and 1.4, respectively.
- There was a strong linear relationship between SES and net ownership in Zambia, Uganda, and Mozambique. The higher the SES of the household, the more likely it was that households owned a net. In Senegal, there was some tendency for the lower SES households to own a net. In Nigeria, SES did not appear to be related to net ownership, except in the highest SES category.

Table 18: Net ownership
Among all households and among households owning mosquito nets

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	999	399	600	1000	400	600	1000	404	596	1000	405	595	999	400	599
Households with at least 1 net (%)	12.0	13.3	11.2	33.6	28.8	36.8	26.5	34.9	20.8	34.0	47.4	24.9	26.5	34.0	21.5
BASE	120	53	67	336	115	221	1000	404	596	340	192	148	265	136	129
Net-owning households with 2+ nets (%)	25.0	28.3	22.4	52.1	40.9	57.9	27.9	33.3	21.8	50.9	55.7	44.6	37.7	37.5	38
Mean number of nets owned per household	1.33	1.38	1.30	2.1	1.8	2.2	1.38	1.45	1.31	1.76	1.83	1.66	1.57	1.53	1.6

Table 19: Proportion of households in each of the SES categories owning nets
Among all households

SES	Nigeria		Senegal		Zambia		Uganda		Mozambique	
	BASE	%	BASE	%	BASE	%	BASE	%	BASE	%
1 (LOW)	195	11.3	200	36.5	200	11.5	199	9.0	199	4.5
2	204	6.4	200	42.0	196	18.4	204	17.2	200	15.5
3	201	13.9	200	32.0	204	25.5	195	30.8	200	26.0
4	200	10.0	200	27.5	200	29.5	199	47.2	201	38.8
5 (HIGH)	199	18.6	200	30.0	200	47.5	199	66.8	199	47.7

4.2 REASONS FOR NON-OWNERSHIP

- The study sought to find out reasons why people did not own a net. The majority (50% -88%) of respondents cited lack of money as a reason they did not own a mosquito net. This reason was consistently cited by more rural than urban respondents.
- Some respondents, ranging from 4% in Zambia to 12% in Nigeria, stated that nets are "not available" or that they "don't know where to get them" as reasons for non-ownership. This reason was cited by a higher percentage of urban than rural respondents in Nigeria and Zambia, and by a higher percentage of rural respondents in Senegal, Uganda, and Mozambique. About a quarter of respondents in Nigeria (22%) and Senegal (27%) said they did not like or did not need nets. A higher proportion of respondents in urban than rural households said that they did not like or did not need nets. Only a small portion of respondents gave this as a reason in Uganda, Zambia, and Mozambique (5-7%).

Table 20: Reasons why households do not own any mosquito nets
Among households that do not own mosquito nets (multiple responses possible)

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	879	346	533	664	285	379	735	263	472	660	213	447	734	264	470
Don't have any/ enough money	59.8	44.8	69.6	49.5	40.0	56.7	88.4	82.1	91.9	85.5	79.3	88.4	84.1	79.2	86.8
Not available/don't know where to get them	11.9	17.1	8.6	9.6	8.1	10.8	4.4	4.9	4.0	9.1	3.3	11.9	8.6	5.7	10.2
Don't like them	9.2	11.8	7.5	2.6	4.6	1.1	0.7	1.1	0.4	3.6	7.5	1.8	3.1	8.3	0.2
Don't need them	13.0	16.5	10.7	24.1	31.9	18.2	5.0	8.4	3.2	3.5	3.3	3.6	3.1	6.8	1.1
Nets won't fit on sleeping space	3.6	4.9	2.8	2.9	3.5	2.4	0	0	0	3.9	5.2	3.4	1.9	4.2	0.6
Other	1.7	2.0	1.5	10.3	10.8	9.8	3.2	5.3	2.3	3.6	5.7	2.0	0	0	0
Don't know	4.9	6.6	3.8	8.6	9.5	7.9	1.6	1.5	1.7	1.1	0.5	1.3	2.3	3.4	1.7

4.3 CHARACTERISTICS OF NETS OWNED

Respondents in net-owning households were asked, for each net owned, where the net was obtained, when the net was obtained, and what brand, size, and 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 both commercial and non-commercial sources. In Nigeria, Senegal, and Mozambique, the majority of nets were obtained from informal commercial sources, including open-air markets, kiosks, and street vendors. In Nigeria, 90% of nets were obtained from open-air markets alone. General shops were the single most common source in Zambia (64%) and Uganda (45%).
- Non-commercial sources, including projects, health facilities, schools, and employers, accounted for a sizable portion of household nets in Zambia (28%), and for some nets in Senegal (11%), Mozambique (8%), and Uganda (6%) and were always a more common source for rural households than urban ones. In Nigeria, no nets were obtained from non-commercial sources. Non-commercial outlets were more commonly found in rural than in urban areas. A fairly high proportion of household nets was given as gifts in Senegal (12%).

Table 21: Type of source where net was obtained
Among total number of nets owned

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	159	73	86	649	205	444	363	203	160	586	341	245	403	208	195
Informal commercial	90.6	87.7	93	52.7	46.3	55.6	6.9	5.9	8.1	22.5	17.6	29.4	57.6	67.3	47.2
Formal commercial	1.9	1.4	2.3	15.6	17.6	14.6	44.6	51.7	35.6	64.2	70.7	55.1	21.3	22.1	20.5
Non-commercial	0	0	0	10.6	8.3	11.7	28.1	19.2	39.4	6.3	5.3	7.8	8.4	1.9	15.4
Gift	5	5.5	4.7	11.9	19.5	8.3	6.6	5.4	8.1	3.8	2.9	4.9	4	1.9	6.2
Other	0	0	0	1.4	2	1.1	1.4	2.5	0	0.2	0	0.4	0.2	0.5	0
Don't Know	2.5	5.5	0	7.9	6.3	8.6	12.4	15.3	8.8	2.9	3.2	2.4	8.4	6.3	10.8

Age of nets

- Over half of all nets owned by households in all countries were acquired within the last three years with a low of 51% in Nigeria and a high of 83% in Mozambique. In Mozambique and Senegal, a sizable portion of nets had been acquired within the twelve months prior to the survey (39% and 25%, respectively).

Table 22: Number of years households have owned their nets
Among total number of household nets

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	159	73	86	649	205	444	363	203	160	586	341	245	403	208	195
0-<1 year	9.4	9.6	9.3	25.1	34.6	20.7	14.9	13.3	16.9	10.4	10.3	10.6	38.7	34.6	43.1
1-<2 years	18.2	21.9	15.1	19.9	17.1	21.2	21.5	24.6	17.5	25.3	29.3	19.6	26.8	29.3	24.1
2-<3 years	25.2	23.3	26.7	17.7	21.0	16.2	20.4	20.7	20	31.6	32.0	31.0	17.9	18.8	16.9
3-<4 years	19.5	20.5	18.6	8.2	4.9	9.7	14.3	16.7	11.3	15.7	15.8	15.5	7.4	8.2	6.7
4-<5 years	4.4	1.4	7.0	6.8	6.3	7.0	9.9	8.4	11.9	9.0	6.7	12.2	1.2	1.4	1.0
5+ years	21.4	20.5	22.1	18.5	12.7	21.2	16.0	13.8	18.8	7.7	5.9	10.2	3.7	3.8	3.6
Don't Know	1.9	2.7	1.2	3.9	3.4	4.1	3.0	2.5	3.8	0.3	0	0.8	4.2	3.8	4.6

Brand of nets owned

- There is little net branding: Few respondents were aware of the brand of their net(s).
- Very few nets in Mozambique, Uganda, and Zambia (2%-7%) were tailor-made, whereas in Nigeria and Senegal the proportion of nets that were tailor-made was much higher (38% and 19%, respectively). In Nigeria, tailor-made nets were more common in the rural (27%) than urban (47%) areas, whereas in Senegal they were more common in urban (26%) than in rural (16%) areas.

Table 23: Net brands owned
Among total number of nets owned

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	159	73	86	649	205	444	363	203	160	586	341	245	403	208	195
PowerNET	2.5	1.4	3.5	0.3	0	0.5	5.8	4.9	6.9	11.6	11.4	11.8	3.7	4.3	3.1
RAID	11.3	16.4	7	0	0	0	0	0	0	0.3	0.3	0.4	1.2	1.9	0.5
Tailor-made (non-manufactured)	37.7	27.4	46.5	19.4	25.9	16.4	4.7	5.4	3.8	6.5	6.2	6.9	1.7	1.9	1.5
Other	0	0	0	1.2	3.5	0.2	5	4.5	5.6	0.9	0.6	1.2	0	0	0
Don't Know	48.4	54.8	43	78.9	70.2	82.9	84.3	85.2	83.1	80.7	81.5	79.6	93.3	91.8	94.9

Size and shape of nets owned

- One of the most common net sizes owned in all countries were double nets, accounting for 31%-62% of nets in most countries. A sizable portion of nets in Nigeria (35%) and Uganda (39%) were single-sized, and in Senegal (44%) and Mozambique (23%), relatively large proportions of nets were king-sized. Cot-sized nets were found mainly in Nigeria (16%).
- Nearly all nets in Nigeria (93%) and Senegal (88%) were rectangular-shaped. In Zambia (66%), Uganda (53%), and Mozambique (59%), most were round/conical, although rectangular nets were also quite prevalent. Very few nets in all countries were triangle/pyramid (1-4%), or wedge-shaped (1-4%).

