Government of Malawi
Ministry of Health

MALAWI NATIONAL MALARIA INDICATOR SURVEY 2010

Ministry of Health
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This report summarizes findings of the 2010 Malawi National Malaria Indicator Survey carried out in March and April 2010 by the Ministry of Health's National Malaria Control Programme; the Malaria Control and Evaluation Partnership in Africa (MACEPA), a programme at PATH; the World Health Organization; the National Statistics Office; UNICEF; US President's Malaria Initiative; and the Malaria Alert Centre at the College of Medicine.

Malawi National Malaria Control Programme. Malawi National Malaria Indicator Survey 2010

Published by: Malawi Ministry of Health
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Acronyms

CDC:	US Centers for Disease Control and Prevention
DHS:	Demographic and health survey
EA:	Enumeration area
EPI:	Expanded Programme on Immunization
IPT:	Intermittent preventive treatment
IRS:	Indoor residual spraying
ITN:	Insecticide-treated mosquito net
LLIN:	Long-lasting insecticidal net
MACEPA:	Malaria Control and Evaluation Partnership in Africa
MK:	Malawian Kwacha
MERG:	Monitoring and Evaluation Reference Group
MICS:	Multiple Indicator Cluster Survey
MoH:	Ministry of Health
NMCP:	National Malaria Control Programme
NMSP:	National Malaria Strategic Plan
NPHL	National Public Health Laboratory
NSO:	National Statistics Office
PDA:	Personal digital assistant
PMI:	US President's Malaria Initiative
RBM:	Roll Back Malaria
RDT:	Rapid diagnostic test
SEA	Standard enumeration area
SP:	Sulphadoxine-Pyrimethamine
UNICEF:	United Nation's Children Fund
USAID:	United States Agency for International Development
WBC	White blood cell
WHO:	World Health Organization

Acknowledgments

This report presents the results of the Malawi National Malaria Indicator Survey (MIS) 2010, a comprehensive, nationally-representative household survey designed to measure progress towards achieving the goals and targets set forth in the National Malaria Strategic Plan 2005–2010. It represents the efforts of several agencies and many individuals. The Ministry of Health (MoH), namely the National Malaria Control Programme (NMCP), had the major responsibility of conducting the survey. The survey was co-funded by the MoH; the Malaria Control and Evaluation Partnership in Africa (MACEPA), a programme at PATH; and United Nations Children's Fund. Other agencies that have been instrumental in this survey include the National Statistical Office (NSO), the World Health Organization (WHO), the University of Malawi's College of Medicine; the US Centers for Disease Control and Prevention (CDC), and the US President's Malaria Initiative (PMI).

Within the MoH, the following individuals provided overall survey leadership and guidance: Mr Chris Kang'ombe, the former Secretary for Health, and Dr Storn Kabuluzi, Director of Preventive Health Services, Mrs. Doreen Ali, Deputy Director of Preventive Health Services (Malaria), and Dr Ben Chilima, Deputy Director of Preventive Health Services (National Public Laboratories). Implementation of the MIS 2010 was led and guided by the Steering Committee under the leadership of Prof Malcolm Molyneux and Dr Grace Malenga.

Mr John Zoya was the MIS Coordinator and he was supported by the NMCP's staff, John Chiphwanya, John Sande, Dubulao Moyo, Mr Kaunda, and Misheck Luhanga. Mr James Mwaisemba from the Epidemiology Unit, and Messrs Rudia Lungu, James Kaphiyo, and Abelo Phiri from National Public Health Laboratory supported fieldwork and supervision of the laboratory technicians and reading of slides. The NSO Commissioner, Mr Charles Machinjiri and Mr Deric Zanera, Chief Statistician, provided support for the sample design and sample selection. The NSO staff also provided support during the field work for identification of cluster boundaries and household listing. At MACEPA, Dr Bertha Nhlema Simwaka, Mr Chris Lungu, John Miller, Mr Edwin Hedvall, and Ms Catherine Seneviratne provided logistics and procurement support, assistance with survey organization and training, and support for design and analysis; Ms Cristina Herdman, Ms Laura Newman, and Mr Manny Lewis edited and proofread the report. Mr Adam Bennett, from Tulane University provided support and training to partners' staff on data cleaning and analysis. Dr Jessica Oyugi from CDC/PMI supported survey activities, data analysis, and report writing. Messrs Wilfred Dodoli, Samson Katikiti, and Khoti Gausi from WHO provided support for training, field work, and data cleaning, analysis, and report writing.

