



**NetMark
2004 Survey on
Insecticide-Treated
Nets (ITNs)
in Ghana**

March 2005



NetMark Baseline Survey on Mosquito Nets in Ghana 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.



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Updated: June 3, 2005

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ACKNOWLEDGEMENTS

This study was 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.

Dr. Carol Baume was responsible for the household surveys in all NetMark countries, from the baselines in 2000 (Mozambique, Nigeria, Senegal, Uganda, Zambia, plus Mali in 2003) through the present series of 2004 surveys (Ethiopia, Ghana, Nigeria, Senegal, and Zambia).

Ms. Celeste Marin conducted the data analysis for this and all of the NetMark surveys for 2004.

Ms. Lonna Shafritz provided technical assistance throughout, including questionnaire revision and pre-testing, training in Ghana with RI, and contributions to writing the report.

Ms. Sheila Somashekhar and Ms. Roshelle Payes provided support for data analysis and report-writing and managed report production.

Mr. Pramod Amatya assisted with proofreading and report production.

The report benefited from review and input by Dr. Nancy Nachbar and Dr. Martin Alilio.

Research International (RI) of South Africa was contracted to implement the fieldwork in all five countries using their local affiliates, and to enter the data. Mr. Joe Boniaszczuk and Mr. Manas Misra were key personnel for those activities.

LIST OF ACRONYMS

AED	Academy for Educational Development
DfID	Department for International Development (UK Aid Agency)
DHS	Demographic and Health Surveys
ITNs	Insecticide treated nets
LLINs	Long-lasting insecticide treated nets
RI	Research International (South Africa)
RBM	Roll Back Malaria
SES	Socio-economic status
UNICEF	United Nations' Children's Fund
USAID	United States Agency for International Development
US\$	U.S. Dollars
WHO	World Health Organization
WRA	Women of reproductive age

MAP OF GHANA



NETMARK 2004 SURVEY OF ITNS IN GHANA EXECUTIVE SUMMARY

- PURPOSE:** Provide measures of
- Ownership of mosquito nets and ITNs
 - Use of nets and treated nets by vulnerable groups: children under five, pregnant women, and women of reproductive age
 - Net treatment practices
 - Characteristics of nets owned
 - Knowledge and beliefs about mosquitoes and malaria
 - Perceptions of treated and untreated mosquito nets
 - Consumer preferences regarding mosquito nets
 - Use of mosquito control products

METHODOLOGY: Survey

SAMPLE: 1500 Ghanaian households from five sites: Accra, Keta, Kumasi, Wa and Tamale. In each site, the target sample was 300: 120 respondents from the urban center, and 180 households from up to 200 kilometers from the urban center. Respondents were women aged 15-49 who were mothers/guardians of children under five years of age.

DATA COLLECTION: August 2004

STUDY FINDINGS

**** HIGHLIGHTS ****

91% of respondents were aware of nets treated with insecticide

38% of households owned a net

19% of households owned a currently treated ITN*

30% of children under five slept under a net the prior night

13% of children under five slept under a currently treated ITN the prior night*

21% of pregnant women slept under a net the prior night

8% of pregnant women slept under a currently treated ITN the prior night*

*Roll Back Malaria Core Indicator

Net Ownership

- The percent of households owning at least one net was 38%, but varied considerably by site. Coverage by site was: Accra 17%, Kumasi 19%, Wa 45%, Tamale 46% and Keta 64%.
- Net ownership was equitable; it did not vary much by socio-economic status (SES).
- The percent of households that owned a net was approximately equal in urban and rural areas.
- Among net-owning households, 27% owned more than one net, with an average of 1.5 nets per household.
- The most common reason given for not owning a net was lack of money (63%). Another 17% of respondents (46% in Tamale) cited lack of availability and 13% of respondents (31% in Accra) said they didn't need nets or used something else for protection against mosquitoes.
- One fourth (25%) of households owned a baby net with a built-in frame.¹

ITN Awareness and Ownership

- Awareness of treated nets was very high; 91% of respondents said they had heard of them.
- Twenty-one percent (21%) of households owned a net that had ever been treated (i.e., already treated when acquired or treated after acquired), ranging from a low of 10% in Accra and Kumasi sites to a high of 36% in Tamale site.
- Nineteen percent (19%) of households surveyed owned an ITN (a currently treated net)², ranging from a low of 9% in Accra site to a high of 34% in Tamale site.
- Ever-treated nets and ITNs were most common in the highest SES households and least common in the middle SES quintile.
- ITN-owning households averaged 1.1 ITNs per household.
- Thirty-seven percent (37%) of all nets owned were already treated when they were acquired (either a long-lasting net, a pre-treated net, or treated by someone before acquired by owner).

Appropriate Use

Children under five

- Among all households, 25% of children under five slept under a *hanging net* the prior night. This ranged from a low of 10% in Accra site and 12% in Kumasi site, to a high of 47% in Keta site. There was not much variation by urban-rural or by SES.
- When baby nets were included, 30% of children under five in all households slept under *some type of net*, ranging from a low of 17% in Accra site and 20% in Kumasi site, to a high of 50% in Keta site. There was not much variation by urban-rural or by SES.

¹ Baby nets are not counted in net coverage (ownership) figures.

² An ITN or currently treated net is defined as a long-lasting net that does not require frequent treatment, a pretreated net obtained within the last 12 months inclusive, or a net that has been soaked with insecticide within the past 12 months inclusive. This definition corresponds with the Roll Back Malaria definition of an ITN.

- Among all households, 13% of children under five slept under an ITN (*currently treated net*) the previous night, ranging from a low of 5% in Accra site to a high of 24% in Tamale site. Under-fives in the middle SES quintile were least likely to sleep under an ITN.
- Within net-owning households, 68% of children under five slept under a net the prior night. When baby nets were included, 71% of under-fives in net-owning households slept under some kind of net.
- Younger under-fives were more likely than older ones to sleep under a net or ITN, with use dropping off most sharply at age four.
- There did not appear to be gender bias in childhood net use.

Pregnant women

- Among all households, 21% of pregnant women slept under a *net* the previous night, from a low of 13% in Kumasi site (n=23) and 14% in Accra site (n=21) to a high of 29% in Tamale site (n=24). There was virtually no urban-rural difference.
- Among all households, 8% of pregnant women slept under an *ITN* the prior night. No pregnant woman in the sample from Wa (n=20) slept under an ITN the prior night. The highest proportion was in Tamale at 17% (n=24).
- Within net-owning households, it appears that pregnant women were somewhat more likely than non-pregnant women of reproductive age to sleep under a net: 69% compared with 61%. (There were only 32 pregnant women in net-owning households, so we cannot draw firm conclusions.)

General patterns

- Within net-owning households, children under five years (71%, including those under baby nets) and pregnant women (69%) were most likely to sleep under a net. Males over the age of 15 were the least likely to sleep under a net (25%).
- Nearly one-quarter of nets (23%) were not used the prior night, with the highest proportion of unused nets in the Accra site (37%).
- Thirty-seven percent (37%) of net-owning households used their nets year-round. The mean number of months nets were in use was 7.2 months per year, but ranged from a low of 5.4 months in Tamale to a high of 9.2 months in Keta.

Characteristics of Nets

Net Treatment and Washing

- Among all nets owned, 45% had ever been treated; 38% were already treated when they were acquired, and 19% had been treated since purchase, regardless of whether they were pretreated. Forty percent (40%) of nets were currently treated (ITNs).
- Seven percent (7%) of nets owned originally came bundled with an insecticide packet.
- Among nets that were treated since acquired, 48% were treated at home by a member of the household the last time they were treated, 4% were treated somewhere else (usually by a health worker), and 9% were treated by someone who came to the house specifically to treat the net.

- Among nets that were treated since acquired, the source of the treatment product was about half commercial and half non-commercial. The non-commercial source was mainly a health facility.
- Brand awareness (aided) of net treatment product was high: 73% of nets that were last treated at home were said to be treated with KO Tab and 12% by Iconet; 16% did not know the brand.
- The median cost of the treatment product was 5000 cedis, but cost ranged widely, from 2000 (US\$0.23) in Tamale to 13000 (US\$1.48) in Keta.
- Three-quarters (75%) of nets had been washed. Net were washed often: 46% of all nets were reportedly washed at least once a month.

Net type, age, source, brand, price, and purchaser

- A high proportion of nets was tailor-made: 58% of nets were manufactured; 38% were tailor-made; and 4% were originally manufactured but re-configured by a tailor (usually rectangular nets re-made into conical).
- Many nets were fairly new: 32% were obtained within the prior year and a total of 52% were obtained within two years prior.
- Most nets (63%) were obtained from commercial sources, almost all from a market. Almost all non-commercial nets were obtained from a health facility. In some sites the source of nets owned was primarily commercial while in others it was primarily non-commercial. In Keta, 85% of nets owned were obtained from commercial outlets, whereas in Tamale, 72% of nets were obtained from a clinic, the only non-commercial source.
- The brand was unknown for 30% of commercially-made nets owned. The main brands identified by the respondent or a label were UNICEF and/or SiamDutch (26%), followed by Permanet (16%), KO Net (13%), NetMark (8%).
- Reported net prices ranged considerably: from under 5,000 to almost 100,000 cedis. The median price was 30,000 cedis (US\$3.42), with higher SES households paying more than lower SES households. [Note that for 24% of nets the cost was unknown and for another 1.4% the net was free. Further, because of potential problems with recall for older nets, and because of currency devaluations over time, these prices should be taken as very general estimates.]
- Just over half (52%) of the nets were obtained by the respondent and one-fourth (24%) by the respondent's husband.

Net size, shape, and color

- Most of the nets owned were double-sized (82%) and rectangular in shape (94%).
- Two-thirds (67%) of nets owned were white (90% in Keta) and 13% were green (39% in Tamale, where the green UNICEF-SiamDutch nets were common.)

Net Preferences

- Equal numbers of respondents (44% each) preferred round/conical-shaped and rectangular-shaped nets.
- Large nets were preferred: 61% preferred triple/king nets and 31% doubles.
- Preferred colors were white (17%), turquoise (13%), and green (13%). Colors most disliked were black (26%) and the dark multi-color sample shown (22%).

Brand awareness, and use and perceptions of other insect control products

- Brand awareness in Ghana is low: 4% could name a net/ITN brand unprompted, and a total of 57% recognized at least one brand after being shown a card with logos with associated brand names. UNICEF was the most recognized “brand”, at 27% (prompted and unprompted).
- Awareness of coils and aerosol insecticides was nearly universal. Use of these commercial insect control alternatives was moderate: 62% had used coils during the mosquito season in the past 12 months and 30% had used aerosols. Among coil users, use was very frequent, with 46% using them daily.
- Among various mosquito control products—coils, sprays, nets, and ITNs—ITNs were ranked highest on most attributes that people want in such products: “is a modern solution”, “keeps mosquitoes away while sleeping”, “is safe to use around children”, “is good value for the money”, “is a long-term solution”, “is a high quality product”, and “reduces malaria.” Sprays were ranked most highly on “kills mosquitoes” and “kills other insects,” with ITNs coming in second on these attributes.

Knowledge of malaria and perceptions of nets

- Recognition of the English term “malaria” was nearly universal at 97%.
- Among those who had heard of the term “malaria”, knowledge of the symptoms of malaria was fair. The main symptoms named were fever (65%), vomiting (37%), pale/yellow palms or eyes (31%), chills (29%), weakness/tiredness (27%), headache (26%) and loss of appetite (25%). Given that the defining symptom of malaria is fever, the proportion mentioning fever was rather low. Only 2% mentioned convulsions, a symptom of severe malaria.
- Among those who had heard the term “malaria”, 82% identified mosquitoes as the cause. Most people also mentioned other causes such as dirty surroundings (31%), weather (24%), and dirty food or water (20%).
- Among those who had heard the term “malaria”, two-thirds correctly named both children under five and pregnant women as the most vulnerable groups.
- Respondents mentioned very few disadvantages of nets and ITNs, and many advantages, chiefly preventing malaria and avoiding mosquito bites. Killing mosquitoes was also commonly cited as an advantage of ITNs.

Communication

- Exposure to information about ITNs was high; 90% had seen or heard something about treated nets in the prior 12 months.
- Those who had heard/seen information about ITNs in the prior year were significantly more likely to own a net that had ever been treated: 23% of those who had heard/seen information and 3% of those who had not owned a net that had ever been treated.
- The main source of information for those who had seen or heard information about ITNs in the previous year was health staff (57% overall, but more than 70% in Keta and Tamale). Other important sources of information were radio (41% overall; 57% in Accra), television (31% overall; more than 50% in Accra and Kumasi), and friends, neighbors or relatives (16%).
- Among those who had seen or heard information on ITNs in the last 12 months, the ideas that were remembered most were: “Kill mosquitoes” (part of the NetMark slogan) and “prevent malaria” (both 41%); protects against mosquito bites (32%); “Mosquitoes kill” (the other part of the NetMark slogan, 22%); “it’s good to use a treated net” (22%); and “prevents illness/better health” (20%).

CONCLUSIONS

There are the beginnings of a “net culture” in many parts of Ghana, and the situation is extremely favorable for further expanding ITN ownership and use. The focus now should be on increasing availability and variety; on reducing the cost of ITNs, especially for vulnerable groups; on using motivational keys to convert non-owners to owners, and on treatments that convert nets to long-lasting insecticide-treated nets (LLINs), given the large quantity of untreated nets already in households. Additionally, special effort is needed to encourage pregnant women to sleep under an ITN.

Favorable factors include:

- Nets are accepted in much of Ghana: they are widely used across SES groups, in urban and rural households, and are generally favorably viewed.
- The great majority of respondents had been exposed to messages about ITNs in the past year; current channels are reaching people.
- The vast majority of people have heard of ITNs. People know that ITNs are more effective than untreated nets; perceive them to be effective against malaria; and do not have negative perceptions of the insecticide.
- A high proportion of nets was obtained in the past 1-2 years, indicating that recent promotion and distribution efforts have been effective.
- Most nets/ITNs are from the commercial sector, suggesting that people see nets/ITNs as a valued commodity that is worth the price.
- There is relatively high use of aerosols and very frequent use of coils, suggesting that people see mosquitoes as a problem and find it worthwhile to pay to combat the problem.
- ITNs are more favorably viewed than aerosols and coils on most desired attributes; people may be open to substituting ITNs for aerosols and coils.
- Within net-owning households, the youngest children are given preference for sleeping under a net and it should be easy to reinforce and expand this practice.

Main barriers to overcome are:

- Within net-owning households, pregnant women are only slightly more likely than other women of reproductive age to sleep under a net; incentives are needed to translate knowledge of vulnerable groups into practice.
- Many nets owned are not used, so family members in net-owning households do not benefit from the protection nets/ITNs afford.
- The perceived (and real) cost of nets is still high for many households – especially among a population largely paid seasonally, mainly after the harvest and end of the rainy season.
- There is still lack of availability in some areas, especially in rural areas, in Tamale, and for households in the lowest SES segment.
- There is lack of variety in net size, shape, and color; and mismatch between features of net/ITN products available and those that consumers want.
- The relatively low education and literacy levels require that approaches to communication about product use and treatment be simple and clear.
- The commercial sector faces a lack of strong branding of nets.

- The commercial sector plays a very small role in supplying individual net treatment kits.
- Net treatment practices are inadequate; people need to know and act on the fact that they can convert nets to ITNs.
- Misconceptions about causes of malaria other than mosquitoes may limit the perception of ITNs as a solution to malaria.
- The idea that nets are not needed is a barrier in urban and upper SES households, where use of window screens or other insect control products is more common.

SECTION 1

INTRODUCTION

1.1 BACKGROUND

The Problem of Malaria

Malaria is a growing health problem in Africa. Each year, 300-500 million people worldwide suffer from the disease (WHO, 1998), with some estimates as high as 515 million (Snow et al., 2005). Of the more than one million people who die from malaria each year, 9 out of 10 live in sub-Saharan Africa (Bryce et al., 2005; WHO, 2003) and the vast majority are children less than five years of age. Pregnant women are also particularly susceptible to the disease. Malaria during pregnancy can cause severe anemia, miscarriage, stillbirth, and maternal death, and in endemic areas, may account for up to 40% of preventable low birth weight among newborns (Brabin, 1991; UNICEF, 1999), the single greatest risk factor for neonatal death (McCormick, 1985; Steketee, 2001). Malaria places a staggering economic burden on already strained national economies and on struggling families. The disease has been estimated to cost sub-Saharan African nations more than 12 billion dollars every year in lost gross domestic product (WHO, 2005) and to slow economic growth in Africa by up to 1.3% each year (Gallup & Sachs, 2000). In addition, malaria reduces human work capacity and productivity, and affects social development indicators such as child health and school attendance.

Malaria transmission can be reduced by up to 90% through the use of insecticide-treated nets (ITNs), according to efficacy trials (Gimnig, 2003). Nightly ITN use can prevent one-fifth of child deaths from all causes, with some country-specific studies in Africa suggesting that as much as 42% of all-cause mortality among children under-five can be averted (Lengeler, 2004). Use of ITNs among pregnant women has been associated with lower prevalence of malaria infection, fewer premature births, and significant reductions in all-cause maternal anemia (D'Alessandro et al., 1996; Ter Kuile et al., 2003).

In 2000 in most African countries, few households owned nets and even fewer owned ITNs. Now in many African countries the picture is beginning to change, with net and ITN ownership increasing. This positive change can be attributed to reductions in taxes and tariffs in many countries, commercial market development, social marketing activities, demand creation, and efforts to reach the most vulnerable populations with free or highly subsidized ITNs. Nevertheless, most African countries are struggling to attain the Abuja objectives of 60% of pregnant women and children under five years of age sleeping under an ITN.

NetMark

NetMark is an eight-year project funded by the United States Agency for International Development (USAID) to prevent malaria by increasing access to and appropriate use of ITNs in sub-Saharan Africa. NetMark is designed to address all three components of the Roll Back Malaria Strategic Framework for Scaling-up of ITNs: commercial expansion, short-term targeted subsidies or market priming activities, and long-term targeted subsidies to vulnerable groups in order to achieve equity. NetMark aims both to develop a sustainable commercial market and to ensure that vulnerable groups have access to affordable ITNs. In addition to increasing the proportion of households that own ITNs, the project also seeks to 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, if not using a long-lasting ITN, regularly treat their nets with insecticide. NetMark is managed by the Academy for Educational Development (AED); its partners include over 40 national and international insecticide and net manufacturers, product distributors, and advertising companies. NetMark has programs in Ethiopia, Ghana, Mali, Nigeria, Senegal, Uganda, and Zambia.

1.2 SURVEY OBJECTIVES, SAMPLE AND SITES, AND IMPLEMENTATION

Objectives

As part of a comprehensive research agenda that includes both market and behavioral research, NetMark conducts periodic household surveys on ITN-related topics in selected countries. The survey provides quantitative information useful to the public health community as well as to the commercial sector. It covers:

- Ownership of mosquito nets and ITNs
- Use of nets and treated nets by vulnerable groups: children under five, pregnant women, and women of reproductive age
- Net treatment practices
- Characteristics of nets owned
- Knowledge and beliefs about mosquitoes and malaria; exposure to information about ITNs
- Perceptions of treated and untreated mosquito nets
- Consumer preferences regarding mosquito nets
- Use of other mosquito control products

Another objective of the survey is to compare results across countries and across time. NetMark has conducted household surveys in the following countries and years:

Country	2000	2003	2004
Mozambique	X		
Uganda	X		
Zambia	X		
Nigeria	X		X
Senegal	X		X
Mali		X	
Ghana			X
Ethiopia			X

The Ghana questionnaire was based on that used in initial surveys conducted during the year 2000. Most of the questions were the same in order to enable comparability of data. However, the questionnaire was pre-tested in Ghana, and minor adjustments made as a result. Survey reports as well as questionnaires for all countries are available from NetMark or on the web at www.netmarkafrica.org/research.

Although NetMark began activities in Ghana in November 2002, a baseline survey was not conducted at that time because USAID was supporting other agencies that were charged with conducting ITN ownership and use studies. The current survey is a “baseline” in the sense that it is the first that NetMark has carried out, and will serve as a point for monitoring changes from 2004 until the end of the project. It will also lend a consumer perspective for commercial companies as they develop, produce, and distribute their net and insecticide products, and provide further input to the design of promotional campaigns encouraging the purchase and correct use of ITNs.

Sample and Sites

Procedure

This survey was conducted among 1500 Ghanaian households with women of reproductive age (15-49) who were mothers or guardians of children under five years of age.

The sample was drawn from five sites: Accra, Keta, Kumasi, Wa and Tamale. In each site, the target sample was 300: 120 respondents from the urban center, and 180 households from up to 200 kilometers from the urban center. The sampling strategy resulted in an urban-rural ratio of 40:60, which approximates that of Ghana nationally. (The Demographic and Health Survey of 2003 is 41.5% urban.) Table 1 depicts the actual distribution of urban and rural respondents by site.

Table 1.1 Distribution of sample among sites

	Total	Urban	Rural
Accra (Greater Accra Region)	301	120	181
Keta (Volta Region)	301	120	181
Kumasi (Ashanti Region)	300	120	180
Wa (Upper West Region)	299	120	180
Tamale (Northern Region)	299	119	180
TOTAL	1500	599	901

This sampling plan was designed to meet the purposes of this study. In the interest of comparability, the same plan was used in all countries surveyed. Annex A describes the sample and procedure in more detail, and lists the reasons why results from this survey may differ from those obtained from national random sample surveys such as the Demographic and Health Surveys (DHS). Annex B contains descriptive data on the Ghana sample and information on how the socio-economic status (SES) indicator was calculated.

Net promotion in sites

Various organizations have had net/ITN promotional activities in the sites included in the survey. In Accra, Kumasi, and Keta, Netmark encouraged the growth of the commercial sector, but ITNs were also available to children under five and pregnant women on a subsidized basis in health facilities. The health facility nets are unbranded but are long-lasting insecticide-treated nets (LLINs) provided by the Global Fund. NetMark initiated a voucher scheme with DFID in April 2004 in Keta to allow pregnant women to obtain an ITN from a commercial source at a reduced price; and in June 2004 initiated a similar scheme with ExxonMobil in greater Accra and Kumasi. PermaNet/PermaNet 2.0, and Dawa Net were available for discounted purchase at the time of the study, and were also available at commercial prices.

In Wa there was a UNICEF/Red Cross immunization program that distributed nets a year before the survey (2003). In Tamale and Wa, UNICEF has been selling ITNs—K-O Nets and SiamDutch nets—at subsidized prices through community agents and health facility personnel.

NetMark launched the Permanet (a long-lasting insecticide-treated net, or LLIN) in November, 2002, and began full-scale promotion in March 2003, airing national television and radio spots. In greater Accra, Kumasi, and Keta, NetMark also sponsored promotion through women's groups and traveling road shows.

Implementation

The data were collected during August 2004, which is at the end of the rainy season in Accra but in the middle of the rainy season in Tamale in the north.

The research was designed and carried out by NetMark, which contracted with Research International South Africa to organize and manage the fieldwork, and to enter the data and produce preliminary tables. NetMark staff conducted further analyses and wrote the report.

1.3 ORGANIZATION OF REPORT AND TABLES

This report must serve the data needs of both the public health community and the commercial sector for nets and insecticide treatments. The report attempts to present a large amount of data in a standard and accessible way. It includes a complete set of tables to serve as a data resource, and each table is accompanied by statements summarizing the main results.

In most of the tables in this report, data are broken down in the following way:

- By **site**: the five primary sampling areas (Accra, Keta, Kumasi, Wa and Tamale), *each of which includes both urban and rural areas*
- By **urban-rural**: all urban respondents across sites compared with all rural respondents across sites
- By **urban Accra** only: only the *urban* households in the Accra site, i.e., only the city of Accra
- By **socio-economic status (SES)**: a scale broken into quintiles (scale description found in Annex B)

These breakdowns are combined in one table, set up as follows:

Table X Percent of...[variable]

Among [description of base/denominator]

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
BASE (N)														

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

SECTION 2

NET AND ITN OWNERSHIP AND USE

2.1 OWNERSHIP OF NETS AND TREATED NETS

The survey examined the extent as well as pattern of net and ITN ownership and use, in terms of household location and socio-economic status (SES). A series of questions was asked to determine whether each net owned was ever treated and whether it was currently treated—thereby qualifying it as an ITN. Baby nets were asked about separately.

The data in this Section describe the proportion of *households* owning nets of different treatment status. If a household owned more than one net, the household was categorized according to the most recently treated net. Section 3 shows the proportion of *nets* falling into each treatment category.

Net Ownership Patterns

- The percent of households owning at least one net was 38%, but varied considerably by site, with ownership highest in Keta site (64%) and lowest in Accra (17%) and Kumasi sites (19%).
- Net ownership was equitable and did not vary much by SES quintile.
- The percent of households owning a net was approximately equal in urban and rural areas, but urban net-owning households were almost twice as likely as rural ones to have more than one net (37% vs. 20%).
- Among net-owning households, 27% owned more than one net, with an average of 1.5 nets per household. Average number of nets owned was higher in urban areas and in Keta site, but did not differ much by SES.
- Two-thirds (67%) of the nets claimed to be owned were seen by the interviewer (data not shown). (Just because the respondent did not show a net does not mean it does not exist. Some respondents did not want the interviewer to enter the bedroom, or to see a dirty or torn net.)