Table 24: Size of nets owned
Among total number of nets owned

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	159	73	86	649	205	444	363	203	160	586	341	245	403	208	195
Cot net	16.4	21.9	11.6	0.2	0	0.2	0.6	0.5	0.6	2.9	3.2	2.4	2.5	4.3	0.5
Single	34.6	38.4	31.4	8.8	5.9	10.1	20.7	16.7	25.6	38.6	40.2	36.3	15.9	9.6	22.6
Double	31.4	20.5	40.7	42.8	44.9	41.9	61.7	66.5	55.6	52.2	51	53.9	52.9	51.9	53.8
King	15.7	15.1	16.3	44.4	46.3	43.5	6.1	5.9	6.3	4.3	4.4	4.1	22.6	29.3	15.4
Other	0	0	0	1.4	1.5	1.3	8.3	7.4	9.4	0	0	0	0	0	0
Don't Know	1.9	4.1	0	2.3	1.5	2.7	2.8	3	2.5	2.0	1.2	3.3	6.2	4.8	7.7

Table 25: Shape of nets owned
Among total number of nets owned

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	159	73	86	649	205	444	363	203	160	586	341	245	403	208	195
Rectangular	92.5	91.8	93	88.1	82.4	90.8	27.3	20.7	35.6	42.8	41.1	45.3	34.5	20.7	49.2
Round/conical	3.8	4.1	3.5	8.6	13.2	6.5	65.6	73.9	55	52.9	54.3	51	59.1	73.6	43.6
Triangle/pyramid	1.9	4.1	0	1.1	2.4	0.5	3.6	1.5	6.3	3.2	3.2	3.3	4.0	5.3	2.6
Wedge	1.3	0	2.3	1.4	2	1.1	3.6	3.9	3.1	0.9	1.2	0.4	1.5	0.5	2.6
Don't know	0.6	0	1.2	0.8	0	1.1	0	0	0	0.2	0.3	0	1.0	0	2.1

Cost of nets owned

Respondents were asked what the cost of each net owned was. The figures obtained give a general idea of price but it should be noted that because of potential problems with recall for older nets, and because of currency devaluation over time, these figures should be taken as very general estimates.

- A relatively large proportion of respondents did not know the cost of their net (17%-35%). Among respondents who reported net costs, reported expenditures for nets were fairly similar for Nigeria, Senegal, Zambia, and Uganda (range: 4.92-5.48 USD). In Mozambique, however, nets were reported to be much more expensive, with households paying an average of 11 USD per net.
- In Nigeria and Zambia nets were reported to be more expensive in urban than in rural areas. In Uganda, there was no substantial price difference between urban and rural areas. In Senegal and Mozambique, they were reported to be more expensive in rural areas. The percentage of nets that were reported to have been free of charge ranged from 3% in Uganda to 11% in Senegal.

Table 26: Average cost of (all) nets (USD)
Nets in households

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	159	73	86	649	205	444	363	203	160	586	341	245	403	208	195
Average price	4.92	5.88	4.32	5.32	4.41	5.72	5.30	5.78	4.71	5.48	5.61	5.3	11.0	9.97	12.44
Standard Deviation	5.13	7.67	2.42	2.31	1.88	2.37	2.56	2.11	2.94	3.34	3.3	3.4	11.1	9.76	12.64
Trade/Barter (%)	0	0	0	0	0	0	1.1	0.5	1.9	0	0	0	0.2	0	0.5
Free (%)	5.7	5.5	5.8	11.2	17.6	8.3	8.5	6.4	11.3	2.7	2.3	3.3	8.4	1.9	15.4
Don't Know (%)	35.2	45.2	26.7	34.2	29.3	36.5	27.3	30.5	23.1	16.7	17.9	15.1	17.4	14.4	20.5

Net washing patterns

- The great majority of nets (69%-94%) in all countries had been washed at least once.
- At least half (50%-77%) of nets washed by households in all countries were reportedly washed at least once a month. At least one-fourth (26%-53%) were washed at least every two weeks.
- Net washing frequency was highest in Nigeria where over half of nets (53%) were reportedly washed at least every two weeks and one-third (32%) were washed weekly. Net washing frequency was lowest in Senegal, however 28% of nets were still washed at least every two weeks and 15% were washed every week.
- There were no large differences in the frequency of net washing between urban and rural areas.

Table 27: Net ever washed
Among total number of nets owned

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	159	73	86	649	205	444	363	203	160	586	341	245	403	208	195
Yes	91.2	93.2	89.5	74.4	69.3	76.8	84.6	89.2	78.8	93.7	93.5	93.9	69.0	69.7	68.2
No	8.8	6.8	10.5	22.2	25.9	20.5	15.4	10.8	21.3	5.1	4.7	5.7	28.5	28.4	28.7
Don't Know	0	0	0	3.4	4.9	2.7	0	0	0	1.2	1.8	0.4	2.5	1.9	3.1

Table 28: Net washing frequency
Among nets that had been washed

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**
BASE	145	68	77	483	142	341	307	181	126	549	319	230	278	145	133
About once a year	4.8	5.9	3.9	17.8	14.1	19.4	9.4	7.2	12.7	2.0	2.2	1.7	8.6	9.7	7.5
About every six months	4.8	2.9	6.5	10.6	6.3	12.3	10.7	11.6	9.5	4.2	5.0	3	10.8	8.3	13.5
About every three months	12.4	19.1	6.5	18.0	10.6	21.1	24.4	26.5	21.4	16.0	16.9	14.8	10.8	12.4	9
About once a month	23.4	20.6	26.0	22.4	28.9	19.6	25.7	25.4	26.2	40.3	35.7	46.5	23	20.0	26.3
About every two weeks	20.7	11.8	28.6	13.0	22.5	9.1	20.8	21.5	19	24.8	26	23	15.1	14.5	15.8
About once a week	32.4	38.2	27.3	14.5	14.1	14.7	4.9	5.0	4.8	11.7	12.5	10.4	29.5	33.1	25.6
Other	0.7	0	1.3	3.2	17.6	18.0	4.0	2.8	5.6	1.1	1.5	0.4	0.4	0.7	0
Don't Know	0.7	1.5	0	0	0	0	0	0	0	0	0	0	1.8	1.4	2.3

SECTION 5
MOSQUITO NET TREATMENT

Nets that are treated with an insecticide (ITNs) 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 "pretreated" (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/retreated ("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. In a later section, 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 has 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.

- Awareness of treating nets varied considerably, ranging from a low of 7% in Nigeria to a high of 70% in Senegal. About half the respondents in Zambia (51%) and about one-quarter in Mozambique and Uganda (28%) had heard of net treatments. Awareness was higher in urban than in rural areas in all countries except Zambia where urban and rural areas reported similar levels of awareness.
- Net treatment rates were calculated both as a percentage of all households in the sample that owned a treated net, and as a percentage of nets owned that were treated. ("Treated" includes those purchased pre-treated and those treated after purchase, or post-treated.) Few households owned a treated net. There were virtually no treated nets in Nigeria (one household reported owning a treated net). The highest proportion of households owning a treated net was found in Senegal (11%) and Zambia (9%).
- Similarly, only a minority of nets owned had ever been treated. The highest percentages of nets ever treated were found in Zambia (35%), Senegal (30%), and Mozambique (26%). Fewer nets had ever been treated in Uganda (12%), and there were essentially no treated nets in Nigeria (0.1%). There were no large differences in net treatment rates between urban and rural areas except in Zambia where proportion of nets ever treated was higher in rural than in urban areas (43% vs. 28%). (The individual country reports that break down data by site suggest that the highest treatment rates are generally found in project areas.)
- The percentage of nets that were pretreated before purchase ranged from effectively 0 in Nigeria (one household reported owning a pretreated net), to 27% of household nets in Zambia. In Zambia and Mozambique, percentages of pretreated nets were higher in rural than in urban areas, whereas in Senegal and Uganda they were higher in urban areas.
- Few household nets were treated after they were acquired. The percentage of post-treated nets was lowest in Nigeria (0%) and highest in Mozambique (19%). Post-treatment was slightly higher in urban areas of Mozambique and Uganda, whereas in Senegal and Zambia the rates were slightly higher in rural areas.
- Among those nets that had been post-treated, the average number of times that a net had been treated ranged from 1.7-2.7 times. (Note that denominators are rather small.) Respondents were asked when they last treated their nets. The average number of months ago a net was last treated ranged from 4 months in Mozambique and Uganda to 6 months in Zambia and Senegal.

