Knowledge, Attitudes, and Practices Related to Malaria and Insecticide Treated Nets in Uganda

Baseline Survey: December 1999 – January 2000

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FOREWORD

The Commercial Market Strategies project (CMS), funded by the United States Agency for International Development (USAID), is a five-year, flagship project of the Commercial and Private Sector Strategies (CAPS) results package developed by USAID's Center for Population, Health, and Nutrition (PHN). CAPS is a ten-year results package that seeks to increase use of quality family planning and other health products and services through private sector partners and commercial strategies.

CMS is a consortium of leading-edge organizations in the areas of reproductive health and family planning, social marketing, and research:

- **DELOITTE TOUCHE TOHMATSU**, one of the world's leading accounting, auditing, management consulting and tax services firms. Through its Emerging Markets division, Deloitte services donor agencies and emerging economies, coordinating resources from 128 national practices in private sector development, public sector reform, agribusiness, utilities and infrastructure, and finance and health care.

- **ABT ASSOCIATES INC**., one of the largest for-profit consulting and research firms in the United States. Abt works on social and economic policy, international development, business research and consulting, clinical trials and measurement services, and health care finance and reform.

- **MERIDIAN GROUP INTERNATIONAL, INC**., a marketing and communication firm with experience in over 30 countries. Meridian creates innovative public/private partnerships that support reproductive health, environmental security, gender equality and related socio-economic development issues that help corporations achieve their long-term strategic goals.

- **POPULATION SERVICES INTERNATIONAL (PSI)**, an innovative social marketing organization managing projects in more than 50 countries. PSI develops programs to encourage healthful behavior and increase the availability of health products and services at prices that low-income people can afford.

The CMS project works with the private and commercial sectors to increase the accessibility and use of high-quality family planning and other health products and services in developing countries. CMS achieves its goals through a combination of initiatives and strategies including social marketing, commercial partnerships, corporate social responsibility, provider networks, NGO sustainability, endowments, health financing and policy change.

The CMS project in Uganda social markets *Protector* condoms, *Pilplan* oral contraceptives, *Injectaplan* injectable contraceptives, *Clear Seven* urethritis treatment kits for men and health insurance. CMS also works with the Uganda Private Midwives Association (UPMA) to provide technical and financial assistance to expand, improve and strengthen private midwifery practices. In addition, CMS recently launched *Smartnet* insecticide treated nets (ITNs) to combat malaria and will soon introduce *Vikela* emergency contraceptive pills and Clean Delivery Kits for expectant mothers.

As with all CMS /Uganda activities, the Ministry of Health is a key partner and their support has contributed to the success of the research outlined in this report.

This report presents our findings regarding the knowledge, attitudes and practices regarding malaria in four districts of Uganda: Mukono, Jinja, Mbarara and Arua.

CMS is pleased to release this report and reiterate its commitment to improving Ugandans' health by increasing access to and use of high quality family planning and other health products.

Peter Cowley,
Country Director, CMS Project, Uganda

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For further information about this study contact Francis Okello-Ogojo at fokello.cmsug@infocom.co.ug or CMS Uganda, PO Box 3495, Plot 46, Windsor Crescent; Kololo, Kampala, Uganda.

EXECUTIVE SUMMARY

This baseline survey, conducted between December 1999 and January 2000 by the Commercial Market Strategies Project (CMS), was designed to investigate the level of knowledge, attitudes and practices about malaria and insecticide treated nets (ITNs)[1] in four districts of Uganda: Mukono, Jinja, Mbarara and Arua. The key objective of the study was to guide the introduction and social marketing of insecticide treated nets in Uganda and to serve as a basis for future comparison after implementation of CMS's ITN activity.

The study involved 700 face-to-face interviews with key decision-makers (male and female) in urban and rural households aged 15 years and above. Sample selection involved the use of a three-stage cluster random sampling procedure.

Demographic characteristics of respondents

Most of the respondents interviewed were between 20-44 years. In rural areas, the majority had attained an education level of primary or lower and worked in the farming/trade sector. In urban areas the majority of respondents had attained education level above secondary and reported working in the professional sector.

English and Luganda were the languages that most respondents could speak and read.

Nearly half of households (47.5%) had between five and eight people and most (72.2%) had children aged five years or under.

Sleeping arrangements

Two sleeping arrangements were examined: beds and mats. The heads of the household (39.6%) and their spouses (35%) generally slept on beds while children (40%) and visitors (14.9%) mainly slept on mats. Most children aged five or under shared sleeping places either with parents (35.4%) or brothers/sisters (19.6%) — only 31.9% of children slept on their own.

Access to media

Radio was the most owned and consumed media both in rural and urban areas and in all districts surveyed. TV ownership was much lower than radio ownership (15.2% versus 77.9%, respectively). The majority of respondents listened to radio every day with 45.9% of respondents listening in the evening hours.

Knowledge about malaria

Most respondents (99%) knew about malaria, and had heard malaria education messages (70.6%), mainly on radio.

[1] Throughout this report the term "net" is used instead of "bed net" because the majority of people in Uganda refer to bed nets simply as "nets."

Malaria transmission, symptoms and prevention

There was a high level of knowledge that mosquitoes transmit malaria (77.6%) and fever was believed to be the main symptom of malaria by 34% of the respondents. Nearly half of the urban respondents (48.3%) believed that nets were the most effective way to prevent malaria. In contrast, among rural respondents there was limited knowledge of the best methods to prevent malaria.

Severity of malaria

Nearly all respondents (98.1%) believed that malaria could cause death and 84.6% of them observed that they knew someone who had died of malaria. Morbidity due to malaria was also found to be very high — 19.9% of respondents reported that they had had malaria within the last month and 45.5% within the last year. 38.5% of the respondents observed that a child five years or under within their household had suffered from malaria within the last month. There was a strong perception (75.1%) that children under five are more vulnerable to malaria, but only 9.9% perceived that pregnant women are also vulnerable.

Mosquito problems

Almost all respondents (96%) were troubled by mosquitoes and biting was cited by most (76.3%) as the main trouble. Although the fact that mosquitoes carry disease was cited by 52.4% of respondents as a way that mosquitoes cause trouble, rural respondents less frequently cited it. Most respondents (87.6%) noticed a lot of mosquitoes during the rainy season,[2] and 73.8% said that mosquitoes bite most at night when people are in bed.

Protection from mosquitoes

Households surveyed were using both commercial and traditional practices to protect themselves from mosquitoes. The main commercial methods used included insecticide sprays (28%) mosquito coils (24.7%) and nets (22.4%). The use of nets was highest in the districts of Mukono (25.9%) and Mbarara (27.2%) compared to Arua (13.3%) and Jinja (17.3%). Most of the households that had nets were in the medium to low socio-economic groups and lived in urban areas.

The main traditional methods included cleaning the house and its surroundings, and closing windows and doors.

Knowledge and attitudes to nets treated with insecticide

There was limited knowledge about nets treated with insecticide (14.1%). However, when the concept of a net treated with insecticide was explained to respondents, 88.3% perceived them to be very important to their households.

[2] Uganda has two rainy seasons: March through May and October through November. In rural areas, the rainy season is often a time of intense agricultural activity, when poor families earn most of their annual income. In addition to the cost of treatment, a single bout of malaria can cost about 10 days of productive output. (Source: WHO Fact Sheet No. 94, October 1998)

Shape and color preference

A rectangular shaped net was preferred by most respondents as compared to round/conical and triangular. The most popular color was white.

Conclusion

Due to the widespread concern regarding malaria, the high household expense of treating the disease and the positive attitude towards nets, there exists a definite need for ITNs and the potential to successfully market the product in Uganda.

INTRODUCTION

CMS's introduction and social marketing of insecticide treated nets in Uganda required a solid understanding of the population's knowledge, attitudes and practices regarding malaria and ITNs. To obtain this information, CMS carried out a *Baseline Survey on Knowledge, Attitudes, and Practices Related to Malaria and Insecticide Treated Nets* in four districts of Uganda: Mukono, Jinja, Mbarara and Arua. In addition to informing CMS's ITN social marketing initiatives, the data collected from the baseline survey will be used in conjunction with a follow-up survey to monitor and evaluate these initiatives.

Malaria is a public health problem in more than 90 countries, inhabited by 40% of the world's population.[3] More than 90% of all malaria cases are in sub-Saharan Africa. Most people survive after an illness of 10-20 days, however mortality due to malaria is estimated to be over 1 million deaths each year. The vast majority of deaths occur among poor children in Africa, especially in remote rural areas with poor access to health services.[4] The WHO (1996) estimates that about 25% of childhood deaths in Africa and half of fever episodes among African children under five years in endemic areas are attributed to malaria. Malaria causes death of approximately 750,000 children under five (the equivalent of almost 3000 children per day or one child every 30 seconds), and accounts for 10% of the total disease burden measured in disability adjusted life years.[5] Malaria is also the sixth leading cause of disability among children under 4 years in the developing world.[6] Pregnant women are also at high risk; there is a fourfold increase in risk of disease and a twofold increase in death rates. Pregnant mothers who have malaria and are HIV-positive are more likely to transmit the virus to their unborn child.[7]

In Uganda, malaria has continued to present a considerable risk to most households and is often stated as one of the top ten health problems. Malaria in Uganda is endemic and is the leading cause of mortality and morbidity among the population, especially among children under five. It is estimated that malaria accounts for about 20% of hospital admissions in Uganda and for 23% deaths among children under five years.[8]

The adverse malaria situation has put pressure on resources in the provision of medical services and on household income, which for a majority of people in Uganda is already limited. Over a quarter of a very poor family's income can be absorbed in the cost of malaria treatment — added to this are the costs of prevention and the opportunity cost of labor lost to illness.[9] It is estimated that malaria reduces the Gross Domestic Product (GDP) of the Ugandan national income by 1.3% per annum and is projected to reduce economic growth in the year 2000-2001 by nearly 30%.[10]

Despite efforts to combat malaria, the disease has continued to be one of the main killers in Uganda. Providing effective treatment is no longer enough because malaria parasites are becoming increasingly resistant to drugs. Consequently, the Ministry of Health has adopted plans to prevent malaria.

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[3] Malaria is caused by four species of parasitic protozoa (one-celled organisms). The protozoa are transmitted via the salivary glands of the female Anopheles mosquito. Fever is the first symptom; several hours later the fever drops and chills set in. Two to four days later the cycle repeats. More serious forms of malaria can affect the brain and the kidneys. Progression of symptoms from initial fever to death can take as little as 24 hours. (Source: http://www.malaria.org/bginfo.html)
[4] WHO Fact Sheet No. 94 (October 1998)
[5] Goodman and Mills (1999) 'Health Policy and Planning'
[6] UNICEF (1998)
[7] WHO Fact Sheet No. 94 (October 1998)
[8] Kilian A. (1998)
[9] Op. Cit.
[10] Health Policy Report (2000/2001)

Insecticide treated nets have emerged in recent years as a promising tool — results from multi-center randomized, controlled field trials in the Gambia, Ghana, Kenya and Burkina Faso suggest that child mortality is reduced by at least 20% if children sleep under nets regularly treated with insecticides.[11]

In 1998, USAID asked CMS to apply its social marketing expertise in reproductive health products to address malaria morbidity and mortality. CMS has considerable experience with social marketing of reproductive health products, and the same approach could be used to increase the acceptability, affordability and access to ITNs. However, to design a malaria intervention initiative, CMS needed to establish how much people knew about malaria, how severe the malaria situation was, what attitudes people had towards malaria and what practices were currently used by households against mosquitoes and malaria. These and a number of other questions formed the basis for the baseline survey whose findings are presented in this report.