DEFINITIONS

Net: any hanging net for use while sleeping regardless of whether it has ever been treated; excludes baby nets but includes cot nets which are hung or draped over a crib

Ever treated: a net that has ever been treated, either when acquired (pre-treated) or since acquired, regardless of when the treatment was put on the net

ITN or currently-treated net: a net that is long-lasting (“permanently treated”), or is pre-treated and has been purchased within the last 12 months, or has had insecticide put on it up to and including the last 12 months. This is equivalent to the Roll Back Malaria (RBM) definition of an ITN.

Baby net: a small umbrella-type net that is not hung but is placed over an infant. They are often used to keep flies off a sleeping infant during the day, but can also be used at night. Baby nets are rarely treated, and the umbrella frame precludes dipping the netting in an insecticide solution. Baby nets are not counted in these net coverage figures, but are reported here separately.

ITN Ownership Patterns

- Twenty-one percent (21%) of households owned a net that had *ever been treated* (i.e., already treated when acquired or treated after acquired), ranging from a low of 10% in Accra and Kumasi to a high of 36% in Tamale.
- Nineteen percent (19%) owned a *currently-treated net (an ITN)*, ranging from a low of 9% in Accra site to a high of 34% in Tamale site.
- Ever-treated nets and ITNs were most common in the highest SES households and least common in the middle SES quintile.
- ITN-owning households owned an average of 1.1 ITNs per household.

Detailed information on net treatment patterns, such as proportion of nets pre-treated and treated since acquired, place where net was treated, treatment product used, and other net treatment information is found in Section 3.

Table 2.1 Percent of households owning mosquito nets and insecticide-treated nets

Among all households

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Own net	38.1	17.3	63.8	18.7	44.8	46.2	20.0	39.1	37.5	42.7	37.8	34.1	36.7	39.3
Own ever-treated net	21.0	10.3	19.6	10.0	29.4	35.8	13.3	19.2	22.2	20.9	21.6	14.2	20.0	28.3
Own ITN (12 mo.)	19.0	8.6	18.3	9.3	24.7	34.1	13.3	16.9	20.4	19.5	19.9	12.3	17.7	25.7
BASE	1500	301	301	300	299	299	120	599	901	302	296	302	300	300

Table 2.2 Number of nets owned

Among net-owning households

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
1	73.3	78.8	50.5	75.0	86.6	89.1	79.2	62.8	80.5	80.6	76.8	68.0	71.8	67.8
2	16.6	17.3	24.5	16.1	12.7	9.4	16.7	19.2	14.8	14.7	13.4	16.5	18.2	20.3
3	5.8	3.8	13.0	5.4	.7	1.4	4.2	9.4	3.3	3.1	4.5	9.7	6.4	5.9
4	2.4	.0	6.3	3.6	.0	.0	.0	4.7	.9	.8	4.5	1.9	1.8	3.4
5 or more	1.9	.0	5.7	.0	.0	.0	.0	3.8	.6	.8	.9	3.9	1.8	2.5
BASE	572	52	192	56	134	138	24	234	338	129	112	103	110	118

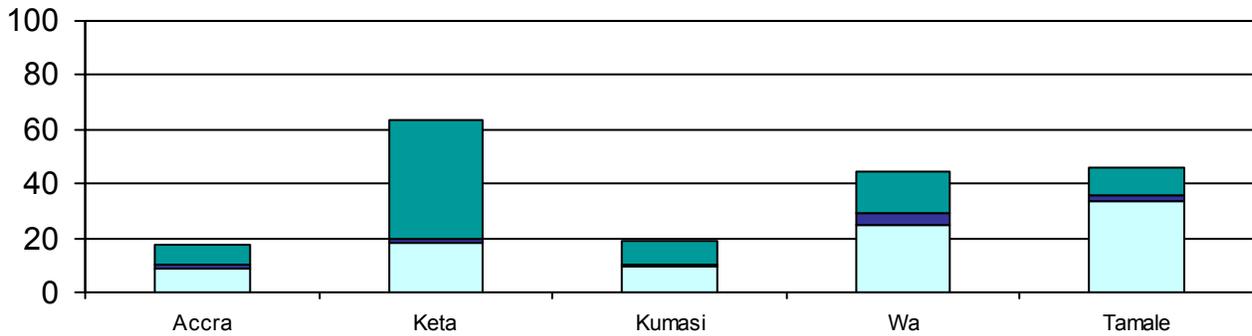
Table 2.3 Average number of nets and insecticide-treated nets owned

Among households owning each type of net

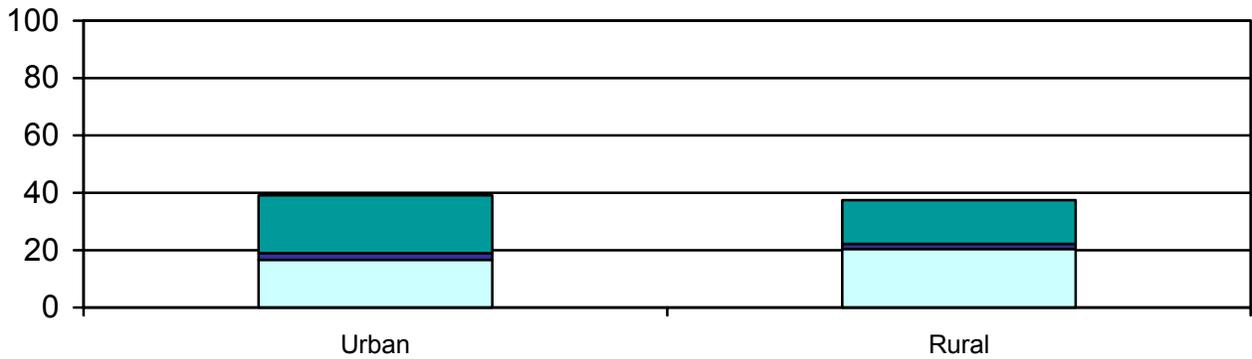
		Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
			Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Nets	Mean	1.5	1.3	2.0	1.4	1.1	1.1	1.3	1.7	1.3	1.3	1.4	1.6	1.5	1.5
	BASE	572	52	192	56	134	138	24	234	338	129	112	103	110	118
Ever-treated nets	Mean	1.2	1.2	1.4	1.3	1.0	1.1	1.2	1.3	1.1	1.0	1.1	1.1	1.2	1.3
	BASE	315	31	59	30	88	107	16	115	200	63	64	43	60	85
ITN (12 mo.)	Mean	1.1	1.1	1.3	1.3	1.0	1.1	1.1	1.2	1.1	1.0	1.1	1.1	1.2	1.2
	BASE	285	26	55	28	74	102	16	101	184	59	59	37	53	77

Figure 2.1

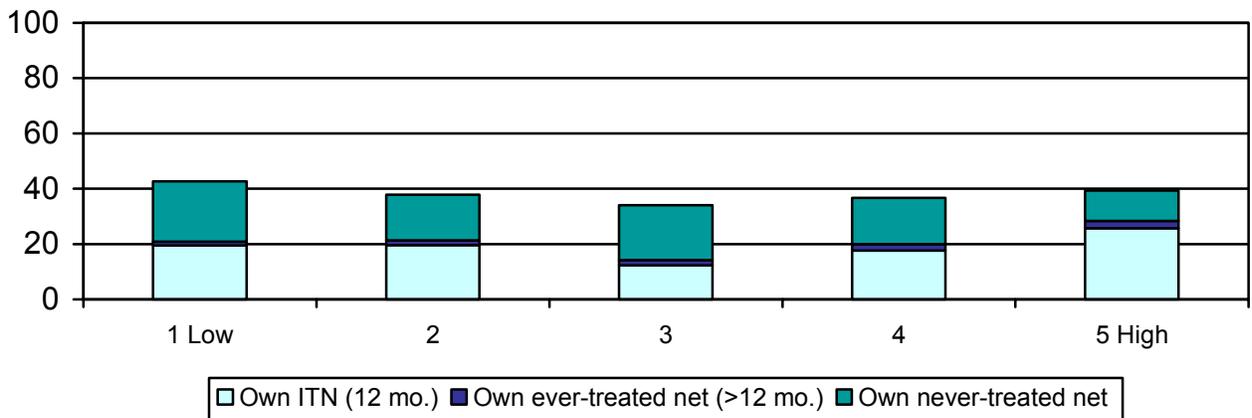
Percent of households owning treated and untreated nets*, by site



Percent of households owning treated and untreated nets*, by urban/rural



Percent of households owning treated and untreated nets*, by SES



□ Own ITN (12 mo.) ■ Own ever-treated net (>12 mo.) ■ Own never-treated net

*See definitions of ITNs and ever-treated nets in box on page 5.

Baby Net Ownership Patterns

- Twenty-five percent (25%) of households owned a baby net with a built-in frame. (Baby nets are *not* included in household ownership rates above.) Baby net ownership ranged from 13% in Tamale to 39% in Kumasi site.
- Ownership of baby nets sharply increased with SES level, from 12% in the lowest quintile to 36% in the highest.
- Fourteen percent (14%) of households, most of them in the upper SES households, owned a baby net but no hanging net; 10% of baby net owners also owned a hanging net.

Table 2.4 Ownership of baby nets (non-hanging)

Among all households

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Own a baby net	24.5	29.6	25.6	38.7	15.4	13.0	31.7	25.9	23.5	11.9	17.6	23.5	33.0	36.3
BASE	1500	301	301	300	299	299	120	599	901	302	296	302	300	300
Average number of baby nets owned	1.1	1.2	1.1	1.1	1.0	1.1	1.2	1.1	1.1	1.0	1.1	1.1	1.1	1.1
BASE	367	89	77	116	46	39	38	155	212	36	52	71	99	109
Own only a baby net (no hanging net)	14.3	24.3	6.3	29.3	5.7	6.0	25.8	14.4	14.3	6.6	9.8	15.2	19.3	20.7
BASE	1500	301	301	300	299	299	120	599	901	302	296	302	300	300

2.2 NET AND ITN USE BY VULNERABLE AND OTHER HOUSEHOLD MEMBERS

Although it is beneficial for any household member to sleep under a net, it is particularly important for those vulnerable to severe malaria — children under five (and especially children under one) and pregnant women — to do so. This section reports on the proportions of various household members sleeping under nets and ITNs³—in all households as well as in net-owning households. The proportion in all households shows status of the sample with regard to Abuja targets⁴, and the proportion within net-owning households shows allocation of net use when nets are present in the household. Note that the proportions under a net/ITN in all households are highly affected by net ownership rates, whereas the proportions under a net in net-owning households are not affected at all by ownership rates.

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

Data were collected during the rainy season, when malaria transmission and therefore net use is typically higher than in the dry season.

Use by children under age five

There was a total of 2008 children under five in all households in the sample, including 746 in net-owning households. (Note that in order to be included in the sample, a child under five had to reside in the household.)

- Among all households, 25% of children under five slept under a hanging net the prior night. This ranged from a low of 10% in Accra site and 12% in Kumasi site, to a high of 47% in Keta site. There was not much variation by urban-rural or by SES, although under-fives in the middle quintile were least likely to sleep under a net.
- When baby nets were included, 30% of children under five in all households slept under some type of net, ranging from a low of 17% in Accra site and 20% in Kumasi site, to a high of 50% in Keta site. There was not much variation by urban-rural or by SES, although under-fives in the middle quintile were least likely to sleep under some kind of net.
- Among all households, 13% of children under five slept under an ITN (treated within the prior 12 months) the previous night, ranging from a low of 5% in Accra site to a high of 24% in Tamale site. Under-fives in the middle SES quintile were least likely to sleep under an ITN.
- Within net-owning households, 68% of children under five slept under a net/ITN the prior night. When baby nets were included, 71% of under-fives in net-owning households slept under some kind of net.

³ Table 2.5 showing proportions of household members sleeping under nets and ITNs includes two definitions of currently treated nets or ITNs: one for long-lasting insecticide treated nets and those treated within the prior 12 months; and another for long-lasting nets and those treated within the prior 6 months. The former definition corresponds to the RBM definition and the latter to that used in the Ghana Demographic and Health Survey (DHS). Although we include the 6-month definition in the table as a reference, we do not report on it in the text in order to keep the ITN definition consistent throughout this document.

⁴ The African Summit on Roll Back Malaria held in Abuja, Nigeria on April 25, 2000, set the target of having at least 60% of children under five years of age and pregnant women use insecticide treated mosquito nets.

- Younger under-fives were more likely than older ones to sleep under a net or ITN, with use dropping off most sharply at age four.
- There did not appear to be gender bias in childhood net use; in net-owning households, 67% of male under-fives and 69% of female under-fives slept under a net/ITN the prior night.

Use by pregnant women and women of reproductive age

The total number of women of reproductive age in all households sampled was 2,068; of these, 784 were from net-owning households. The total number of pregnant women in the households sampled was 105 and, of these, 32 were from net-owning households. The results for pregnant women should be interpreted in light of these small sample sizes.

Pregnant women

- Among all households, 21% of pregnant women slept under a net the previous night, from a low of 13% in Kumasi site (n=23) and 14% in Accra site (n=21) to a high of 29% in Tamale site (n=24). There was virtually no urban-rural difference.
- Among all households, 8% of pregnant women slept under an ITN the prior night. No pregnant woman in the sample from Wa (n=20) slept under an ITN the prior night. The highest proportion was in Tamale at 17% (n=24).
- Within net-owning households, it appears that pregnant women were somewhat more likely than non-pregnant women of reproductive age to sleep under a net/ITN: 69% compared with 61%. (There were only 32 pregnant women in net-owning households, so we cannot draw firm conclusions.)

Women of reproductive age

- Among all households, 23% of WRA slept under a net the prior night, ranging from a low of 8% in the Accra site to a high of 47% in the Keta site.
- Among all households, 11% of WRA slept under an ITN the prior night, ranging from a low of 4% in the Accra site to a high of 23% in the Tamale site.
- Within net-owning households, 62% of WRA slept under a net/ITN the prior night, ranging from a low of 46% in the Accra site to 69% in the Keta site. There was no difference by urban-rural location, and there was little difference in the four lowest SES quintiles (61%-68%); however, the proportion was somewhat lower in the highest quintile: 54%.

Overall household use

There was a total of 7824 people in all households in the sample, including 2987 in net-owning households.

- Among all households, 18% of all household members slept under a net/ITN the previous night; in net-owning households 48% of household members did so.
- Among all households, 8% of household members slept under an ITN the previous night.

- Within net-owning households, children under five years (71%, including those under baby nets) and pregnant women (69%) were most likely to sleep under a net/ITN. Males over the age of 15 were the least likely to sleep under a net/ITN (25%).

Figure 2.2

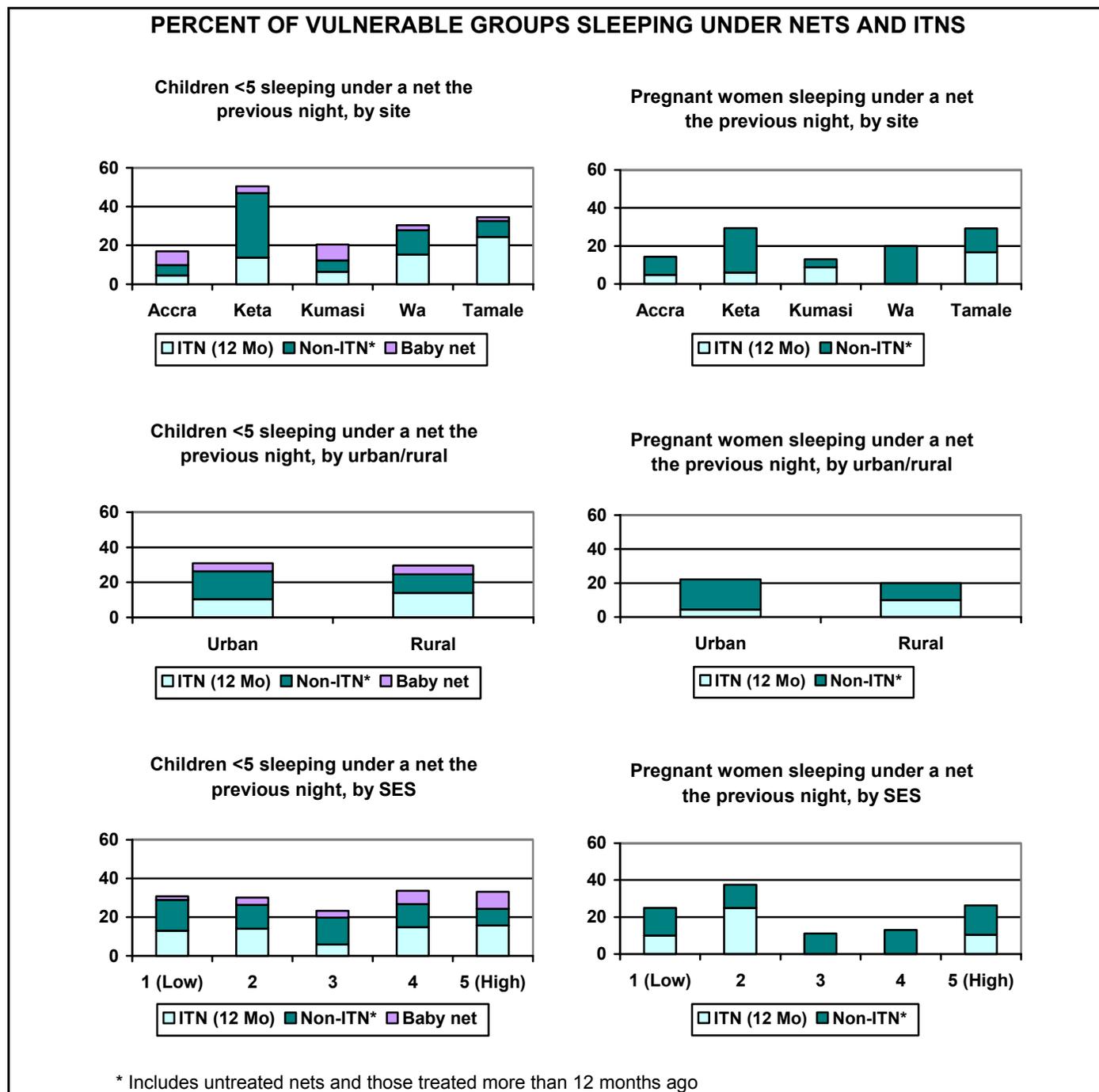


Table 2.5 Proportions of household members who slept under a net last night

In net-owning and all households

	Household members in all households				Household members in NET-OWNING households: Intra-household net allocation	
	BASE	% sleeping under a net (n)	% sleeping under an ITN (12 mo.) (n) ¹	% sleeping under an ITN (6 mo.) (n) ²	BASE	% sleeping under a net (n)
ALL	7824	18.3 (1430)	7.9 (622)	6.5 (503)	2987	47.9 (1430)
Younger children (under 5)						
<i>Excluding baby nets</i>	2008	25.3 (508)	12.7 (255)	10.3 (207)	746	68.1 (508)
<i>Including baby nets</i>	2008	30.1 (604)				70.9 (529)
Males	999	24.4 (244)	12.9 (129)	10.4 (104)	362	67.4 (244)
Females	1009	26.2 (264)	12.5 (126)	10.2 (103)	384	68.8 (264)
Age 0 - <1						
<i>Excluding baby nets</i>	446	29.8 (133)	15.2 (68)	12.6 (56)	180	73.9 (133)
<i>Including baby nets*</i>	446	44.6 (199)			180	80.6 (145)
Age 1 - <2						
<i>Excluding baby nets</i>	343	32.1 (110)	17.8 (61)	14.6 (50)	149	73.8 (110)
<i>Including baby nets*</i>	343	38.2 (131)			149	78.5 (117)
Age 2 - <3	360	23.9 (86)	11.4 (41)	8.6 (31)	119	72.3 (86)
Age 3 - <4	400	24.5 (98)	12.5 (50)	9.8 (39)	144	68.1 (98)
Age 4 - <5	459	17.6 (81)	7.6 (35)	6.8 (31)	154	52.6 (81)
Older children (ages 5-14)	1941	13.2 (256)	4.5 (88)	3.8 (73)	764	33.5 (256)
Males	961	11.8 (113)	3.7 (36)	3.1 (30)	358	31.6 (113)
Females	980	14.6 (143)	5.3 (52)	4.3 (42)	406	35.2 (143)
Adults (age 15+)	3781	17.2 (652)	7.4 (280)	6.0 (225)	1441	45.2 (652)
Males	1506	9.6 (144)	3.3 (49)	2.7 (41)	585	24.6 (144)
Females	2275	22.3 (508)	10.2 (231)	8.0 (184)	856	59.3 (508)
Females 15-49	2068	23.4 (484)	10.9 (226)	8.5 (179)	784	61.7 (484)
Non-pregnant females 15-49	1966	23.5 (462)	11.1 (218)	8.9 (175)	752	61.4 (462)
Pregnant women	110	21.0 (22)	7.6 (8)	5.5 (6)	32	68.8 (22)
Don't Know Age	94	14.9 (14)	1.1 (1)	1.1 (1)	36	38.9 (14)

1 Corresponds to RBM definition of a currently treated net, or ITN: a long-lasting insecticide treated net or one treated within and including the prior 12 months

2 Corresponds to DHS definition of currently treated net, or ITN: a long-lasting insecticide treated net or one treated within and including the prior 6 months

*Note: These figures include babies who slept under either a hanging net or a baby net with a built-in frame. All other figures include hanging nets only.

Table 2.6 Proportions of vulnerable groups who slept under a net and under ITN last night

Among persons most vulnerable to severe malaria in ALL households

	Total	Site					Location			Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale	Urban Capital	Total Urban	Total Rural	1 low	2	3	4	5 high
Children <5														
Hanging net	25.3	9.8	46.9	12.3	27.8	32.6	11.4	26.3	24.7	29.0	26.3	19.8	26.8	24.3
Hanging or baby net	30.1	17.0	50.4	20.4	30.4	34.5	19.8	30.9	29.6	30.8	30.1	23.3	33.6	33.1
ITN (12 mo.)	12.7	4.5	13.7	6.3	15.3	24.3	7.2	10.5	14.0	13.0	14.0	5.9	14.8	15.7
ITN (6 mo.)	10.3	3.3	11.8	5.8	13.2	18.0	4.8	8.4	11.5	11.2	9.3	4.7	13.1	13.6
BASE	2008	400	373	446	378	411	167	753	1255	445	418	404	366	375
Pregnant women														
Any net	21.0	14.3	29.4	13.0	20.0	29.2	.0	22.2	20.0	25.0	37.5	11.1	13.0	26.3
ITN (12 mo.)	7.6	4.8	5.9	8.7	0.0	16.7	0.0	4.4	10.0	10.0	25.0	0.0	0.0	10.5
ITN (6 mo.)	5.7	4.8	5.9	8.7	0.0	8.3	0.0	4.4	6.7	5.0	18.8	0.0	0.0	10.5
BASE	105	21	17	23	20	24	9	45	60	20	16	27	23	19
WRA / Females 15-49														
Any net	23.4	8.1	47.1	10.3	23.6	30.6	8.4	24.2	22.7	28.4	24.4	20.9	22.0	21.6
ITN (12 mo.)	10.9	3.6	11.9	5.3	12.7	23.0	4.7	8.8	12.5	12.1	12.4	5.9	11.2	12.8
ITN (6 mo.)	8.7	2.6	9.7	4.8	10.7	17.2	3.7	6.9	10.1	10.1	8.1	4.4	10.0	10.9
BASE	2071	422	403	456	411	379	190	875	1196	388	418	407	419	439

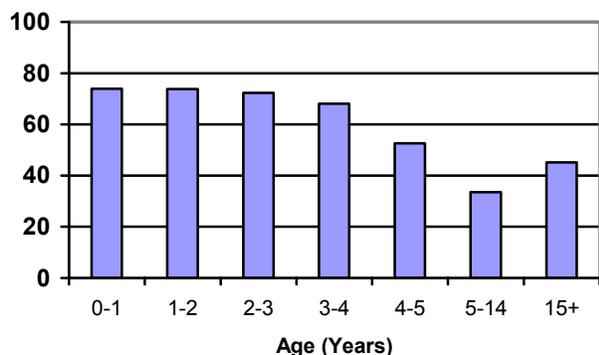
Table 2.7 Proportions of vulnerable groups who slept under a net and under ITN last night
Among persons most vulnerable to severe malaria in **net-owning** households

	Total	Site					Location			Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale	Urban Capital	Total Urban	Total Rural	1 low	2	3	4	5 high
Children <5														
Hanging net	68.1	56.5	76.4	66.3	60.7	69.8	55.9	70.2	66.8	67.9	73.3	62.0	72.1	64.5
Hanging or baby net	70.9	62.3	78.6	68.7	63.6	72.4	61.8	73.0	69.6	68.9	74.7	64.3	76.5	70.2
BASE	746	69	229	83	173	192	34	282	464	190	150	129	136	141
WRA / all women 15-49														
Any net	61.7	45.9	68.8	58.0	55.7	64.8	36.4	61.1	62.2	63.6	68.0	62.5	61.3	54.3
BASE	784	74	276	81	174	179	44	347	437	173	150	136	150	175
Pregnant women														
Any net	68.8	60.0	55.6	100.0	50.0	100.0	.0	76.9	63.2	71.4	100.0	50.0	60.0	62.5
BASE	32	5	9	3	8	7	2	13	19	7	6	6	5	8

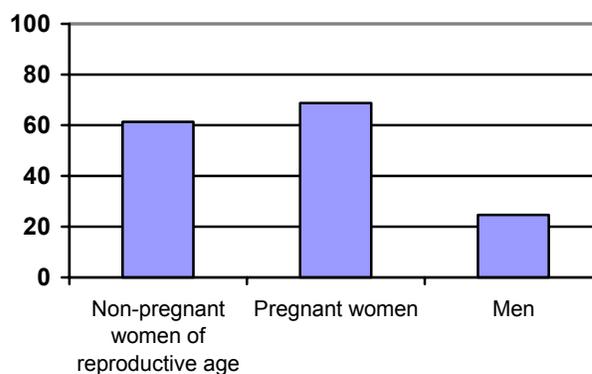
Figure 2.3

INTRA-HOUSEHOLD NET ALLOCATION

Percent of household members sleeping under a net the previous night, by age



Percent of adults sleeping under a net the previous night, by gender



2.3 REGULARITY OF NET USE

Ideally, in areas of stable malaria transmission, nets should be used throughout the year to afford maximum malaria protection.