Table 29: Awareness of insecticide treated mosquito nets
Among all respondents

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	999	399	600	1000	400	600	1000	404	596	1000	405	595	999	400	599
Yes	7.3	11	4.8	70.2	76.3	65.8	50.7	50	51.2	28.5	33.6	25.0	28.2	33.5	24.7
No	92.7	89	95.2	29.8	23.8	33.8	49.3	50	48.8	71.0	66.2	74.3	71.6	66	75.3
Not answered	0	0	0	0	0	0	0	0	0	0.5	0.2	0.7	0.2	0.5	0

Table 30: Household ownership of treated (pre and/or post) mosquito nets
Among all households

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	999	399	600	1000	400	600	1000	404	596	1000	405	595	999	400	599
Yes	0.1	0.3	0	11.0	10.0	11.7	9.3	9.4	9.2	3.8	6.7	1.8	7.2	9.3	5.8
No	99.9	99.7	100	89.0	90.0	88.3	90.7	90.6	90.8	96.2	93.3	98.2	92.8	90.8	94.2

Table 31: Ownership of treated mosquito nets
Among total number of nets owned

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	159	73	86	649	205	444	363	203	160	586	341	245	403	208	195
Nets ever treated (%)	0	0	0	30.2	34.6	28.2	34.7	28.1	43.1	11.6	4.7	7.3	25.6	25.5	25.6
Nets pre-treated (%)	0.6	1.4	0	17.9	27.3	13.5	27.3	19.7	36.9	6.5	7.6	4.9	17.9	14.4	21.5
Nets post-treated (%)	0	0	0	14.8	13.2	15.5	15.2	12.8	18.1	9.4	12	5.7	18.9	19.7	17.9

Table 32: Treatment patterns
Among nets that were post-treated

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	0	0	0	96	27	69	55	26	29	55	41	14	76	41	35
Mean number of times net treated (post-treated)	0	0	0	2.67	1.32	3.21	2.05	2.15	1.95	2.16	2.09	2.33	1.67	1.70	1.63
Mean number of months ago net was last treated (post-treated)	0	0	0	5.75	3.1	6.69	6.0	5	6.86	4.49	4.94	3.36	3.75	4.09	3.36

- Insecticide treatments were obtained from formal (fixed stores) and informal (markets, kiosks, hawkers) commercial sources, as well as non-commercial sources (e.g. projects, clinics). Denominators for calculating source were somewhat small, and many people did not know where the treatments came from, but in most countries, the non-commercial sector provided the greatest proportion of treatments. Treatments from non-commercial sources and as "gifts" (possibly from projects or clinics) were highest in Zambia; only about 20% of treatments were reported to have come from commercial sources. The proportion of treatments reported to have come from commercial sources was highest in Mozambique, at 50%, although 29% also said they did not know the source of treatment.
- Those who had treated a net were asked the cost of the treatment product or service. Price data should be taken as general estimates, since denominators are small: A rather high proportion of respondents — from 24% in Zambia to 47% in Uganda — who had treated a net since purchase did not know the cost of treatment; and a fair proportion of treatments — from 9% in Uganda to 26% in Zambia — had been

received free. The prices reported varied considerable, ranging from an average of .74USD in Senegal to 1.73 USD in Mozambique, and the standard deviations in each country were high.

Table 33: Type of source where insecticide treatment was obtained
Among all nets that were post-treated

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**
BASE	0	0	0	96	27	69	55	26	29	55	41	14	76	41	35
Informal commercial source	---	---	---	3.1	11.1	0	3.6	7.7	0	0	0	0	22.4	24.4	20
Formal commercial source	---	---	---	24	81.5	1.4	16.4	34.6	0	32.7	31.7	35.7	27.6	39	14.3
Non-commercial source	---	---	---	50	3.7	68.1	63.6	38.5	86.2	41.8	36.6	57.1	13.2	0	28.6
Gift	---	---	---	3.1	0	4.3	10.9	7.7	13.8	7.3	7.3	7.1	3.9	7.3	0
Other	---	---	---	0	0	0	0	0	0	7.3	9.8	0	0	0	0
Don't Know	---	---	---	19.8	3.7	26.1	5.5	11.5	0	10.9	14.6	0	32.9	29.3	37.1

Table 34: Cost of insecticide treatment (USD)
Among nets that were post-treated

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**
BASE	0	0	0	96	27	69	55	26	29	55	41	14	76	41	35
Average price	---	---	---	0.74	1.65	0.44	0.96	1.64	0.58	1.13	1.21	0.56	1.73	2.19	1.07
Standard Deviation	---	---	---	0.84	0.97	0.52	1.07	1.54	0.38	0.46	0.44	0	1.4	1.15	1.5
Trade/barter (%)	---	---	---	0	0	0	0	0	0	0	0	0	0	0	0
Free (%)	---	---	---	11.5	11.1	11.6	25.5	19.2	31	9.1	7.3	14.3	21.1	19.5	22.9
Don't Know/can't recall (%)	---	---	---	34.4	40.7	31.9	23.6	42.3	6.9	47.3	41.5	64.3	40.8	39	42.9

SECTION 6
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 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 (WRAs), and pregnant women. Measures were calculated to indicate use of any net, and specifically, use of treated nets by the vulnerable groups.

6.1 OVERALL HOUSEHOLD USE

There were a total of 8,012 people in net-owning households in all countries sampled.

- Among those people living in net-owning households, 34% (Zambia) to 63% (Uganda) had slept under a net the prior night; 0% (Nigeria) to 14% (Senegal) slept under a *treated* net the prior night.
- Children under five were most likely to sleep under a net in all countries; adult males were the least likely to sleep under a net. It was difficult to draw conclusions about pregnant women since the denominators were so small.

Table 35: Proportions of net-owning household members who slept under a net last night
Among household members

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Base	under any net % (N)	under treated net % (N)	Base	under any net % (N)	under treated net % (N)	Base	under any net % (N)	under treated net %	Base	under any net (%)	under treated net (%)	Base	under any net (%)	under treated net (%)
ALL	588	44.7% (263)	.2% (1)	2682	45.9% (1231)	14.2% (383)	1578	33.8% (534)	11.9% (188)	1578	62.5% (987)	7.5% (119)	1586	39% (621)	11% (174)
Adults (age 15+)															
Males	140	21.1% (31)	0% (0)	499	39.3% (196)	11.4% (57)	330	29.7% (98)	10.6% (35)	286	52.1% (149)	5.2% (15)	346	37.0% (128)	10.4% (36)
Females	139	46.8% (65)	0% (0)	771	49.9% (385)	15.3% (118)	423	40.4% (171)	13.2% (56)	434	66.6% (289)	7.1% (31)	478	44.6% (213)	13.6% (65)
Females ages 15-49	139	46.8% (65)	0% (0)	669	48.9% (327)	15.2% (102)	397	42.1% (167)	13.6% (54)	425	66.8% (284)	7.1% (30)	452	46.0% (208)	13.7% (62)
Pregnant women	12	58.3% (7)	0% (0)	42	59.5% (25)	16.7% (7)	17	17.6% (3)	5.9% (1)	39	69.2% (27)	5.1% (2)	54	55.6% (30)	16.7% (9)
Older children (ages 5-14)															
Males	75	31.5% (23)	0% (0)	383	42.8% (164)	13.6% (52)	214	16.8% (36)	7.0% (15)	206	48.5% (100)	7.3% (15)	182	23.1% (42)	8.8% (16)
Females	65	30.8% (20)	0% (0)	419	39.6% (166)	12.2% (51)	244	22.1% (54)	9.0% (22)	201	56.2% (113)	8.0% (16)	217	29.5% (64)	3.7% (8)
Younger children (ages 0-4)															
All	169	73.4% (124)	.6% (1)	610	52.5% (320)	17% (104)	367	47.7% (175)	16.3% (60)	451	74.5% (336)	9.3% (42)	363	47.9% (174)	13.5% (49)
Males	90	74.4% (67)	1.1% (1)	314	51.3% (161)	17.2% (54)	173	42.2% (73)	14.5% (25)	221	70.1% (155)	7.7% (17)	177	49.7% (88)	13.6% (24)
Females	79	72.2% (57)	0% (0)	296	53.7% (159)	16.9% (50)	194	52.6% (102)	18% (35)	230	78.7% (181)	10.9% (25)	186	46.2% (86)	13.4% (25)
Age 0 - <1	19	73.7% (14)	0% (0)	107	52.3% (56)	41.7% (18)	69	62.3% (43)	17.4% (12)	29	72.4% (21)	27.6% (8)	59	55.9% (33)	22% (13)
Age 1 - <2	25	80.0% (20)	4% (1)	96	56.3% (54)	16.7% (16)	77	61.0% (47)	16.9% (13)	90	86.7% (78)	11.1% (10)	59	55.9% (33)	18.6% (11)
Age 2 - <3	40	70.0% (28)	0% (0)	142	54.9% (78)	19.0% (27)	64	39.1% (25)	17.2% (11)	105	75.2% (79)	3.8% (4)	70	51.4% (36)	14.3% (10)
Age 3 - <4	39	64.1% (25)	0% (0)	134	53.0% (71)	22.4% (30)	70	40.0% (28)	12.9% (9)	112	73.2% (82)	8.0% (9)	88	38.6% (34)	8.0% (7)
Age 4 - <5	46	80.4% (37)	0% (0)	131	46.6% (61)	9.9% (13)	87	36.8% (32)	17.2% (15)	115	66.1% (76)	9.6% (11)	87	43.7% (38)	9.2% (8)

6.2 USE BY CHILDREN UNDER AGE FIVE

There were a total of 7,740 children under 5 years in all countries and 1959 children under age five in net-owning households. (Note that in order to be included in the sample, a child aged 0-4 had to reside in the household.)

- About three-fourths of children under five in net-owning households in Nigeria (73%) and Uganda (75%) had slept under a net the prior night. This represents 9% and 25%, respectively, of all children under five in households sampled in those countries. About half of children under age five in Zambia (48%), Mozambique (48%), and Senegal (53%) had slept under a net the prior night, representing 12%-18% of all children under five in households sampled in those countries.
- Few children under five in net-owning households had slept under a *treated* net the prior night. Ranges were from 0.6% in Nigeria to 17% in Senegal. This represents 0%-6% of children under five in households sampled among all countries.