The District Health Offices worked with the survey teams and provided artemesinin-based combination therapy for treatment of children who participated in the survey and tested positive for malaria. The Health Education Unit of the MoH supported the programme on communication and awareness about the survey. Also within the MoH, various personnel assisted with organization, community sensitization efforts, logistics, ordering of supplies, and training.

The CDC in Atlanta, Georgia (USA) took responsibility for programming the questionnaire into handheld computers. The Roll Back Malaria Monitoring and Evaluation Reference Group (RBM MERG) questionnaire and survey instruments were adapted and used for the Malawi 2010 MIS. The training materials, methodology, and questionnaires used in the survey were largely drawn from the work of the RBM MERG.

A complete list of the field teams and individuals involved in the survey is presented in Appendix C.

Preface

Malaria continues to be a major public health problem in Malawi, with an estimated six million cases occurring annually. Its effects are greater among children under five years of age and pregnant women. The Ministry of Health in collaboration with its partners has been implementing the National Malaria Strategic Plan 2005–2010 whose goal was to scale up malaria interventions towards the national vision of "Malaria-free Malawi." Specifically, we are striving for progress in scaling up malaria interventions including prompt and effective antimalarial treatment, insecticide- treated nets, indoor residual spraying, and prevention of malaria in pregnancy.

We have set for ourselves high coverage targets for these interventions. By achieving high coverage we are confident in our ability to reach our strategic goals of reducing malaria incidence and deaths as well as reducing malaria parasite prevalence and malaria-related anaemia.

Measurement is essential for understanding progress towards these goals. Without measurement we can only speculate as to our progress. The Malawi Malaria Indicator Survey 2010 represents this country's first nationally representative assessment of the coverage of the key malaria interventions in combination with measures of malaria-related burden using malaria parasite and anaemia prevalence testing among children under five years of age.

There is progress in controlling malaria. The coverage of pregnant women receiving at least two doses of intermittent preventive treatment (IPTp) has reached 60% and over 80% of women reported taking IPTp at least once during their last pregnancy. There is also an increase in ownership of insecticide-treated nets as measured through the number of households possessing them. Changes in antimalarial drug policy have provided challenges to increasing effective antimalarial treatment. Nevertheless, more children are receiving artemisin-based combination therapy than before and we expect these figures to continue to increase.

These results represent the combined work of numerous agencies contributing to the overall scale-up of malaria interventions. I would like to request that all partners make use of the information presented in this report in their project implementation so as to address the weaknesses and challenges depicted here.

Finally, I would like to thank all those who travelled to various areas including the most remote areas of the country to collect data. More importantly, I thank the survey respondents for their contribution to this survey. Together we can kick malaria out.

Willie Samute
Secretary for Health
Ministry of Health

Executive Summary

This report presents the results of the Malawi National Malaria Indicator Survey (MIS) 2010, a nationally representative household survey assessing coverage of key malaria interventions and malaria-related burden among children under five years of age. This MIS, the first conducted in Malawi, provides a benchmark against which progress towards scale-up of key interventions can be measured. In addition, it provides nationally representative measures of malaria and anaemia prevalence in children under five years of age. This survey was developed and conducted by the National Malaria Control Program within the Ministry of Health, along with several malaria control partners including the Malaria Control and Evaluation Partnership in Africa, a programme at PATH; the United Nations Children's Fund; the World Health Organization; the National Statistical Office; the University of Malawi's College of Medicine; the US Centers for Disease Control and Prevention; and the US President's Malaria Initiative.

The MIS was based on a nationally representative two-stage cluster sample of 3,500 households surveyed from 140 standard enumeration areas, which were randomly selected from 28 districts in the Northern, Central, and Southern regions to produce representative national, regional, and urban and rural estimates. Fieldwork was conducted in March and April 2010 by 10 field teams using standardized questionnaires pre-programmed into personal digital assistants to facilitate data entry, extraction, and analysis. Malaria parasite testing was conducted by analysis of blood smears at the National Public Laboratories and SD Bioline Malaria Pf® rapid diagnostic tests were used to determine treatment needs in the field. Anaemia testing was conducted using HemoCue® Hb 201 analyzers and microcuvettes.

The use of insecticide-treated nets (ITNs) when sleeping is the primary control strategy for preventing malaria in Malawi. Results from the 2010 MIS indicate that 63.4% of households have at least one mosquito net, and 58.2% of households possess at least one ITN. This represents an increase from 38% of households who reported possession of an ITN in the 2006 Multiple Indicator Cluster Survey (MICS). Some 55.4% of all children under five years of age slept under an ITN the night before the survey; among houses with at least one ITN, 80.7% of children under age five years slept under an ITN the night before the survey. This represents a substantial increase from the 2006 MICS, when only 25% of children reportedly slept under an ITN.