- Households in Ghana that owned nets used them on average 7.2 months out of the year; 37% reported using them year-round. In addition to having the highest level of ownership among the five sites, households in Keta reported using their nets the longest, at 9.2 months. Tamale households used their nets the least number of months per year: 5.4.
- Over three-quarters (77%) of all nets owned had been used the night prior to the interview, with the highest proportion of nets used in Tamale site (85%) and the lowest in Accra site (63%) and urban Accra (57%).

Table 2.8 Number of months per year people in household sleep under a net
Among net-owning households

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
0	5.5	15.6	3.2	7.1	5.2	5.1	22.7	6.5	4.9	3.9	2.8	9.9	4.7	7.0
1	3.8	.0	1.1	8.9	3.0	7.2	.0	2.6	4.6	4.7	5.5	4.0	.9	3.5
2	5.7	2.2	3.8	12.5	4.5	8.0	.0	4.8	6.4	4.7	5.5	6.9	4.7	7.0
3	8.8	8.9	4.8	3.6	9.0	15.9	9.1	7.0	10.0	10.2	7.3	8.9	7.5	9.6
4	7.3	8.9	4.3	12.5	4.5	11.6	9.1	5.7	8.5	4.7	12.8	5.0	7.5	7.0
5	4.1	.0	1.1	5.4	5.2	8.0	.0	3.5	4.6	5.5	3.7	1.0	5.7	4.3
6	16.6	13.3	12.9	8.9	23.9	18.8	.0	16.1	17.0	14.1	15.6	14.9	23.6	15.7
7	2.9	6.7	.5	7.1	3.0	2.9	9.1	2.2	3.3	4.7	2.8	2.0	.0	4.3
8	5.0	.0	6.5	1.8	6.7	4.3	.0	6.5	4.0	5.5	6.4	6.9	2.8	3.5
9	2.5	.0	.5	1.8	8.2	.7	.0	.9	3.6	5.5	1.8	3.0	.9	.9
10	1.1	2.2	.0	3.6	2.2	.0	4.5	.9	1.2	1.6	1.8	.0	.0	1.7
11	.2	.0	.5	.0	.0	.0	.0	.4	.0	.0	.0	.0	.0	.9
12	36.5	42.2	60.8	26.8	24.6	17.4	45.5	43.0	31.9	35.2	33.9	37.6	41.5	34.8
Mean number of months	7.2	7.2	9.2	6.1	6.9	5.4	7.2	7.7	6.9	7.4	7.1	7.1	7.6	7.0
Standard deviation	4.2	4.7	3.9	4.3	3.7	3.6	5.1	4.2	4.1	4.0	4.0	4.5	4.0	4.3
BASE	572	52	192	56	134	138	24	234	338	129	112	103	110	118

Table 2.9 Nets used (had someone sleeping under) the prior night
Among all nets owned

	Total	Site (city plus surrounding rural areas)					Urban Accra only	Location		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Yes	77.4	63.1	76.3	81.8	76.5	84.5	56.7	78.1	76.7	81.5	83.9	69.6	76.9	75.1
No	22.6	36.9	23.7	18.2	23.5	15.5	43.3	21.9	23.3	18.5	16.1	30.4	23.1	24.9
BASE	808	65	358	77	153	155	30	383	425	162	155	158	156	177

SECTION 3

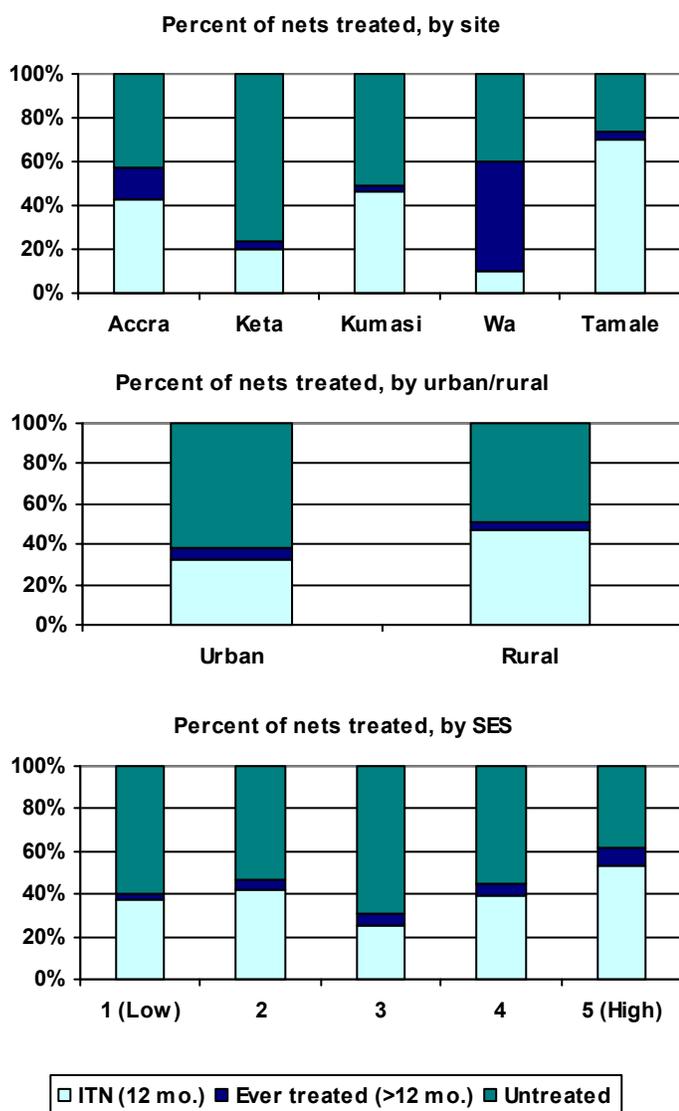
MOSQUITO NET TREATMENT AND WASHING PATTERNS

Nets that are treated with an insecticide are much more effective than untreated nets. Nets that are “pretreated” (i.e., already have insecticide on them when purchased) are available in some areas, but unless these nets are “long-lasting” ITNs, even these nets need to be re-treated regularly (“post-treated”) to remain effective.

For each net owned, up to a maximum of four nets, respondents were asked whether it was bought pre-treated, whether it came bundled with an insecticide treatment, whether it had been treated since purchase (“post-treated”), how many months it has been since the last treatment, who treated the net, product used to treat the nets, place where the treatment product was obtained, and how much it cost.

Note that the base of the tables in this section is *nets*, not *households*, and all figures are based on the proportion of nets owned. The proportion of *households* owning a treated net is shown in Section 2 (Table 2.1).

Figure 3.1



3.1 PERCENT OF NETS TREATED

- *Ever treated*: 45% of nets had ever been treated, ranging from a low of 23% in the Keta site to a high of 74% in the Tamale site. Nets from households in the highest SES quintile (62%) were more likely than those from lower quintiles to have ever been treated.
- *Currently treated (ITN)*: 40% percent of nets were currently treated (i.e., qualified as an ITN), ranging from a low of 20% in the Keta site to a high of 70% in the Tamale site. Nets from households in the highest SES quintile (54%) were more likely than those from lower quintiles to be currently treated.
- *Pre-treated*: 38% of nets were already treated when they were acquired, ranging from a low of 17% in the Keta site to a high of 65% in the Tamale site. Those in urban Accra (63%) and households in the highest SES quintile (52%) were also most likely to be pre-treated.
- *Post-treated*: 19% of nets were treated since they were acquired, ranging from a low of 9% in Accra site to a high of 33% in the Tamale site. Nets from households in the highest SES quintile (26%) were more likely than those from lower quintiles to have been treated after having been acquired.

Table 3.1 Percent of nets treated

Among all nets owned

	Total	Sites (city plus surrounding rural areas)					Urban Accra Only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Ever treated*	45.0	56.9	23.2	49.4	60.1	73.5	63.3	38.1	51.3	40.1	46.5	30.4	44.9	61.6
Currently treated (12 mo.)	40.0	43.1	20.4	46.8	50.3	70.3	60.0	32.6	46.6	37.7	41.9	25.3	39.7	53.7
Bought pretreated ("pretreated")	38.1	55.4	17.7	40.3	52.4	64.6	63.3	33.5	42.3	33.8	38.5	27.9	36.1	52.3
Treated since acquired ("post-treated")	19.3	9.2	10.7	19.5	29.6	33.3	10.0	15.9	22.4	18.5	17.5	11.4	22.2	26.1
BASE	808	65	358	77	153	155	30	383	425	162	155	158	156	177

3.2 NET TREATMENT PRACTICES

- Almost all nets that were “post-treated” (all but 1.3%) were reportedly treated last within the last year.
- Seven percent (7%) of nets (18% in Tamale) came bundled with an insecticide treatment. The bundled insecticide was the product used for 25% of “post-treated” nets.
- Nearly half (49%) of nets that were “post-treated” were treated at home by a member of the household the last time they were treated. The great majority of the rest of post-treated nets were treated at a health facility.
- The main source for net treatment for those who treated themselves *at home* was health facility (49%), a product that came with the net (25%), and drug store (17%).
- For nets treated last time at home, aided brand awareness of net treatment used was high. K-O Tab was said to be the brand for 73% and Icon for 12% of nets when they were last treated. The respondent did not know what brand was used for 16% of nets treated at home last time.
- Among post-treated nets treated by someone other than a household member, 67% were treated at a health facility and 22% by a community health worker/hygiene brigade.
- About half of post-treated nets (53%) were treated for free. Among those who paid for net treatment (including those treated at home and elsewhere), the median cost was 5000 cedis or US\$0.57.

Table 3.2 Number of months ago net was last treated

Among nets that were post-treated

	Total	Sites (city plus surrounding rural areas)					Urban Accra Only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Within past month	24.0	*	18.4	33.3	27.3	23.5	*	25.0	23.4	31.0	14.8	33.3	8.8	32.6
2 months ago	20.1	*	18.4	26.7	25.0	15.7	*	21.7	19.1	20.7	22.2	5.6	29.4	17.4
3 months ago	18.2	*	23.7	6.7	15.9	17.6	*	16.7	19.1	6.9	18.5	22.2	35.3	10.9
4 months ago	10.4	*	10.5	26.7	6.8	9.8	*	6.7	12.8	20.7	11.1	.0	8.8	8.7
5 months ago	2.6	*	7.9	.0	.0	2.0	*	3.3	2.1	3.4	.0	5.6	2.9	2.2
6 months ago	11.0	*	10.5	6.7	11.4	11.8	*	15.0	8.5	6.9	7.4	11.1	8.8	17.4
7 months ago	1.9	*	.0	.0	4.5	2.0	*	.0	3.2	.0	11.1	.0	.0	.0
8 months ago	1.3	*	.0	.0	.0	3.9	*	1.7	1.1	.0	3.7	.0	.0	2.2
9-12 months ago	9.1	*	10.5	.0	6.8	11.8	*	8.3	9.6	6.9	11.1	16.7	5.9	8.7
13-24 months ago	1.3	*	.0	.0	2.3	2.0	*	1.7	1.1	3.4	.0	5.6	.0	.0
BASE	154	6	38	15	44	51	3	60	94	29	27	18	34	46

Table 3.3 Net came with insecticide package

Among all nets owned

	Total	Sites (city plus surrounding rural areas)					Urban Accra Only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
No	93.0	96.9	97.7	97.4	89.4	81.7	96.7	94.2	91.9	89.4	92.9	95.5	91.6	95.4
Yes	7.0	3.1	2.3	2.6	10.6	18.3	3.3	5.8	8.1	10.6	7.1	4.5	8.4	4.6
BASE	801	65	355	77	151	153	30	380	421	160	154	157	155	175

Table 3.4 Place where net was treated

Among nets that were post-treated

	Total	Sites (city plus surrounding rural areas)					Urban Accra Only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
A family member treated net in household	49.0	*	33.3	60.0	48.9	54.9	*	53.3	46.2	53.3	48.1	55.6	46.9	45.7
Someone came to house to treat net	9.2	*	2.8	.0	8.9	17.6	*	10.0	8.6	6.7	18.5	5.6	9.4	6.5
Net treated outside the house	41.8	*	63.9	40.0	42.2	27.5	*	36.7	45.2	40.0	33.3	38.9	43.8	47.8
BASE	153	6	36	15	45	51	3	60	93	30	27	18	32	46

*Denominator too small to permit meaningful calculations

Table 3.5 Type of place where insecticide treatment was obtained

Among nets that were post-treated by a family member at home, where source of treatment product was known

	Total	Site (city plus surrounding rural areas)					Urban Accra Urban Accra only	Location		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Health facility	48.6	*	61.5	*	52.6	55.6	*	39.3	54.5	56.3	53.8	60.0	66.7	16.7
Pharmacy	16.7	*	30.8	*	.0	14.8	*	28.6	9.1	6.3	.0	.0	20.0	44.4
Other commercial	9.7	*	7.7	*	.0	11.1	*	14.3	6.8	12.5	7.7	.0	.0	22.2
Treatment bundled w/ net	25.0	*	.0	*	47.4	18.5	*	17.9	29.5	25.0	38.5	40.0	13.3	16.7
BASE	72	4	13	9	19	27	3	28	44	16	13	10	15	18

*Denominator too small to permit meaningful calculations

Table 3.6 Product used to treat net

Among nets that were post-treated at home

	Total	Sites (city plus surrounding rural areas)					Urban Accra Only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
KO Tab	72.7	*	92.9	*	68.2	82.1	*	53.1	86.7	100.0	84.6	80.0	70.6	42.9
Iconet	11.7	*	7.1	*	13.6	7.1	*	12.5	11.1	.0	15.4	20.0	17.6	9.5
Don't know	15.6	*	.0	*	18.2	10.7	*	34.4	2.2	.0	.0	.0	11.8	47.6
BASE	77	4	14	9	22	28	3	32	45	16	13	10	17	21

*Denominator too small to permit meaningful calculations

Table 3.7 Where outside the home net was treated

Among nets treated by someone not in the household

	Total	Sites (city plus surrounding rural areas)					Urban Accra Only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
HEALTH WORKER														
Health facility	67.2	*	69.6	*	78.9	64.3	*	72.7	64.3	91.7	*	*	85.7	54.5
Immunization day	3.1	*	.0	*	.0	14.3	*	.0	4.8	.0	*	*	7.1	.0
Community health worker/ Hygiene brigade	21.9	*	21.7	*	15.8	21.4	*	13.6	26.2	.0	*	*	7.1	31.8
OTHER NON-COMMERCIAL														
NGO / project	4.7	*	8.7	*	.0	.0	*	9.1	2.4	.0	*	*	.0	9.1
Friend/ Neighbor / Relative	1.6	*	.0	*	5.3	.0	*	4.5	.0	.0	*	*	.0	4.5
Community official /organization	1.6	*	.0	*	.0	.0	*	.0	2.4	8.3	*	*	.0	.0
COMMERCIAL	.0	*	.0	*	.0	.0	*	.0	.0	.0	*	*	.0	.0
BASE	64	2	23	6	19	14	0	22	42	12	9	7	14	22

*Denominator too small to permit meaningful calculations

Table 3.8 Cost of insecticide treatment (cedis)

Among nets that were post-treated

	Total	Sites (city plus surrounding rural areas)					Urban Accra Only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Mean**	7115	*	11857	14714	5250	2833	*	11042	3750	4000	2875	2750	7400	12353
SD	6534	*	3671	7135	2887	2176	*	7208	3307	3674	1808	1500	4575	7842
Median**	5000	*	13000	12000	5000	2000	*	10000	2000	2000	2000	2000	9000	10000
% Paid	38.0	*	18.9	58.3	43.2	39.1	*	42.9	34.6	50.0	36.4	28.6	32.3	38.6
% Free	52.6	*	78.4	41.7	51.4	41.3	*	39.3	61.7	46.2	63.6	64.3	51.6	47.7
% DK cost	9.5	*	2.7	.0	5.4	19.6	*	17.9	3.7	3.8	.0	7.1	16.1	13.6
BASE	137	5	37	12	37	46	3	56	81	26	22	14	31	44

*Denominator too small to permit meaningful calculations

** based on 52 people who paid for treatment and knew price

Table 3.9 Cost of insecticide (US\$)

Among nets that were post-treated

	Total	Sites (city plus surrounding rural areas)					Urban Accra Only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Mean**	.81	*	1.35	1.68	.60	.32	*	1.26	.43	.46	.33	.32	.84	1.41
SD	.74	*	.42	.81	.33	.25	*	.82	.38	.42	.21	.17	.52	.89
Median**	.57	*	1.48	1.37	.57	.23	*	1.14	.23	.23	.23	.23	1.03	1.14
% Paid	38.0	*	18.9	58.3	43.2	39.1	*	42.9	34.6	50.0	36.4	28.6	32.3	38.6
% Free	52.6	*	78.4	41.7	51.4	41.3	*	39.3	61.7	46.2	63.6	64.3	51.6	47.7
% DK cost	9.5	*	2.7	.0	5.4	19.6	*	17.9	3.7	3.8	.0	7.1	16.1	13.6
BASE	137	5	37	12	37	46	3	56	81	26	22	14	31	44

*Denominator too small to permit meaningful calculations

** based on 52 people who paid for treatment and knew price

3.3 NET WASHING PATTERNS

Respondents were asked if the net was washed and, if so, how often. Since effectiveness of the treatment diminishes with washing, frequency of washing will affect decisions about educational messages.

- One-quarter (25%) of nets had been washed at least once, but there was variability by site: 89% of nets in Keta had been washed and 54% of nets in Tamale had been washed. (The next section shows that nets tended to be newer in Tamale, so fewer may be ready to be washed.)
- Washing was frequent: 46% of all nets were reportedly washed at least once a month, with 72% of all nets washed at least once every six months.

Figure 3.2

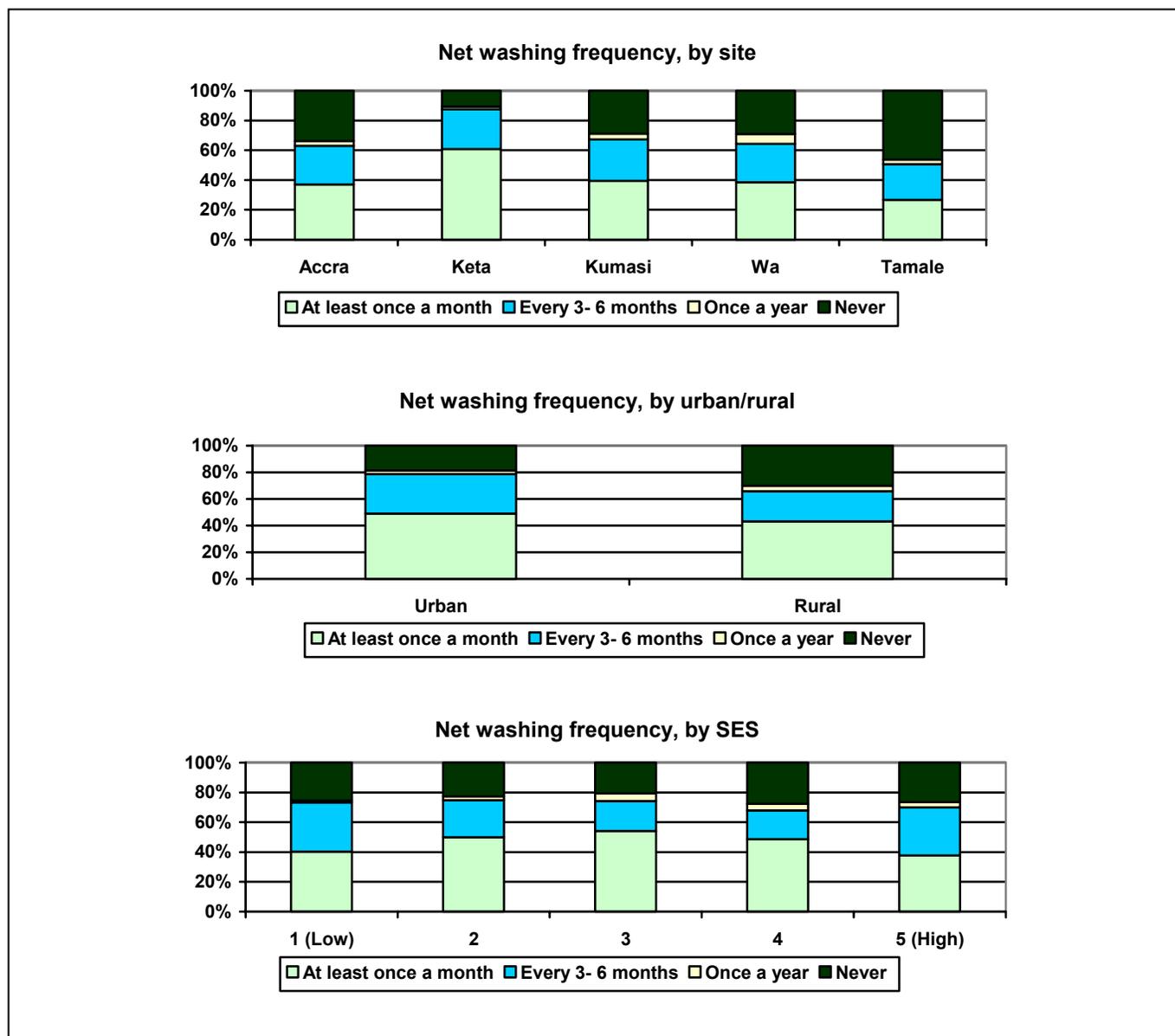


Table 3.10 Net washing patterns

Among total number of nets owned, where washing patterns were known

	Total	Sites (city plus surrounding rural areas)					Urban	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale	Accra Only	All Urban	All Rural	1 Low	2	3	4	5 High
Never washed	24.6	33.8	10.6	28.9	29.1	46.1	36.7	18.6	30.1	25.5	22.7	20.6	27.6	26.5
About once a week	7.8	6.2	10.3	6.6	8.6	2.6	.0	7.4	8.1	6.2	7.1	11.6	7.1	7.1
About every two weeks	15.1	16.9	17.4	14.5	15.9	8.4	13.3	11.9	17.9	19.3	11.7	19.4	14.7	10.6
About once a month	23.1	13.8	33.1	18.4	13.9	15.6	16.7	29.7	17.2	14.9	31.2	23.2	26.9	20.0
About every three months	17.0	18.5	18.6	14.5	15.2	15.6	20.0	22.3	12.2	26.1	13.0	12.3	11.5	21.2
About every six months	9.0	7.7	8.0	13.2	10.6	8.4	10.0	7.4	10.5	6.8	11.7	7.7	7.7	11.2
About once a year	3.4	3.1	2.0	3.9	6.6	3.2	3.3	2.7	4.1	1.2	2.6	5.2	4.5	3.5
BASE	796	65	350	76	151	154	30	377	419	161	154	155	156	170

SECTION 4

CHARACTERISTICS OF NETS OWNED

Respondents in net-owning households were asked, for each net owned (up to four nets), when and where the net was acquired and what type, brand, price, size, shape, and color it was. They were also asked who obtained the net.

4.1 AGE OF NETS OWNED

- Most nets were fairly new: 32% were obtained within the prior year and a total of 53% were obtained within the prior 2 years.
- Tamale and Kumasi had by far the highest proportion of nets acquired during the previous year (51% and 45%) and Keta the lowest (21%).