Table 36: Proportions of children under five who slept under a net last night
Among children under five in all households and in net-owning households

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
Children under 5 in all households															
BASE	1402	536	866	1811	649	1162	1470	575	895	1361	542	819	1388	520	868
Slept under any net (%)	8.8	9.9	8.2	17.7	13.7	19.9	11.9	19.3	7.2	24.7	34.3	18.3	12.5	17.1	9.8
Slept under a *treated* net (%)	0.1	0.2	0	5.7	4.9	6.2	4.1	6.1	2.8	3.1	5.5	1.5	3.5	4.6	2.9
Children under 5 in net-owning households															
BASE	169	72	97	610	193	417	367	198	169	451	249	202	363	172	191
Slept under any net (%)	73.4	73.6	73.2	52.5	46.1	55.4	47.7	56.1	37.9	74.5	74.7	74.3	47.9	51.7	44.5
Slept under a *treated* net (%)	0.6	1.4	0	17.0	16.6	17.3	16.3	17.7	14.8	9.3	12.0	5.9	13.5	14.0	13.1

6.3 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 responsible for a child under five. The total number of WRA in the households sampled in all countries was 7,317. The number of WRA among net-owning households was 2082. The total number of pregnant women in the households sampled was 576 and, of these, 164 were from net-owning households.

- The number of WRA sleeping under any net in net-owning households ranged from a low of 42% in Zambia to a high of 67% in Uganda. This represents 6% to 23% of the total sample.
- Few WRA in net-owning households slept under a *treated* net the prior night. Percentages were lowest for Nigeria (0%) and highest for Senegal (15%). The percentages of WRA in all households who slept under a *treated* net the prior night ranged from 0-5%.
- The number of pregnant women sleeping under any net in net-owning households ranged from a low of 18% in Zambia to a high of 69% in Uganda. The percentages of pregnant women in all households who slept under any net the prior night ranged from 4% in Zambia to 21% in Uganda and Senegal. (The denominators for pregnant women, however, were very small.)

- Few pregnant women in net-owning households slept under a *treated* net the prior night. Percentages were lowest for Nigeria (0%) and highest for Senegal and Mozambique (17%). The percentages of pregnant women in all households who slept under a *treated* net the prior night ranged from 0-6%.

Table 37: Proportions of women of reproductive age who slept under a net last night
Among women of reproductive age in all households and in net-owning households

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**
WRAs in all households															
BASE	1140	469	671	1937	782	1155	1469	638	831	1219	497	722	1552	682	870
Slept under any net (%)	5.7	4.9	6.3	16.9	12.3	20.0	11.4	17.6	6.6	23.3	31.4	17.7	13.4	16.6	10.9
Slept under a *treated* net (%)	0	0	0	5.3	4.2	6.0	3.7	5.5	2.3	2.5	4.2	1.2	4.0	4.7	3.4
WRAs in net-owning households															
BASE	139	65	74	669	238	431	397	224	173	425	244	181	452	249	203
Slept under any net (%)	46.8	35.4	56.8	48.9	40.3	53.6	42.1	50.0	31.8	66.8	63.9	70.7	46.0	45.4	46.8
Slept under a *treated* net (%)	0	0	0	15.2	13.9	16.0	13.6	15.6	11.0	7.1	8.6	5.0	13.7	12.9	14.8

Table 38: Proportions of pregnant women who slept under a net last night
Among pregnant women in all households and in net-owning households

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**
Pregnant women in all households															
BASE	95	33	62	117	43	74	74	25	49	130	52	78	160	68	92
Slept under any net (%)	7.4	9.1	6.5	21.4	18.6	23.0	4.1	8.0	2.0	20.8	28.8	15.4	18.8	26.5	13.0
Slept under a treated net (%)	0	0	0	6	9.3	4.1	1.4	0	2.0	1.5	1.9	1.3	5.6	8.8	3.3
Pregnant women in net-owning households															
BASE	12	5	7	42	18	24	17	8	9	39	21	18	54	32	22
Slept under any net (%)	58.3	60.0	57.1	59.5	44.4	70.8	17.6	25.0	11.1	69.2	71.4	66.7	55.6	56.3	54.5
Slept under a treated net (%)	0	0	0	16.7	22.2	12.5	5.9	0	11.1	5.1	4.8	5.6	16.7	18.8	13.6

6.4 GENERAL PATTERNS

- The average number of months people in the household slept under mosquito nets ranged from a low of 5.97 months in Senegal to a high of 9.9 months in Uganda.

Table 39: Number of months a year people in household sleep under a net
Among net-owing households

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	120	53	67	336	115	221	265	141	124	340	192	148	265	136	129
Avg. # mo./yr. People sleep under a net	7.58	7.66	7.52	5.69	5.65	5.71	6.55	6.84	6.21	9.9	10.1	9.7	6.32	6.45	6.18

SECTION 7
CONSUMER MOSQUITO NET PREFERENCES

Nets owned are a reflection of types of nets generally available in countries. This section reports on the characteristics of nets that consumers *prefer*, with regard to shape, size and color. The question was asked of all respondents whether or not their household owned a net. The information in this section is useful for developing nets with features that consumers want.

7.1 NET SHAPE AND SIZE PREFERENCES

- The majority of respondents in four of the countries — Senegal, Uganda, Zambia and Mozambique — prefer conical/round nets, except in Nigeria where consumers prefer rectangular nets. Preferences did not differ widely between urban and rural areas. The second preferred option for all countries except Nigeria was rectangular nets. Again, there were no large differences between urban and rural areas.
- The majority of consumers prefer large size nets — king size in Senegal (80%), Nigeria (56%), Mozambique (54%), Zambia (51%); and double size in Uganda (56%). In Uganda, the preferences mirror the characteristics of nets owned, but in all the other countries consumers prefer much larger sized nets than those they own. The largest difference is in Zambia where currently only 6% of respondents own king size nets and 51% report they would prefer this size. Only 3-19% of respondents in all countries preferred single-sized nets. Cot-nets were preferred by few respondents (2-8%).

Table 40: Net shape preferences
Among all respondents

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	999	399	600	1000	400	600	1000	404	596	1000	405	595	999	400	599
Rectangular	59	56.9	60.3	37.8	41.3	35.5	23.5	22.8	24	39.4	41	38.3	32.7	35.5	30.9
Round/conical	23.5	25.6	22.2	53.5	53	53.8	67.4	69.3	66.1	44.7	43.5	45.5	55.6	55.5	55.6
Triangle/pyramid	9.0	8.0	9.7	3.5	2.3	4.3	5.7	4.2	6.7	8.1	7.7	8.4	4.2	3.3	4.8
Wedge	7.8	8.5	7.3	3.9	3	4.5	2.9	3.2	2.7	5.9	5.9	5.9	3.5	2.5	4.2
Other	0.5	0.5	0.5	0.7	0.5	0.8	0.2	0.5	0	0.7	0.5	0.8	0.4	0	0.7
No preference	0.2	0.5	0	0.6	0	1	0.3	0	0.5	1.2	1.5	1	3.6	3.3	3.8

Table 41: Net size preferences
Among all respondents

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	999	399	600	1000	400	600	1000	404	596	1000	405	595	999	400	599
Cot-net	8.2	9	7.7	5.1	5.3	5	3.2	2.5	3.7	2.3	2	2.5	1.9	2.3	1.7
Single	14	15	13.3	3.2	4	2.7	11.0	7.9	13.1	19.3	16.5	21.2	5.4	6.3	4.8
Double	21.8	20.8	22.5	11.7	12.8	11	35.0	39.4	32	55.9	54.8	56.6	37.2	39.5	35.7
King	55.8	55.1	56.2	79.9	78	81.2	50.5	50.2	50.7	22.1	25.9	19.5	53.7	50	56.1
Other	0.2	0	0.3	0	0	0	0.3	0	0.5	0	0	0	0	0	0
No preference	0.1	0	0.2	0.1	0	0.2	0	0	0	0.4	0.7	0.2	1.8	2	1.7

7.2 NET COLOR PREFERENCES

- Overall, light colors were preferred to dark colors for nets. In all countries, respondents' most preferred net color was white (29%-47%). At the same time, however, 9-27% said they disliked white nets.
- In general, respondents disliked dark colored nets. In particular, black nets were disliked by a substantial portion of respondents (36%-66%) in all countries.

Table 42: Net color preferences
Among all respondents

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	999	399	600	1000	400	600	1000	404	596	1000	405	595	999	400	599
White	34.1	33.1	34.8	28.6	32.3	26.2	39.9	51.2	32.2	46.9	51.6	43.7	29.3	41	21.5
Light blue	15.4	17	14.3	16.5	17.3	16	9.7	8.7	10.4	13.0	14.6	11.9	16.3	17.3	15.7
Dark blue	9.2	8.3	9.8	18.5	16	20.2	11.1	7.7	13.4	8.5	6.9	9.6	11.5	12.8	10.7
Light green	12.7	13.5	12.2	7.4	4.8	9.2	15.9	13.1	17.8	9.4	8.1	10.3	12.9	8	16.2
Dark green	3.6	4.8	2.8	3.1	2.8	3.3	6.2	5	7	3.3	1.7	4.4	3	1.5	4
Pink	22.1	20.8	23	17.8	19.5	16.7	9.4	8.2	10.2	12.2	13.6	11.3	18.4	15	20.7
Black	2.4	2.3	2.5	7.7	7	8.2	7.7	5.9	8.9	6.3	2.7	8.7	6.7	4	8.5
No preference/ don't know	0.4	0.3	0.5	0.4	0.5	0.3	0.1	0.2	0	0.4	0.7	0.2	1.8	0.5	2.7

Table 43: Net color dislikes
Among all respondents (multiple responses possible)