Objectives of the study

The primary objective of this study was to generate strategies that would guide the introduction and social marketing of insecticide treated nets. The specific objectives were to:

- Ascertain the levels of knowledge regarding malaria
- Investigate attitudes and practices in the prevention of malaria and mosquito bites
- Examine attitudes towards nets and insecticide treatment
- Determine costs of prevention and treatment for malaria
- Inform marketing decisions about net design and price

Study area

Uganda is administratively broken down into regions, districts, counties, sub-counties and parishes/villages. It has four regions and 43 districts (see figure1). For this study, one district in each of the four regions was purposively selected into the sample to ensure national geographic representation. The districts surveyed included Mukono in the central region (about 25 km from Kampala), Jinja in the eastern region (approximately 80 km from Kampala), Mbarara in the western region, (approximately 300 km from Kampala) and Arua in the northern region (about 525 km from Kampala). All four districts have high or medium-high levels of malaria. In each district, both rural and urban areas were surveyed.

[11] The recommended insecticides include pyrethroids: natural biodegradable substances derived from pyrethrum (found in chrysanthemums) which remain effective for 6–12 months. (Source: WHO Fact Sheet No. 94, October 1998)

Figure 1: The districts surveyed in Uganda

THE STUDY DESIGN & METHODOLOGY

The study design

This report outlines the findings collected from a sample survey. A pre-coded questionnaire was administered to each respondent in a face-to-face interview approach. A team of 15 interviewers was trained by CMS for four days prior the start of data collection. The questionnaire was translated into Luganda, Runyankore, Lusoga and Lugbara. A pre-test was conducted in Kampala before going for field data collection in the districts.

The study population

The study population comprised of residents in the four districts of Mukono, Jinja, Arua and Mbarara. According to the 1991 Population and Housing census data, the study districts had a total population of 2,679,793. Only 10.4% of this population was based in urban areas. The study population was broken down by district, county, sub-county, and village.

Sample selection

Sample selection involved the use of a three-stage cluster random sampling procedure at the district level to select counties, sub-counties and villages from where the study sample could be drawn. In each district, the area was broken down by county from which three counties were selected based on population. From each county selected, two sub-counties were sampled again based on population.[12] In the final stage, two villages were randomly selected from a list of villages obtained at the sub-county headquarters. Within the selected villages, households were randomly sampled using the left-hand rule procedure. In the household, a key decision-maker respondent (male or female) was selected for interview. This procedure was applied in the selection of both urban and rural respondents.

Data analysis

Data was entered using the Epidemiological Information (Epi-Info) data processing package and analyzed using the Statistical Package for Social Sciences (SPSS).

[12] Counties and sub-counties with large population size had a higher chance of being selected into the sample

Quality control

The questionnaire used in this study was pre-tested in Kampala. The pre-test helped CMS to correct areas of inconsistency, ambiguity, comprehension and exhaustiveness. The pre-test also helped CMS to assess the interviewers. The questionnaire was translated into Luganda, Lugbara, Lusoga and Runyankore, the main languages of the study districts.

Two team leaders were appointed from the interviewers. They were charged with the responsibility of allocating work, supervising data collection, field checking and editing questionnaires in addition to providing necessary guidance and administrative roles to the team.

Before data entry, cleaning and analysis, the questionnaires were checked for coding errors, completeness and consistency.

RESPONDENTS' CHARACTERISTICS

Sample structure

A total of 700 face-to-face interviews were conducted with respondents at their households. The sample was allocated to each district in proportion to its population. Proportionality was used in the allocation of sample down to the sub-county level. A large proportion of the sample was drawn from the districts of Mbarara and Mukono as they had the largest population among selected districts.

The sample comprised 49.1% male and 50.9% female respondents. This sample was designed to ensure a proportionate gender representation because both men and women play an important role in household decision making. Representativeness was, however, not applied in defining the urban/rural sample because the urban population in Uganda is very small (11% of the national population and 10.4% in the study districts). A representative urban sample would have been too small for meaningful analysis and comparison with rural areas. In addition, most distribution channels for goods, such as those distributed by the CMS social marketing project, are in urban areas. The sample therefore included 20.4% urban and 79.6% rural interviews. The data presented in this report are not weighted to take into account the over sampling of urban areas; therefore the results in the total column/row may be slightly biased towards urban areas. A summary of the sample structure is presented in Table 1, below.

Table 1: Percentage distribution of the sample by residence and by gender

District	Sample size N = 700	Urban N = 143	Rural N = 557	Male N = 344	Female N = 356
Mukono	30.9	32.2	30.5	31.4	30.3
Jinja	10.7	10.5	10.8	10.5	11.0
Mbarara	34.7	34.3	34.8	34.3	35.1
Arua	23.7	23.1	23.1	23.8	23.6
Total (%)	100	100	100	100	100

Age distribution of respondents

Table 2 below shows a summary of respondents' age groups broken down by residence. The majority was in the 20-34 group (52.2% of the total sample) and just over 40% were above 34 years old.

Table 2: Percentage distribution of respondents' age groups by residence

Age group	Urban N = 143	Rural N = 557	Total N = 700
15-19	7.7	3.9	4.7
20-34	53.5	51.9	52.2
35-44	21.8	22.5	22.4
45 or above	16.9	21.7	20.7
Total (%)	100	100	100

Languages spoken and read by respondents

Luganda and English were spoken by a majority of respondents. In urban areas, 83.2% of respondents could speak English and 67.8% could speak Luganda. The percentage of urban respondents who could also read English and Luganda was high (86.9% and 56.9% respectively). Among rural respondents, 41.1% could speak English and 55.1% could speak Luganda, while 50.1% could read English and 55.1% could read Luganda.

Table 3: Percentage of respondents' who could speak and read various languages by residence

Languages speak (Multiple answers)	Urban N = 143	Rural N = 557	Total N = 700
English	83.2	41.1	49.7
Luganda	67.8	55.1	57.7
Lusoga	14.8	16.5	16.1
Lugbara	20.3	24.1	23.3
Runyankole	35.7	33.9	34.3
Kiswahili	42.0	21.9	26.0
Other	15.4	11.5	12.3
Language read (Multiple answers)	**Urban N = 137**	**Rural N = 439**	**Total N = 576**
English	86.9	50.1	58.9
Luganda	56.9	55.1	55.6
Lusoga	11.7	10.7	10.9
Lugbara	16.8	19.1	18.6
Runyankole	33.6	32.8	33.0
Kiswahili	21.2	10.0	12.7
Other	5.1	6.4	6.1

Education and occupation of respondents

Education levels in rural areas were comparatively lower than in urban areas. Just over half of the rural respondents had primary education and nearly 20% had no education at all. In addition, only 15% of the rural respondents had attained secondary education and another 13% had attained above secondary level. Among urban respondents, 44% had education level above secondary, 29.6% had secondary education, 20.4% had attained primary education and only 5.6% had no school education.

In terms of occupation, a large percentage of rural respondents were either farmers or traders (74.4%) while in urban areas, a majority were either in public, private or other professional employment.

Table 4: Percentage distribution of respondents' education level and occupation by residence

Education level	**Urban N = 143**	**Rural N = 557**	**Total N = 700**
Never attended school	5.6	19.9	17.0
Primary or lower	20.4	52.0	45.5
Some or completed secondary	29.6	15.0	18.0
Above secondary	44.4	13.0	19.5
Total (%)	100	100	100

Occupation	**Urban N = 143**	**Rural N = 557**	**Total N = 700**
Farmer/trader	21.7	74.4	63.6
Private/public professional	37.1	9.5	15.2
Other professional	41.3	16.0	21.2
Total (%)	100	100	100

Socio-economic status

This survey included questions to determine the socio-economic status of respondents. Accurate income classification is generally difficult to determine; this study used both the Amenities Possession Index (API) and the Relative Socio-Economic Status (SES) to estimate the income classification of respondents (see Appendix B).

According to the Amenities Possession Index (API), 94.4% of respondents were in the medium income group, the majority of who were from the rural areas. The API indicated that none of the urban respondents were in the low-income group and that none of the rural respondents were in the high-income group. Overall, the API indicated that urban respondents had a higher socio-economic status than rural respondents.

In contrast to the API, the relative Socio-Economic Status (SES) quartiles show that a majority of respondents were in the medium to low socio-economic groups (75.7%). In rural areas over 85% of respondents were in the medium to low income groups, while in urban areas over half were in the medium-high income group. Both the API and the relative SES quartiles showed that most respondents in Arua were in the low-income group, while Mukono had most respondents in the medium-high and high groups. Table 5 below summarizes income classification of respondents using the Amenities Possession Index and the Socio-Economic Status by residence.

Table 5: Frequency distribution of respondents' income groups by residence

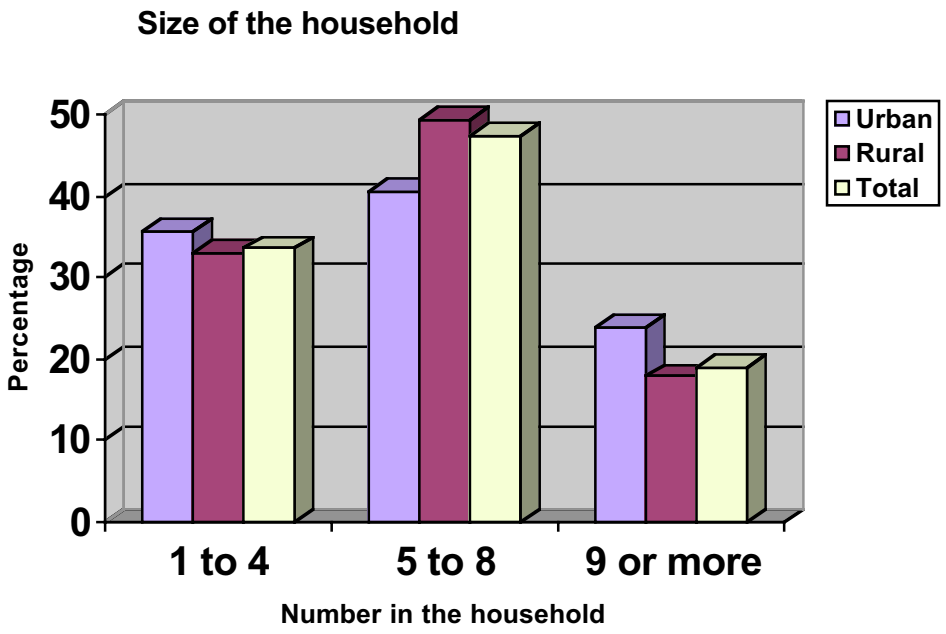
API index	Urban N = 143	Rural N = 557	Total N = 700
High	0.7	-	0.1
Medium-High	15.4	0.9	3.9
Medium	83.9	97.1	94.4
Low	-	2.0	1.6
Total (%)	100	100	100

Relative SES quartiles	Urban N = 143	Rural N = 557	Total N = 700
High	11.9	1.4	3.6
Medium-High	56.6	11.5	20.7
Medium	20.3	41.8	37.4
Low	11.2	45.2	38.3
Total (%)	100	100	100

HOUSEHOLD STRUCTURE AND SLEEPING ARRANGEMENTS

Household size

As seen in the chart below, most households that were surveyed had five to eight people (47.5%) and an average household size of six people. 19% of households had nine or more people. The majority of the households with nine or more people were in Arua district. A large percentage of households (72.7%) had children aged five years or under. In total, there were 961 children aged five years or under reported in this survey. Rural areas had more children five years or under.