Figure 4.1

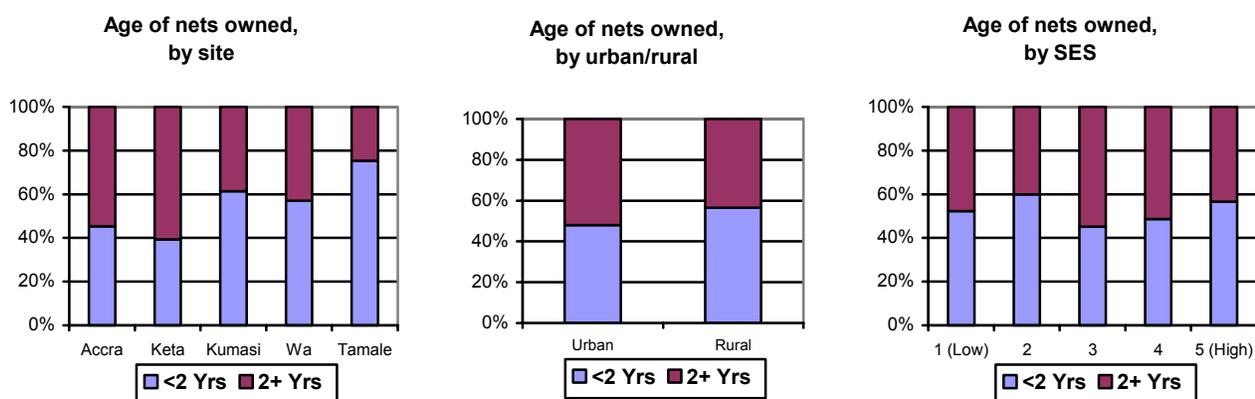


Table 4.1 Number of years households have owned their nets
Among total number of nets

	Total	Site (city plus surrounding rural areas)					Location			Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale	Urban Accra only	All Urban	All Rural	1 Low	2	3	4	5 High
<1 year	31.8	29.7	20.6	45.3	30.2	51.3	36.7	30.3	33.0	29.8	29.3	27.8	31.3	39.8
1 - <2 years	20.8	15.6	18.7	16.0	26.8	24.0	20.0	17.7	23.5	22.4	30.6	17.4	17.3	16.9
2 - <3 years	14.3	17.2	14.4	9.3	19.5	10.4	6.7	14.9	13.8	15.5	16.3	13.9	12.7	13.3
3 - <4 years	8.3	10.9	10.4	8.0	6.0	5.2	6.7	7.3	9.2	9.3	6.8	9.7	7.3	8.4
4 - <5 years	8.6	7.8	10.4	9.3	8.7	4.5	6.7	11.2	6.3	8.1	9.5	6.9	11.3	7.2
5 years or more	16.1	18.8	25.5	12.0	8.7	4.5	23.3	18.5	14.1	14.9	7.5	24.3	20.0	14.5
BASE	768	64	326	75	149	154	30	356	412	161	147	144	150	166

4.2 SOURCE OF NETS

- Most nets (63%) were obtained from commercial sources. Markets were the single greatest source of nets. Overall, 50% of nets were obtained from this source, but in urban areas the percentage was 57%, compared to 43% in rural areas.
- Thirty-seven percent (37%) of nets were obtained from a non-commercial source such as a health facility, NGO, or project. This source was higher in rural areas (45%) compared to urban (29%), and much higher in Tamale (72%) and Wa (56%) sites compared to the other sites. (In the Wa area, the Red Cross and UNICEF had distributed nets during an immunization program the prior year. In Tamale and Wa UNICEF had been selling nets at subsidized prices via community agents and health personnel.)

Figure 4.2

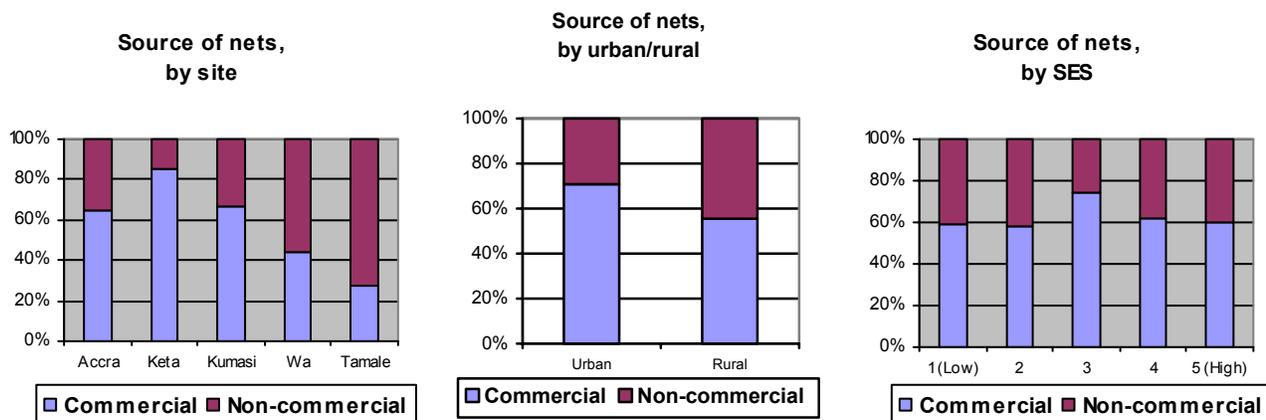


Table 4.2 Place where net was obtained

Among all nets where respondents knew the source of the net

	Total	Site (city plus surrounding rural areas)					Urban Accra only	Location		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
COMMERCIAL	62.7	65.0	85.3	66.7	44.3	27.6	67.9	70.8	55.5	59.5	58.5	74.3	61.9	59.8
Market	49.8	41.7	75.8	47.8	32.9	12.5	28.6	57.2	43.3	46.8	49.7	65.5	49.7	39.1
Kiosk/ Street vendor	1.1	.0	.0	2.8	2.7	1.3	.0	.0	1.9	3.2	2.1	.0	.0	.0
Itinerant vendor	2.6	1.7	2.1	2.9	2.0	4.6	3.6	1.4	3.7	5.7	2.0	2.7	2.0	.6
Pharmacy/ Drug store	3.5	8.3	3.5	8.7	.7	2.0	17.9	4.2	2.9	.0	.7	2.7	3.4	10.1
General shop	1.0	.0	.3	1.4	2.0	2.0	.0	2.2	.0	.0	.0	.7	3.4	1.2
Textile shop	.1	1.7	.0	.0	.0	.0	3.6	.3	.0	.0	.0	.0	.0	.6
Supermarket	.1	.0	.0	.0	.0	.7	.0	.3	.0	.0	.0	.7	.0	.0
Tailor	.7	.0	1.5	.0	.0	.0	.0	1.4	.0	.0	.0	.0	.7	2.4
Petrol station	.8	3.3	.3	1.4	.0	1.3	7.1	1.4	.2	.0	.7	.0	.0	3.0
Gift	2.6	6.7	1.8	1.4	3.4	2.6	7.1	2.5	2.7	2.5	3.4	2.0	2.0	3.0
Employer	.4	1.7	.0	.0	.7	.7	.0	.0	.7	1.3	.0	.0	.7	.0
NON-COMMERCIAL	37.3	35.0	14.7	33.3	55.7	72.4	32.1	29.2	44.5	40.5	41.5	25.7	38.1	40.2
Clinic	34.5	33.3	10.0	30.4	54.4	71.7	32.1	24.7	43.0	37.3	40.1	24.3	34.7	35.5
Project	2.0	.0	3.8	1.4	.0	.7	.0	3.6	.5	1.3	.7	.7	3.4	3.6
Women's group	.4	.0	.0	1.4	1.3	.0	.0	.0	.7	1.3	.7	.0	.0	.0
Other non-commercial source	.5	1.7	.9	.0	.0	.0	.0	.8	.2	.6	.0	.7	.0	1.2
BASE	769	60	339	69	149	152	28	360	409	158	147	148	147	169

4.3 MANUFACTURED VS. TAILOR-MADE NETS

- Most nets owned were manufactured (58%), though a large minority of nets (38%) was tailor-made. Another 4% were originally manufactured but re-configured by a tailor (usually rectangular nets re-made into conical).
- There was large variation by site; in Keta site 34% of nets were manufactured, compared with Tamale site where 92% were.
- Nets in the highest SES households were most likely to be manufactured.

Figure 4.3

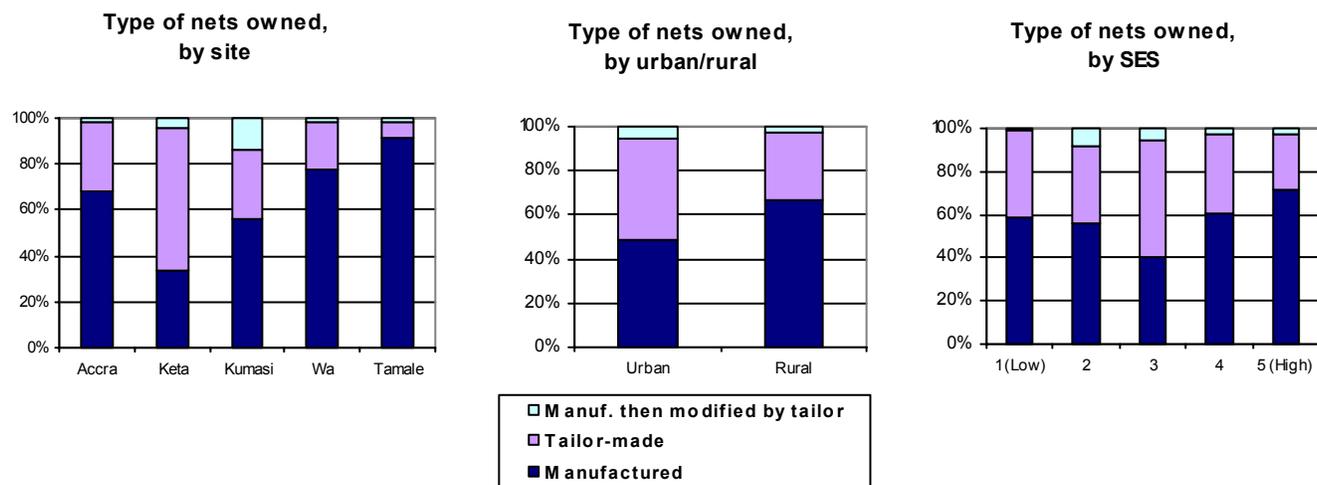


Table 4.3 Manufactured vs. tailor-made nets

Among all nets owned

	Total	Site (city plus surrounding rural areas)					Urban Accra only	Location		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Manufactured	57.9	67.7	33.7	56.2	77.6	91.5	73.3	48.7	66.3	58.6	56.3	40.8	60.4	72.0
Tailor-made	38.0	30.8	61.8	30.1	21.1	6.5	26.7	45.8	31.1	40.1	35.1	54.1	36.4	25.7
Manufactured then modified by tailor	4.0	1.5	4.5	13.7	1.3	2.0	.0	5.6	2.6	1.2	8.6	5.1	3.2	2.3
BASE	799	65	356	73	152	153	30	378	421	162	151	157	154	175

4.4 BRAND OF NETS

Respondents were asked the brand of each manufactured net owned, and shown a card with the logos of various net brands available in Ghana to help them identify brand. The card included the NetMark logo. NetMark is not a brand, but the NetMark logo appears on nets supplied by partners: PermaNet, DawaNet, Iconet, and K-O Net. Interviewers were also instructed that if they had the opportunity to look at the net, they were to see if there are any labels sewn in that identified brand.

- A large minority of people were unaware of the brand of their nets: the brand was unknown for 30% of manufactured nets.
- The single most common brand identified by label or respondent was UNICEF and/or SiamDutch (26%). Sixteen percent (16%) of nets were said to be PermaNet, 13% K-O Net, 8% NetMark (23% in the Accra site), and 3% were Dawa Nets (11% in Accra site).
- PermaNet was most common in the highest SES quintile.

Table 4.4 Net brands owned

Among manufactured (non tailor-made) nets owned

	Total	Site (city plus surrounding rural areas)					Urban Accra only	Location		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
DawaNet	3.0	11.4	2.5	4.9	.8	2.1	18.2	2.7	3.2	3.2	2.4	1.6	3.2	4.0
Iconet	2.6	4.5	.8	2.4	3.4	2.9	.0	2.2	2.9	2.1	2.4	6.3	2.2	1.6
KO Net	13.4	.0	4.2	9.8	14.4	25.7	.0	9.8	15.8	17.9	16.5	15.6	17.2	4.0
NetMark	7.8	22.7	4.2	9.8	8.5	5.0	45.5	13.0	4.3	5.3	5.9	3.1	4.3	15.9
PermaNet	16.4	11.4	12.5	12.2	21.2	18.6	18.2	19.0	14.7	15.8	7.1	15.6	18.3	22.2
UNICEF and SiamDutch	13.0	13.6	8.3	7.3	17.8	14.3	.0	10.9	14.3	13.7	14.1	7.8	18.3	10.3
UNICEF only	5.0	.0	4.2	.0	4.2	9.3	.0	2.7	6.5	4.2	11.8	6.3	4.3	.8
SiamDutch only	8.2	11.4	3.3	7.3	9.3	10.7	.0	2.7	11.8	11.6	12.9	10.9	4.3	4.0
Other	.4	.0	.8	2.4	.0	.0	.0	.0	.7	.0	1.2	.0	1.1	.0
Don't know	30.2	25.0	59.2	43.9	20.3	11.4	18.2	37.0	25.8	26.3	25.9	32.8	26.9	37.3
BASE	463	44	120	41	118	140	22	184	279	95	85	64	93	126

4.5 COST OF NETS

- The reported total price for nets (including vouchers where used, but excluding free nets) ranged considerably: from under 5,000 to almost 100,000 cedis. The median price was 30,000 cedis (US\$3.42, using the exchange rate at the time of fieldwork of 8772/cedis per US\$). [Note that because of potential problems with recall for older nets, the fact that one-quarter of the net's prices were not known, and because of currency devaluations over time, these prices should be taken as very general estimates.]
- Wealthier households paid more for nets than poorer ones. The median price paid by those in the lowest SES quintile was 25,000 cedis (US\$2.85); those in the three middle quintiles was 30,000 cedis (US\$3.42); and those in the highest quintile was 35,000 cedis (US\$3.99).

Table 4.5 Cost of nets owned (cedis)

Among all nets

	Total	Site (city plus surrounding rural areas)					Urban Accra only	Location		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Mean*	32341	39022	39368	34961	28483	19608	48524	37449	27970	26923	31768	32706	32984	38140
SD	20021	22967	20479	16884	15481	15747	28920	20944	18115	17682	19565	20963	18565	21939
Median*	30000	35000	35000	30000	25000	15000	35000	35000	25000	25000	30000	30000	30000	35000
% Paid	74.9	69.2	68.4	76.6	79.7	86.5	70.0	72.8	76.7	84.6	80.6	69.6	71.8	68.4
% Free	1.4	.0	.8	1.3	2.0	2.6	.0	1.0	1.6	1.2	2.6	.6	2.6	.0
% Don't know cost	23.8	30.8	30.7	22.1	18.3	11.0	30.0	26.1	21.6	14.2	16.8	29.7	25.6	31.6
BASE	808	65	358	77	153	155	30	383	425	162	155	158	156	177

*Based on price reported; excludes free nets

Table 4.6 Cost of net (US\$)

Among all nets

	Total	Site (city plus surrounding rural areas)					Urban Accra only	Location		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Mean*	3.69	4.45	4.49	3.99	3.25	2.24	5.53	4.27	3.19	3.07	3.62	3.73	3.76	4.35
SD	2.28	2.62	2.33	1.92	1.76	1.80	3.30	2.39	2.07	2.02	2.23	2.39	2.12	2.50
Median*	3.42	3.99	3.99	3.42	2.85	1.71	3.99	3.99	2.85	2.85	3.42	3.42	3.42	3.99
% Paid	74.9	69.2	68.4	76.6	79.7	86.5	70.0	72.8	76.7	84.6	80.6	69.6	71.8	68.4
% Free	1.4	.0	.8	1.3	2.0	2.6	.0	1.0	1.6	1.2	2.6	.6	2.6	.0
% Don't know cost	23.8	30.8	30.7	22.1	18.3	11.0	30.0	26.1	21.6	14.2	16.8	29.7	25.6	31.6
BASE	808	65	358	77	153	155	30	383	425	162	155	158	156	177

*Based on price reported; excludes free nets

4.6 SIZE, SHAPE, AND COLOR OF NETS OWNED

- Most (82%) of the nets owned were double-sized; 14% were single-sized and 4% were king-sized (triple). (See Net Preferences section that shows that 61% preferred triple-size nets, suggesting a lack of affordability or availability of this size.)
- Most nets owned (94%) were rectangular and 5% were conical. (See Net Preferences section showing almost half of respondents preferred conical nets—suggesting a lack of availability or affordability of the preferred shape.)
- Two-thirds (67%) of nets owned were white (90% in Keta); 13% were green (39% in Tamale, where the green UNICEF-SiamDutch nets were common). Nets were more likely to be white in urban areas (77%) than rural areas (58%). (Questions on net preference indicate that only 17% of respondents—and net-owners—preferred white, suggesting unavailability of alternative colors.)

Table 4.7 Size of nets owned

Among total number of nets owned

	Total	Site (city plus surrounding rural areas)					Urban Accra only	Location		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Single	13.6	15.4	12.1	20.8	12.4	14.2	16.7	15.1	12.3	14.2	10.3	8.9	17.5	16.9
Double	81.6	66.2	81.7	77.9	87.6	83.9	70.0	79.6	83.5	83.3	84.5	84.8	78.6	77.4
Triple/ King	4.3	13.8	6.2	1.3	.0	1.9	13.3	5.2	3.5	2.5	5.2	6.3	3.9	4.0
Cot net	.1	1.5	.0	.0	.0	.0	.0	.0	.2	.0	.0	.0	.0	.6
Other	.2	3.1	.0	.0	.0	.0	.0	.0	.5	.0	.0	.0	.0	1.1
BASE	806	65	356	77	153	155	30	383	423	162	155	158	154	177

Table 4.8 Shape of nets owned

Among total number of nets owned

	Total	Site (city plus surrounding rural areas)					Urban Accra only	Location		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Rectangular	94.4	86.2	98.6	85.7	95.9	91.0	86.7	92.7	95.9	97.5	96.7	97.4	92.3	88.7
Round/conical	5.1	12.3	1.4	13.0	4.1	7.7	10.0	6.6	3.8	1.9	3.3	1.9	7.7	10.2
Triangle/pyramid	.1	.0	.0	.0	.0	.6	.0	.3	.0	.0	.0	.6	.0	.0
Wedge	.4	1.5	.0	1.3	.0	.6	3.3	.5	.2	.6	.0	.0	.0	1.1
BASE	800	65	356	77	147	155	30	381	419	158	153	156	156	177

Table 4.9 Color of nets owned

Among the total number of nets owned

	Total	Site (city plus surrounding rural areas)					Urban Accra only	Location		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
White	67.0	63.1	89.9	68.4	54.9	27.1	70.0	77.4	57.5	52.8	67.1	73.4	69.9	71.2
Light blue	8.0	4.6	2.2	7.9	12.4	18.1	.0	6.0	9.7	11.3	6.5	5.7	10.3	6.2
Dark blue	3.9	4.6	1.4	1.3	7.8	6.5	6.7	2.1	5.4	6.3	4.5	2.5	3.8	2.3
Gray	.2	1.5	.3	.0	.0	.0	.0	.3	.2	.6	.6	.0	.0	.0
Yellow	.1	.0	.3	.0	.0	.0	.0	.0	.2	.0	.0	.6	.0	.0
Black	.1	.0	.0	.0	.7	.0	.0	.0	.2	.6	.0	.0	.0	.0
Peach	.7	1.5	.0	1.3	2.6	.0	3.3	.8	.7	.6	.6	.6	.6	1.1
Pink	3.1	9.2	2.0	2.6	4.6	1.9	6.7	3.4	2.8	1.9	3.9	1.9	.0	7.3
Orange	.2	.0	.0	1.3	.0	.6	.0	.3	.2	.6	.0	.0	.0	.6
Turquoise	1.5	1.5	.0	1.3	2.6	3.9	.0	.3	2.6	2.5	.6	3.8	.0	.6
Sea Green	.9	3.1	.3	2.6	.7	.6	.0	.8	.9	.0	1.3	.6	1.9	.6
Green	13.3	9.2	3.4	13.2	11.8	39.4	13.3	8.4	17.7	19.5	14.2	10.1	13.5	9.6
Olive Green	.1	.0	.0	.0	.0	.6	.0	.0	.2	.6	.0	.0	.0	.0
Multi-coloured design	.7	1.5	.3	.0	1.3	1.3	.0	.3	1.2	1.9	.6	.6	.0	.6
Other	.1	.0	.0	.0	.7	.0	.0	.0	.2	.6	.0	.0	.0	.0
BASE	805	65	356	76	153	155	30	381	424	159	155	158	156	177

4.7 WHO OBTAINED THE NET

- Just over half (52%) of the nets were obtained by the respondent and one-fourth (24%) by the respondent's husband.

Table 4.10 Who acquired the net

Among all nets owned

	Total	Site (city plus surrounding rural areas)					Urban Accra only	Location		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Respondent	51.9	50.0	44.1	41.6	54.2	73.5	55.2	45.5	57.6	59.3	60.0	46.8	56.4	38.6
Husband	23.7	34.4	19.6	42.9	24.8	18.1	24.1	25.7	21.9	18.5	17.4	22.2	19.9	38.6
Mother	7.9	4.7	15.6	3.9	1.3	.0	6.9	12.6	3.8	4.9	6.5	13.3	5.8	9.1
Mother-in-law	1.7	.0	3.1	.0	2.0	.0	.0	2.4	1.2	.6	2.6	.6	3.2	1.7
Another family member	11.9	4.7	16.5	9.1	11.1	6.5	6.9	12.3	11.5	14.8	11.0	15.2	10.3	8.5
Given by someone	2.9	6.3	1.1	2.6	6.5	1.9	6.9	1.6	4.0	1.9	2.6	1.9	4.5	3.4
BASE	807	64	358	77	153	155	29	382	425	162	155	158	156	176

SECTION 5

KNOWLEDGE, BELIEFS AND SOURCES OF INFORMATION ABOUT MALARIA AND NETS

This section contains information on awareness, perceptions, and knowledge about malaria and ITNs, as well as exposure to information on ITNs. We report on:

1. Recognition of the English term “malaria”
2. Perceived symptoms and causes of malaria
3. Knowledge of vulnerable groups
4. Awareness of treated nets, or ITNs
5. Perceived advantages and disadvantages of net and ITN use by vulnerable groups
6. Reasons for not owning a net
7. Exposure to information on ITNs, source of information, and recall of content

5.1 RECOGNITION OF THE TERM “MALARIA”

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

- Recognition of the term “malaria” was nearly universal at 97%.

Table 5.1 Recognition of term “Malaria”

Among all respondents

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
No	2.9	.7	2.3	.7	7.0	3.7	.0	2.5	3.1	7.9	2.4	1.7	1.7	.7
Yes	97.1	99.3	97.7	99.3	93.0	96.3	100.0	97.5	96.9	92.1	97.6	98.3	98.3	99.3
BASE	1500	301	301	300	299	299	120	599	901	302	296	302	300	300

5.2 PERCEIVED SYMPTOMS AND CAUSES OF MALARIA

Malaria can exhibit a diverse set of symptoms, but fever is common to all symptomatic cases. In order to determine the extent to which respondent perceptions of malaria coincide with the biomedical ones, those who had heard of the term “malaria” were asked what the symptoms and causes were.

- Fever, a defining symptom of malaria, was mentioned by 65% of those who had heard of the term “malaria”. There was considerable variation among sites, from a low of 49% in Keta to a high of 71%-73% of respondents in Kumasi, Tamale, and Accra sites mentioning fever.
- A little more than one-quarter of respondents mentioned some manifestation of fever: 29% mentioned feeling cold/chills; 26% mentioned headache/body aches. Other malaria symptoms were also mentioned: nausea or vomiting (37%), weakness/tiredness (27%), and loss of appetite (25%). Only 2% mentioned convulsions/fits, a symptom of severe malaria.
- The great majority (82%) of respondents who had heard of malaria said that mosquitoes cause malaria. Other causes mentioned included dirty or stagnant water (31%), probably because of perceptions about mosquito

breeding habits. Erroneous causes of malaria such as exposure to weather (rain/cold/sun) or dirty food were mentioned by 24% and 20% of respondents respectively.