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	999	399	600	1000	400	600	1000	404	596	1000	405	595	999	400	599
White	9	8.8	9.2	17	17	17	22.6	15.1	27.7	18.9	14.1	22.2	27.4	23.8	29.9
Light blue	3.7	2.5	4.5	3.6	3.5	3.7	6.9	6.4	7.2	5.8	5.2	6.2	9.4	9	9.7
Dark blue	9.6	11.5	8.3	13.9	16.8	12	22.7	27	19.8	25.8	30.4	22.7	17.2	18.8	16.2
Light green	4.9	5.8	4.3	8.9	11.3	7.3	11.9	13.1	11.1	12.9	16.3	10.6	9.3	11	8.2
Dark green	14.1	11.3	16	18.9	19.3	18.7	26.4	29	24.7	32.4	44.9	23.9	29	32.8	26.5
Pink	6.2	6.5	6	9.9	10	9.8	15.5	13.9	16.6	14	15.1	13.3	19.4	26.3	14.9
Black	52.2	54.4	50.7	36.2	39.5	34	53.5	63.6	46.6	58.8	64.7	54.8	65.9	71.5	62.1
None/don't know	14.9	13.8	15.7	32	26.3	35.8	10.6	8.2	12.2	9.3	6.2	11.4	10.9	7	13.5

SECTION 8
USE OF OTHER MOSQUITO CONTROL PRODUCTS

The study sought to find out the role of nets in the larger context of other mosquito control products. Respondents were asked what other mosquito control products they knew of and had used in the prior year. In addition, they were asked what attributes of mosquito control they valued most, and what products and brands they associated with various attributes. This information will be particularly useful to the private sector as it seeks to meet consumer needs.

8.1 AWARENESS OF MOSQUITO CONTROL PRODUCTS AND METHODS

- The commercial insect control product respondents were most aware of (unprompted mention) were coils and aerosols in Nigeria and Senegal and mosquito nets in Zambia, Uganda, and Mozambique. Few mentioned repellants.
- Mention of mosquito nets (untreated or treated nets) was lowest in Nigeria (25%) and highest in Uganda (85%).
- Respondents also mentioned non-commercial methods of mosquito control. "Keep surroundings clean" was mentioned most frequently as a non-commercial method by respondents in Nigeria, Senegal, and Uganda. "Burn things" was mentioned most frequently in Zambia, especially in rural areas.

Table 44: Awareness of mosquito control products and methods
Among all respondents (multiple responses possible)

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	999	399	600	1000	400	600	1000	404	596	1000	405	595	999	400	599
COMMERCIAL PRODUCTS															
Mosquito net (untreated or unspecified)	24.5	23.3	25.3	62.4	63.5	61.7	64.2	65.3	63.4	85.1	87.7	83.4	56.4	67	49.2
Insecticide-treated mosquito net	0.2	0.3	0.2	22.1	27.5	18.5	5.9	6.4	5.5	4.0	4.9	3.4	6.1	6.5	5.8
Mosquito coils	77.9	68.4	84.2	84.7	84	85.2	48.8	55.7	44.1	64.7	61.5	66.9	41.6	51.5	35.1
Aerosol insecticide	79.8	86.2	75.5	80.4	88.5	75	43.0	56.9	33.6	67.7	77.0	61.3	45.3	60	35.6
Commercial mosquito repellent on body	7.7	11.3	5.3	0.1	0.3	0	8.4	11.6	6.2	0	0	0	0	0	0
Flit gun/spray gun (that you fill yourself)	4.7	5.8	4	4.8	5.8	4.2	1.5	2	1.2	1.5	0.2	2.4	4	6.5	2.3
Screens on windows/doors	29.8	36.1	25.7	5.5	12.5	0.8	0.1	0	0.2	11.4	11.4	11.4	18.4	25.8	13.5
Other commercial methods	7.2	7.8	6.8	32.8	34.9	31.5	0.4	0.5	0.3	1.0	1.4	0.7	0	0	0
NON-COMMERCIAL METHODS															
Close windows and doors	11	11.5	10.7	12.8	15.5	11	7.3	6.7	7.7	43.2	43.5	43	25.7	34.5	19.9
Burn things	11.7	8	14.2	0.7	0.8	0.7	43.1	27.5	53.7	0	0	0	0	0	0
Keep surroundings clean	18.2	16.8	19.2	17.5	21.5	14.8	19.9	17.8	21.3	46.7	47.9	45.9	17.5	19.3	16.4
Other non-commercial methods	4.8	4	5.3	18.6	17.3	19.5	6.5	5.2	7.4	12.6	11.6	13.3	10.3	8.8	11.4

8.2 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 the total number of respondents as the base. Note also that use of nets is covered separately in Section 6.

- The commercial mosquito control products (other than nets) respondents most often reported having used in the last 12 months in all countries were coils and aerosols. The percentage of households using coils and aerosols was lowest in Zambia and Mozambique and highest in Nigeria and Senegal.
- Use of coils ranged from a low of 25% in Mozambique to a high of 62% in Nigeria. Use of aerosols ranged from a low of 20% in Zambia to a high of 54% in Nigeria and Senegal. Use of repellants and flit gun sprayers was mentioned by less than 3% of respondents in all five countries.
- In all countries, aerosols were used by a higher percentage of urban than rural respondents. Coils were used by a higher percentage of rural respondents everywhere but Zambia.

Table 45: Use of commercial mosquito control products
Among all respondents (Multiple responses possible)

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	999	399	600	1000	400	600	1000	404	596	1000	405	595	999	400	599
Mosquito coils	62.3	49.4	70.8	61.1	59.3	62.3	29.1	35.1	25	36.5	36	36.8	24.8	27.8	22.9
Aerosol insecticide	53.8	70.9	42.3	53.5	66	45.2	19.6	32.7	10.7	37.4	51.4	27.9	26	37.5	18.4
Commercial mosquito repellent on body	3.4	6	1.7	1.6	3.5	0.3	2.8	4.5	1.7	0.6	1	0.3	3.4	6.3	1.5
Flit gun/spray gun (that you fill yourself)	2.2	2.3	2.2	2.7	4	1.8	0.4	0.5	0.3	0.3	0	0.5	1.8	4	0.3
Mosquito screens/nets in windows/doors	15	21.8	10.5	2.8	6.3	0.5	0	0	0	4.5	5.4	3.9	15.8	23.5	10.7
Other commercial methods	6.4	7.3	5.8	35.8	38.5	34	0.1	0	0.2	1.5	2.6	0.7	0.4	0.5	0.3

8.3 FREQUENCY, LOCATION, AND PRICE OF COIL, AEROSOL, AND REPELLANT PURCHASES

Coils

- Coils were purchased frequently among the 25-62% of households that had purchased them in the last 12 months before the interview. Frequency of purchase was particularly high in Nigeria, where 73% of households had bought them within the last week. Frequency of purchase was high in Uganda and Mozambique as well, where 47% and 49% of users, respectively, reported buying coils within the last week. In Senegal and Zambia, frequency of purchase—while lower—was still fairly high with 26% of households that used coils purchasing them within the last week.
- In Nigeria and Mozambique, coils were generally purchased from informal commercial outlets, such as open-air markets, kiosks, and street vendors. In Senegal and Uganda, coils were generally purchased from formal commercial outlets, mostly general shops.

Table 46: Frequency of mosquito coil purchase
Among households that used mosquito coils in the 12 months before the interview

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	622	197	425	535	264	271	291	142	149	365	146	219	248	111	137
Today or yesterday	46.5	42.6	48.2	5.8	6.1	5.5	10.0	16.2	4.0	15.9	18.5	14.2	16.5	17.1	16.1
Within the last 7 days	26.5	24.9	27.3	20.4	23.1	17.7	16.2	21.1	11.4	31.0	37.7	26.5	32.3	32.4	32.1
Within the last month	11.1	11.2	11.1	49	54.2	43.9	15.5	17.6	13.4	26.8	22.6	29.7	22.2	26.1	19
Within the last 3 months	4.8	7.6	3.5	11.4	8.3	14.4	9.3	7.7	10.7	12.6	11	13.7	8.1	9.9	6.6
More than 3 months ago	8.4	10.7	7.3	11	6.8	15.1	44.3	31.0	57.0	9.9	8.2	11	13.7	6.3	19.7
Don't know/ can't recall	2.7	3	2.6	2.4	1.5	3.3	4.8	6.3	3.4	3.8	2.1	5	7.3	8.1	6.6

Table 47: Place where mosquito coils were purchased
Among households that used mosquito coils in the 12 months before the interview

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	622	197	425	611	237	374	291	142	149	365	146	219	248	111	137
Market	24.9	21.3	26.6	2.9	2.5	3.2	23.7	24.6	22.8	8.2	4.8	10.5	60.9	58.6	62.8
Kiosk	49.2	50.8	48.5	0	0	0	25.4	26.1	24.8	15.3	19.9	12.3	5.6	5.4	5.8
Street vendor	14.3	14.7	14.1	2.1	0.8	2.9	6.2	6.3	6	1.4	1.4	1.4	10.9	18.9	4.4
General shop	2.1	3	1.6	92.8	94.1	92	21.6	20.4	22.8	67.7	67.8	67.6	17.3	10.8	22.6
Wholesaler	0.3	1	0	0.5	0.4	0.5	2.4	3.5	1.3	1.9	0.7	2.7	0	0	0
Pharmacy	1	0.5	1.2	0	0	0	1.4	2.1	0.7	0.3	0	0.5	0	0	0
Drugstore	0.2	0	0.2	0	0	0	0.7	1.4	0	0	0	0	0.4	0.9	0
Supermarket	0	0	0	0	0	0	6.5	6.3	6.7	1.4	3.4	0	0.8	0.9	0.7
Mini-mart	6.4	6.1	6.6	0.2	0.4	0	2.1	2.1	2	0	0	0	0.8	0.9	0.7
Other	0.3	1	0	0.4	0.8	0	1.0	0	2.0	1.7	0.7	2.3	0	0	0
Don't Know	1.3	1.5	1.2	0.8	0.8	0.8	8.9	7	10.7	2.2	1.4	2.7	3.2	3.6	2.9

Aerosols

- Among the 20-54% of households that had used aerosols in the last 12 months, 40-75% purchased them within the last month. Purchase was least frequent in Zambia (40%) and most frequent in Senegal (75%).
- In Nigeria, aerosols were mainly purchased through informal commercial outlets, including open-air markets, and kiosks. In Senegal, Zambia, and Uganda, they were generally purchased through formal commercial outlets, such as general shops and supermarkets. In Mozambique they were bought in both formal and informal commercial outlets.