Sleeping arrangements

This survey investigated sleeping arrangements in households as they are directly related to the use of nets. In most households in Uganda, as in many other African countries, there is a tendency to share sleeping places. Children often sleep with parents, other relatives, or siblings. This part of the survey findings also presents which people in the household slept on a bed or a mat regardless of whether they were shared or not. A "bed" in this study was defined as any form of mattress whether on a frame or the floor; a "mat" was defined as an item made from straw or fabric and used by households for sleeping.

A spontaneous question was asked as to which people in the respondent's household slept on beds. For households with only some people sleeping on beds, a further question was asked to find out which people in the household slept on mats. As seen in Table 6, in rural areas many heads of household and their partner slept on beds. In urban areas, more than half of the respondents reported everyone in their household to be sleeping on a bed. The majority of children were reported to be sleeping on mats — in the total sample, 40% of households reported some or all children in their household to be sleeping on mats. Another 14.9% reported visitors to be sleeping on mats.

Table 6: Percentage of household members sleeping on a bed/mat by residence

Household member (Multiple answers)	Sleep on Beds			Sleep on mats		
	Urban N = 143	Rural N = 557	Total N = 700	Urban N = 143	Rural N = 439	Total N = 576
Head of household	30.1	42.0	39.6	1.6	5.4	2.7
Head of household partner	27.3	37.0	35.0	0.7	3.8	3.1
Some adults	6.3	5.0	5.3	4.9	7.4	6.9
All adults	9.1	12.2	11.6	0.7	2.9	2.4
Some children	9.8	22.6	20.0	12.6	24.6	22.1
All children	18.2	9.7	11.4	2.8	21.7	17.9
Visitors	6.3	1.4	2.4	10.5	15.1	14.9
Nobody	0.7	4.5	3.7	65.7	39.3	44.7
Everybody	58.7	32.3	37.7	0.7	2.5	2.1
Other person	1.4	0.7	0.9	2.8	1.3	1.6

Sleeping arrangements for children five years or under

A large percentage of children five years or under were either sleeping with their parents (35.4%) or on their own (31.9%). In rural areas 21.2% of the children were sleeping with brothers/sisters, while only 13.3% in urban areas were sleeping with brothers/sisters.

Table 7: Sleeping arrangements for children five years or under by residence

Sleeping place (Multiple answers)	Urban N = 143	Rural N = 557	Total N = 700
On their own	28.0	32.9	31.9
With parents	34.3	35.7	35.4
With brothers/sisters	13.3	21.2	19.6
Other	1.4	0.5	0.7
No children 5 or below	32.9	23.3	27.3

ACCESS TO MEDIA

Radio/TV ownership and radio listenership

Table 8 below shows radio and TV ownership and radio listenership. Radio has a very high penetration both in urban and rural areas. Overall, 77.9% respondents had radios in their households. The largest percentage of households with radios (93%) was in urban areas. Arua district had the lowest radio ownership with 62.4% respondents having a radio in their household while Mukono had the highest with 86.5% households having radios. More than half of the respondents listened to radio every day, with 45.9% listening most often in the evening hours.

TV ownership was much lower than radio with only 15.2% of the total sample owning a TV. In urban areas, 42.7% households had TVs while only 8.1% of rural households had TVs. Like radio ownership, Arua again had the lowest number of TVs (3.1%) while Mukono had the highest (25.8%).

Table 8: Percentage of respondents owning a radio/TV and radio listenership by residence

Radio/TV ownership (multiple answers)	**Urban N = 143**	**Rural N = 557**	**Total N = 700**
Own a radio	93.0	74.1	77.9
Own a TV	42.7	8.1	15.2
Days of the week most often listen to radio (multiple answers)	**Urban N = 143**	**Rural N = 557**	**Total N = 700**
Week days	5.6	3.8	4.1
Weekends	22.4	23.9	23.6
Every day	65.0	52.1	54.7
Other	2.8	3.4	3.3
Times of the day often listen to radio (multiple answers)	**Urban N = 143**	**Rural N = 557**	**Total N = 700**
Morning	35.0	17.2	20.9
Afternoon	9.8	13.5	12.7
Evening	46.9	45.6	45.9
All day	30.8	21.2	23.1
Other	1.4	2.2	2.0

KNOWLEDGE ABOUT MALARIA

Awareness of malaria and exposure to malaria education messages

Respondents were asked if they had ever heard of malaria. It is important to note that in most languages in Uganda, the word for "malaria" also means "fever," thus creating the possibility that some respondents who reported awareness of malaria could have meant fever. The survey found that awareness of malaria was very high (99%) and was similar between rural and urban areas and among districts.

The awareness of malaria education messages was also high; 70.6% respondents in the total sample had seen or heard education messages about malaria. As might be expected, more urban respondents (83%) had seen or heard malaria education messages than rural respondents (67.5%).

Radio was the main medium through which most respondents (74.8%) both in urban and rural areas had heard malaria education messages. The other major channel for malaria messages, both for urban and rural respondents, was a health worker (37.9%). More respondents in the rural areas had heard educational messages from a health worker than urban respondents. A large proportion of urban respondents (31.6%) had heard education messages from school. Other important sources for malaria education messages among urban respondents included TV (18.8%), newspapers/magazines (17.9%) and posters/notices (10.3%). The types of messages that had been heard by respondents included messages about malaria prevention (76.8%), malaria transmission (44.5%) and malaria treatment (44.1%).

Table 9: Percentage of respondents exposed to malaria education messages, source and type of message seen/heard

Exposure to malaria messages	**Urban N = 141**	**Rural N = 550**	**Total N = 691**
% who have seen/heard malaria education messages	83.0	67.5	70.6
Source of malaria education messages by medium (multiple answers)	**Urban N = 117**	**Rural N = 371**	**Total N = 488**
Radio	84.6	71.7	74.8
TV	18.8	5.4	8.6
Newspapers/Magazines	17.9	5.7	8.6
Posters/notices	10.3	5.1	6.6
Friends/relatives	8.5	5.4	6.1
Health worker	32.5	39.6	37.9
Government official	4.3	5.9	5.5
Church/Mosque	1.7	1.6	1.6
School	31.6	10.5	15.6
Other source	1.7	4.3	3.7
Type of message seen/heard (Multiple answers)	**Urban N = 117**	**Rural N = 371**	**Total N = 488**
Messages about prevention	79.5	76.0	76.8
Messages about treatment	58.1	39.6	44.1
Messages about transmission	53.0	41.8	44.5
Other messages	1.7	2.7	2.5

MALARIA TRANSMISSION, SYMPTOMS AND PREVENTION

Knowledge of the main cause of malaria

Table 10 below summarizes the responses obtained about the main cause of malaria. Knowledge that mosquitoes transmit malaria was higher in urban areas than in rural areas (89.5% and 74.5% respectively). Drinking dirty water was cited by 5.6% of rural respondents as the main cause of malaria, while another 5.4% cited getting cold as the main cause of malaria.

Table 10: Percentage distribution of respondents citing the main cause of malaria

Main Cause	Urban N = 143	Rural N = 540	Total N = 683
Working in the sun	-	0.2	0.1
Being in rain	0.7	1.3	1.1
Getting cold	1.4	5.4	4.6
Drinking dirty water	3.5	5.6	5.2
Another person with malaria	-	0.7	0.6
Mosquito bites	89.5	74.5	77.6
Other	2.1	8.1	6.9
Don't know	2.8	4.2	3.9
Total (%)	100	100	100

The main malaria symptom

Overall, no single malaria symptom had a very high frequency of mention and the responses were similar between urban and rural respondents. Fever was the main symptom cited by 34% of respondents. Other symptoms that had a fairly significant level of mention included feeling cold (18%), headache (14.5%), body/joint pain (11.7%) and general body weakness (10.6%).

Table 11: Percentage distribution of respondents' perception of main symptom of malaria by residence

Main symptom	Urban N = 139	Rural N = 528	Total N = 667
Fever	34.5	33.9	34.0
Feeling cold	15.8	19.3	18.6
Headache	15.1	14.4	14.5
Vomiting	4.3	5.7	5.4
Diarrhea	0.7	1.1	1.0
General body weakness	11.5	10.4	10.6
Loss of appetite	2.2	2.1	2.1
Body/joints pain	15.1	10.8	11.7
Eyes become yellow	0.7	1.7	1.5
Don't know	-	0.6	0.4
Total (%)	100	100	100

Perception of the best prevention method

Respondents had several opinions about ways to prevent malaria, but a full 17% of the rural respondents had no idea how to prevent malaria. In urban areas 48.3% of respondents observed that the use of nets was the best way to prevent malaria, but in rural areas, the use of nets was only cited by 24.6% of respondents. Keeping the house and surroundings clean was cited as the best method by 19.5% of respondents in the total sample. Interestingly, 12.7% of rural respondents observed that drinking clean water was the best method of prevention, while 11.2% of respondents in urban areas cited the use of insecticide spray as the best method.

Table 12: Percentage distribution of respondents citing the best malaria prevention method by residence

Best perceived method of preventing malaria	Urban N = 143	Rural N = 553	Total N = 696
Use a bed net	48.3	24.6	29.5
Avoid being bitten by mosquitoes	6.3	6.7	6.6
Take preventive medicine	2.8	9.2	7.9
Use mosquito coils	2.1	1.1	1.3
Use insecticide spray	11.2	3.1	4.7
Avoid going out in the cold	-	0.5	0.4
Keep the house and surroundings clean	17.5	20.1	19.5
Drinking clean water	2.1	12.7	10.5
Other	4.2	5.1	4.9
Don't know	5.6	17.0	14.7
Total (%)	100	100	100

UNDERSTANDING OF THE SEVERITY OF MALARIA

Incidence and morbidity

Incidence of malaria was similar among urban and rural respondents. A large percentage of respondents (95.5%) had at one time had malaria. About 20% of respondents had suffered from malaria within the last month, and almost half had suffered from malaria within the last year. Among the respondents who had suffered from malaria within the last month, the majority was in rural areas (40.6% rural compared to 25.9% urban). Virtually all respondents (98.1%) observed that malaria could cause death and 84.6% of respondents knew someone who had died of malaria. Table 13 shows the percentage breakdown of how recently respondents had had malaria.

Table 13: Percentage distribution of respondents who had ever had malaria and period since the last malaria episode by residence

Incidence of malaria	Total N = 692
% who have ever suffered from malaria	95.5

Period since the last malaria episode	Total N = 670
Last month	19.9
Last year	45.5
Over 1 year	34.6
Total (%)	100

Perception of risk

Children under five were largely seen to be at great risk of contracting malaria. This perception was reported by 75.1% of respondents. There was also an observation by 19.4% of respondents that adults were at risk while 13.1% noted that all people were at risk. Response was similar across districts and between rural and urban areas.