Table 5.2 Perceived symptoms of malaria

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

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio economic status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Fever	64.9	72.6	48.6	70.5	60.4	71.9	73.3	67.0	63.5	62.2	58.1	61.6	71.2	70.8
Chills	28.8	34.1	24.1	22.5	40.6	23.3	40.8	34.6	25.0	24.8	22.1	26.6	26.8	43.3
Headache/ body ache/ pain	25.9	25.1	24.8	16.1	38.8	25.3	34.2	33.7	20.6	25.5	18.0	23.6	25.8	36.2
Cough	3.0	4.0	2.4	2.7	2.9	3.1	2.5	2.7	3.2	4.0	1.4	2.4	3.7	3.7
Nausea/ vomiting	36.7	41.5	31.6	31.9	37.1	41.3	57.5	38.9	35.2	32.4	29.8	39.7	38.3	42.6
Diarrhea	12.8	13.4	15.3	12.4	5.4	17.4	15.0	12.0	13.4	13.7	12.1	11.4	13.6	13.4
Loss of appetite	25.4	28.1	25.2	20.1	34.9	19.1	33.3	28.9	23.0	21.2	22.1	19.9	27.5	35.9
Pale eyes/palms	30.5	29.8	35.0	22.8	30.6	34.7	23.3	26.0	33.6	34.5	34.6	33.0	29.8	21.1
Weakness	27.0	33.8	26.2	17.1	28.8	29.2	42.5	27.6	26.6	25.2	27.3	27.3	27.5	27.5
Convulsions	2.4	1.0	2.0	2.0	2.9	4.2	.0	2.7	2.2	2.9	2.4	2.7	3.1	1.0
Anemia/ lack of blood	3.6	4.7	4.4	1.7	2.2	5.2	5.0	2.7	4.2	2.5	4.2	3.7	3.1	4.7
Thirst	1.5	.3	4.1	.3	2.2	.7	.8	1.4	1.6	1.1	2.4	1.7	1.7	.7
Rash	.9	1.0	1.7	.7	.4	.7	.8	.5	1.1	.4	1.0	1.0	1.7	.3
Other	4.9	6.4	6.1	8.4	2.2	1.0	5.8	3.8	5.6	4.7	3.8	6.4	5.8	3.7
Don't Know	5.9	3.7	9.5	10.1	2.9	3.1	1.7	5.5	6.2	9.4	8.3	4.7	4.7	2.7
BASE	1457	299	294	298	278	288	120	584	873	278	289	297	295	298

Table 5.3 Perceived causes of malaria

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

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio economic status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Mosquitoes	82.4	82.9	85.7	79.5	87.4	76.4	93.3	90.2	77.1	68.7	75.8	84.5	88.1	93.6
Dirty surroundings/ standing water	31.1	40.5	22.4	37.2	16.9	37.5	44.2	30.7	31.4	30.9	25.6	30.0	31.5	37.2
Weather	24.4	9.7	20.4	8.1	59.0	27.4	8.3	22.4	25.8	34.5	28.7	26.3	21.7	11.7
God/Allah	1.2	.3	.0	.7	4.7	.7	.0	1.9	.8	1.8	.7	1.3	1.0	1.3
Another person with malaria	2.3	1.7	1.7	1.3	5.0	1.7	.8	2.9	1.8	1.1	2.8	1.7	2.7	3.0
Cold or dirty food or water	19.8	20.4	22.8	14.8	18.0	23.3	13.3	19.2	20.3	16.5	20.8	22.9	23.1	15.8
Specific type of food	5.4	8.7	5.1	5.0	2.5	5.6	6.7	5.1	5.6	4.0	5.2	7.4	6.4	4.0
Overwork	2.1	.3	6.1	.0	1.1	3.1	.0	2.7	1.7	2.2	2.8	2.4	2.4	1.0
Other	2.9	1.3	4.8	5.7	1.8	.7	.8	1.7	3.7	2.9	4.5	3.0	2.0	2.0
Don't Know	5.8	2.0	4.4	5.0	3.6	14.2	.0	3.1	7.7	16.5	8.0	3.7	1.4	.3
BASE	1457	299	294	298	278	288	120	584	873	278	289	297	295	298

5.3 KNOWLEDGE OF VULNERABLE GROUPS

In order to measure knowledge of vulnerable groups — children under five and pregnant women — interviewers showed those respondents who recognized the term “malaria” a card with drawings of five household members and identified each: a man, a woman (not pregnant), a pregnant woman, a child of age 3, and a child of age 6.

Respondents were asked to select the person most vulnerable to a serious case of malaria and to then select, among the remaining, who else is most vulnerable.

- Two-thirds (66%) of those who had heard the term “malaria” knew the vulnerable groups—i.e., selected both the youngest child (age 3) and the pregnant woman.
- Those in urban areas (72%) were more likely than rural areas (62%) to know vulnerable groups, and the proportion of respondents who knew the two vulnerable groups rose with SES, from 58% in the lowest SES category up to 73% in the highest.
- One-third (34%) of respondents included in their selection a household member who was *not* among the most vulnerable: 27% selected the child of 6 years; 3% selected the non-pregnant woman; and 3% selected the man.

Figure 5.1

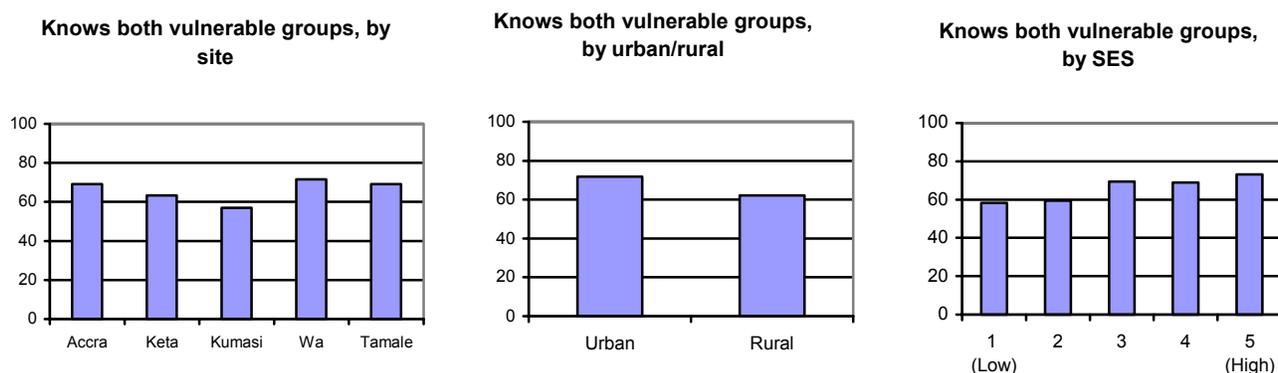


Table 5.4 Selection of vulnerable household members

Among respondents who have heard of malaria (two responses per person)

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Man	2.7	2.3	2.0	3.7	1.8	3.8	.8	2.1	3.2	2.9	5.9	3.0	1.4	.7
Woman	3.2	2.3	3.7	4.7	1.8	3.5	1.7	1.9	4.1	6.1	2.8	2.4	3.1	2.0
Pregnant Woman	73.4	74.6	72.4	64.1	79.9	76.4	78.3	77.2	70.8	68.0	68.9	76.4	75.6	77.5
Child 6 years old	27.3	26.1	29.6	34.2	23.7	22.6	20.8	24.0	29.6	31.3	30.8	24.6	25.8	24.5
Child 3 years old	91.1	94.3	89.5	89.3	91.0	91.7	97.5	93.5	89.6	86.0	90.0	92.3	92.9	94.3
DK	.9	.0	1.0	1.7	.7	1.0	.0	.5	1.1	2.9	.3	.7	.3	.3
BASE	1457	299	294	298	278	288	120	584	873	278	289	297	295	298

Table 5.5 Knowledge of vulnerable groups

Among respondents who have heard of malaria

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio economic status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Knows no vulnerable group	1.4	.3	1.4	3.7	.7	1.0	.0	1.0	1.7	4.3	.7	.7	.3	1.3
Knows one vulnerable group	32.6	30.4	35.4	39.3	27.7	29.9	24.2	27.2	36.2	37.4	39.8	30.0	30.8	25.5
Knows both vulnerable groups	66.0	69.2	63.3	57.0	71.6	69.1	75.8	71.7	62.1	58.3	59.5	69.4	68.8	73.2
BASE	1457	299	294	298	278	288	120	584	873	278	289	297	295	298

5.4 AWARENESS OF INSECTICIDE-TREATED NETS

All respondents were asked if they had heard of nets that have been treated with an insecticide.

- The great majority (91%) of all respondents had heard of treated mosquito nets. Awareness of ITNs did not vary much by site or urban-rural, but generally increased with SES status: awareness was 85% in the lowest quintile and 97% in the highest.

Figure 5.2

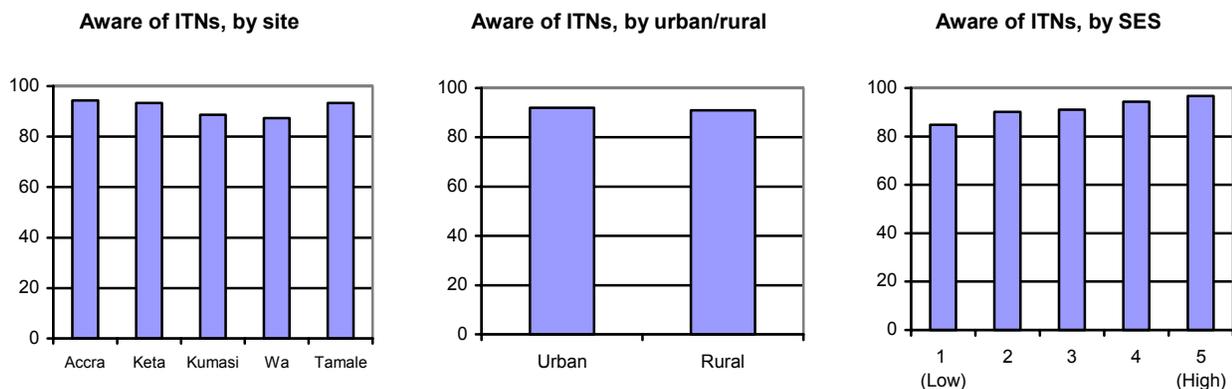


Table 5.6 Awareness of insecticide treated mosquito nets
Among all respondents

	Total	Sites (city plus surrounding rural areas)					Urban Accra Only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
No	8.6	5.6	6.6	11.3	12.7	6.7	3.3	8.0	9.0	15.2	9.8	8.9	5.7	3.3
Yes	91.4	94.4	93.4	88.7	87.3	93.3	96.7	92.0	91.0	84.8	90.2	91.1	94.3	96.7
BASE	1500	301	301	300	299	299	120	599	901	302	296	302	300	300

5.5 PERCEIVED ADVANTAGES AND DISADVANTAGES OF NET AND ITN USE BY VULNERABLE GROUPS

All respondents were asked what advantages and disadvantages they could think of for

- (1) a child under five sleeping under a net
- (2) a child under five sleeping under a *treated* net; and
- (3) a pregnant woman sleeping under a *treated* net.

For all tables in section 5.5, we checked for differences between owners and non-owners but did find any notable differences, so those results are not reported or included in the tables.

Overall, respondents saw many advantages, and few disadvantages of ITN use. They viewed treated nets as more effective than untreated ones, and with the exception of Wa respondents, few expressed concerns about having insecticide on the net.

Advantages of sleeping under a mosquito net (untreated) for child under five

- The great majority of respondents (92%) named at least one advantage for a child under five sleeping under a mosquito net.
- The most commonly mentioned advantage of a child under five sleeping under a mosquito net was avoiding getting bitten by mosquitoes (63%). Other advantages frequently mentioned were avoiding getting malaria (49%); better health for child (37%), and better sleep (26%). Nine percent (9%) of respondents mentioned that nets protect against other insects.
- Overall, six percent (6%) of respondents said they did not see any advantage for a young child to sleep under a mosquito net. However, 16% of respondents in urban Accra, and 12% in the highest SES group, said they saw no advantage. (Note that these groups overlap considerably.)

Table 5.7 Advantages of a child under five sleeping under a mosquito net (untreated)

Among all respondents (multiple responses possible)

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Avoid mosquito bites	63.0	58.1	70.1	70.3	66.6	49.8	59.2	63.3	62.8	58.9	67.6	62.9	60.3	65.3
Avoid "malaria"	48.7	45.2	45.2	50.0	52.5	50.8	45.8	50.1	47.8	43.0	47.0	52.3	49.7	51.7
Avoid other illness	1.9	2.3	.7	2.3	3.0	1.0	1.7	1.3	2.2	2.0	2.7	3.0	1.0	.7
Avoid other insects	8.9	6.0	8.6	10.0	9.4	10.7	8.3	10.4	8.0	6.0	10.8	7.9	11.3	8.7
Can sleep better	26.2	20.9	23.9	17.3	37.1	31.8	25.0	28.5	24.6	34.4	21.6	23.8	25.0	26.0
Gives warmth	3.7	1.3	6.6	1.7	3.0	5.7	.8	3.5	3.8	5.0	4.4	2.3	3.7	3.0
Protects from dirt	3.3	2.3	4.7	1.7	2.7	5.4	2.5	3.8	3.0	1.7	4.1	4.6	3.0	3.3
Gives privacy	.7	.7	2.0	.0	.3	.3	1.7	1.0	.4	1.0	.3	.7	.7	.7
Saves money because child not sick	5.7	4.0	6.3	5.0	6.0	7.4	5.8	5.2	6.1	6.3	5.7	7.3	4.3	5.0
Economical solution	.9	.7	.0	1.3	.7	2.0	.0	1.0	.9	1.3	.3	1.3	1.0	.7
Better health	36.5	20.9	46.8	13.3	52.2	49.5	21.7	36.4	36.6	43.0	37.8	42.7	36.3	22.7
Other	.3	.3	.3	.3	.0	.3	.0	.2	.3	.3	.7	.0	.3	.0
None	6.2	13.6	4.0	9.7	1.3	2.3	15.8	6.5	6.0	3.6	5.7	3.0	6.3	12.3
Don't know	1.7	2.7	2.0	.7	.7	2.3	.8	.7	2.3	3.3	1.7	1.0	2.0	.3
BASE	1500	301	301	300	299	299	120	599	901	302	296	302	300	300

Disadvantages of sleeping under a mosquito net for child under five

- The majority (56%) of respondents did not cite any disadvantage (“none” or “don’t know any”) for a child under five to sleep under a net.
- The most commonly mentioned disadvantages were that mosquitoes can bite through or still get in the net (23%), and that it’s hot sleeping under a net (12%).

Table 5.8 Disadvantages of a child under five sleeping under a mosquito net (untreated)

Among all respondents (multiple responses possible)

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Too little air under net/ child could suffocate	4.9	2.7	5.6	1.0	9.0	6.0	1.7	5.5	4.4	4.3	3.7	6.6	5.3	4.3
Hot sleeping under net	12.1	6.3	4.3	11.7	26.1	12.0	6.7	15.2	10.0	13.2	10.5	13.2	10.3	13.0
Mosquitoes still bite through/get in	23.2	39.9	20.9	22.0	16.7	16.4	42.5	24.2	22.5	12.9	21.6	22.8	25.0	33.7
Mosquitoes still make noise	5.7	3.7	.7	5.0	12.0	7.0	6.7	8.8	3.6	4.3	5.4	4.0	8.3	6.3
Inconvenient if child gets up night	4.3	3.0	2.7	1.0	11.7	3.3	3.3	6.7	2.8	1.3	4.7	6.0	5.7	4.0
Takes time to tuck in	2.0	.7	.0	.0	7.7	1.7	1.7	2.7	1.6	2.0	2.4	1.7	2.0	2.0
Child could tear net	3.6	1.3	1.3	.0	9.7	5.7	.8	4.2	3.2	5.3	3.4	3.3	2.7	3.3
Child may get caught/trapped in net	2.0	1.3	1.3	.7	1.7	5.0	2.5	2.3	1.8	2.6	1.4	3.0	.7	2.3
Child could get used to sleeping under net	1.5	1.7	.3	.0	4.0	1.3	2.5	1.8	1.2	1.3	1.7	1.3	1.3	1.7
Net too expensive	3.5	3.7	8.0	.0	5.7	.3	3.3	3.0	3.9	2.3	2.4	5.3	3.7	4.0
Other	.5	2.0	.7	.0	.0	.0	.8	.2	.8	.3	.3	.3	1.0	.7
None	43.2	36.5	43.5	52.7	29.1	54.2	40.0	41.9	44.1	46.0	44.3	39.4	45.7	40.7
Don't know	13.1	12.3	17.9	9.0	14.7	11.7	8.3	11.0	14.5	21.9	14.9	11.6	10.0	7.3
BASE	1500	301	301	300	299	299	120	599	901	302	296	302	300	300

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

- Nearly all respondents (98%) named at least one advantage for a child under five to sleep under a *treated* net rather than an untreated net.
- Most advantages cited had to do with its greater efficacy compared to an untreated net: “works better against mosquitoes/ fewer bites than an untreated net” (59%), “better at preventing malaria” (52%); “kills mosquitoes (39%), “child will be more protected/ healthy” (37%) . Another commonly cited advantage was that the “child would sleep better” (26%).
- Only 2% said they did not know of any advantage of a child under five sleeping under treated net rather than an untreated net.

Table 5.9 Advantages of a child under five sleeping under an ITN

Among all respondents (multiple responses possible)

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Works better/ fewer bites than untreated net	59.2	66.1	62.5	77.0	52.5	37.8	63.3	56.1	61.3	51.0	63.5	58.3	58.3	65.0
Kills mosquitoes	38.7	52.8	39.2	35.7	33.4	32.1	51.7	38.7	38.6	32.5	35.8	37.4	36.3	51.3
Repels mosquitoes	15.5	8.6	15.3	13.3	17.4	22.7	10.8	15.4	15.5	16.9	17.9	14.9	15.7	12.0
Repels other insects	11.1	4.3	9.3	7.3	18.4	16.4	6.7	12.0	10.5	15.6	9.8	8.6	12.7	9.0
Better at preventing "malaria"	52.4	60.1	42.5	59.0	51.8	48.5	61.7	52.6	52.3	42.7	50.7	52.0	56.0	60.7
Better at preventing other illness	1.6	2.3	1.0	2.7	1.7	.3	2.5	1.2	1.9	3.0	1.7	1.3	.7	1.3
Child more protected	36.7	31.2	44.2	25.0	37.1	46.2	25.0	32.2	39.7	39.4	39.5	36.1	42.7	26.0
Saves money because child doesn't get sick	4.7	4.0	5.3	2.3	4.7	7.0	5.0	4.8	4.6	5.0	6.1	3.3	5.7	3.3
Child sleeps better	25.9	28.2	23.6	18.3	27.1	32.1	32.5	25.9	25.9	31.5	20.9	23.2	25.7	28.0
Other	.1	.0	.7	.0	.0	.0	.0	.0	.2	.0	.3	.3	.0	.0
None	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Don't know	2.2	1.7	4.0	3.3	1.0	1.0	1.7	2.3	2.1	3.6	1.7	2.6	1.7	1.3
BASE	1500	301	301	300	299	299	120	599	901	302	296	302	300	300

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

- Most respondents (79%) said there was no disadvantage or that they did not know of a disadvantage for a child under five to sleep under a *treated* mosquito net rather than an untreated net. Fewer rural than urban respondents cited disadvantages.
- Among those who cited disadvantages, the most common concerns were about cost (“more expensive than regular net” – 9%) and effects of the chemical (smell can be bad – 9%, chemical could be dangerous – 5%, and cause irritation/cough – 4%). Mentions of all four of these disadvantages were highest in Wa, with “bad smell” at 23% and the other three at 13%-14%.

Table 5.10 Disadvantages of a child under five sleeping under an ITN

Among all respondents (multiple responses possible)

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Insecticide not effective	1.3	1.3	.0	.0	3.7	1.3	2.5	2.5	.4	1.0	1.4	1.0	1.0	2.0
Smell can be bad	8.9	3.3	4.3	3.3	23.1	10.4	6.7	14.0	5.4	6.6	9.1	10.3	7.0	11.3
Can't wash treated net	1.0	.7	.7	.0	2.3	1.3	.8	1.0	1.0	1.7	1.4	.7	.7	.7
Causes irritation/ cough/ illness	4.4	.7	2.0	1.0	13.7	4.7	1.7	7.5	2.3	3.0	5.4	3.3	3.0	7.3
Chemical dangerous, can kill child if chews/sucks net	5.0	2.0	3.3	.7	13.0	6.0	4.2	9.3	2.1	4.3	5.7	2.6	4.3	8.0
More expensive than regular net	8.7	9.3	12.3	1.0	13.0	8.0	8.3	10.7	7.4	7.6	7.8	8.3	10.3	9.7
Other	1.8	1.0	.7	2.7	3.3	1.3	.0	1.0	2.3	1.7	2.4	2.6	1.0	1.3
None	64.0	74.4	60.5	78.3	39.5	67.2	71.7	59.3	67.1	56.3	63.5	65.2	69.3	65.7
Don't know	14.5	9.6	19.9	13.7	18.1	11.0	8.3	11.2	16.6	25.2	14.2	14.2	11.0	7.7
BASE	1500	301	301	300	299	299	120	599	901	302	296	302	300	300

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

- Nearly all respondents (98%) named at least one advantage for a pregnant woman to sleep under a *treated* net rather than an untreated net.
- The most commonly mentioned advantages mentioned had to do with its greater protective effect: “better at preventing malaria” (55%), “pregnant woman/fetus better protected” (54%), “works better against mosquitoes/fewer bites” (50%), “kills mosquitoes (35%), and “the woman sleeps better” (26%).

Table 5.11 Advantages of pregnant woman sleeping under an ITN

Among all respondents (multiple responses possible)

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Works better/ fewer bites than untreated net	49.7	61.8	50.2	60.7	42.5	33.1	55.0	45.1	52.7	43.4	54.1	48.3	51.3	51.3
Kills mosquitoes	35.3	46.8	35.5	33.3	26.1	34.8	50.0	37.2	34.1	30.8	32.1	36.1	36.0	41.7
Repels mosquitoes	12.4	7.0	16.3	11.0	13.0	14.7	6.7	10.5	13.7	10.6	13.2	13.6	14.0	10.7
Repels other insects	9.1	3.3	7.3	6.3	17.7	11.0	4.2	9.3	9.0	10.9	9.8	9.3	9.0	6.7
Better at preventing "malaria"	54.7	57.5	44.5	63.7	52.2	55.5	66.7	56.1	53.7	48.0	53.4	47.4	58.3	66.3
Better at preventing other illness	1.1	2.0	.7	1.3	1.3	.3	1.7	.7	1.4	2.0	.3	2.0	.3	1.0
Prevents miscarriage	9.5	4.7	17.9	5.7	13.4	6.0	4.2	9.7	9.4	6.6	8.4	9.3	13.0	10.3
Woman/ fetus more protected	54.0	56.8	57.5	45.7	53.5	56.5	52.5	44.7	60.2	59.6	57.1	54.0	53.3	46.0
Saves more money because woman not sick	6.1	4.7	9.6	2.0	5.7	8.4	5.0	5.7	6.3	7.6	7.4	5.3	4.7	5.3
Woman sleeps better	26.2	28.6	20.9	20.3	29.8	31.4	30.8	28.9	24.4	30.8	23.0	23.2	22.3	31.7
Other	.3	.7	.3	.7	.0	.0	.8	.3	.3	.3	.7	.7	.0	.0
None	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Don't know	2.3	1.7	4.0	4.3	.7	.7	1.7	2.3	2.2	3.3	2.7	2.6	1.3	1.3
BASE	1500	301	301	300	299	299	120	599	901	302	296	302	300	300

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

- Three-fourths (77%) of respondents did not cite or know any disadvantage of a pregnant woman sleeping under a *treated* net.
- The single most commonly mentioned disadvantage for a pregnant woman to sleep under a *treated* net was the odor, but that was mentioned by only 11% of respondents. The other three disadvantages most mentioned were the same as for children: chemical could be dangerous (7%), cost is more than regular nets (7%), and could cause irritation/illness (4%). As with the disadvantages to children, all four of these disadvantages were mentioned most in Wa, where 24% of respondents mentioned odor and 22% mentioned that the chemical could be dangerous.

Table 5.12 Disadvantages of pregnant woman sleeping under an ITN
Among all respondents (multiple responses possible)

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Insecticide not effective	1.3	1.3	.0	.3	3.3	1.7	2.5	2.2	.8	1.0	1.4	1.3	1.3	1.7
Smell can be bad	10.7	5.3	5.6	4.3	23.4	14.7	7.5	16.4	6.9	6.3	9.1	12.6	11.3	14.0
Can't wash treated net	.3	.0	.3	.0	1.0	.3	.0	.5	.2	.7	.0	.0	.3	.7
Can cause irritation/ cough/ illness	4.3	1.7	1.3	1.0	14.0	3.3	2.5	7.5	2.1	3.6	4.4	3.3	3.3	6.7
Chemical dangerous, can kill fetus, cause nausea/vomiting	7.3	3.3	4.3	1.7	22.1	5.0	5.0	12.4	3.9	5.6	7.1	5.6	7.3	10.7
More expensive than regular net	7.3	8.0	10.0	.3	9.4	9.0	5.0	8.5	6.5	6.0	5.4	8.9	8.3	8.0
Other	1.7	1.3	1.0	2.3	2.7	1.0	.8	1.2	2.0	1.0	2.7	2.0	1.0	1.7
None	62.9	71.1	59.5	74.3	40.5	69.2	71.7	57.8	66.4	60.6	62.2	61.6	65.7	64.7
Don't know	14.1	10.6	20.3	16.3	16.7	6.7	7.5	11.0	16.2	21.5	16.9	14.2	11.7	6.3
BASE	1500	301	301	300	299	299	120	599	901	302	296	302	300	300

5.6 REASONS FOR NON-OWNERSHIP

- The most common reason stated for not owning a net was lack of money (63%). Respondents from the highest SES quintile were less likely to give this reason than the others, but 50% of them also cited cost. Cost appeared to be more of an issue in the Wa site, where 80% of respondents mentioned this reason for non-ownership, compared to 53% and 56% in Tamale and Keta sites, respectively.
- Among urban Accra non-owners, 45% said the reason for non-ownership was lack of need; 31% in the Accra site said the same, as did 28% in the highest SES category. (Urban and high SES households are more likely to have window screens and/or use aerosols.)