Table 48: Frequency of aerosol insecticide purchase
Among households that used aerosol insecticides in the 12 months before the interview

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	537	283	254	535	264	271	196	132	64	374	208	166	260	150	110
Today or yesterday	8.4	8.1	8.7	5.8	6.1	5.5	2.6	2.3	3.1	3.5	2.9	4.2	5.4	7.3	2.7
Within the last 7 days	21.4	24	18.5	20.4	23.1	17.7	10.7	15.9	0	27.5	27.9	25.9	26.2	28.7	22.7
Within the last month	32.4	35.3	29.1	49	54.2	43.9	27.0	28.8	23.4	40.6	41.8	39.2	30.8	28.7	33.6
Within the last 3 months	14.2	11.7	16.9	11.4	8.3	14.4	21.9	24.2	17.2	11	11.1	10.8	13.1	12	14.5
More than 3 months ago	19.2	16.3	22.4	11	6.8	15.1	35.2	25	56.3	13.9	12	16.3	15	14	16.4
Don't know/ can't recall	4.5	4.6	4.3	2.4	1.5	3.3	2.6	3.8	0	4	4.3	3.6	9.6	9.3	10

Table 49: Place where aerosols were purchased
Among households that used aerosols in the 12 months before the interview

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	537	283	254	535	264	271	196	132	64	374	208	166	260	150	110
Market	49.9	47	53.1	6	5.7	6.3	7.7	8.3	6.3	3.7	2.4	5.4	32.3	30	35.5
Kiosk	12.7	8.1	17.7	0.4	0	0.7	6.6	5.3	9.4	2.9	0.5	6	3.8	4.7	2.7
Street vendor	1.5	0.7	2.4	0.4	0.4	0.4	1.0	0.8	1.6	2.1	3.4	0.6	5.4	8	1.8
General shop	2.2	2.8	1.6	70.5	72.7	68.3	17.3	14.4	23.4	66	68.8	62.7	40.4	36.7	45.5
Wholesaler	0.9	1.1	0.8	2.4	1.9	3	3.1	3	3.1	12	9.6	15.1	1.5	2	0.9
Pharmacy	15.1	17.3	12.6	0	0	0	3.6	0.8	9.4	0	0	0	0.8	1.3	0
Drugstore	1.9	2.8	0.8	0	0	0	1.0	1.5	0	0.3	0	0.6	0.8	1.3	0
Supermarket	9.7	15.5	3.1	1.1	2.3	0	43.9	54.5	21.9	7.2	12	1.2	6.2	8.7	2.7
Mini-mart	3	2.5	3.5	5.2	7.6	3	3.1	1.5	6.3	0	0	0	1.5	2.7	0
Other	0.4	0.4	0.4	3.1	3.4	2.6	1.5	0.8	3.1	4.0	1.5	7.2	0	0	0
Don't Know	2.8	1.8	3.9	11	6.1	15.9	11.2	9.1	15.6	1.6	1.9	1.2	7.3	4.7	10.9

8.4 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 (1=not very important; 7=very important) how important to them various attributes were.

- The most valued attribute of any mosquito product was the product's ability to "kill mosquitoes." Another top-ranked attribute in all countries was the product's ability to "reduce malaria." In Nigeria and Zambia "is a high quality and effective brand" was ranked as a very important attribute. In addition, "keeps mosquitoes away for a long time" was ranked as one of the most important attributes to respondents in Nigeria, Uganda, and Mozambique, whereas in Senegal and Mozambique "kills other insects, other than mosquitoes" was found to be more important.

Table 50: Mean rating of mosquito control product attributes
Among all households

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
BASE	999	399	600	1000	400	600	1000	404	596	1000	405	595	999	400	599
Kills mosquitoes	6.08	6.09	6.08	6.76	6.76	6.75	6.38	6.39	6.38	5.86	5.94	5.8	6.17	6.27	6.1
Keeps mosquitoes away for a long time	5.68	5.74	5.64	4.65	4.49	4.76	5.86	5.80	5.90	5.38	5.34	5.41	5.26	5.28	5.24
Keeps mosquitoes away while sleeping	5.67	5.72	5.63	5.54	5.64	5.47	5.79	5.73	5.83	5.68	5.73	5.64	4.95	5.05	4.88
Kills other insects, other than mosquitoes	5.29	5.33	5.26	6.57	6.64	6.53	5.51	5.44	5.57	4.77	4.72	4.80	5.75	6.01	5.57
Is safe to use around children	5.01	4.75	5.18	6.28	6.33	6.24	6.00	6.00	6.00	5.34	5.20	5.43	4.1	3.88	4.25
Is a good value for the money	5.56	5.50	5.61	5.82	5.89	5.77	5.66	5.66	5.65	5.04	5.13	4.98	3.69	3.73	3.66
Is a long-term solution to mosquito problems	5.37	5.35	5.39	6.19	6.33	6.09	6.05	5.96	6.11	5.03	4.99	5.06	4.82	5.02	4.69
Is high quality and effective brand	5.75	5.84	5.69	5.62	6.01	5.37	6.06	6.08	6.04	4.98	4.99	4.97	4.53	4.8	4.36
Reduces malaria	5.71	5.55	5.81	6.51	6.58	6.47	6.31	6.22	6.37	5.70	5.78	5.65	5.37	5.33	5.39

Association of attributes with specific mosquito control products

Respondents were again read the list of attributes and asked which type(s) of mosquito control products they thought of when they heard each attribute. They could indicate more than one product. (Note that the base is the respondents who were aware of 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 those for aerosols and coils in all countries, except for Nigeria, on the following attributes: "keeps mosquitoes away while sleeping," "is safe to use around children," "is a long-term solution to mosquito problems," and "reduces malaria." In addition, in Senegal, Zambia, and Uganda nets were most associated with the attribute "is good value for the money," in Zambia, Uganda, and Mozambique with "keeps mosquitoes away for a long time, and in Zambia and Uganda with "is a high quality/effective brand." In Nigeria, nets were only associated with "safe to use around children," whereas all other attributes were associated with aerosols.
- In all countries, the product most strongly associated with "kills mosquitoes" and "kills other insects, other than mosquitoes" was an insecticide aerosol. In addition, in Nigeria, Senegal, and Mozambique aerosols were most strongly associated with "is a high quality/effective brand" compared to nets or coils.

Table 51: Association of attribute with specific mosquito control products
Among respondents who are aware of specific mosquito control products

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Net	Aerosol	Coil	Net	Aerosol	Coil	Net	Aerosol	Coil	Net	Aerosol	Coil	Net	Aerosol	Coil
BASE	599	943	967	955	972	991	928	763	816	974	898	923	832	728	758
Kills mosquitoes	11.2	87.2	58.8	10.6	91.9	30.9	15.3	84.5	37.1	7.2	84	28.2	10.8	87.5	43.5
Keeps mosquitoes away for a long time	53.6	63.8	55.1	42.4	29.8	79.8	56.1	23.2	37.5	50.5	31.1	31.0	52.9	28.8	47.6
Keeps mosquitoes away while sleeping	62.1	63.3	55.7	70.8	33.7	55.2	73.3	16.9	30.4	74.6	29.6	36.9	69.6	25.1	39.1
Kills other insects, other than mosquitoes	14.2	84.6	32.3	7.9	91.2	14.6	5.2	83.6	13.5	3.3	76.4	15.4	10.1	77.9	20.7
Is safe to use around children	70.5	31.1	36.9	89.1	20.7	24.9	76.9	14.8	11.5	76.2	7.3	15.9	55.3	9.5	21.5
Is a good value for the money	47.1	64.1	48.1	64.0	47.7	43.2	60.3	21.5	28.1	59.7	22.4	18.3	23.6	17.4	32.5
Is a long-term solution to mosquito problems	56.8	62.9	39.2	78.3	42.1	22.0	78.9	15.1	5.4	54.8	13.8	8.2	43.1	29.9	13.1
Is a high quality/effective brand	41.1	76.1	33.5	48.1	60.3	22.9	66.1	39.7	11.2	59.1	30.3	7.4	26.8	42.4	19.5
Reduces malaria	50.6	71.4	48.4	83.0	59.7	46.0	67.5	36.8	20.1	68.6	38.6	28.5	45.1	37	22.8

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 of brands by total awareness (unprompted and prompted).