Table 14: Proportion of people cited to be at risk of malaria

People at high risk of malaria (Multiple answers)	Urban N = 143	Rural N = 553	Total N = 696
Adults	23.1	18.4	19.4
Children under 5	71.3	76.1	75.1
Elderly people	11.2	9.9	10.2
Pregnant women	9.8	9.9	9.9
Adult men	7.0	4.7	5.2
Children between 5-14 years	8.4	3.9	4.9
All people	15.4	12.6	13.1
Others	7.0	5.4	5.7

Malaria among children five years or under in the past month

There were a total of 961 children five years or under in the sample of 700 households; 38.5% were reported to have had malaria within the last month. Nearly all children five years or under who had malaria last month were reported to have received treatment (37% received treatment and only 1% were not treated). As seen in Table 15 below, fewer incidents of malaria in the last month (6.4%) were reported among children in households with nets than among children in households without nets (32%). The study did not investigate whether these children slept under nets last month.

Table 15: Percentage distribution of children five years or under who had malaria last month

Malaria among children and in-house presence of nets	Children five years or below N = 943
Children in households with nets but had malaria	6.4
Children in households without nets but had malaria	32.0
Children who did not have malaria	61.5
Total (%)	100

The average cost for treatment of the last malaria episode

Respondents reported spending an average of 4114 USh[13] (US $2.20) on treatment the last time they personally had an episode of malaria. This figure included the cost for medication only and did not include income lost due to illness nor the cost of transport to get treatment. Respondents (20.6%) who did not pay for treatment or did not know how much was spent on treatment were excluded from this calculation. The majority of respondents had spent 5000 USh (US $2.70) or less with over half of Arua respondents spending 1000 USh (US $0.54) or less. The Mbarara and Mukono districts had the highest frequency of respondents who reported spending over 5000 USh (33.4% and 21.3% respectively) and Arua had the lowest percentage of respondents (8.9%) reporting spending above 5000 USh. These results are summarized in Table 16, below.

Table 16: Percentage distribution of respondents' expenditure on treatment of the last malaria episode by district

Amount spent	Mukono N = 164	Jinja N = 60	Mbarara N = 207	Arua N = 124	Total N = 555
1000 (US $ 0.5) or less	37.8	41.7	30.0	56.5	39.5
1001 – 5000 (US $ 0.5-2.70)	40.9	41.7	36.7	34.7	38.8
5001 – 10000 (US $ 2.70-5.40)	12.8	13.3	21.3	8.1	15.0
10001 (US $ 2.70) or more	8.5	3.3	12.1	0.8	7.6
Total %	100	100	100	100	100

[13] Ush = Uganda Shillings

Average household expenditure and per capita expenditure on malaria treatment

Respondents were asked how many people in their household had had malaria in the last three months. In 88.4% of households, at least one person was reported to have contracted malaria within the last three months. Among households reporting malaria in the last three months, on average two to three people had had malaria. The average household expenditure on malaria medication was 10,285 USh (US $5.60) over the last three months or 3,428 USh (US $2) per month.[14] These results imply an average annual expenditure of 41,136 USh (US $22.20) per household[15] on malaria medication.

As mentioned earlier, the findings of this research indicated an average household size of six people. The Population and Housing Census Report (1991) reported an average of five people per household in the districts surveyed. Taking the average household size of six people and average household expenditure of 41,136 USh on malaria treatment per year, the annual per capita expenditure on malaria treatment is 6,856 USh (US $3.70).[16] With Uganda's per capita GDP currently estimated at 164,000 USh (US $88.65);[17] malaria treatment accounts for 4.2% of the per capita GDP.

[14] The average household expenditure to treat malaria in the last three months was derived by multiplying the average number reported to have had malaria in household in the last three months by average cost of treatment (2.5 x 4114 USh).
[15] The average annual expenditure was derived by multiplying the average monthly expenditure by 12 months (3,428 USh x 12).
[16] Per capita expenditure on malaria treatment was derived by dividing the annual household expenditure by average household size (41136 Ush / 6)
[17] The State of Uganda's Population (2000)

MOSQUITO PROBLEMS

Types of problems experienced due to mosquitoes

Both urban and rural households were troubled by mosquitoes. As seen in Table 17, the situation was similar in all districts surveyed though Arua had a slightly higher frequency of problems. Overall, 96% of respondents were troubled by mosquitoes in their households. The biggest problem, experienced by 76.3% of respondents, was mosquito bites. Mosquito bites were cited by a larger percentage of respondents in Arua (89.6%) as compared to the other districts. The fact that mosquitoes carry disease was cited by 52.2% of respondents as a way in which they were troubled by mosquitoes. However, looking at Table 17, concern about the disease was higher in the districts of Mbarara, Jinja and Mukono than in Arua. This indicates a limited knowledge that mosquitoes transmit disease among the people of Arua. More urban respondents (67.4%) cited disease as a problem than rural respondents (48.6%).

Table 17: Percentage of respondents troubled by mosquito problems and type of trouble experienced by district

Households troubled by mosquitoes	Mukono N = 216	Jinja N = 75	Mbarara N = 243	Arua N = 166	Total N = 700
Percentage who are troubled by mosquitoes	94.4	96.0	95.9	98.2	96.0

Ways in which mosquitoes cause trouble (multiple answers)	Mukono N = 204	Jinja N = 72	Mbarara N = 233	Arua N = 163	Total N = 672
Mosquito bites	75.5	68.1	70.4	89.6	76.3
Bites are itchy	24.5	30.6	27.5	26.4	26.6
Mosquitoes carry disease	51.0	51.4	65.7	36.2	52.5
Mosquitoes make noise	40.7	30.6	42.5	39.3	39.9
Other	8.8	9.7	8.6	3.1	7.4

Seasonality of mosquitoes and time of day they bite most

A large percentage of respondents (87.6%) noticed mosquitoes primarily during the rainy season.[18] This perception was similar among urban and rural respondents and across the four districts. Although malaria is transmitted year-'round, only 4.7% of respondents noticed mosquitoes throughout the year and 1.7% did not experience a lot of mosquitoes at any time. As seen in Table 18, the majority of respondents (73.8%) mentioned that mosquitoes bite most at night while they are in bed.

Table 18: Percentage distribution of respondents citing seasons they notice a lot of mosquitoes and the time of day when mosquitoes bite most (by residence)

Seasonal occurrence of mosquitoes	Urban N = 143	Rural N = 556	Total N = 699
Dry season	8.4	4.0	4.9
Rainy season	81.1	89.2	87.6
Throughout the year	8.4	3.8	4.7
Don't experience a lot	0.7	2.0	1.7
Other	-	0.9	0.7
Don't know	1.4	0.2	0.4
Total (%)	100	100	100

Time mosquitoes bite most	Urban N = 143	Rural N = 552	Total N = 695
Morning	1.4	2.4	2.2
Afternoon	7.7	2.2	3.3
Evening	18.9	18.7	18.7
At night in bed	69.2	75.0	73.8
All day	2.1	1.3	1.4
Don't know	0.7	0.5	0.6
Total (%)	100	100	100

[18] Uganda has two rainy seasons: March through May and October through November.

PROTECTION AGAINST MOSQUITOES

Household practices in the prevention of mosquito bites

Households were found to be using a number of methods to protect themselves from mosquitoes. These practices can broadly be categorized as "commercial" or "non-commercial." "Commercial" methods include methods that involve a direct exchange of cash, while "non-commercial" methods refer to traditional methods or methods that do not involve monetary exchange.

There was a significant difference in the methods used by rural and urban households. The use of commercial methods such as nets and insecticide sprays was higher in urban households. However, the use of mosquito coils (a commercial method) was similar in both urban and rural areas. The most common methods used by rural households included cleaning the house and its surroundings (26.4%), mosquito coils (24.2%), closing doors and windows (20.5%) and use of insecticide spray (20.8%). Quite a large percentage (24.4%) of households in rural areas were found not to be using any method of protection from mosquitoes. Among urban households, the most widely used methods were insecticide spray (55.9%), nets (45.5%), cleaning the house and its surroundings (37.8%) and closing windows and doors (28%). These results are summarized in Table 19 below.

Table 19: Percentage of respondents using different mosquito protection methods by residence

Methods use to protect household from mosquito bites (multiple answers)	Urban N = 143	Rural N = 557	Total N = 700
Net	45.5	16.5	22.4
Insecticide spray	55.9	20.8	28.0
Cleaning the house and surroundings	37.8	26.4	28.7
Closing windows and doors	28.0	20.5	22.0
Light a fire in the house	0.7	1.3	1.1
Mosquito coils	26.6	24.2	24.7
Apply insect repellant	1.4	0.2	0.4
Light a candle	0.7	0.4	0.4
Burn cow dung/traditional plants	7.7	14.4	13.0
Other traditional method	12.1	12.1	12.1
Other commercial method	1.5	5.2	4.3
Don't use any protection method	7.7	24.4	21.0

Mosquito protection method by district

Cleaning the house and its surroundings and the use of insecticide spray were the most commonly cited mosquito protection methods in all districts surveyed except Arua (which had the lowest use of almost all protection methods). Mukono and Mbarara had the highest percentage of respondents using insecticide spray (38.4 % and 33.3% respectively) and the frequency of respondents citing use of mosquito coils was highest in the districts of Jinja (29.3%), Mukono (28.7%) and Mbarara (23.5%). The majority of respondents not using any protection method from mosquitoes were in the Arua district where nearly half of the respondents (42.7%) were not using any method at all. Table 20, below, summarizes the findings regarding method use by district.

Table 20: Percentage of respondents using different prevention methods by district

Prevention method (Multiple answers)	Mukono N = 216	Jinja N = 243	Mbarara N = 243	Arua N = 166	Total N = 700
Net	25.9	17.3	27.2	13.3	22.4
Insecticide spray	38.4	26.7	33.3	7.2	28.0
Cleaning the house and surroundings	25.5	37.3	42.8	8.4	28.7
Close windows and doors	19.4	25.3	35.4	4.2	22.0
Light a fire in the house	1.4	2.7	0.8	0.6	1.1
Mosquito coils	28.7	29.3	23.5	19.3	24.7
Apply insect repellant	0.5	1.3	0.4	-	0.4
Light a candle	0.5	-	-	1.2	0.4
Burn cow dung/traditional plants	13.4	17.3	10.3	14.5	13.0
Other traditional method	13.1	12.5	11.8	10.4	12.1
Other commercial method	5.5	-	3.3	7.3	4.3
Don't use any protection method	15.4	14.7	13.2	42.7	21.0

NET USE

Household use and attitudes to nets

One of the main goals of this study was to find out the level of use and attitudes towards nets. It should be noted that this study examined net use in the household regardless of whether the respondent personally used a net. The presence of nets in the household was confirmed by visual check by the interviewer (though not all respondents allowed interviewers to see their nets). Some of the nets seen by interviewers were torn. The number of nets in the household was *not* examined — respondents with nets in their households were simply asked if they had them on some or all beds.