Figure 5.3

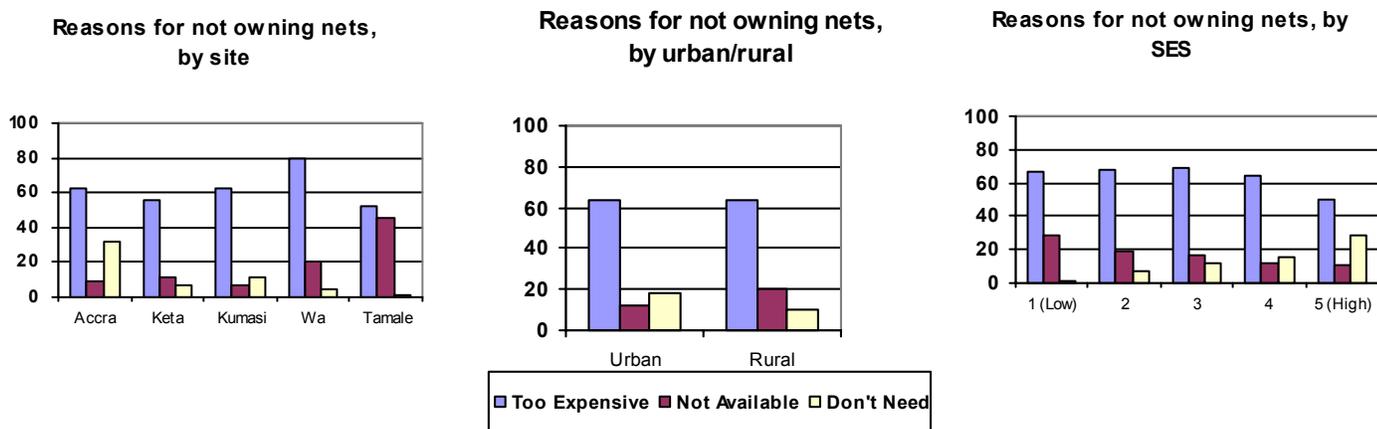


Table 5.13 Reasons why households do not own any mosquito nets

Among households that do not own a net (multiple responses possible)

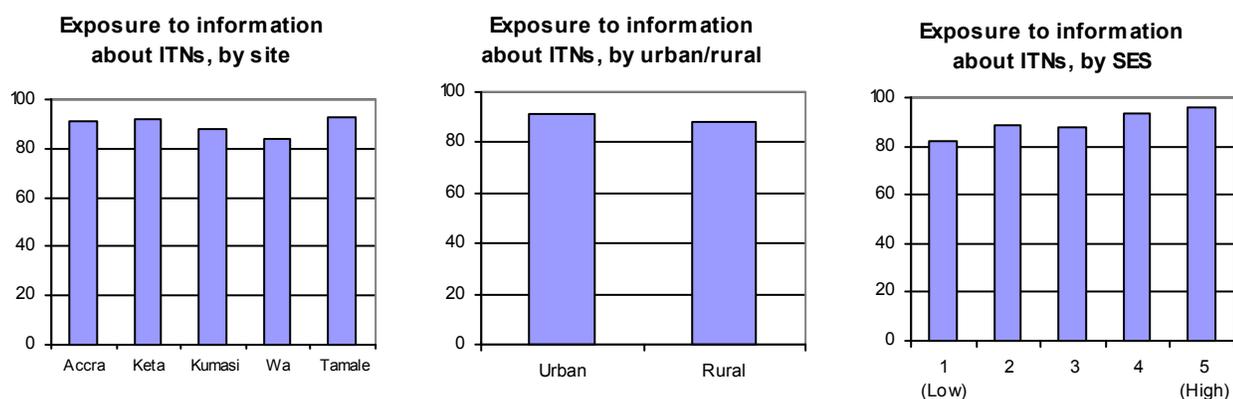
	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
No money/ nets too expensive	63.3	62.7	56.0	62.7	80.0	52.8	50.0	63.3	63.2	66.5	67.4	68.8	63.7	49.5
Nets not available/don't know where to get them	17.1	9.2	11.0	6.6	20.6	46.0	6.3	12.1	20.4	28.9	19.0	16.1	12.1	10.4
Don't like nets	2.8	1.6	6.4	2.9	4.8	.0	3.1	4.1	2.0	1.2	2.7	1.5	2.6	6.0
Don't need nets/use something else	13.1	31.3	6.4	11.5	4.8	.6	44.8	18.6	9.6	1.7	7.6	12.1	15.8	28.0
Net cannot fit in sleeping space	2.4	2.4	2.8	4.1	1.2	.6	5.2	3.6	1.6	2.3	1.1	1.5	2.6	4.4
Outlets are too far/ too expensive to get to	2.3	1.2	8.3	.4	1.8	3.1	.0	1.1	3.0	3.5	1.6	1.0	4.2	1.1
Other	6.0	6.8	6.4	10.7	1.2	2.5	5.2	5.2	6.6	1.7	6.5	7.5	7.4	6.6
Don't know	2.8	4.0	6.4	3.3	.6	.0	3.1	3.3	2.5	.6	2.7	2.5	3.2	4.9
BASE	928	249	109	244	165	161	96	365	563	173	184	199	190	182

5.7 EXPOSURE TO INFORMATION ON ITNS

All respondents were asked whether they had heard or seen any information about nets treated with insecticide in the last 12 months, where they had heard/seen the information, and what they had heard/seen. NetMark aired TV and radio spots saying that mosquitoes cause malaria, and that ITNs can prevent bites and kill mosquitoes that cause malaria. The tagline for the ads was “Mosquitoes kill; kill mosquitoes.”

- The vast majority of respondents — 90% — said they had heard or seen something about ITNs in the last twelve months. Exposure varied little by site, but as SES increased, so did exposure.
- Those who had been exposed to information on ITNs in the prior year were more likely to own a net that had ever been treated: 23% of those exposed to information, compared with 3% of those who had not, owned a net that had ever been treated.

Figure 5.4



- The main sources of information for those who had heard/seen information on ITNs in the last 12 months were health staff/personnel (57%), radio (41%), and TV (31%).
- The proportion who had received information from radio or TV was much higher in urban (52% radio, 49% TV) than rural (34% radio, 18% TV) areas. Information from health staff was much higher in rural (67%) than urban areas (42%), and in Keta and Tamale sites (70% and 76% respectively). Radio and TV exposure increased as SES level rose, whereas exposure to information from health staff decreased as SES level rose.
- Friends/neighbors/relatives were not an important source of information about ITNs — 16%.
- Among those who had heard/seen information on ITNs in the last 12 months, almost all (96%) remembered at least one idea, word or image. The main responses were: were “Kill mosquitoes” (part of NetMark tagline-41%), “prevent malaria” (41%), “protects against mosquito bites” (32%), “Mosquitoes kill”(the other part of the NetMark tagline -22%), “it’s good to use a treated net” (22%), and “prevents illness/better health”(20%).
- The percent of those who said the complete NetMark tagline “Mosquitoes Kill; Kill Mosquitoes” was lowest in Tamale (where NetMark did not air local ads) and highest in Kumasi site (27%) and in the highest SES bracket (22%).

Figure 5.5

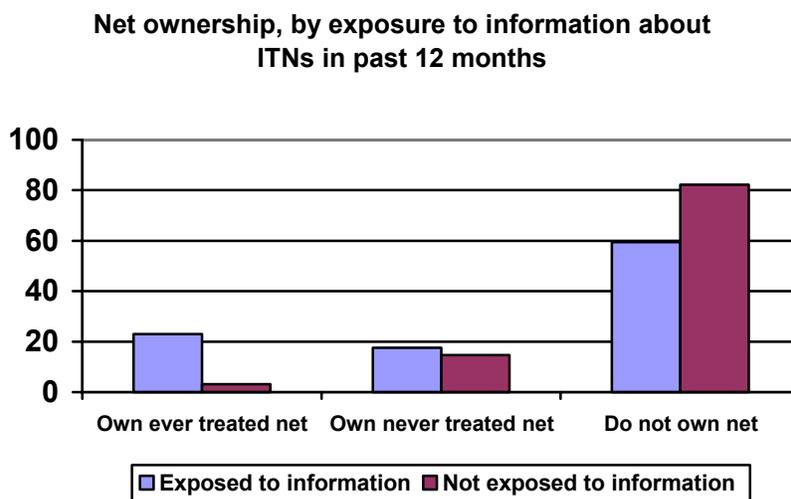


Table 5.14 Seen or heard anything in past 12 months about mosquito nets treated with insecticide

All respondents

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Net Ownership		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	Non-Owners	Owners	1 Low	2	3	4	5 High
No	10.5	8.6	8.0	12.3	16.4	7.0	1.7	8.7	11.7	13.9	4.9	18.2	11.5	12.6	6.3	3.7
Yes	89.5	91.4	92.0	87.7	83.6	93.0	98.3	91.3	88.3	86.1	95.1	81.8	88.5	87.4	93.7	96.3
BASE	1500	301	301	300	299	299	120	599	901	928	572	302	296	302	300	300

Table 5.15 Percent who own a net and ever-treated net, by exposure to communication in last 12 months

Among all respondents

	Has heard information about ITNs in past 12 months		Total
	No	Yes	
Own an ever treated net	3.2	23.0	20.9
Own an untreated (never treated) net	14.6	17.5	17.2
Do not own a net	82.2	59.5	61.9

Table 5.16 Source of message on ITNs

Among those who saw/heard information on treated (multiple responses possible)

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio economic status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Radio	41.1	56.7	42.2	41.8	44.8	20.5	67.8	51.6	33.9	18.6	27.9	43.2	52.7	59.2
TV	30.8	55.3	14.4	51.3	23.2	10.1	80.5	48.8	18.3	5.3	11.8	21.2	37.4	72.0
Newspaper/ magazine	1.0	1.1	.7	.4	2.8	.4	2.5	1.8	.5	.4	.8	.4	.7	2.8
Shop employee	2.1	4.4	1.1	.8	2.8	1.4	7.6	3.5	1.1	1.6	.8	1.1	1.8	4.8
Poster in shop	1.9	5.5	1.1	.8	1.6	.4	8.5	2.9	1.1	.8	1.5	.8	1.4	4.5
Health staff	56.7	40.0	70.4	35.4	61.6	75.5	28.0	41.5	67.2	70.9	65.6	59.8	52.7	37.7
Poster at health facility	7.1	8.0	7.9	6.8	7.2	5.4	8.5	7.3	6.9	7.7	4.2	6.1	8.2	9.0
Church, school, organization	2.3	1.1	5.4	1.9	1.6	1.4	.0	2.7	2.0	.8	1.5	2.7	4.3	2.1
Drama group	1.8	.7	4.0	2.7	1.6	.0	1.7	1.5	2.0	.8	2.3	1.9	2.1	1.7
Friends	16.3	18.2	9.7	22.8	14.8	16.2	18.6	16.6	16.1	17.8	19.1	18.2	15.3	11.8
Billboards	.4	.7	.7	.0	.8	.0	1.7	.9	.1	.0	.0	.0	.7	1.4
Women's group	1.9	.0	.0	1.1	1.2	7.2	.0	2.0	1.9	4.0	3.1	1.5	1.4	.0
Other	.1	.0	.0	.4	.0	.0	.0	.2	.0	.0	.0	.0	.0	.3
Don't Know	.1	.0	.4	.0	.0	.0	.0	.2	.0	.0	.0	.0	.0	.3
BASE	1343	275	277	263	250	278	118	547	796	247	262	264	281	289

Table 5.17 Content of message about treated nets in the last 12 months

Among those who had heard/seen something in the last 12 months

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio economic status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Mosquitoes kill	22.4	16.7	22.7	33.5	29.2	11.2	23.7	27.4	19.0	14.2	19.1	20.1	24.6	32.5
Kill mosquitoes	41.3	49.8	35.7	36.9	41.6	42.1	56.8	46.1	37.9	36.0	37.0	43.9	41.3	47.1
Mosquitoes/ malaria dangerous for pregnant women	9.2	5.5	16.2	3.0	12.4	9.0	3.4	7.7	10.3	7.3	9.9	9.8	12.8	6.2
Mosquitoes/ malaria dangerous for young children	9.2	7.6	8.3	7.6	12.4	10.4	5.1	7.9	10.2	6.9	11.1	9.8	12.5	5.9
NetMark	1.5	2.5	1.1	.0	3.6	.4	5.9	3.1	.4	.0	.4	.4	1.4	4.8
PermaNet	.1	.4	.0	.0	.4	.0	.0	.2	.1	.0	.0	.0	.4	.3
Mosquito flying	5.4	10.5	1.4	7.6	4.8	2.9	16.9	8.2	3.5	1.6	3.4	4.5	4.3	12.5
Mosquito that falls/ dies	8.5	6.9	7.6	13.7	9.6	5.0	10.2	10.2	7.3	7.3	5.0	9.1	7.5	13.1
Person hitting/ slapping /trying to kill mosquito	5.7	6.5	1.4	11.0	5.2	4.3	11.0	9.7	2.9	1.2	5.0	4.2	6.8	10.4
Demonstration on how to use a net	12.6	14.5	7.6	6.5	8.8	24.8	15.3	11.9	13.1	14.2	13.0	11.0	11.7	13.1
Saw a treated net	6.6	7.6	6.1	7.2	2.8	8.6	10.2	6.8	6.4	5.7	6.1	6.4	7.1	7.3
Saw someone sleeping well	12.2	17.5	6.1	24.0	8.4	5.4	20.3	18.5	7.9	2.0	8.4	11.0	13.5	24.2
Where to get a net	6.6	7.6	13.7	3.0	3.2	4.7	7.6	6.0	6.9	4.0	8.4	7.6	7.8	4.8
Treat net	17.3	15.6	17.3	12.9	12.0	27.7	12.7	13.7	19.7	25.5	14.5	16.7	16.7	13.8
Protect against mosquitoes/ bites	31.6	23.3	38.6	31.9	26.0	37.4	23.7	26.0	35.4	39.3	33.2	29.9	26.7	29.8
Prevent malaria	41.0	34.5	43.3	49.8	32.8	43.9	34.7	38.0	43.0	40.1	42.4	40.2	43.4	38.8
Prevent illnesses	20.3	9.1	31.0	16.0	21.2	24.1	3.4	14.3	24.5	25.1	22.1	19.3	24.9	11.1
Good to use	21.9	19.3	40.1	25.5	10.8	12.9	11.0	19.0	23.9	18.2	18.7	26.5	23.5	22.1
Economical	1.4	.7	2.9	.4	2.8	.4	.8	1.5	1.4	.8	.4	1.1	2.5	2.1
Other	1.2	2.9	2.5	.0	.4	.0	.8	.7	1.5	.4	1.1	1.9	1.8	.7
Don't know	4.2	1.8	2.9	3.0	10.8	2.9	.8	4.0	4.3	6.5	5.0	3.8	3.9	2.1
BASE	1343	275	277	263	250	278	118	547	796	247	262	264	281	289

SECTION 6

OTHER CONSUMER PREFERENCES AND PERCEPTIONS

This section contains information of particular interest to the commercial sector. It covers

1. Consumers' preferred size, shape, and color for a net
2. Unprompted, prompted, and total awareness of mosquito net brands
3. Awareness and use of other mosquito control products
4. Attributes associated with various mosquito control products, including nets and ITNs

6.1 PREFERRED NET SIZE, SHAPE, AND COLOR

Section 4 described the size, shape and color of nets owned, which largely reflects characteristics of nets currently available. This section reports on the characteristics of nets that consumers *prefer*. Questions on preferences were asked of all respondents, whether or not their household owned a net. This information can be used to develop and supply nets with features that consumers want.

Size

- Respondents were shown a card depicting different sized nets and asked which one they preferred. Large nets are preferred: 61% preferred king-sized (triple) nets and 31% doubles. Few preferred single or cot-sized nets (4% each).
- The strong preference for triple/king nets, especially in rural and lower SES households contrasts with the fact that 82% of all nets currently owned are double, and suggest a potential market for triple-sized nets, if reasonably priced.

Table 6.1 Net size preferences

Among all respondents

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Single	3.7	5.0	5.0	2.0	3.3	3.0	3.3	2.7	4.3	3.0	5.4	4.3	3.7	2.0
Double	31.3	31.1	42.7	25.0	36.1	21.4	36.7	38.5	26.5	24.5	26.5	30.1	35.3	39.8
Triple/King	61.1	61.5	50.7	69.0	55.2	68.9	57.5	55.7	64.6	66.6	63.3	60.9	57.7	56.9
Cot-net	4.0	2.3	1.7	4.0	5.4	6.7	2.5	3.2	4.6	6.0	4.8	4.6	3.3	1.3
BASE	1497	299	300	300	299	299	120	598	899	302	294	302	300	299

Shape

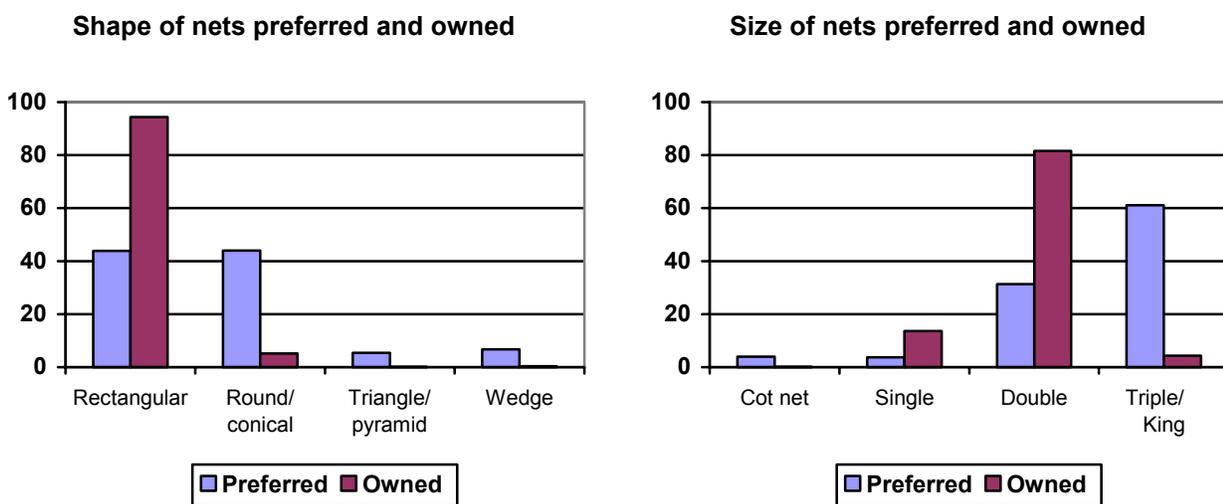
- Respondents were also shown a card with different shaped nets on it, and were asked which one they preferred. Equal proportions of respondents (44% each) preferred conical and rectangular nets, although shape preference varied by site. Few preferred triangle/pyramid (5%) or wedge (7%) shaped nets (though these shapes may not be known or available).
- The equal preference for conical and rectangular nets contrasts with the fact that the great majority of nets owned (94%) are rectangular, and suggest that conical nets would sell well if reasonably priced.

Table 6.2 Net shape preferences

Among all respondents

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Rectangular	43.9	37.0	54.3	33.1	52.2	42.8	41.7	48.0	41.2	41.5	40.1	43.7	45.7	48.3
Round/ Conical	44.0	49.3	37.3	54.5	37.8	41.1	49.2	41.8	45.5	46.8	46.3	41.4	43.3	42.3
Triangle/ Pyramid	5.4	7.7	3.3	8.0	4.3	3.7	5.0	4.8	5.8	3.7	6.1	6.6	5.3	5.3
Wedge	6.7	6.0	5.0	4.3	5.7	12.4	4.2	5.4	7.6	8.0	7.5	8.3	5.7	4.0
BASE	1497	300	300	299	299	299	120	598	899	301	294	302	300	300

Figure 6.1



Color

- Respondents were shown a card with samples of netting in different colors. Colored nets were preferred by 83% of respondents, white nets by 17%. The preferred colors were turquoise (13%), and green (13%).
- There were considerable urban-rural and SES differences in net color preference, with white being more popular in the two highest SES levels and in urban areas, while turquoise and green were more popular than white in rural areas and among the three lowest SES levels.
- The strong preference for colored nets contrasts with the fact that most nets owned (67%) are white.
- Twenty-six percent (26%) reported disliking black and 22% the dark multi-color sample they were shown. No other color shown was disliked by more than 8% of the overall sample.

Table 6.3 Net color preferences

Among all respondents

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
White	16.5	24.3	25.9	13.0	15.4	3.7	37.8	25.8	10.3	7.3	12.5	11.6	18.3	32.8
Light blue	8.6	13.0	10.6	8.0	7.4	4.0	16.0	11.0	7.0	4.3	4.1	9.3	9.7	15.7
Dark blue	7.4	5.7	9.3	9.3	7.7	5.0	5.9	6.4	8.1	8.9	7.8	8.6	5.3	6.4
Light green	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Dark green	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Pink	9.2	12.0	14.6	7.3	5.7	6.4	6.7	7.7	10.2	4.6	8.1	11.9	12.0	9.4
Black	1.8	.7	2.3	2.0	3.0	1.0	.0	1.7	1.9	4.0	2.0	.3	1.3	1.3
Gray	4.8	6.7	1.0	5.7	5.7	5.0	5.0	4.2	5.2	6.0	4.4	4.6	4.7	4.3
Yellow	4.5	6.0	4.0	5.7	4.3	2.7	3.4	3.5	5.2	3.3	7.1	3.6	4.3	4.3
Peach	4.3	5.3	3.7	3.3	3.7	5.4	5.0	3.8	4.6	5.0	5.1	4.3	4.3	2.7
Orange	4.7	3.7	1.7	6.3	6.7	5.0	4.2	5.2	4.3	5.0	4.7	6.3	4.3	3.0
Turquoise	13.1	8.3	10.3	9.3	13.7	24.1	4.2	9.2	15.8	18.9	18.6	13.9	8.7	5.7
Sea Green	4.6	5.3	2.0	7.0	3.3	5.4	3.4	3.2	5.5	5.6	5.1	4.6	4.7	3.0
Green	12.8	5.7	10.6	12.0	13.4	22.4	5.9	11.9	13.4	17.2	13.5	13.2	14.0	6.0
Olive Green	3.7	1.0	2.7	5.3	4.7	4.7	.0	2.8	4.2	4.6	3.0	4.0	4.3	2.3
Multi-colored design	4.0	2.3	1.3	5.7	5.4	5.4	2.5	3.7	4.2	5.3	4.1	3.6	4.0	3.0
BASE	1499	300	301	300	299	299	119	598	901	302	296	302	300	299

Table 6.4 Net color dislikes

Among all respondents

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
White	3.6	4.0	3.0	2.0	4.0	5.0	.8	2.5	4.3	3.6	5.1	1.7	4.3	3.3
Light blue	2.7	1.0	1.3	5.3	4.0	1.7	.0	2.0	3.1	3.0	3.7	3.6	2.7	.3
Dark blue	5.5	6.3	3.3	8.3	3.7	5.7	2.5	4.2	6.3	6.3	4.4	4.3	8.0	4.3
Light green	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Dark green	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Pink	2.9	1.0	.7	4.0	6.0	2.7	.8	1.8	3.6	4.6	3.7	1.7	2.7	1.7
Black	26.0	39.2	27.2	19.3	19.4	24.7	52.5	32.1	22.0	19.9	23.0	22.5	25.3	39.3
Gray	7.9	4.7	6.0	9.7	10.4	9.0	1.7	6.7	8.8	9.9	11.1	8.6	6.7	3.3
Yellow	2.9	1.3	3.3	3.0	3.3	3.3	.8	3.7	2.3	2.0	1.4	4.3	4.0	2.7
Peach	4.7	2.3	4.0	7.0	4.0	6.0	3.3	3.8	5.2	7.0	3.7	5.0	2.0	5.7
Orange	6.3	6.3	4.3	2.7	9.0	9.4	7.5	7.0	5.9	7.6	7.1	6.3	6.3	4.3
Turquoise	1.2	.3	1.0	1.0	2.0	1.7	.8	1.7	.9	1.7	1.4	.7	1.0	1.3
Sea Green	2.0	.7	1.7	3.3	1.3	3.0	.0	1.7	2.2	1.3	3.0	2.3	2.7	.7
Green	1.5	.7	3.0	1.3	1.3	1.0	.8	1.5	1.4	1.3	2.4	1.3	1.3	1.0
Olive Green	4.4	2.0	3.0	5.0	5.4	6.7	.8	3.2	5.2	6.3	3.7	5.3	6.0	.7
Multi-colored design	22.1	26.6	22.6	22.7	21.4	17.4	24.2	22.4	22.0	20.5	20.3	22.8	20.3	26.7
Don't know	6.4	3.7	15.6	5.3	4.7	2.7	3.3	5.8	6.8	5.0	6.1	9.6	6.7	4.7
BASE	1500	301	301	300	299	299	120	599	901	302	296	302	300	300

6.2 AWARENESS OF MOSQUITO NET BRANDS

Respondents were asked to name the brands of mosquito nets and ITNs they were aware of, even if they did not use them (unprompted awareness). After responding, they were shown a card with the name and logo of different brands. The interviewer read aloud each name/brand and asked the respondent to indicate which other brands, apart from any already mentioned, they recognized (prompted awareness). Since “NetMark” was used in promotional ads, it was included on the card, even though it is not a brand. UNICEF was also included, since some subsidized nets are from UNICEF. The following tables show respondent unprompted, prompted, and total (unprompted plus prompted) brand awareness.