- Brand awareness among respondents was highest for "Mobil" in Nigeria (85%), "Yotox" in Senegal (93%), "Target" in Zambia (72%), "Doom" in Uganda (94%), and "Baygon" in Mozambique (84%).
- "Baygon" was among the more recognized brands in Senegal, Uganda, and Mozambique; "Doom" in Zambia, Uganda, and Mozambique, and "Ridsect" in Zambia and Uganda.
- Respondents' associations of each brand name with specific mosquito control attributes can be found in the individual country reports.

Table 52: Awareness of mosquito control product brand names, total
Among all respondents (multiple responses possible)

	Nigeria			Senegal			Zambia			Uganda			Mozambique		
	Total	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**	**Urban**	**Rural**
BASE	999	399	600	1000	400	600	1000	404	596	1000	405	595	999	400	599
Baygon	39.9	50.6	32.8	76.5	87.8	69	18.7	30.4	10.7	45.9	54.1	40.3	84.4	95	77.3
Elf	30.4	37.3	25.8	65.7	79.3	56.7	---	---	---	---	---	---	---	---	---
Mobil	84.8	91.5	80.3	---	---	---	---	---	---	---	---	---	---	---	---
Raid	64.8	69.7	61.5	48.1	62.3	38.7	4.2	5.4	3.4	4.6	5.9	3.7	9.6	14.3	6.5
Rambo	44.3	55.1	37.2	---	---	---	---	---	---	---	---	---	---	---	---
Shelltox	69.5	72.4	67.5	---	---	---	---	---	---	---	---	---	---	---	---
Cock	---	---	---	5.1	6.8	4	---	---	---	---	---	---	---	---	---
Doom	---	---	---	0.3	0.5	0.2	32.8	45.0	24.5	93.9	96.8	91.9	45.6	55.8	38.9
Yotox	---	---	---	93.1	95.8	91.3	---	---	---	---	---	---	---	---	---
Peaceful Sleep	---	---	---	---	---	---	11.9	15.1	9.7	---	---	---	---	---	---
Ridsect	---	---	---	---	---	---	37.4	52.5	27.2	59.3	69.1	52.6			
Target	---	---	---	---	---	---	72.2	81.7	65.8	---	---	---	14.7	22.8	9.3
Off	---	---	---	---	---	---	---	---	---	8	10.1	6.6	---	---	---
Autan Sensitive	---	---	---	---	---	---	---	---	---	3.1	4	2.5	---	---	---
Fastkill	---	---	---	---	---	---	---	---	---	---	---	---	7.9	12.3	5

SECTION 9
PROGRAM/PRODUCT IMPLICATIONS

9.1 GENERAL

There are many very favorable aspects for ITM promotion in all countries surveyed—Nigeria, Senegal, Zambia, Uganda, and Mozambique—as well as some important barriers to be overcome. Some of the favorable factors are country-specific; others are crosscutting.

The favorable factors for ITM promotion and sales are:

- High awareness of malaria and general understanding that mosquitoes cause malaria in all countries
- Adequate levels of knowledge of vulnerable groups in two countries – Uganda and Senegal
- Moderate to high exposure to information on avoiding malaria in four countries: Mozambique, Senegal, Uganda, and Zambia, however gaps in information coverage exist (see below)
- High level of perceived advantages of nightly use of treated nets by vulnerable groups in all countries; relatively low levels of perceived disadvantages of nightly use of treated nets by vulnerable groups in Mozambique, Senegal, and Zambia
- Access to nets reasonable in one country—Senegal—where for many consumers, time to nearest purchase site is not long
- Common use and relatively frequent purchase of mosquito control products (including aerosol sprays, which are comparatively expensive) in Senegal and Nigeria
- A "net culture" is already being established in four countries: Senegal, Uganda, Zambia and Mozambique. Over one-fourth of all households surveyed already own at least one net and over half of all owned nets were acquired in the last three years
- Nets are already obtained primarily through the commercial sector in all five countries
- Already moderate level of ITM awareness in Senegal and Zambia
- Moderate levels of net use by children under five in households who own nets, particularly in Nigeria and Uganda. In all study countries children under five are favored to sleep under nets.
- Nets viewed extremely positively — more positively than any other insect control product (except that aerosols perceived as doing a better job of killing mosquitoes and other insects)—in all surveyed countries except Nigeria
- Strong valuing in all countries studied of a key product attribute that *insecticide treated nets* deliver: killing mosquitoes. In all countries surveyed except Nigeria, there was also stronger association of the following attributes with nets than with coils or aerosols: " reduces malaria," "keeps mosquitoes away while sleeping," "is safe to use around children," and "is a long-term solution to mosquito problems."

Important barriers to overcome for ITM promotion and sales in all the countries are:

- Erroneous beliefs in all countries about non-mosquito related causes of malaria
- Only moderate levels of knowledge of vulnerable groups in Zambia, Nigeria, and Mozambique
- Inadequate exposure to information on malaria prevention in Nigeria
- Moderate levels of perceived disadvantages of mosquito net use by children under five in Nigeria and Uganda; moderate levels of perceived disadvantages of *treated net* use by vulnerable groups, particularly in Nigeria and Uganda
- Concerns about safety and potential adverse health effects of insecticide treatments, particularly with regard to young children and pregnant women (in all study countries, but especially in Uganda)
- Dislike of nets or perception that nets are unnecessary among a sizeable minority of non-owners in Senegal and Nigeria
- Limited access to nets in all countries surveyed except Senegal—people have to travel long distances to obtain nets (especially in Zambia)
- Lack of variety of net size, shape, color among available nets
- Lack of even a nascent "net culture" in Nigeria
- Public sector provides a fairly large proportion of nets in Zambia and to a lesser extent in Senegal and people may be used to paying subsidized prices.
- Cost of nets (especially in Mozambique) and perception that they are not affordable
- Lack of net branding
- Use of nets only part of the year in all countries
- Low levels of awareness of insecticide treatments for nets in three countries: Uganda, Mozambique, and especially Nigeria
- Very low levels of ITM use in all countries, especially Nigeria; low rates of net treatment/retreatment, even in Zambia and Senegal
- Marginal to negligible availability of insecticide treatments through the commercial sector

The majority of findings from this baseline study are consistent with results of NetMark's formative qualitative research in Nigeria, Senegal, Zambia, and Uganda. The qualitative research reports from these countries contain more detailed information on a number of topics discussed here and are available from NetMark.

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

9.2 KNOWLEDGE AND BELIEFS ABOUT MALARIA, MOSQUITOES, AND NETS

- Recognition of the English term, "malaria" (or the French term, "paludisme/palu" and Portuguese term, "paludismo" in Mozambique) was high, demonstrating that the appropriate terms 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/paludisme/paludismo" 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 about what malaria is.

- Despite the fact that a the majority of respondents in all study countries knew that mosquitoes cause malaria, most people erroneously believed that there were other causes of malaria as well. These other causes varied by country, but included for example, being in the rain, living in dirty surroundings/near standing water, getting hot/sun overexposure, and drinking dirty water. Malaria prevention efforts should emphasize that mosquitoes are the *only* cause of malaria, dispel erroneous beliefs about other causes, and stress that environmental management measures (such as reducing the amount 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 convey the fact that night-biting mosquitoes are the ones that transmit malaria.
- Knowledge of the groups most vulnerable to malaria was adequate in Senegal and Uganda but not in Zambia, Nigeria, or Mozambique. In countries where understanding of the vulnerability of these groups is low, efforts to promote ITM acquisition and proper use can build on the existing perception of the vulnerability of children more generally, but should emphasize the special vulnerability of *children under five* and pregnant women to suffering severe consequences of malaria.
- Exposure to information about malaria prevention (e.g., through mass media or professional and non-professional interpersonal sources) varied across the countries. At one extreme was Senegal, where exposure was quite high, even in rural areas. At the other extreme was Nigeria, where exposure was low in general and virtually absent in some areas. In Mozambique and Zambia, where information exposure was moderate overall, it is unequally distributed (e.g., rates are lower in rural areas or in certain regions). Increased exposure to accurate malaria prevention information is still needed in *all countries* and must reach *all regions* and all populations (not just urban). A coordinated strategy that provides information from a variety of media and interpersonal sources is likely to be effective.
- In all countries studied, a high proportion of respondents perceived advantages of net/ITN 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.
- *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.
- There was variation across the countries in the percentage of respondents who said that there were disadvantages of children under five sleeping under a net. In Senegal, Zambia, and Mozambique, the vast majority of respondents did not name any disadvantages, but in Uganda and Nigeria, the vast majority did. The main disadvantages cited were that a child might get caught/trapped or suffocate under the net, that it is hot/not enough air under a net, and that it is difficult/inconvenient if the child has to get up in the night. These perceived disadvantages 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.
- Overall, there were stronger disadvantages of *treated* nets, although there was variation across the countries. In Nigeria and Uganda, the majority of respondents named at least one disadvantage of a pregnant woman or child under five sleeping under a *treated net* and in the other countries, a sizeable minority did, as well. The main disadvantages cited were that the chemical is dangerous/harmful to health (even that it might kill the child, or cause miscarriage) and that the smell is bad/might make a pregnant woman vomit. Negative perceptions of treated nets may be based on previous experience with aerosols and coils (e.g., smell, irritation, and adverse health effects). Since smell and irritation are mild and transient in treated nets, 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 the insecticide is present and still effective.