As seen in Table 20 on the previous page, 22.4% of households surveyed had a net. Incidence of nets was highest in Mbarara (27.2%) and Mukono (25.9%) and lowest in Arua where only 13.3% of households had a net. In the urban areas, 45.5% of households at least had one net. This was more than twice the incidence in rural areas where only 16.5% of respondents had a net. Only 8% of households had nets on all beds, 14% had nets on some beds only and 77.6% were not using nets at all. In households where only some people slept under nets, it was primarily the adults and *not children* who slept under a net.

Table 21: Percentage use of nets in the household by residence

Net use within households	Urban N = 143	Rural N = 557	Total N = 700
Have nets on all beds/mats	18.9	5.2	8.0
Have nets on some beds/mats	25.9	11.5	14.4
Not using nets	55.2	83.3	77.6
Total (%)	100	100	100

Household member using nets in households with nets on some beds/mats only (multiple answers)	Urban N = 37	Rural N = 64	Total N = 101
Head of household bed	29.7	43.8	38.6
Bed of spouse to head of household	16.2	21.9	19.8
Bed shared with spouse	29.7	39.1	35.6
Children's bed	70.3	54.7	60.4
Visitor's bed	-	1.6	1.0
Other bed	10.8	6.3	7.9

Comparison of household net use and respondents' access to malaria education messages

Among respondents with nets in their households, 82.1% had seen/heard malaria education messages while only 17.9% had not. This suggests a likely relationship between access to malaria education messages and the use of nets.

Table 22: Percentage distribution of respondents who had access to malaria education messages by household use of nets

Access to education messages	Households with a net N = 157
Seen/heard malaria education messages and have a net in the household	82.1
Not seen/heard malaria education messages but have a net in the household	17.9
Total %	100

Net use among socio-economic groups

The use of nets across socio-economic groups was analyzed by cross-tabulating households with nets and income groups. According to the API, 90.4% of all respondents with nets in their households were in the medium group, 8.9% were in the medium-high group and only 0.6% were in the low income group. None of the net users were in the high-income group. The API also shows that 90.6% of the respondents without nets in their households were in the medium income group.

Based on the relative SES quartiles, use of nets was more evenly distributed among the income groups. Net use was highest among the medium-high income group (36.6%), 28.7% were in the medium income group and 26.8% were in the low-income group. In addition, SES classification shows that 40% of households without nets were in the medium income group. Therefore, even if a majority of households currently using nets were in the medium and medium-high income groups, both the API and the SES income categorization indicated that there were still a large number of people in this group who were not using nets in their households. These findings are shown in Table 23, below.

Table 23: Percentage distribution of net using and non-net using households by income group

API	Use net in Household N = 157	Don't use Net in Household N = 543	Total income Category N = 700
High	-	0.2	0.1
Medium – high	8.9	2.4	3.9
Medium	90.4	95.6	94.4
Low	0.6	1.8	1.6
Total (%)	100	100	100

Relatives SES Quartiles	Use net in Household N = 157	Don't use net in household N = 543	Total income Category N = 700
High	8.3	2.2	3.6
Medium – high	36.3	16.2	20.7
Medium	28.7	40.0	37.4
Low	26.8	41.6	38.3
Total (%)	100	100	100

Reasons for using nets

Protection against mosquito bites was cited as the main reason for using nets by 76.8% of respondents. A small percentage (19.4%) cited protection from malaria as the main reason they used nets, thus suggesting a low top of mind link between net use and malaria prevention.

Table 24: Percentage distribution of respondents citing the main reason for using nets by residence

Reasons for using nets	Urban N = 65	Rural N = 90	Total N = 155
Prevent against mosquito bites	70.3	81.3	76.8
Prevent malaria	26.6	14.3	19.4
Prevent annoyance from mosquitoes	3.1	4.4	3.9
Total (%)	100	100	100

Reasons for not having nets on all beds/mats

Respondents in households that only had nets on some beds/mats were asked why they did not have nets on all beds/mats. The main reason, cited by 72.3% of households, was the high cost of nets. A few respondents cited other reasons: unavailability of nets, difficulty of hanging, the belief that mosquitoes could bite through the net, and a dislike for nets among some household members.

Table 25: Reasons cited for not having nets on all beds/mats by residence

Reasons for having nets only on some beds/mats (respondents with nets only on some beds/mats) multiple answers	Urban N = 37	Rural N = 64	Total N = 101
Nets are too expensive	70.3	73.4	72.3
Not interested in putting a net on all beds/mats	8.1	4.7	5.9
Only children need nets	10.8	4.7	6.9
Only adults need nets	-	3.1	2.0
Some beds are not occupied	4.0	1.6	4.0
Dislike by other household members	3.2	6.7	5.0
Nets are not available	1.7	5.5	3.6
Difficult to hang the net over the bed/mat	4.1	7.8	6.0
Some households are resistant to malaria	4.3	5.2	4.7
Net occupies too much space	3.3	2.1	2.7
Mosquitoes can still bite through the net	6.2	8.1	7.1
Other	15.0	17.7	16.2

Reasons for not using nets

Table 26 summarizes the reasons given by the 543 respondents who did not use nets in their households. As in households with nets on some but not all beds/mats, the high cost of nets was cited as the main reason for non-use. This observation was similar across urban and rural areas and among all of the districts surveyed.

Table 26: Percentage of different reasons cited for not using nets by residence

Reasons for non-use (multiple answers)	Urban N = 78	Rural N = 465	Total N = 543
Not bothered by mosquitoes	3.8	2.4	2.6
Nets are too expensive	35.9	33.3	33.6
Feels uncomfortable sleeping under a net	6.4	0.9	1.7
Don't know where to buy nets from	-	0.2	0.2
Nets are too hot	3.8	0.6	1.1
Other	15.4	9.0	9.9

Benefits of sleeping under a net

Respondents were asked to cite the benefits of sleeping under a net regardless of whether or not they used nets in their households. Prevention from mosquito bites was cited by 89% of respondents, while 62.2% of urban respondents and 44% of the rural respondents cited prevention from malaria. Benefits of sleeping under a net are summarized in Table 27 below.

Table 27: Benefits of sleeping under a net

Benefits of sleeping under a net (multiple answers)	Urban N = 143	Rural N = 557	Total N = 700
Don't get bitten by mosquitoes	89.5	88.9	89.0
Don't get malaria	62.2	44.0	47.7
Don't get bothered by insects	20.3	18.9	19.1
Sleep better	23.8	25.9	25.4
It is warmer	5.6	4.3	4.6
Other	4.9	3.2	3.6

Problems of sleeping under a net

Problems associated with sleeping under a net were investigated from all respondents (regardless of use or non-use). About half of the respondents found no problems with sleeping under nets. The majority of respondents who had no problems with sleeping under a net were in the rural areas. There was, however, a concern among 26% of respondents that sleeping under a net was too hot and that the net did not allow in enough air (10.1%).

Table 28: Respondents perception of problems of sleeping under a net

Problems of sleeping under a net (multiple answers)	Urban N = 143	Rural N = 557	Total N = 700
Nets are too hot	30.1	25.0	26.0
Mosquitoes can still bite through the net	4.2	2.0	2.4
Difficult to get out of a net at night	9.1	4.8	5.7
Takes time to tuck the net each night	7.0	3.9	4.6
The net does not allow in enough air	12.6	9.3	10.1
Other problem	14.7	10.4	11.3
No problems with nets	44.1	52.1	50.4

Sources of nets

Among respondents who had nets in their households, 65% obtained them from a general merchandise shop and 19.1% obtained them from the market. The market was a source cited by 25% of rural respondents, while 10.8% of urban households obtained their nets from the market.

The majority of respondents with nets in their households purchased them — only a few received free nets. Interestingly, there were more people in urban areas who had obtained nets for free than in the rural areas. These findings are summarized in Table 29, below.

Table 29: Percentage of respondents who obtained nets from different sources by residence

Source of net (Multiple answers)	Urban N = 65	Rural N = 92	Total N = 157
Shop	73.8	58.7	65.0
Health center	3.1	1.1	1.9
Market	10.8	25.0	19.1
Other	7.7	8.7	8.3

How net were obtained (Multiple answers)	Urban N = 65	Rural N = 92	Total N = 157
Given for free	6.2	1.1	3.2
Bought	93.8	94.6	94.3
Can't remember	-	2.2	1.3

Washing of nets

Among net owning households, 39.9% washed them once a month. However, quite a substantial percentage (25.9%) washed them weekly and 16.8% washed twice a month.

Table 30: Percentage distribution of the frequency of washing nets by residence

How often nets are washed	Urban N = 61	Rural N = 82	Total N = 143
Weekly	24.6	26.8	25.9
Bi-monthly	19.7	14.6	16.8
Monthly	37.7	41.5	39.9
Every 2 months	11.5	11.0	11.2
Every 3 months	6.6	6.1	6.3
Total (%)	100	100	100

Price perception for a net

Respondents were asked to state an appropriate price for a bed net. A price range of 4001 to 8000 USh (US $2 to 4.30) was suggested by more than half of respondents. Among the rural respondents, 30.7% mentioned a price of 4000 USh (US $2) or less. The average suggested price was 6108 USh (US $3.30) with a mode of 5000 USh (US $2.70) and a standard deviation of 3778 USh (US $ 2).

Table 31: Percentage distribution of perceived appropriate price for a net by residence

Perceived appropriate price (in Uganda Shillings)	Urban N = 121	Rural N = 365	Total N = 486
4000 (US $2) or less	14.9	30.7	26.7
4001 – 8000 (US $2 to 4.30)	59.5	53.7	55.1
8001 (US $4.30) or more	25.6	15.6	18.1
Total (%)	100	100	100

INSECTICIDE TREATED NETS: KNOWLEDGE AND ATTITUDES

Awareness of nets treated with insecticide

There was very limited awareness about nets treated with insecticide among the populations surveyed. Only 14.1% (99 out of 700) respondents had ever seen or heard of nets treated with insecticides. Most of the respondents aware of nets treated with insecticide were in the Jinja and Mukono districts.

Perception of nets treated with insecticide

During data collection, interviewers explained to respondents the concept of an Insecticide Treated Net (ITN) and then asked how important they perceived it to be to their households. 88.3% of respondents perceived a bed net treated with insecticide to be very important to their household with Arua having the highest percentage (99.4%).

Table 32: Percentage awareness and perception of nets treated with insecticides

Awareness of ITN	**Mukono N = 216**	**Jinja N = 75**	**Mbarara N = 243**	**Arua N = 166**	**Total N = 700**
Percentage who have ever seen/heard of a net treated with insecticide	19.4	24.0	9.9	9.0	14.1

Perception of importance	**Mukono N = 212**	**Jinja N = 73**	**Mbarara N = 243**	**Arua N = 166**	**Total N = 694**
Very important	82.1	84.9	87.2	99.4	88.3
Somewhat important	13.2	11.0	11.5	-	9.2
Neither important nor unimportant	0.9	-	0.4	0.6	0.6
Not very important	2.8	2.7	0.8	-	1.4
Not important at all	0.9	1.4	-	-	0.4
Total (%)	100	100	100	100	100

Price perception for an ITN

Respondents who felt that a bed net treated with insecticide was very important or somewhat important to their household were asked what price they could afford to pay for a medium size ITN. As seen in Table 33, rural respondents were more likely to cite a lower price than urban respondents. Over half of the rural respondents (66.5%) suggested a price of 5000 USh (US $2.70), while nearly half (45.9%) of the urban respondents suggested a price between 5001 to 10000 USh (US $2.70 to 5.40). The average suggested price was 6014 USh (US $3.25), with a standard deviation of 4036 USh (US $3.20). This price was similar to the suggested appropriate price for an untreated net.