- Very few (4%) could name a brand of net or ITN spontaneously (unprompted) and no single brand/name was mentioned by more than 2% of respondents overall. In the city of Accra, however, 11% mentioned NetMark.
- After being shown the card of logos and read the brand names, 26% recognized UNICEF/SiamDutch. The next highest name/logo recognitions were NetMark (15% - NetMark brand awareness was highest in Accra site, urban areas, and among the highest SES quintile—all groups with highest TV ownership), PermaNet (11%), and K-O Net (11%).
- Total awareness, as calculated by the addition of unprompted and prompted responses, was highest for UNICEF/SiamDutch (27%), NetMark (17%), PermaNet (11%), and K-O Net (11%). A large proportion of respondents (41%) did not recognize any brand even after being shown the logos and told the names.

Table 6.5 Awareness of mosquito control product brand names, unprompted

Among all respondents (multiple responses possible)

	Total	Sites (city plus surrounding rural areas)					Urban Accra Only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
DawaNet	0.1	.7	.0	.0	.0	.0	1.7	.3	.0	.0	.0	.0	.0	.7
Iconet	0.1	.3	.0	.0	.3	.0	.0	.2	.1	.0	.0	.0	.0	.7
KO Net	0.4	.3	.0	.3	.7	.7	.8	1.0	.0	.0	.3	.0	.3	1.3
NetMark	2.1	5.0	.0	.3	5.0	.3	10.8	5.0	.2	.3	1.0	.0	.7	8.7
PermaNet	0.6	.3	.0	.3	1.0	1.3	.8	1.2	.2	1.3	.7	.0	.0	1.0
UNICEF/SiamDutch	1.2	1.3	.7	.0	3.0	1.0	2.5	1.8	.8	.7	1.0	1.0	1.3	2.0
No brand mentioned	95.9	92.7	98.7	99.3	92.0	97.0	85.8	92.0	98.6	97.7	97.3	98.3	97.7	88.7
BASE	1500	301	301	300	299	299	120	599	901	302	296	302	300	300

Table 6.6 Awareness of mosquito control product brand names, prompted

Among all respondents (multiple responses possible)

	Total	Sites (city plus surrounding rural areas)					Urban Accra Only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
DawaNet	3.2	5.0	5.3	1.7	2.0	2.0	5.8	4.2	2.6	1.7	1.7	1.3	4.7	6.7
Iconet	5.5	7.0	5.6	3.0	6.4	5.4	7.5	6.7	4.7	3.0	4.7	5.6	7.3	6.7
KO Net	10.6	5.6	9.6	7.7	12.7	17.4	5.8	11.7	9.9	9.3	10.5	7.9	14.7	10.7
NetMark	14.5	22.9	11.3	14.3	12.4	11.7	35.8	20.7	10.4	8.6	11.5	10.9	14.7	27.0
PermaNet	10.8	6.0	12.6	5.3	11.7	18.4	9.2	13.0	9.3	9.9	7.4	9.9	15.0	11.7
UNICEF/SiamDutch	25.7	24.6	26.9	22.7	24.4	30.1	23.3	24.9	26.3	22.5	23.6	29.5	29.0	24.0
No brand recognized	42.9	43.9	45.2	56.0	43.1	26.1	31.7	37.9	46.2	49.7	48.6	45.0	36.7	34.3
BASE	1500	301	301	300	299	299	120	599	901	302	296	302	300	300

Table 6.7 Awareness of mosquito control product brand names, total unprompted and prompted

Among all respondents (multiple responses possible)

	Total	Sites (city plus surrounding rural areas)					Urban Accra Only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
DawaNet	3.3	5.6	5.3	1.7	2.0	2.0	7.5	4.5	2.6	1.7	1.7	1.3	4.7	7.3
Iconet	5.6	7.3	5.6	3.0	6.7	5.4	7.5	6.8	4.8	3.0	4.7	5.6	7.3	7.3
KO Net	11.0	6.0	9.6	8.0	13.4	18.1	6.7	12.7	9.9	9.3	10.8	7.9	15.0	12.0
NetMark	16.7	27.9	11.3	14.7	17.4	12.0	46.7	25.7	10.7	8.9	12.5	10.9	15.3	35.7
PermaNet	11.4	6.3	12.6	5.7	12.7	19.7	10.0	14.2	9.5	11.3	8.1	9.9	15.0	12.7
UNICEF/SiamDutch	26.9	25.9	27.6	22.7	27.4	31.1	25.8	26.7	27.1	23.2	24.7	30.5	30.3	26.0
None	40.9	39.2	44.2	56.0	39.5	25.4	24.2	34.4	45.2	48.3	48.0	44.0	35.7	28.3
BASE	1500	301	301	300	299	299	120	599	901	302	296	302	300	300

6.3 AWARENESS AND USE OF COILS AND AEROSOLS

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

To measure awareness, respondents were shown a card including images of coils and aerosols. The interviewer pointed to and named each, and asked whether the respondent knew of the method.

- Awareness of coils was nearly universal (100%) and extremely high for aerosols (94%).

Table 6.8 Awareness of mosquito control products and methods

Among all respondents (multiple responses possible)

	Total	Sites (city plus surrounding rural areas)					Urban Accra Only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Aware of coils	99.8	99.7	99.7	99.7	100.0	100.0	100.0	100.0	99.7	99.7	99.3	100.0	100.0	100.0
Aware of aerosol	94.3	98.3	93.0	96.0	92.3	91.9	100.0	96.5	92.9	87.7	92.6	95.0	97.3	99.0
BASE	1497	301	301	300	297	298	120	598	899	300	296	301	300	300

If a respondent was aware of coils or aerosols, she was asked whether she had used that method in the prior year. (Note that “use” figures in the tables are based on all respondents; respondents who were not aware were assumed to be non-users.)

- Use of commercial mosquito control products was moderate: 62% reported using coils in the past 12 months, and 30% reported using aerosols during that period.
- Use of these products differed by site. Coil use was highest in Wa and Tamale sites (over 73% compared to under 57% in the other three sites). Aerosol use was highest in Wa (40%) and Accra (35%) sites compared to the other three sites (under 30%). Urban respondents were also much more likely to use aerosols during the last year than rural respondents (48% vs. 19%).
- Aerosol use rose sharply with SES level—from 9% in the lowest to 62% in the highest SES group. Coil use did not differ much by SES.

Figure 6.2

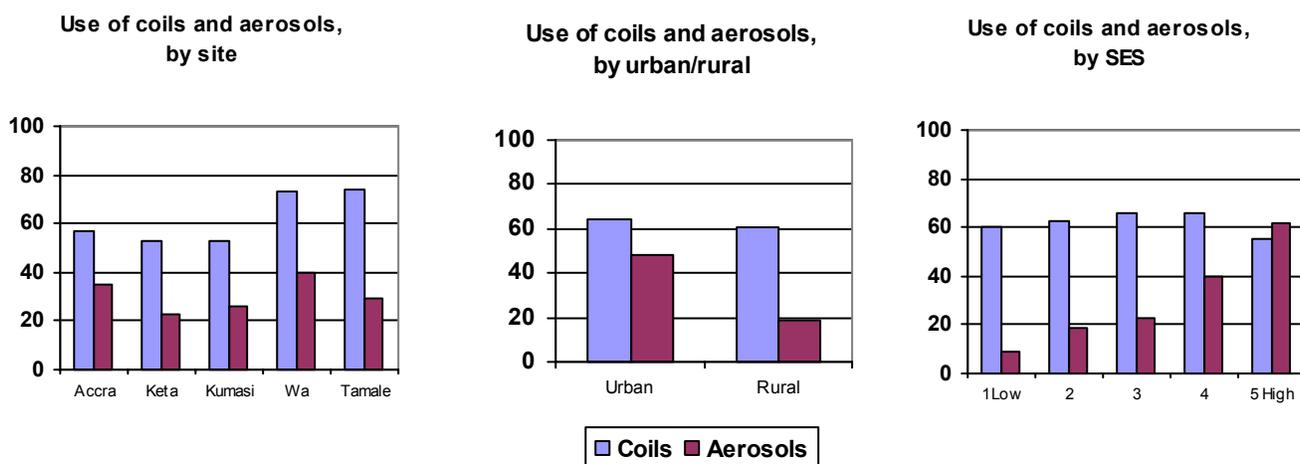


Table 6.9 Use of commercial mosquito control products in last 12 months

Among all respondents (multiple responses possible)

	Total	Sites (city plus surrounding rural areas)					Urban Accra	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Used mosquito coils	61.9	56.8	52.8	52.7	73.2	74.2	50.0	64.4	60.3	60.3	62.5	65.9	65.7	55.3
Used aerosol	30.4	34.6	22.6	26.3	39.5	29.1	60.0	48.1	18.6	8.6	18.9	22.8	40.0	61.7
BASE	1500	301	301	300	299	299	120	599	901	302	296	302	300	300

- Coils were used frequently: of the 62% of households that had purchased mosquito coils in the last 12 months, 46% reported using them daily and another 32% used them several times a week. There was no difference in the frequency of use by SES: 42% of respondents in the lowest and highest SES categories who used coils did so daily.
- Of the 62% of households that had purchased coils in the last 12 months, most (70%) bought them from a local kiosk or table-top vendor. No other source was higher than 10% in the total sample.

Table 6.10 Frequency of mosquito coil use

Among households that used mosquito coils in the 12 months before the interview

	Total	Sites (city plus surrounding rural areas)					Urban Accra	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Every day	46.0	39.2	43.5	38.6	50.5	53.8	43.3	49.9	43.2	42.0	45.1	47.0	52.8	42.2
Several times (2 to 6) a week	32.0	36.8	29.9	34.8	25.2	34.4	35.0	27.5	35.2	37.6	32.1	27.8	30.1	33.1
Once a week / Several times a month	14.5	18.7	14.9	13.9	17.4	8.6	11.7	13.8	15.1	13.3	12.5	17.2	13.0	16.9
Once a month	3.4	1.8	5.2	5.7	2.8	2.3	1.7	4.2	2.8	3.9	4.9	3.5	2.1	2.4
Less than once a month	4.1	3.5	6.5	7.0	4.1	.9	8.3	4.7	3.7	3.3	5.4	4.5	2.1	5.4
BASE	922	171	154	158	218	221	60	385	537	181	184	198	193	166

Table 6.11 Place where mosquito coils were purchased

Among households that used mosquito coils in the 12 months before the interview

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Open air / structured market	9.8	10.6	13.3	5.1	10.0	9.9	10.0	10.9	9.0	9.3	10.3	11.6	10.7	6.7
Local kiosk / tabletop vendor	69.5	72.4	48.7	71.5	78.1	72.1	70.0	65.2	72.5	74.7	74.1	66.2	67.0	65.5
Itinerant vendor	.5	.0	2.5	.6	.0	.0	.0	.5	.6	.5	.5	1.0	.5	.0
Wholesaler	.1	.0	.0	.0	.0	.5	.0	.3	.0	.0	.5	.0	.0	.0
Pharmacy / chemist / drug store	3.8	3.5	5.7	4.4	1.4	4.5	1.7	3.1	4.2	3.3	2.7	5.1	5.6	1.8
Petrol station / Mobil mart	.2	.0	.0	.0	.0	.9	.0	.5	.0	.0	.0	1.0	.0	.0
Minimart / Supermarket	6.8	8.8	6.3	5.1	2.7	10.8	10.0	6.5	7.0	7.1	3.8	7.1	5.6	10.9
General shop	9.3	4.7	23.4	13.3	7.8	1.4	8.3	13.0	6.6	4.9	8.1	8.1	10.7	15.2
BASE	927	170	158	158	219	222	60	385	542	182	185	198	197	165

- Among the 30% of households that had purchased aerosols in the last 12 months, 19% reported using them daily during the mosquito season (33% in Tamale), and another 34% said they used them several times a week.
- Sources of aerosols varied greatly by urban/rural location. Rural respondents were twice as likely to cite market as their usual source, while urban respondents were twice as likely to cite supermarkets (highest source in urban areas) as their usual source and also more likely to cite petrol station/mart (12% vs. 2% for rural).

Table 6.12: Frequency of aerosol insecticide use

Among households that used aerosol insecticides in the 12 months before the interview

	Total	Sites (city plus surrounding rural areas)						Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale	Urban Accra only	All Urban	All Rural	1 Low	2	3	4	5 High
Every day	18.9	19.2	8.8	10.1	19.5	33.3	20.8	20.5	16.1	11.5	19.6	27.5	23.3	13.5
Several times (2 to 6) a week	33.6	45.2	17.6	40.5	28.8	32.2	47.2	37.8	26.2	23.1	14.3	24.6	35.0	43.2
Once a week / Several times a month	24.8	22.1	27.9	22.8	22.9	29.9	20.8	21.9	29.8	42.3	30.4	21.7	20.8	24.3
Once a month	11.0	9.6	20.6	8.9	14.4	2.3	8.3	11.1	10.7	3.8	7.1	14.5	10.0	12.4
Less than once a month	10.7	3.8	22.1	16.5	12.7	2.3	2.8	8.3	14.9	19.2	26.8	10.1	9.2	5.9
Once a year	.7	.0	2.9	1.3	.0	.0	.0	.3	1.2	.0	1.8	.0	1.7	.0
Don't know	.4	.0	.0	.0	1.7	.0	.0	.0	1.2	.0	.0	1.4	.0	.5
BASE	456	104	68	79	118	87	72	288	168	26	56	69	120	185

Table 6.13: Place where aerosol insecticides were purchased

Among households that used aerosol insecticides in the 12 months before the interview

	Total	Sites (city plus surrounding rural areas)					Urban	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale	Accra Only	All Urban	All Rural	1 Low	2	3	4	5 High
Open air / structured market	24.8	19.4	15.2	14.1	34.2	35.4	17.1	18.4	35.8	62.5	41.5	20.3	28.8	14.0
Local kiosk / tabletop vendor	21.6	23.5	9.1	14.1	37.7	13.4	18.6	20.6	23.3	16.7	20.8	26.6	24.3	19.0
Itinerant vendor	.2	.0	1.5	.0	.0	.0	.0	.0	.6	4.2	.0	.0	.0	.0
Wholesaler	.7	.0	.0	1.4	.9	1.2	.0	.4	1.3	.0	3.8	.0	.9	.0
Pharmacy / chemist / drug store	7.9	13.3	13.6	5.6	5.3	2.4	18.6	9.2	5.7	4.2	7.5	3.1	5.4	11.7
Petrol station / Mobil mart	8.6	10.2	3.0	15.5	1.8	14.6	12.9	12.1	2.5	4.2	1.9	7.8	7.2	12.3
Minimart / Convenience Store / Supermarket	18.3	24.5	10.6	23.9	12.3	20.7	24.3	22.4	11.3	4.2	7.5	18.8	15.3	25.1
General shop	17.6	9.2	47.0	23.9	7.9	12.2	8.6	16.9	18.9	4.2	15.1	23.4	18.0	17.9
Other	.2	.0	.0	1.4	.0	.0	.0	.0	.6	.0	1.9	.0	.0	.0
BASE	431	98	66	71	114	82	70	272	159	24	53	64	111	179

6.4 ASSOCIATION OF ATTRIBUTES WITH NETS, ITNs, COILS AND AEROSOLS

Respondents were asked which mosquito control products (coils, aerosols, untreated nets and treated nets) they thought of when each of a list of nine mosquito control product attributes was named:

1. Kills mosquitoes
2. Is a modern solution to mosquito problems
3. Keeps mosquitoes away while sleeping
4. Kills insects other than mosquitoes
5. Is safe to use around children
6. Is good value to the money
7. Is a long-term solution to mosquito problems
8. Is a high quality product
9. Reduces malaria

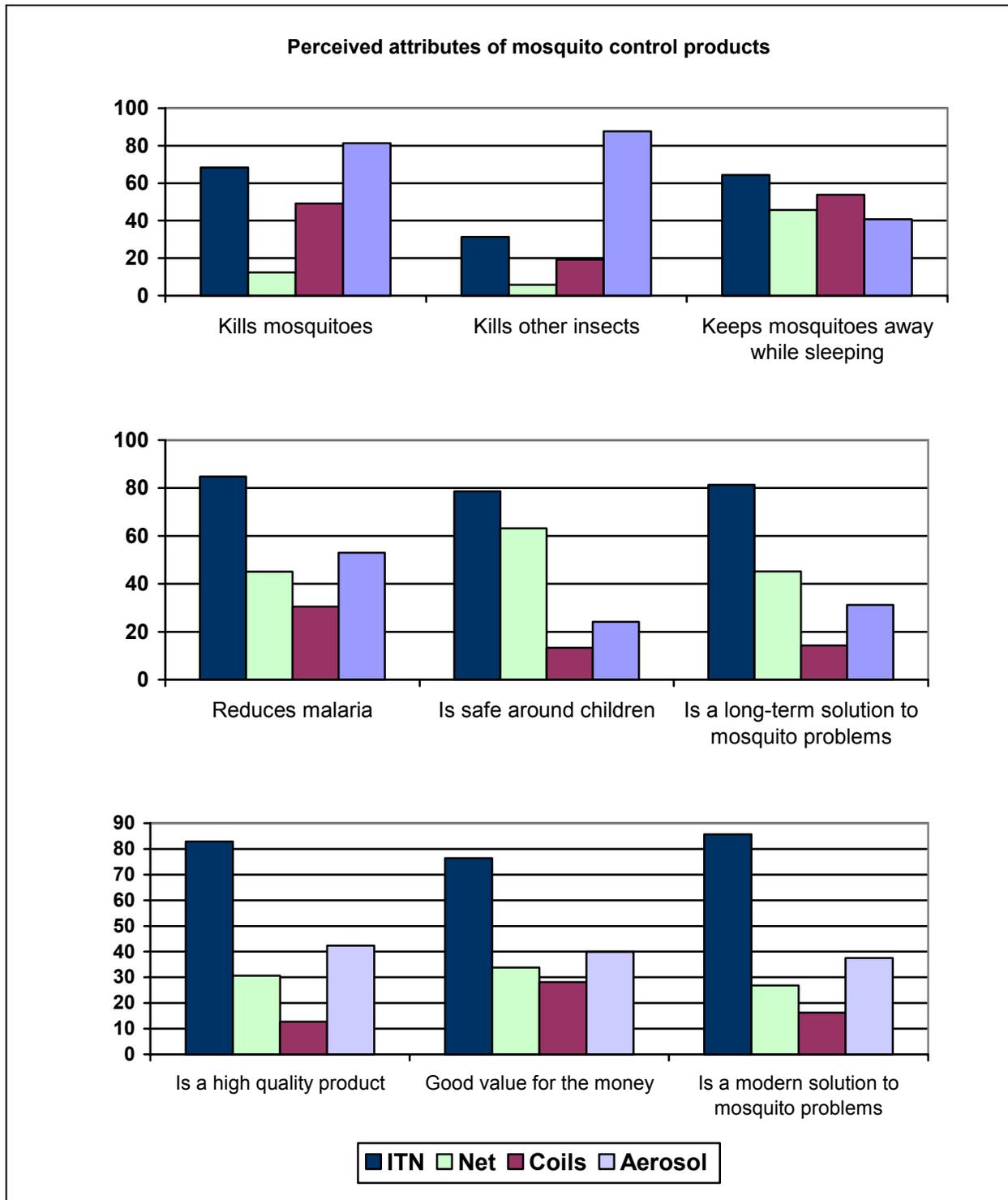
The respondent could indicate more than one product per attribute. (Note that the base is respondents who were aware of a given product. The table indicates the percentage of those respondents selecting a given product when a particular attribute was named.)

- Treated mosquito nets were very highly regarded and were most associated with seven of the nine attributes. The product associated most with the other two attributes—“killing mosquitoes” and “killing other insects”—was aerosol. Treated nets were next most associated with these two “killing” attributes.
- Mosquito nets — untreated — were second most (after ITNs) associated with being safe around children and being a long-term solution. They were least associated with killing mosquitoes and other insects.
- Aerosols were second most (after ITNs) associated with being a modern solution, good value for the money, high quality product, and reducing malaria and least associated with keeping mosquitoes away while sleeping.
- Coils were least associated with the most attributes.

Table 6.14: Association of mosquito control products and attributes
Among respondents who are aware of specific mosquito control products (multiple responses possible)

Attribute	Coils	Aerosol	Net	ITN	None	Don't Know
Kills mosquitoes	49.1	81.3	12.4	68.3	0.3	1.0
Keeps mosquitoes away while sleeping	53.8	40.7	45.7	64.3	0.3	1.3
Kills other insects	19.2	87.7	5.8	31.3	1.7	4.2
Is safe around children	13.3	24.1	63.2	78.7	0.8	2.1
Good value for the money	28.1	39.9	33.8	76.4	0.5	1.9
Is a long-term solution to mosquito problems	14.3	31.2	45.2	81.3	1.0	2.1
Reduces malaria	30.5	53.0	45.1	84.8	1.1	4.3
Is a modern solution to mosquito problems	16.2	37.5	26.8	85.7	0.4	1.5
Is a high quality product	12.7	42.3	30.6	82.9	0.8	1.9
BASE	1494	1412	1461	1371	1500	1500

Figure 6.3



SECTION 7

PROGRAM/PRODUCT IMPLICATIONS

GENERAL

There are the beginnings of a “net culture” in many parts of Ghana, and the situation is extremely favorable for further expanding ITN ownership and use. The focus now should be on increasing availability and variety; on reducing the cost of ITNs, especially for vulnerable groups; on using motivational keys to convert non-owners to owners; and on treatments that convert nets to long-lasting insecticide-treated nets (LLINs), given the large quantity of untreated nets already in households. Additionally, special effort is needed to encourage pregnant women to sleep under an ITN.

Favorable factors include:

- Nets are accepted in much of Ghana; they are widely used across SES groups, in urban and rural households, and are generally favorably viewed.
- The great majority of respondents had been exposed to messages about ITNs in the past year; current channels are reaching people.
- The vast majority of people have heard of ITNs. People know that ITNs are more effective than untreated nets; perceive them to be effective against malaria; and do not have negative perceptions of the insecticide.
- A high proportion of nets was obtained in the past 1-2 years, indicating that recent promotion and distribution efforts have been effective.
- Most nets/ITNs are from the commercial sector, suggesting that people see nets/ITNs as a valued commodity that is worth the price.
- There is relatively high use of aerosols and very frequent use of coils, suggesting that people see mosquitoes as a problem and find it worthwhile to pay to combat the problem.
- ITNs are more favorably viewed than aerosols and coils on most desired attributes; people may be open to substituting ITNs for aerosols and coils.
- Within net-owning households, the youngest children are given preference for sleeping under a net and it should be easy to reinforce and expand this practice.

Main barriers to overcome are:

- Within net-owning households, pregnant women are not much more likely than other women to sleep under a net; incentives are needed to translate knowledge of vulnerable groups into practice.
- Many nets owned are not used, so family members in net-owning households do not benefit from the protection nets/ITNs afford.
- The perceived (and real) cost of nets is still high for many households – especially among a population largely paid seasonally, mainly after the harvest and end of the rainy season.
- There is still lack of availability in some areas, especially in rural areas, in Tamale, and for households in the lowest SES segment.
- There is lack of variety in net size, shape, and color; and mismatch between features of net/ITN products available and those that consumers want.

- The relatively low education and literacy levels imply that approaches to communication about product use and treatment be simple and clear.
- The commercial sector faces a lack of strong branding of nets.
- The commercial sector plays a very small role in supplying individual net treatment kits.
- Net treatment practices are inadequate; people need to know and act on the fact that they can convert nets to ITNs.
- Misconceptions about causes of malaria other than mosquitoes may limit the perception of ITNs as a solution to malaria.
- The idea that nets are not needed is a barrier in urban and upper SES households, where use of window screens or other insect control products is more common.
- The middle SES group is lowest on many indicators, indicating need to further understand and target this group could be useful

Specific program, product, and promotion implications are outlined below.