9.3 ACCESS TO ITMS

- There was a great range in time consumers would have to travel to find a net. In Senegal, almost half the respondents could walk to a place where they could purchase a net in approximately ¼ of an hour. But, in Zambia and Nigeria, it would take the majority of respondents an hour or more to the nearest place of purchase. In all countries, rural respondents would have to travel longer distances to obtain nets than would urban respondents. In Nigeria (especially in urban areas) and Mozambique (especially in rural areas), a sizeable number of consumers did not know where a net could be obtained or said nets were not available. In Senegal, Mozambique, and Zambia, a relatively large proportion of nets was obtained through the public sector, whereas in Nigeria and Uganda, virtually all nets came from commercial sources.

  Access to treated nets and to insecticide treatments for nets is even more problematic. In Nigeria, ITNs and net treatments are virtually non-existent. In Zambia and Senegal, insecticide treatments are available almost exclusively through the public sector. A key challenge will therefore be to make nets and net treatments more accessible and available through various commercial sector outlets, bringing them closer to where people live, with particular attention to rural areas. Promotional efforts should also provide information on where these products can be obtained.

9.4 MOSQUITO NET OWNERSHIP

- The proportion of households owning at least one net varied considerably across the study countries and between urban and rural settings. Ownership was low in Nigeria, but moderate elsewhere. In Senegal, rural dwellers were more likely to have nets than were urban residents, whereas the reverse was true in the other four countries. Non-net owners in all countries, especially Uganda, Zambia, and Mozambique and those in rural areas said cost was a critical reason they did not own nets. A key challenge to increasing net ownership will be to make nets more affordable (particularly in Mozambique) and countering perception of nets as unaffordable, particularly in countries or settings where people are already spending a lot of money on other commercial mosquito control products. In countries or regions where a fairly sizable portion of nets comes from the public sector, people may expect the cost of nets to be low. 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. Possibly commercial nets will be seen as reasonably priced when compared with the cost of regular aerosol use or when weighed against the cost of multiple cases of malaria. Ideally, subsidized nets would be targeted to low income groups unable to afford even reasonably priced commercial nets.
- In Nigeria and Senegal a sizeable minority of non-net owners (especially in urban areas) said they did not own a net because they did not like or need them. Special attention must be paid to countering these perceptions, possibly by emphasizing the benefits of treated nets in killing/repelling mosquitoes and in reducing malaria.
- Because brands of nets were generally unknown in all countries studied, and the proportion of tailor-made nets is fairly high in Nigeria and Senegal, commercial players will need to develop and market strong brands of nets that are associated with the benefits that consumers want. Consumers in all countries want a mosquito control product that kills mosquitoes and reduces malaria. Other benefits that consumers want vary somewhat by country and should be taken into consideration in country-specific marketing campaigns.

- Nets were washed frequently: at least half to three-quarters of nets that were ever washed were washed at least once a month. And in all countries between one-quarter and half of all ever-washed nets were washed at least every two weeks. Promotional efforts must address how often nets should be treated/retreated as well as washed in between treatments. Long-lasting nets must be able to withstand frequent washing.

9.5 MOSQUITO NET TREATMENT

- Awareness of insecticide treatment for mosquito nets varied considerably across countries. At one extreme was Nigeria, where almost no one had ever heard of ITMs, and at the other was Senegal, where awareness was moderately high. Even where awareness was moderate, treatment rates were low, with few nets treated after purchase and even fewer retreated on a regular basis. In Nigeria, only one ITM owner was found and the net had not been treated after purchase. It is essential to make net treatments available; then promotional and communication efforts are needed to raise treatment rates. Such a campaign can build on respondents' positive reaction to the concept of ITMs, particularly emphasizing the effectiveness of net treatment in killing/repelling mosquitoes—highly valued attributes of mosquito control products that are not currently associated with nets. A long-lasting net would help to overcome the challenge of getting people to retreat frequently, but as long as untreated nets are used, retreatment will be necessary.
- Although respondents in Zambia, Senegal, Mozambique, and Uganda were able to get insecticide treatments through commercial outlets, in Zambia and Senegal—the study countries with the highest retreatment rates—treatments were obtained mainly through the public sector and were often free or low cost. A key challenge will be to increase involvement of the commercial sector in the production and distribution of net treatment in all areas, but especially in rural ones. Brands of net treatments were generally unknown. Strong branding of net treatments that have the attributes that consumers desire is encouraged as well.

9.6 APPROPRIATE USE

- Although the overall proportion of pregnant women and children under five—the groups most vulnerable to severe malaria—is low in all countries studied, among *net-owning* households, these groups generally get priority over other household members for sleeping under a net (except in Zambia). The proportion of children under five living in net-owning households who slept under a net the prior night was highest in Nigeria and Uganda. The proportion of pregnant women sleeping under nets in net-owning households was highest in Uganda and lowest in Zambia.

  Because ownership of treated nets is low overall, so is ITM use by children under five and pregnant women. Promotional and educational efforts are important to encourage net (ITM) use by children under five and pregnant women, even in settings where these vulnerable groups are already given priority for sleeping under nets.
- In all countries, behavior-change strategies are needed to encourage *year-round net use* and address any barriers to doing so.

9.7 CONSUMER NET PREFERENCES

- Consumer preferences for net size, shape, and color do not always match what they currently own; what they currently own is largely a reflection of availability. For example, in Senegal, there was some preference for round/conical nets, but the vast majority of respondents owned rectangular ones. In Nigeria and Zambia, at least half the respondents preferred king-size nets, yet very few net owners had this size. Product development should take into consideration consumer preferences for net size (king and double) and shape (both conical and rectangular, with some preference for one or the other in the different

countries), and color (generally white, but also other colors, especially light ones). Attention to consumer wants should help to raise sales and enhance strength of brand. (It should be noted that in NetMark's formative qualitative research, consumers explained that they prefer rectangular nets for their shape and because they were thought to allow greater air flow, while conical nets were liked for the fact that they are easy to hang because only one point is needed. If a rectangular net that hangs from a single point could be devised, it would combine two features that consumers like. However, product modification should be addressed in light of any cost increases they would involve.)

9.8 OTHER MOSQUITO CONTROL PRODUCTS

Awareness and use of mosquito control products and methods

- Although awareness of other commercial mosquito control products other than nets was moderate (Zambia and Mozambique) to relatively high (Uganda, Nigeria, and Senegal), use varied. In Nigeria and Senegal, use and frequency of purchase was moderate, even in rural areas. In the other countries, especially Zambia and Mozambique, use was much lower. The fact that a sizeable number of urban and rural dwellers know about and (in some countries) use commercial insect control products is favorable for net and insecticide treatment promotion. In addition, the fact that many consumers in Nigeria and Senegal spend significant money on aerosol sprays is favorable for ITM promotion and sales. Promotional efforts should emphasize the insecticide characteristics of treated nets that are likely to have strong consumer appeal (see below). In addition, where aerosol sprays are commonly used (Nigeria and Senegal), efforts should stress that use of insecticide treated nets is more economical in the long run.
- Insect control products such as coils and aerosols are sold in the same outlets as nets in Zambia and Uganda, but not elsewhere. In Senegal and Mozambique, aerosols were bought mainly in formal commercial outlets such as general stores, but nets are available mainly in open-air markets. In Nigeria, aerosols were purchased in open-air markets, where most nets are found (but NetMark's formative qualitative research showed that the stalls selling nets were not those that sold insecticides). In Zambia and Uganda, aerosols were purchased mainly in formal commercial outlets such as general shops—the same types of outlets most commercially procured nets were bought. In these countries, nets, ITMs, and net treatments can likely be sold together in the same outlet. In the other countries, successful sale of ITMs and net treatments may require that the commercial sector overcome this specialization.

Perceptions of mosquito control attributes, products, and brands

- In all countries studied, the most highly valued attribute that consumers wanted in a mosquito control product was that it kills mosquitoes. Also in all countries, respondents wanted a product that reduces malaria. The fact that consumers 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 and prevent malaria.

  Other desired attributes varied somewhat among the countries. In Mozambique, respondents wanted a product that "keeps mosquitoes away for a long time" and "kills other insects other than mosquitoes." Nigeria, consumers also wanted a product that "keeps mosquitoes away for a long time," "keeps mosquitoes away while sleeping", and is a "high quality and effective brand." In Senegal, the desired attributes were "kills other insects other than mosquitoes" and is "safe to use around children." In Uganda, respondents wanted a product that "keeps mosquitoes away for a long time," "keeps mosquitoes away while sleeping," and "is safe to use around children." In Zambia, consumers valued mosquito control products that are "a long-term solution to mosquito problems", "a high quality and effective brand," and that keep "mosquitoes away for a long time. In all countries except Nigeria, mosquito nets were rated higher on many attributes, but aerosol insecticides were most strongly associated with killing mosquitoes and other insects.

In Senegal and Mozambique, special emphasis should also be placed on the fact that ITMs kill other insects. The safety of ITMs for use around children should be highlighted in Senegal and Uganda. Brand quality and effectiveness should be stressed in Zambia and Nigeria. Also in Zambia, the fact that ITMs are a long-term solution to mosquito problems can be emphasized. The ability of ITMs to keep mosquitoes away for a long time and while sleeping should be highlighted in Nigeria and Uganda.

APPENDIX: SAMPLING STRATEGY

A multistage sampling procedure was used to select the respondents participating in each country 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. (See Table 1.)

2- Selection of sampling points: In each country, within each of the five sites, 20 sampling points (villages or urban neighborhoods) were randomly selected from the 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.

In most countries, the sampling strategy resulted in an urban-rural breakdown that approximated the national proportions. In other ways, however, the sampling procedure devised for this study may have resulted in samples that differed from true national random samples (which were 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.

b) Only households with children under five were included in the sample, 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.