Table 33: Percentage price perception by residence

Appropriate price for a net	Urban N = 135	Rural N = 535	Total N = 670
5000 (US $ 2.70) or less	30.4	66.5	59.3
5001 – 10000 (US $ 2.70-5.40	45.9	28.4	31.9
10001 or more (US $ 5.40+)	23.7	5.0	8.8
Total (%)	100	100	100

SHAPE AND COLOR PREFERENCE FOR NETS

Shape preference

Drawings of rectangular, round/conical and triangular nets were shown to respondents and questions regarding shape preference were asked. The rectangular-shaped net was preferred by 58.2% of respondents. It was the popular choice among both urban and rural respondents and in all districts. The round/conical shape was preferred by only 25.8% respondents and primarily in urban areas.

Table 34: Percentage shape preference by residence

Preferred shape	Urban N = 141	Rural N = 557	Total N = 698
Rectangular	50.4	60.1	58.2
Round/conical	34.8	23.5	25.8
Triangular	12.8	13.3	13.2
No difference	1.4	3.1	2.7
Other	0.7	-	0.1
Total (%)	100	100	100

Color preference

Respondents were asked to state spontaneously the colors they preferred for nets. White nets were preferred by 34.2% of the respondents in the total sample. Preference for white was, however, stronger in urban areas. In rural areas there was a higher preference for colored nets. Other colors mentioned included pink, light green and purple.

Table 35: Percentage distribution of respondents' color preference by residence

Most preferred color	Urban N = 141	Rural N = 557	Total N = 698
Light blue	13.4	10.8	11.3
Navy blue	2.8	11.9	10.0
Green	12.7	15.5	14.9
White	47.9	30.8	34.2
Red	2.1	2.9	2.7
Yellow	2.1	3.4	3.2
Black	2.8	12.6	10.6
No preference	0.7	4.1	3.4
Other	15.5	8.1	9.6
Total (%)	100	100	100

CONCLUSIONS

The findings from this study have highlighted a number of issues that are important in understanding the knowledge, attitudes and practices regarding malaria and its prevention. A number of general conclusions and recommendations can be derived:

- Malaria is a concern to most households and is bearing hard on household incomes. On average, each household is spending 3,428 USh (nearly US $2) a month on malaria treatment, accounting for 4.2% of the per capita GDP.

- There is knowledge that children five years or under are at greater risk from malaria (71.5%), but almost no knowledge that pregnant women are also at high risk (9.9%).

- It is well known that mosquitoes transmit malaria (77.6%), but the link between using nets and malaria prevention is not well known, particularly among rural households where only 24.6% of respondents cited the use of nets as the best prevention method, and 17% did not know how to prevent malaria at all.

- Awareness of malaria education messages is high, particularly in urban areas where 83% of respondents had heard malaria education messages compared to 67.5% in rural areas. It is primarily messages about malaria prevention that have been heard by both urban and rural respondents. In urban areas, messages about malaria treatment and transmission had been heard by over half of respondents (58.1% and 53% respectively).

- Generally, the attitude toward nets is positive, as only a few problems were associated with net use. However, nets were perceived to be expensive; indicating the likelihood that price will be an important determinant to purchase of ITNs.

- A net was also considered to cause heat and lack of enough air when you sleep under it.

- The positive attitude towards nets has not yet been translated to use as only 22.4% of households in the four districts surveyed had at least one net, the majority of whom were residents of urban areas (45.5% compared with only 16.5% of rural households).

- Only 8% of the households with nets had them on all beds/mats. Considering that a majority of households had 5 to 8 people, it is likely that only a few people were sleeping under a net in households that only had nets on some beds.

- It is interesting to note that nearly all respondents had purchased nets as opposed to receiving them for free. This indicates that people are open to buying nets.

- An important finding of this research is that fewer children in households with nets were reported to have had malaria in the last month.

- Awareness of insecticide treatment for nets is extremely low (14.1%).

- Radio is widely listened to by both rural and urban people. Advertising, educational messages and promotional activities on radio have a greater chance of reaching a large number of people, especially if aired in the evening hours when most people (45.9%) listen.

- There may be a need to educate people on the washing of ITNs. This is because quite a substantial number who have nets wash them at least once a month (82.6%).

- White rectangular nets are preferred. However, the round/conical shape and green color are also popular.

This study has demonstrated a potential for the social marketing of ITNs in Uganda, as most households perceived ITNs to be very important. The adoption of nets by households is likely to reduce expenditure on malaria treatment and therefore improve household income and foster national economic growth.

APPENDIX A

Sample district population

District	Male population	Female population	Urban dwellers	Rural dwellers	Total population
Mukono	413,580	411,024	98,735	725,869	824,604
Jinja	143,336	146,140	80,893	205,583	286,476
Mbarara	458,257	472,515	46,616	884,156	930,772
Arua	307,679	330,262	26,712	611,229	637,941
Total	1,322,852	1,359,941	252,956	2,426,837	2,679,793

Source: Population and Housing census report (1991)

APPENDIX B

The API Index

The Amenities and Possessions Index (API) defined for use in this study is based on an individual's access to the basic amenities of toilet facilities, drinking and non-drinking water, and electricity, and to four consumer durables: radio, television, refrigerator, and car (this definition is adopted from: Kishor, Sunita and Katherine Neitzel. 1996. *The Status of Women: Indicators for Twenty-Five Countries.* DHS Comparative Studies No. 21. Calverton, Maryland: Macro International Inc., pp.6–7). An individual is assumed to have access to these basic amenities and consumer durables if the household that he/she lives in has these basic amenities and consumer durables. This assumption appears to be justifies because all amenities and consumer durables included in the index are collective goods (the car being least so), and questions of inequitable distribution relevant to income-based measures are less likely to apply. Specifically, individuals are assigned the following index values according to whether their household has the specified combination of basic amenities and consumer durables:

HIGH API — any kind of drinking and non-drinking water source other than surface water, any kind of flush or pit toilet latrine or "other" toilet facilities, may or may not have electricity, and at least two of any of the four consumer durables;

MEDIUM API (the residual category) — any kind of drinking or non-drinking water source including surface water and "other" water sources, any kind of flush toiled facility including those listed under no facility and "other," may or may not have electricity, any combination of the four consumer durables including none; and finally,

LOW API — only surface water for drinking and non-drinking purposes, no toilet facility, no electricity, and none of the four consumer durables.

This definition of the API ensures that the two ends of the scale coincide with the tow ends of the poverty-wealth spectrum — those in the HIGH API category have everything, even a car, and those in the LOW API category have absolutely nothing. The MEDIUM-HIGH and the MEDIUM categories are less clear-cut and differ from the two extremes because they allow for several different combinations of the types of amenities and the number of durable goods. Persons are assigned to the MEDIUM category only if they do not satisfy the conditions of the other API categories. This ensures that those in the MEDIUM category are better off in some way than those in the LOW category but are worse off than those in the MEDIUM-HIGH category.

The Relative SES Index

The Relative SES Index measures a respondent's socio-economic status relative to that of other respondents. As with the API, amenities and possessions such as a car, refrigerator, radio, TV, electricity, water source, and toilet type are used to derive the relative SES index. A cumulative scale is obtained by assigning a score of the respondents who have each of the amenities and possessions. Respondents are then divided based on their cumulative scores into four fairly equal groups (quartiles):[19]

[19] The grouping of respondents into quartiles varies by sample depending on its distribution according to amenities and possessions.

First Quartile = Low SES
Second Quartile = Medium SES
Third Quartile = Medium-High SES
Fourth Quartile = High SES

The Relative SES locates a respondent's socio-economic status in relation to those of the others in the sample. It thus adjusts for possible skewness in SES of respondents in a sample compared to the population. Relative SES implies that a respondent with low socio-economic status (i.e., those in the first 25% measured by Relative SES Index) may not have low socio-economic status in absolute terms (measured by API).

APPENDIX C

More information on malaria

http://www.who.int/inf-fs/en/fact094.html
http://www.malaria.org/bginfo.html
http://www.government.go.ug/local_admin.htm

APPENDIX D

Baseline questionnaire *(attached)*

BASELINE SURVEY ON MALARIA PREVENTION & ITN
COMMERCIAL MARKET STRATEGIES

Hello, my name is _____ from the Commercial Market Strategies. I am part of a team of people who are carrying out a survey on people s health in Uganda. I would like to ask you some questions and this will take about 45 minutes. Your answers will remain confidential, and we will not take down your name or address so that no one will know who gave us these answers. There are no correct answers, each of your answers will depend on you views and your situation.

NOTE TO INTERVIEWERS.

Remember to ask all questions unless the questionnaire tells you to skip questions or move to another section. All answers to pre-coded questions must be coded by circling the correct response. Where you see open-ended questions, you are required to write in the answer. Unless the instructions read so, do not prompt for answers. Always read instructions written in bold as they will guide you through your interviewing process.

Name of Interviewer: _____ Date: _ _/_ _/_ _
ID Number: (*leave blank)* _ _ _ Start time: _ _/_ _ End time: _ _/_ _

Sampling point number:

District

Mukono	1
Jinja	2
Mbarara	3
Arua	4

Type of area
Urban .1
Rural ..2

Interviewer agreement

I certify that I have filled this questionnaire in accordance to the briefing I received and it is a true and accurate record of the interview I conducted with the respondent. I have checked this questionnaire and confirmed that the information in it is correct.