MOSQUITO NET/ITN OWNERSHIP

- There is great variation in ownership and use of nets and treated nets by site. Different strategies are needed on a site by site basis, depending on what the site data say the specific focus of efforts should be.
- Since upper as well as lower-SES households own nets, upper SES “model families” can be used in aspirational ads. Ownership might be increased by making ITNs a more attractive and status household item with the features that consumers prefer. (See consumer preferences, below.)
- In low SES areas, nets need to be made more accessible and affordable, and special strategies that target the economically vulnerable should be implemented.
- Many nets were fairly new: 30% were obtained within the prior year. In Kumasi, 45% of nets were obtained with the prior year and 2/3 of them were obtained from the commercial sector. It would be good to get a better understanding of what activities in Kumasi have been effective in causing this recent upsurge in net acquisition from the private sector.
- Baby nets are fairly common – about one-fourth of households own at least one, more among the higher SES quintiles. This is positive as it indicates concern about protecting babies, but people should be encouraged to spend their resources on hanging, treated nets that will protect a child longer than just during infancy, and will afford some protection to others, even if they are not sleeping under a net.
- Special effort is needed to make ITNs more available in Wa and Tamale. A substantial proportion of non-net owners in those sites said that the reason they did not own a net was because nets are not available or they do not know where to find them.
- Although cost is cited by respondents as the most important barrier to net/ITN ownership (even among the highest SES level), the fact that over one-third of households own a net and that most of those nets are from the private sector indicates a high willingness to pay and suggests that cost is not the major barrier, except probably at the lowest SES levels.
- ITNs are more favorably viewed than aerosols and coils on most desired attributes, but are ranked very low on “kills other insects.” Apparently people do not know that ITNs can kill other insects, presenting a opportunity for promotion to make this link. Further, if ITNs were promoted as more economical in the long run, then more people might substitute ITNs for other commercial products. It also suggests that where possible, retailers, employers, women’s or youth groups, and others should consider allowing installment plans for payment.

- The idea that nets are not needed is a barrier in urban and upper SES households. Net ownership and use is lowest in Accra, and capital cities often set an example and influence other parts of the country; since use of screens and other insect control products is high in Accra and other urban areas, it may be useful to promote nets as a decorative and status item in addition to their protective value.
- Half of all nets were acquired by the female head of household, a quarter by the husband and the remaining quarter by other family members. ITN purchase messages may need to be targeted differently to various household members. Alternatively, an attempt to include the woman and husband or woman and mother/mother-in-law in the same communication materials might be useful.

NET TREATMENT

- Some consumers are unsure whether their nets are treated. Ideally a visible indicator on the net to show whether it has been treated, and whether the treatment is still effective, could be found.
- Almost all respondents had heard of ITNs, but few own them. It is essential to encourage purchase of LLINs and to make treatments readily available so that existing nets can be converted to ITNs. Mass treatment campaigns should be considered and efforts should also be made to make treatment kits more widely available in the commercial sector. Effective promotional and communication strategies should be used to encourage families to bring their nets for re-treatment or to purchase treatment kits themselves. Such a campaign can emphasize the effectiveness of net treatment in killing/repelling mosquitoes and other insects — valued attributes of mosquito control products that are not currently associated with nets. Marketing of long-lasting insecticide-treated nets and treatments will help to overcome the challenge of getting people to re-treat nets.
- When nets tear, people tend to keep them but not use them. By promoting the idea that old nets can be inexpensively “brought back to life” by treating them—that even nets with tears and holes will protect against mosquitoes and other insects if treated—many of these currently unused nets might be put into use.
- The methods and approaches to communicating about treatment, including treatments that convert nets to LLINs, must take into account the relatively low levels of literacy and education, which will make it difficult for many to understand instructions included in packaging, even in pictorial form. Commercial partners selling treatment kits will likely need to include significant person-to-person communication and product demonstrations in their marketing plans.
- The fact that over one-third of nets owned are tailor-made presents a special challenge for net treatment campaigns. Messages need to affirm that tailor-made nets *can* be treated, but those messages must be based on an understanding of how to adapt treatment practices to the variety of fabrics used in these nets. Consideration should be given to encouraging bundling of locally manufactured (tailored) nets with insecticide treatments.
- Given the preference for colored nets, consideration should be given to exploring the feasibility of adding dye to the treatment product so that the consumer would have a double incentive for treating a net: enhancing both its beauty and effectiveness. The special treatment packets could come in several colors so that the consumer could choose among colors.
- The majority of nets owned by households that had been washed were washed at least once a month. Consumers need to understand, through promotional messages, that frequent washing will reduce the effectiveness and life of the ITN and that it is better to reduce washing frequency.

APPROPRIATE USE

- The majority of respondents knew the groups most vulnerable to a severe case of malaria. However, pregnant women were not much more likely than non-pregnant women of reproductive age to sleep under a net/ITN. Although a small minority of respondents specifically expressed safety fears, the safety of treated nets for

pregnant women should be emphasized. Safety concerns were higher in urban areas and much higher in Wa (where *no* pregnant woman slept under an ITN) than other sites. Since the clinic is the source of half the nets in Wa, special efforts by health staff to reassure women about the safety of ITNs as well as to emphasize the importance of being protected by them are likely to be effective.

- Given that many families use their nets only part of the year, once ownership levels in the country are satisfactory, a second stage of behavior change strategies will be needed to encourage year-round net use in areas of stable transmission and address any barriers to doing so. It would be important to have a better understanding of the barriers to year-round use in order to inform the behavior change communication strategy and content.

CONSUMER PREFERENCES AND PERCEPTIONS

- Since the great majority of people are already aware of ITNs, promotional efforts can move beyond awareness and focus on positioning nets in a way that motivates people to buy and use them. Motivational points include: (1) associating ITNs with killing mosquitoes as well as with killing other insects; (2) the safety of ITNs, especially when compared with other insect control products, and (3) the long-range economical benefit. ITNs are already seen as being a high quality product, a modern solution to mosquito problems, and as effective in reducing malaria; these ideas need to be only lightly reinforced.
- The characteristics of nets owned do not match consumer preferences. Product distribution should take into consideration consumer preferences for king-sized nets, both rectangular and conical nets, and more variety of color (especially turquoise, green, pink, and light and dark blue) to raise sales and enhance strength of brand. Brand owners and distributors who specialize in colored, conical, or king size nets could distinguish their brand on the basis of these characteristics to gain market share. Given that most nets owned are white but most people prefer colored nets, there is an opportunity to expand the market by offering additional preferred colors. Decisions to promote colored nets should be balanced with scientific evidence of the efficacy and duration of treatment products on colored fabric.
- Distribution plans should be adjusted to shape and color preferences by geographical location (site, urban-rural). For example, rectangular and conical nets were equally preferred in Tamale and rectangular nets were more preferred in Keta and Wa than conical ones. And regarding colors, turquoise and green were strongly preferred in Tamale, white, pink and light blue most strongly in Accra and Keta.
- There is very low brand recognition, even among net-owners. Commercial manufacturers and distributors should be encouraged to invest in brand promotion. NetMark brand and slogan awareness was highest in Accra, in urban areas, and among the highest SES quintile, all of which have higher television ownership than comparative groups, suggesting a relationship between TV advertising and NetMark awareness. Brand owners and distributors will need to more actively build their brands through a range of above-the-line and below-the-line activities, such as point-of-purchase promotions, television, radio, and point-of-sale materials. Brand-specific advertising is likely to be most effective if it is associated with the benefits and features that consumers want.

KNOWLEDGE AND BELIEFS ABOUT MALARIA AND MOSQUITOES

- Recognition of the English term “malaria” was nearly universal, meaning that the term will be understood by almost everyone who hears promotional material. Use of a single term around which educational efforts can build a common understanding is important in efforts to promote behavior change.
- There is some confusion about causes of malaria other than mosquitoes. However, this lack of understanding does not appear to be a barrier to net acceptance and use. Although it is desirable that people be better informed, this need not be the main emphasis in promotion of ITNs.

- The majority of respondents knew the groups most vulnerable to a severe case of malaria, but more effort needs to be directed toward getting a higher proportion of pregnant women to sleep under an ITN. Suggestions how to do so are included in “Appropriate Use”, above.

ANNEX A: SAMPLING PLAN AND PROCEDURE

The following is a description of the sampling plan as well as a comparison of this sample with national random samples.

PLAN AND PROCEDURE

The sample was composed of 1500 Ghanaian households. Respondents were women of reproductive age (15-49) who were mothers or guardians of children under five years of age.

The sample was drawn from five primary sites: Accra, Keta, Kumasi, Wa and Tamale. In each site, the target sample was 300: 120 respondents from the urban center, and 180 households from up to 200 kilometers from the urban center. Table 1.1 shows the actual distribution by site. The sampling strategy resulted in an urban-rural ratio of 40:60, which approximates that of Ghana. (The Demographic and Health Survey of 2003 is 41.5% urban.)

In the interest of comparability, the same procedure was used in all countries surveyed. A multistage sampling procedure was used to select respondents, as follows.

1- Selection of primary sampling units: Purposive sampling was used to select five sites across the country where NetMark was active in product distribution and/or programs to provide targeted subsidies for women who were pregnant or who had a child under five. In every country except Ethiopia, the capital was included as a site.

2- Selection of sampling points: Within each of the five sites, 30 sampling points (villages or urban neighborhoods) were randomly selected from electoral lists using quota sampling: 12 from within the city ("urban"), 9 from within 100 kilometer radius from the city and 9 from within a 100-200 kilometer radius from the city ("rural"). At each sampling point, ten households were selected for the sample.

This stratification scheme was designed to meet the purposes of the evaluation. Since a key objective of NetMark is to increase ownership of ITNs 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 where lower socio-economic status (SES) individuals typically reside.

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, 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.

HOW THE SAMPLE MAY DIFFER FROM NATIONALLY RANDOM SAMPLES

This sampling procedure was designed to meet the purposes of this study (which was neither desirable nor feasible for this study). This procedure may result in findings that would differ from those obtained from a true national random sample (which was neither desirable nor feasible for this study):

- a) Only households with children under five were included in the sample, and households with young children are more likely than others to own a net.
- b) The sample was drawn only from areas where malaria is a problem. Net ownership will be much higher in areas where malaria is a problem than in other areas.
- c) Various organizations have had net/ITN promotional activities in areas in Ghana included in the study. (See introduction for description.) Because there are five primary sites rather than a randomly distributed sample, if a site is unusually high or low in coverage, it will have a disproportionate impact on the overall ownership and use figures. For example, if a donor or project were particularly active in a site and coverage is very high, that high coverage will count as 20% of the entire sample, even though the site does not account for 20% of the population nationally.
- d) When net ownership in the capital is lower than in other areas, overall levels of ownership and use will be higher than a random sample because the sample included the same number of respondents per site, even though proportionally the capital has more people than other sites.

The following shows the population of the states in which the primary sites were located. Note, however, that the sampling was not conducted by state, but by selected urban area plus surrounding rural areas up to 200 kilometers from the urban center; therefore the site sampling can cross state boundaries.

Table A.1 Population of Region in which the sites included in the sample are located

Site	Region	Population of Region (2000 census)
Accra	Greater Accra	2,903,753
Keta	Volta	1,630,254
Kumasi	Ashanti	3,600,358
Wa	Upper West	575,579
Tamale	Northern	1,805,428

- e) Only women of reproductive age were selected as respondents. Responses from men or from older women may differ from those of women of reproductive age.

ANNEX B

CHARACTERISTICS OF RESPONDENTS AND HOUSEHOLDS, AND SES SCALE

This Annex provides tables of variables describing respondents and households in the sample, as well as a description of how these variables were combined to construct a socio-economic status (SES) scale.

CHARACTERISTICS OF RESPONDENTS

Table B.1 Characteristics of respondents

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio economic status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
AGE GROUP														
15-19 years	3.6	4.7	5.0	4.7	2.3	1.3	4.2	3.3	3.8	3.0	3.0	4.3	4.7	3.0
20-29 years	45.3	46.5	39.9	49.3	46.5	44.1	38.3	39.2	49.3	47.4	47.6	47.4	45.0	39.0
30+ years	51.1	48.8	55.1	46.0	51.2	54.5	57.5	57.4	46.9	49.7	49.3	48.3	50.3	58.0
Mean age	29.8	30.0	30.3	29.1	29.8	29.9	31.0	30.7	29.2	29.5	29.7	29.3	29.6	31.0
EDUCATION														
None	36.3	15.9	17.9	15.7	53.8	78.6	8.3	29.4	41.0	71.5	45.3	32.1	26.7	6.0
1-3 years	5.0	5.3	6.0	5.0	4.7	4.0	5.0	5.3	4.8	6.3	5.1	5.6	5.7	2.3
4-6 years	12.7	17.6	12.3	16.0	12.0	5.4	9.2	12.5	12.8	7.9	13.9	16.9	16.3	8.3
7-9 years	24.3	32.6	33.6	37.3	13.7	4.3	28.3	22.4	25.6	10.3	25.7	29.5	30.0	26.3
10-12 years	16.5	16.9	25.9	23.0	11.0	5.7	25.0	20.2	14.1	3.6	9.8	14.6	18.7	36.0
13+ years	5.1	11.6	4.3	3.0	4.7	2.0	24.2	10.2	1.8	.3	.3	1.3	2.7	21.0
BASE	1500	301	301	300	299	299	120	599	901	302	296	302	300	300

CHARACTERISTICS OF HOUSEHOLDS

Table B.2 Household distribution and composition

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio economic status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
Number of households in sample	1500	301	301	300	299	299	120	599	901	302	296	302	300	300
Average number of people in HH	5.2	4.7	5.0	5.6	5.4	5.3	4.8	5.2	5.2	5.4	5.5	5.1	5.0	5.0
Average number of women of reproductive age in HH	1.4	1.4	1.3	1.5	1.4	1.3	1.6	1.5	1.3	1.3	1.4	1.3	1.4	1.5
Average number of children under 5 in HH	1.3	1.3	1.2	1.5	1.3	1.4	1.4	1.3	1.4	1.5	1.4	1.3	1.2	1.3

Table B.3 Age distribution of household members

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
0	5.7	5.3	6.4	6.2	5.0	5.6	5.5	4.9	6.2	6.1	5.7	6.1	5.3	5.2
1	4.4	4.8	5.0	4.6	3.1	4.5	4.7	4.1	4.6	5.3	4.4	4.4	4.1	3.7
2	4.6	5.3	4.2	5.3	4.0	4.2	4.8	4.5	4.7	4.4	4.6	4.1	4.8	5.1
3	5.1	4.6	5.0	5.3	5.7	5.0	5.4	4.9	5.3	5.1	5.5	5.0	4.9	5.1
4	5.9	7.9	4.2	5.3	5.5	6.5	8.5	6.0	5.8	6.1	5.8	6.4	5.1	5.8
5-14	24.8	20.6	23.7	23.7	28.5	27.1	18.0	24.5	25.0	27.5	23.8	25.6	24.0	22.9
15-49	43.0	44.9	43.0	41.9	43.3	42.1	48.6	44.7	41.9	39.4	41.9	41.8	45.6	46.6
50+	5.3	4.2	6.0	6.9	4.7	4.7	4.0	5.6	5.1	4.8	6.7	5.1	5.2	4.9
Don't know	1.2	2.3	2.6	.8	.2	.3	.5	.9	1.4	1.2	1.7	1.5	.9	.7
BASE	7824	1429	1511	1669	1625	1590	578	3096	4728	1643	1614	1552	1510	1505

SOCIO-ECONOMIC CHARACTERISTICS

Table B.4 Socio-economic status (SES) indicators

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural		Socio-Economic Status				
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural	1 Low	2	3	4	5 High
HEAD OF HOUSEHOLD														
Self	14.3	18.9	17.9	18.0	12.7	3.7	21.7	16.9	12.5	12.6	16.6	14.2	14.3	13.7
Husband	68.9	63.8	60.8	58.7	76.6	84.6	60.8	66.4	70.5	68.9	64.5	70.2	67.3	73.3
Father	6.4	5.3	5.6	10.0	3.7	7.4	6.7	5.8	6.8	7.3	9.1	3.6	6.3	5.7
Brother	.8	.7	1.3	.7	.7	.7	.0	.5	1.0	1.3	.7	.3	1.3	.3
Mother	6.0	7.6	9.0	9.0	3.7	.7	7.5	6.2	5.9	7.0	5.7	7.3	6.0	4.0
Sister	.8	1.3	.7	1.3	.7	.0	1.7	1.2	.6	.3	.3	1.0	1.0	1.3
Other	2.9	2.3	4.7	2.3	2.0	3.0	1.7	3.0	2.8	2.6	3.0	3.3	3.7	1.7
INCOME REGULARITY														
Regular	24.8	47.2	17.6	19.7	18.7	20.7	62.5	36.7	16.9	1.0	6.1	19.9	35.3	61.7
Occasional	35.7	31.2	52.2	41.7	34.1	19.1	31.7	43.4	30.5	19.5	33.4	44.7	46.3	34.3
Seasonal	39.0	20.6	28.9	38.7	46.8	60.2	4.2	19.2	52.2	79.5	59.8	34.8	18.0	3.0
Don't Know	.5	1.0	1.3	.0	.3	.0	1.7	.7	.4	.0	.7	.7	.3	1.0
HEAD OF HOUSEHOLD YEARS OF SCHOOLING														
None	4.1	2.3	3.0	4.3	8.4	2.3	1.7	5.2	3.3	6.6	6.8	4.0	2.7	.3
1-5 years	4.1	4.0	4.3	3.7	4.3	4.3	2.5	4.5	3.9	6.3	4.7	3.6	3.7	2.3
6-12 years	47.5	55.1	61.5	65.3	29.4	26.1	51.7	47.2	47.7	20.9	49.0	57.0	58.3	52.7
13 years or more	12.9	21.9	13.6	11.3	9.4	8.0	35.0	19.5	8.4	.7	2.7	8.6	13.3	39.0
Don't know	31.4	16.6	17.6	15.3	48.5	59.2	9.2	23.5	36.6	65.6	36.8	26.8	22.0	5.7
HOUSEHOLD ASSETS														
Electricity	59.6	85.0	62.8	64.7	39.1	46.2	92.5	74.0	50.1	5.6	36.5	66.2	91.3	98.3
Radio	78.1	82.7	70.4	75.7	84.3	77.3	92.5	83.8	74.3	53.3	63.9	81.8	92.7	98.7
TV	34.9	52.2	32.2	38.3	27.4	24.4	84.2	56.8	20.4	.0	2.7	18.5	57.7	95.7
Phone	13.6	27.9	10.3	17.3	9.0	3.3	63.3	29.9	2.8	.0	.3	.7	7.7	59.3
Fridge	25.5	39.2	22.6	26.7	22.1	17.1	70.8	44.2	13.1	1.0	1.7	7.3	33.7	84.0
Bike	37.9	14.0	15.6	7.7	70.9	81.6	15.8	35.6	39.4	56.0	37.2	33.1	36.7	26.3
Motorcycle	9.1	2.0	2.0	1.7	21.1	18.7	1.7	11.5	7.4	2.6	7.8	9.3	14.0	11.7
Car	6.7	10.0	6.0	5.7	4.0	7.7	20.8	11.4	3.6	.0	3.4	4.0	6.3	19.7
Cart	1.3	1.0	.0	.3	2.3	3.0	1.7	.8	1.7	.7	1.0	1.7	2.3	1.0
Plough	1.9	.7	.0	.3	5.7	2.7	.8	.8	2.6	2.3	2.0	2.6	1.7	.7
None	8.5	6.0	16.9	10.7	4.0	4.7	2.5	6.2	10.0	26.5	13.2	2.6	.0	.0
SOURCE OF DRINKING WATER														
Piped into home	15.9	27.6	9.0	24.7	9.0	9.4	59.2	35.4	3.0	.3	1.0	4.3	14.3	59.7
Public tap	37.4	42.2	60.1	31.3	21.4	31.8	40.0	50.9	28.4	12.9	32.8	51.7	56.0	33.7
Well into residence	2.8	.3	4.0	1.0	3.0	5.7	.0	2.3	3.1	2.3	3.0	4.0	4.0	.7
Public well	6.0	2.7	9.6	2.7	9.0	6.0	.0	5.8	6.1	9.3	9.8	6.3	3.7	1.0
Public bore hole	24.6	21.3	3.3	24.0	51.2	23.4	.0	4.3	38.1	41.7	37.5	24.8	15.7	3.3
Spring	.8	.0	.7	3.0	.3	.0	.0	.0	1.3	.3	1.4	1.0	1.3	.0
River	9.2	2.3	2.7	13.0	4.3	23.7	.0	.3	15.1	27.2	11.5	5.0	2.3	.0
Pond/lake	.9	.3	3.0	.3	1.0	.0	.0	.0	1.6	2.6	1.4	.0	.3	.3
Tanker truck	1.1	3.0	2.7	.0	.0	.0	.0	.0	1.9	.7	1.4	2.0	1.0	.7
Rainwater	1.0	.0	5.0	.0	.0	.0	.0	.7	1.2	2.0	.3	1.0	1.3	.3
Bottled water	.1	.3	.0	.0	.0	.0	.8	.2	.0	.0	.0	.0	.0	.3
Other	.1	.0	.0	.0	.7	.0	.0	.0	.2	.7	.0	.0	.0	.0
SANITARY FACILITIES														
Flush	5.3	13.3	3.3	7.0	2.0	.7	33.3	12.5	.4	.0	.0	.3	.7	25.3
Shared	4.8	8.3	.0	11.0	3.3	1.3	20.0	9.8	1.4	.0	.7	1.7	3.0	18.7
Trad. pit latrine	16.5	16.3	17.6	24.3	21.1	3.0	8.3	14.4	17.9	9.9	16.6	20.9	20.3	14.7
Ventilated pit latrine	20.3	12.3	30.9	19.0	21.7	17.4	11.7	25.9	16.5	6.3	11.8	21.2	35.0	27.0
None	52.9	49.2	48.2	38.3	51.5	77.6	25.8	36.9	63.6	83.4	70.9	56.0	40.7	13.7
Other	.3	.7	.0	.3	.3	.0	.8	.5	.1	.3	.0	.0	.3	.7

ENERGY SOURCE FOR COOKING

Electricity	.3	.0	.3	.7	.3	.0	.0	.5	.1	.0	.0	.0	.0	1.3
LPG	9.8	19.9	10.3	12.3	5.7	.7	46.7	22.2	1.6	.0	.0	.3	4.7	44.0
Biogas	.1	.7	.0	.0	.0	.0	.8	.2	.1	.0	.0	.0	.0	.7
Kerosene	1.1	1.7	.7	.3	.7	2.0	2.5	1.3	.9	1.0	1.0	.0	1.3	2.0
Coal	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Charcoal	39.0	43.5	49.2	36.7	44.1	21.4	46.7	58.1	26.3	7.6	25.3	46.0	67.0	49.0
Firewood	49.7	34.2	39.5	50.0	49.2	75.9	3.3	17.7	71.0	91.4	73.6	53.6	27.0	3.0
Dung	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Other	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

MAIN FLOORING & WINDOWS WITH MOSQUITO NETTING/SCREENS

Earth	11.6	12.3	17.3	7.0	8.0	13.4	2.5	4.8	16.1	35.4	10.1	7.3	4.0	1.0
Dung	.1	.3	.0	.0	.0	.0	.8	.2	.0	.0	.0	.0	.0	.3
Wood planks	.1	.3	.0	.0	.0	.0	.8	.2	.0	.0	.0	.0	.3	.0
Palm	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Parquet	.1	.0	.0	.3	.0	.0	.0	.2	.0	.0	.0	.0	.0	.3
Vinyl	3.9	14.0	5.6	.0	.0	.0	21.7	5.8	2.7	.3	.0	.7	4.7	14.0
Ceramic	1.3	3.7	.0	2.0	.7	.3	8.3	3.0	.2	.3	.3	.0	.3	5.7
Cement	79.6	64.8	76.1	83.3	88.3	85.6	55.8	80.0	79.4	63.9	89.2	90.4	87.0	67.7
Carpet	3.3	4.7	1.0	7.3	3.0	.7	10.0	5.8	1.7	.0	.3	1.7	3.7	11.0
Screens	45.4	69.1	42.9	47.0	37.8	30.1	90.8	67.6	30.6	1.3	17.2	45.7	72.0	90.7
Other	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
BASE	1500	301	301	300	299	299	120	599	901	302	296	302	300	300

CALCULATION OF SOCIO-ECONOMIC STATUS (SES)

The socio-economic status (SES) scale was developed from the above questions on ownership of assets, household characteristics, and level of education. Most of these variables were drawn from the DHS. Principal components analysis was used to extract the main, single factor that accounted for the largest amount of variance in the data. Using the factor scores from the principal component analysis, respondents were divided into quintiles based on their factor scores.

Table B.5 Distribution of SES levels

	Total	Sites (city plus surrounding rural areas)					Urban Accra only	Urban/Rural	
		Accra	Keta	Kumasi	Wa	Tamale		All Urban	All Rural
1 Low	20.1	5.6	13.6	12.0	32.4	37.1	.8	5.3	30.0
2	19.7	12.3	20.3	23.7	22.1	20.4	.8	10.5	25.9
3	20.1	21.9	25.6	18.3	15.4	19.4	7.5	17.7	21.8
4	20.0	20.9	23.9	21.3	16.4	17.4	10.8	24.9	16.8
5 High	20.0	39.2	16.6	24.7	13.7	5.7	80.0	41.6	5.7
BASE	1500	301	301	300	299	299	120	599	901

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