Signed_____ Date_____

SECTION 1: GENERAL INFORMATION

1. Sex of respondent:

Male	1
Female	2

2. Respondents age

Refused to disclose 99

3. What is your relationship to the head of household?

Self	1
Wife/common law wife	2
Husband	3
Daughter	4
Son	5
Sister	6
Brother	7
Cousin	8
Other relative, specify _____	9

4. What is your occupation (whatever you do to earn money)

Peasant farmer	1
Large scale farmer	2
Street trader	3
Market trader	4
Professional, in private sector (specify)_____	5
Professional, in public sector (specify)_____	6
Other (please specify) _____	7

5. What is the highest standard of education you have attained?

Primary education (not completed)	1
Primary education (completed)	2
Ordinary level (not completed)	3
Ordinary level (completed)	4
Advanced level (completed)	5
Advanced level (not completed)	6
College/institution	7
University	8
Never attended school	9
Refused to disclose	10
Other	11

6. What languages do you speak?

For each language the respondent can speak, ask Q.7

7. Can you read ?

8. Is there any other member of your household who can read ?

Languages speak		**Languages read**		**Languages read by other**	
English	1	English	1	English	1
Luganda	2	Luganda	2	Luganda	2
Lusoga	3	Lusoga	3	Lusoga	3
Lugbara	4	Lugbara	4	Lugbara	4
Runyankore	5	Runyankore	5	Runyankore	5
Other Specify _____	6	Other Specify _____	6	Other Specify _____	6
		None	7	None	7

SECTION 2: LIVING CONDITIONS

9. Type of house

Permanent house	1
Semi-permanent house	2
Traditional/hut	3

10. How many rooms do you have in your house (not including the toilet/bathroom and kitchen?

Interviewer, write with leading zeros

11. What is your house made of? _____ **(Confirm from observation)**

Walls	**Code**	**Roof**	**Code**	**Windows**	**Code**
Grass and poles	1	Grass	1	Wooden	1
Mud and poles	2	Banana leaves	2	Glass	2
Mud and unbaked bricks	3	Iron sheets	3	Iron	3
Mud and baked bricks	4	Tiles/asbestos	4	Polythene/cloth/cardboard	4
Cement and bricks	5	Other Specify	5	Open windows	5
Other specify _____	6	_____		No windows	6
				Other, specify _____	7

12. What source of lighting do you use in your house?

Electricity	1
Kerosene/Paraffin Lamp	2
Tin with wick candle	3
Wax candle	4
Other, specify _____	5

13. Where does your household mainly obtain drinking water? **(One answer only)**

14. Where else do you obtain water from? **(Multiple answers possible)**

	Main source	**Other sources**
In — house tap	1	1
Piped to the compound	2	2
Stand — pipe in street/local area	3	3
Bore-hole	4	4
River/stream	5	5
Protected well	6	6
Unprotected well	7	7
Other (please specify) _____	8	8

15. What type of toilet facility does your household have?

Own flush toilet	1
Shared flush toilet	2
Own pit latrine	3
Shared pit latrine	4
No toilet	5
Other (specify)	6

16. Do you or anyone in your household own a (radio)?

Yes	1
No	2

17. When do you most often listen to radio?

Circle all positive answers

DO NOT PROMPT

In the morning	1
In the afternoon	2
In the evening	3
All day	4
Other (specify)	5

18. What day(s) of the week do you most often listen to the radio?

DO NOT PROMPT (Circle all positive answers)

Weekdays	1
Weekends	2
Every day	3
Other (specify)	4

19. Do you or anyone in your household own a Television?

Yes	1
No	2

20. Do you or anyone in your household own a bicycle/motorcycle?

	Bicycle	**Motorcycle**
Yes	1	1
No	2	2

21. Do you or anyone in your household own a car/truck?

Yes	1
No	2

22. How many people normally sleep in your home?

23. How many people slept in your home last night?

24. How many children less than 5 years of age slept in your home last night?

25. How many children aged between 5 and 14 slept in your home last night?

26. How many beds do you have in your home?

27. How many sleeping mats do you have in your home?

28. Which people in your home sleep on beds?

29. And which people in your home sleep on mats? **(Circle all positive responses*)***

Sleep on beds(Q.28)		**Sleep on mats(Q.29)**	
Head of the household	1	Head of the household	1
Head of Household Partner	2	Head of Household Partner	2
Some Adults	3	Some Adults	3
All the adults	4	All the adults	4
Some children	5	Some children	5
All the children	6	All the children	6
Visitors	7	Visitors	7
Nobody	8	Nobody	8
Everybody	9	Everybody	9
Other (specify)	10	Other (specify)	10

30. Where do the children under 5 years sleep? **(Circle all positive responses)**

On their own	1
With Parents	2

With brother/sisters	3
Other (please specify) _____	4
No children under 5	5

31. At what time do the children under 5 normally go to bed?

32. At what time do you normally go to bed?

SECTION 3: MALARIA

33. Have you ever heard of a disease called malaria /musujja?

Yes	1
No	2

If No, go to section 4

34. Can you please tell me what the main symptom or sign of this illness is?
35. What other symptoms or signs of malaria are you aware of?

Main symptom (One answer only) Q.34		**Other symptoms (Multiple answers possible) Q.35**	
Fever	1	Fever	1
Feeling cold	2	Feeling cold	2
Headache	3	Headache	3
Vomiting	4	Vomiting	4
Diarrhea	5	Diarrhea	5
General body weakness	6	General body weakness	6
Loss of appetite	7	Loss of appetite	7
Body pain/joint pain	8	Body pain/joint pain	8
Eyes become yellow	9	Eyes become yellow	9
Don t know	10	Don t know	10
Other (specify)	11	Other (specify)	11

36. Which categories/groups of people are most affected by malaria/musujja in this area?

DO NOT PROMPT, MULTIPLE ANSWERS POSSIBLE

Adults	1
Children under 5	2
Elderly people	3
Pregnant women	4
Adult men	5
Other (please specify)	6

37. What is the main cause for malaria/musujja that you know of?

DO NOT PROMPT, ONE ANSWER ONLY.

38. Are there any other ways you can get the disease?

DO NOT PROMPT. (Circle all answers given, multiple answers possible)

Main way (one answer only) Q.37		**Other ways (multiple answers possible) Q.38**	
Working in the sun	1	Working in the sun	1
From being in the rain	2	From being in the rain	2
From getting cold	3	From getting cold	3
From drinking dirty water	4	From drinking dirty water	4
From another person with malaria	5	From another person with malaria	5
From being bitten by mosquitoes	6	From being bitten by mosquitoes	6
Don t know	7	Don t know	7
Other (please specify) _____	8	Other (please specify) _____	8
		None	9

39. Have you seen or heard any malaria/musujja education messages from any source?

Yes	1
No	2

If No, go to Q.42

40. Where did you see or hear these education messages from?

DO NOT PROMPT. Circle all answers

Radio	1
TV	2
News paper/magazine	3
Posters/notices	4
Friends	5
Parents	6
Health workers	7
Government officials	8
Church/mosque	9
School	10
Other (please specify) _____	11

41. What message or messages did you see or hear?

DO NOT PROMPT. (Circle all answers).

Messages about prevention	1
Messages about treatment	2
How malaria is transmitted	3
Other (specify) _____	4
Can t remember	5

42. Do you think that a person can die from malaria?

Yes	1
No	2

If no, go to Q.44

43. Do you know of someone who has died from malaria/musujja illness?

Yes	1
No	2

44. Are you aware of any ways to prevent getting malaria?

Yes	1
No	2

If No, go to Q.47

45. What is the best way to prevent yourself from getting malaria/musujja?
46. Are there other ways you can prevent yourself from getting malaria/musujja?

Best way (one answer only) Q.45		**Other ways (multiple answers possible) Q.46**	
Sleeping under a mosquito net	1	Sleeping under a mosquito net	1
Avoiding being bitten by mosquitoes	2	Avoiding being bitten by mosquitoes	2
Taking preventive medicine	3	Taking preventive medicine	3
Using coils	4	Using coils	4
Using spray	5	Using spray	5
Avoid getting cold	6	Avoid getting cold	6
Avoid being in the sun too long	7	Avoid being in the sun too long	7
Keep the surrounds of the house clean	8	Keep the surrounds of the house clean	8
Drinking Clean water	9	Drinking Clean water	9
Don t know	10	Don t know	10
Other, specify_____ _____	11	Other, specify _____	11

47. Have you ever had an attack of malaria/musujja?

Yes	1
No	2

If No go to Q.59

48. How long ago did you last have malaria?

_ _ days ago
_ _ months ago
_ _ years ago

49. When you last had malaria did you get treatment for it?

Yes	1
No	2

If No go to Q.54

50. Where did you get the treatment? **(circle all responses)**

The pharmacy	1
Drug shop	2
A general merchandize shop	3
A traditional Healer	4
Government Hospital/clinic	5
Private Hospital/clinic	6
Other (please specify) _____	7

51. What treatment were you given? **(circle all responses)**

Traditional medicine (Specify) _____	1
Nivaquine/chloroquine tablets	2
Fancidar tablets	3
Quinine tablets	4
Mephaquine tablets	5
Metakelfin tablets	6
Aspirin/panadol	7
Tablets, unspecified	8
Chloroquine injection	9
Other, (Specify) _____	10
Don t know	11

52. How much money was spent on treatment?

Ush.					

Don t know ..1

53. How much money was spent on transport to get treatment?.

Ush.					

Don t know 1

54. When you last had malaria did you go to work?

Yes	1
No	2

If Yes go to Q.57

55. Did you lose any pay?

Yes	1
No	2

If No, go to Q.57

56. How much pay did you lose?

Ush.					

57. Which of the following statements best describes what you do when you have malaria: do you **always seek treatment, sometimes seek treatment or never seek treatment?**

Always seek treatment	1
Sometimes seek treatment	2
Never seek treatment	3

58. In the past year (12 months) how many times have you had malaria?

Once	1
2-4 times	2
5-7 times	3
8-10	4
Over 10 times	5
Never had malaria	6

59. In the past 3 months, how many people in your household have suffered from malaria?

60. What is the most important thing you do in your household to prevent getting malaria/musujja?

If the respondent does not do anything (code 11), go to section 4

61. What other things do you do to prevent malaria?

Most important thing (Q.60)		**Other things done, (Q61)**	
Use a bed net	1	Use a bed net	1
Take nivaquin/chloroquin	2	Take nivaquin/chloroquin	2
Avoid being bitten by mosquitoes	3	Avoid being bitten by mosquitoes	3
Use mosquito coils	4	Use mosquito coils	4
Use insecticide sprays	5	Use insecticide sprays	5
Avoid going out in the cold	6	Avoid going out in the cold	6
Avoid staying under sunshine for a long time	7	Avoid staying under sunshine for a long time	7
Close the doors and windows at night	8	Close the doors and windows at night	8
Keep the house and surrounds clean	9	Keep the house and surrounds clean	9
Other (please specify) _____ _____	10	Other (please specify) _____ _____	10
Don t do anything	11		

SECTION 4: MOSQUITOES

62. Do mosquitoes cause any trouble to you?

Yes	1
No	2

If No go to Q. 64

63. In what ways do they cause you trouble? **DO NOT PROMPT. Circle all answers**.

They bite	1
Their bites are itchy	2
They carry disease	3
They make noise	4
Other	5

- During what season do you notice a lot of mosquitoes? **DO NOT PROMPT**

During the dry season	1
During the rainy season	2
Throughout the year	3
Do not experience a lot	4
Don t know	5
Other (specify) _____	6

65. At what time of the day do mosquitoes bite most? **DO NOT PROMPT**

The morning	1
The afternoon	2
The evening	3
At night in bed	4
All day	5
Don t know	6
Other (please specify) _____	7

66. Are you currently using any method, even if traditional, to protect your household from mosquitoes?

Yes	1
No	2

If Yes, go to Q.68

67. Why don t you protect your household against mosquitoes?

DO NOT PROMPT. Circle all answers then go to Q.89.

I don t know how to	1
I don t have the money	2
I don t have the time	3
Protection materials are not available to me	4
I can t be bothered	5
Other (please specify) _____	6

68. What methods are you currently using to protect your household from mosquitoes? **DO NOT PROMPT. Circle all positive answers.**

69. For any commercial method mentioned, ask: How much money does ..(**mention method used)** cost?

Method used (Q.68)		**Cost for method used (Q.69)**
Use a mosquito net	1	Ush._____
Use insecticide spray	2	Ush._____
Clean the area around the house	3	
Close windows and doors	4	
Light the fire in the house	5	
Use coils	6	Ush._____
Apply mosquito repellent to the skin	7	Ush._____
Use traditional plants	8	
Light a candle	9	
Burn cow dung/traditional plants	10	
Other traditional (please specify) _____	11	
Other commercial (please specify) _____	12	Ush._____

70. On average, how many times per month do you buy ..**(mention each commercial method used)** in the rainy season? **(Interviewer record number of times in figures)**

Insecticide spray	
Coils	
Mosquito repellant	
Other commercial	

71. On average, how many times per month do you buy ..**(mention method)** in the dry season? **(Interviewer record number of times in figures)**

Insecticide spray	
Coils	
Mosquito repellant	
Other commercial	

72. Considering all methods that people can use to protect themselves from mosquitoes, which do you think is the best for protecting hopusehold from mosquitoes?

Spontaneous response. One answer only

Use a bed net	1
Use insecticide spray	2
Clean the area around the house	3
Close windows and doors	4
Light the fire in the house	5
Use coils	6
Apply mosquito repellent	7
Use traditional plants	8
Light a candle	9
Burn cow dung/traditional plants	10
Other (please specify _____	11

SECTION 5: BED NETS

Ask Questions 73 — 88 only to respondents who currently use bed nets

73. Do you have bed nets on every bed/mat in your household or are nets only in some beds/mats and not others?

All beds/mats	1
Some beds/mats only	2

If all beds/mats go to Q.77

74. Why don t you have nets on all beds/mats?

DO NOT PROMPT. Circle all positive answers.

Bed/nets are too expensive	1
I am not interested in putting them on every bed	2
I don t know how to fit the net on all the beds	3
Only children need nets	4
Only adults need nets	5
Some beds are not occupied	6
Don t know	7
Other (please specify) _____	8

75. On whose bed is/are the net(s)? **(Code all answers)**

76. And on whose bed do you not have nets?

Beds with nets, (Q.75)		**Beds without nets, (Q.76)**	
Head of household	1	Head of household	1
Spouse	2	Spouse	2
Bed shared with spouse	3	Bed shared with spouse	3
Children	4	Children	4
Visitors	5	Visitors	5
Other	6	Other	6

77. Last night did you personally sleep under a bed net?

Yes	1
No	2

If Yes go to Q.79

78. Why did you not use a net?

It is too hot	1
Mosquitoes still bite through the net	2
It is difficult if you want to get up in the night	3
It takes time to tuck the net each night	4
There is not enough air	5
Other (specify)_____	6

79. What is the main reason you use bed nets in your house?

80. What other reasons do you have for using bed nets in your house?

Main reason (Q.79)		**Other reasons (Q.80)**	
To prevent against mosquito bites	1	To prevent against mosquito bites	1
To prevent malaria/musujja	2	To prevent malaria/musujja	2
To prevent annoyance from mosquitoes	3	To prevent annoyance from mosquitoes	3
Other (please specify) _____	4	Other (please specify) _____	4
Don t know	5	None	5

81. For how long have you had bed nets in this house?

Weeks _ _

Months _ _

Years _ _

82. What type of bed net(s) do you have in your house? **Interviewer ask to see the net**

Prompt if necessary. Multiple answers possible

Manufactured net	1
Cotton net, home made	2
Nylon net, home made	3
Other (specify)	4
Don t know	5

83. How did you obtain your bed net(s)? **Multiple answers possible**

It was/they were given to me for free	1
I bought it/them	2
I can t remember	3
Other, specify	4

84. Where did you obtain/buy your bed net(s) from?

A shop	1
A pharmacy	2
A drug shop	3
A health center	4
A market	5
Other (specify)	6

85. How much in total was paid for the bed nets?

Ush					

86. What do you think of this price? Would you say it was **very high, high, affordable or low/cheap.**

Very high	1
High	2
Affordable/reasonable	3
Low/cheap	4

87. How often do you wash your bed net(s)?

- - times a week
- - times in two weeks
- - times in a month
- - times in two months
- - times in three months

Other, specify _ _ _____

(Interviewer go to Q.91)

ASK Q S.88-90 ONLY TO RESPONDENTS WHO DO NOT CURRENTLY USE BEDNETS IN THEIR HOUSEHOLDS

88. Have you personally ever used a bed net?

Yes	1
No	2

If No, go to Q.90

89. Why are you not using a bed net nowadays?

DO NOT PROMPT. Circle all positive answers, then go to Q.91

I am not bothered by mosquitoes	1
Nets are too expensive	2
I feel uncomfortable sleeping under a mosquito net	3
I don t know where to buy a net from	4
Nets are too hot	5
Nets are not available in this area	6
Other (please specify) _____	7

90. Why have you never used a bed net?

DO NOT PROMPT. Circle all positive answers.

We don t get bothered by mosquitoes	1
Nets are too expensive	2
I am not interested in having one	3
I don t know where to buy one from	4
It is too hot sleeping in a net	5
Other (please specify) _____	6

91. Where in this area can someone obtain a bed net? **Ask all:**

General shop	1
Open air market	2
Market stall/kiosk	3
Drug shop	4
Pharmacy	5
Clinic/hospital	6
Other (Specify)_____	7
Not available	8
Don t know	9

If don t know go to Q.96

92. On average, how many times a month do you or someone from your household visit that place?

Less than once a month	1
1 to 4 times a month	2
5 to 10 times a month	4
11 or more times	5
Never visit	6
Don t know	7

93. How long does it take to get there?

_ _ hours _ _ minutes

94. On average, how much does a bed net cost?

Ush					

Don t Know 1

95. From your own point of view, how much do you think a bed net should cost?

USh					

Don t know 1

96. If you were to buy a bed net, how much money can your household afford to spend?

USh					

Can t tell .1

97. What do you think are the benefits of sleeping under a bed net?

DO NOT PROMPT. Circle all answers.

Don t get bitten by mosquitoes	1
Don t get malaria	2
Don t get bothered by other insects	3
Sleep better	4
It is warmer	5
Other: (please specify) _____	6

98. What then do you think are the problems associated with sleeping under a bed net?

DO NOT PROMPT. Circle all answers

It is too hot sleeping in a net	1
Mosquitoes can still bite through the net	2
It is difficult if you want to get up in the night	3
It takes time to tuck the net each night	4
There is not enough air	5
Other, specify	6
None	7

SECTION 6: TREATED BED NETS

99. Have you ever heard about or seen bed nets treated with insecticide?

Yes	1
No	2

If No, go to Q.109

100. Where did you see / hear about treated nets from?

Friends / Family	1
Health professionals	2
Posters	3
On radio	4
In the news paper	5
Can t remember	6
Other (specify)	7

101. Are any of your bed nets treated with insecticide?

Yes	1
No	2

102. What do you think is the reason for treating bed nets?

To kill mosquitoes	1
To make the net stronger	2
To repel mosquitoes	3
Other (specify) _____	4

103. Can you obtain a bed net treated with insecticide in this area?

Yes	1
No	2
Don t know	3

If No or Don t know, go to Q.105

104. Where can you buy a bed net treated with insecticide in this area?

Shops	1
Pharmacies	2
Health center/clinics	3
Markets	4
Other (specify)	5
Don t know	6

105. Have you ever seen somebody treat a net with insecticide?

Yes	1
No	2

If No, go to Q. 107

106. Where did you see it being treated?

A general merchandise shop	1
Pharmacy	2
Drug shop	3
Health center/clinic	4
Markets	5
At home	6
Other (specify) _____	7

107. Do bed nets have to be re-treated?

Yes	1
No	2
Don t know	3

If No/Don t know, go to Q.109

108. After how long do nets have to be re-treated?

Every____Months

Every____years

Don t know .99

INTERVIEWER READ THE FOLLOWING TEXT ABOUT A TREATED BED NET TO THE RESPONDENT BEFORE ASKING THE NEXT TWO QUESTIONS.

I am now going to explain to you what a treated net is. This explanation will help you to answer the next two questions that I am going to ask you.

A treated bed net is almost like any other ordinary bed net. The only difference is that it is treated with insecticides. These insecticides are safe to people, but effectively kill and repel mosquitoes. The treatment is done by dipping a clean net into a recommended dosage of insecticide solution until it is completely wet. The wet net is then dried on a clean surface.
Re-treatment can be done twice or more times a year depending on how frequently the net is washed.

109. How important do you think this kind of a net would be to you and your household? Would you say it would be **very important, somewhat important, neither important nor unimportant, not very important or not important at all?**

Very Important	1
Somewhat important	2
Neither important nor unimportant	3
Not very important	4
Not important at all	5

If codes 3,4,5, go to Q.111

110. If such a treated bed net was made available to you, at what price do you think you can afford a medium size net?

Ush.					

Interviewer, show the respondent the different shapes of a net and ask the following question.

111. Bed nets can be made in three different shapes. They could be **rectangular (like a box) shape, round or conical shape or triangular.** Which shape of net would you prefer?

Rectangular	1
Round/conical	2
Triangular	3
No difference	4
Other (specify)	5

112. Nets can also be made in different colors. What color of net do you prefer most? (**One answer only)**

113. Which other colors would you prefer? **Multiple answer possible**

114. Which color(s) don t you like if any? **Multiple answer possible**

Most preferred color (Q.112)		**Other preferred colors (Q.113)**		**Colors disliked (Q114)**	
Light Blue	1	Light Blue	1	Light Blue	1
Navy Blue	2	Navy Blue	2	Navy Blue	2
Green	3	Green	3	Green	3
White	4	White	4	White	4
Red	5	Red	5	Red	5
Yellow	6	Yellow	6	Yellow	6
black	7	Black	7	Black	7
No difference	8	No difference	8	No difference	8
Other (Specify)	9	Other (Specify)	9	Other (Specify)	9

115. Thinking about the items you might buy in future, are you likely to buy a net?

Yes	1
No	2

116. How many males in your household fall in each of the following age categories?

Interviewer read out each age category and write in the number of persons in two digits with leading zeros. For age categories where there is no person, write 00.

5 years and below	
6 — 14 years	
15 - 23	
24 — 32	
33- 40	
41+	

117. And how many females in your household fall in each of the following age categories?

Interviewer read out each age category and write in the number of persons in two digits with leading zeros. For age categories where there is no person, write 00.

5 years and below	
6 — 14 years	
15 — 23	
24 — 32	
33 — 41	
41+	

118. Last night, how many children under the age of 5 slept under a bed net?

119. Last night how many children aged 6-14 slept under a bed net?

120. Last night how many adult women (15 years +) slept under a bed net?

121. Last night how many adult men (15 years +) slept under a bed net?

Ask the following questions only to households with children aged 5 years and below. If there no children of that age, close the interview and thank the respondent..

	1st Child	2nd Child	3rd Child	4th Child	5th Child
A. Sex of child					
B. Age					
C. Has the child had malaria in the last month? ***(If no go to G)***					
D. Was the child treated for Malaria? ***(If no thank respondent and close interview)***					
E. Where did you obtain treatment from?					
A pharmacy 1					
A government hospital/clinic.. ...2					
A private hospital/clinic .3					
A drug shop 4					
A traditional healer 5					
Other (Specify)_____6					
Don t know 7					
F. What treatment was given?					
Traditional medicine (Specify) _____1					
Chloroquine 2					
Fancidar ..3					
Quinine tablets 4					
Quinine injection 5					
Aspirin/Panadol .. 6					
Other (Specify)_____7					

This is the end of the interview. Thank you very much for participating in this research