Malaria prevention in pregnancy relies both on the use of ITNs and intermittent preventive treatment (IPT) during pregnancy. The night preceding the survey, 56.2% of all women ages 15 to 49 slept under a mosquito net, and 50.8% slept under an ITN. Among pregnant women, 54.4% reported sleeping under a mosquito net, and 49.4% reported sleeping under an ITN the night before the survey. Some 82.7% of women reported taking IPT at least once during their last pregnancy, and 60.4% took the recommended two (or more) doses, which improves upon the 48% who took two or more doses reported in the 2006 MICS. Malaria knowledge was similarly high, as 95.6% of women had heard of malaria and 75.6% recognized fever as a primary symptom. These women also were very likely to know how to prevent malaria; 86.9% of them recognized sleeping under a mosquito net as a prevention method.

Rapid case identification and management is vital for reducing malaria-related mortality in children. In the 2010 MIS, 39.2% of children under five years of age had fever in the two weeks preceding the survey, and among them only 26.8% went for treatment within the same or next day following symptom onset; 30.9% of febrile children ultimately took an antimalarial, but only 21.9% did so in the first 24 hours. Artemether-lumefantrine, known locally as LA, is the primary antimalarial treatment in Malawi. Among children with fever, 27.6% took LA, and 20% of those children did so within the first 24 hours.

The malaria parasite prevalence rate by slide microscopy was 43.3% nationally, and severe anaemia prevalence (haemoglobin concentration <8g/dl) was 12.3% in children under five years of age. Malaria parasitaemia and severe anaemia rates were much higher in rural areas than in urban areas (46.9% to 14.7%, respectively, for parasitaemia, and 13.3% to 4.2%, respectively, for severe anaemia). Malaria parasite prevalence increased with increasing age, while severe anaemia showed the opposite trend. Both malaria parasite and severe anaemia prevalence rates were higher among children who did not sleep under an ITN the night before the survey compared with those who did; the prevalence of severe anaemia among children under two years of age who did not sleep under an ITN the night before the survey was

25.7%, compared to a rate of 13.6% among those children who did. Children aged 24–50 months who did not sleep under an ITN the night before the survey had a parasitaemia rate of 47.0%, children that age who did sleep under an ITN the night before the survey had a parasitaemia rate of 44.8%. Malaria and severe anaemia prevalence rates were highest in the poorer households (parasitaemia rates of 52.4% among those in the second wealth quintile compared to 22.5% in the highest wealth quintile and severe anaemia rates of 17.2% in the lowest wealth quintile compared to 4.8% in the highest wealth quintile), and among those households in the Central and Southern regions; households in urban areas had much higher parasitaemia and severe anaemia rates than did their urban counterparts (parasitaemia rates of 46.9% and 14.7%, respectively, and severe anaemia rates of 13.3% and 4.2%, respectively).

Chapter 1: Introduction

Background

Malaria is endemic throughout Malawi and continues to be a major public health problem, with an estimated six million cases occurring annually. It is the leading cause of morbidity and mortality in children under five years of age and pregnant women. Ninety-eight percent of malaria infections in Malawi are caused by *Plasmodium falciparum,* with *Anopheles funestus*, *A. gambiae,* and *A. arabiensis* as the primary mosquito vectors. Malaria transmission is largely determined by climatic factors, including temperature, humidity, and rainfall. Vector abundance follows seasonal rainfall patterns and increased temperature raises the parasite's reproductive rate, thereby influencing the prevalence rate of malaria in the population. Transmission is higher in areas with high temperatures and during Malawi's rainy season (October through April), particularly along the lakeshore and lowland areas of the lower Shire valley.

The goal of the current National Malaria Strategic Plan (NMSP) 2005–2010 is to scale up malaria interventions towards the achievement of the national vision of "a malaria-free Malawi." The National Malaria Control Programme (NMCP) aims to reduce the burden of malaria to a level of no public health significance in Malawi. The NMCP, in collaboration with multiple partners, set high targets for coverage of interventions and reductions in malaria burden as outlined in the NMSP. Principal strategic areas include case management, intermittent preventive treatment (IPT) among pregnant women, and insecticide-treated mosquito nets (ITN). As the current NMSP expires in 2010, a new strategic plan covering the next five-year period is in development.

The specific targets for the NMSP 2005–10 were based on the Abuja Declaration of halving malaria mortality and morbidity by the year 2010. Intervention targets were outlined as follows:

1. At least 80% of those suffering from fever due to malaria have access to and are able to use correct and appropriate treatment within 24 hours.
2. At least 80% of pregnant women have access to appropriate treatment by 2010.
3. At least 80% of pregnant women have access to malaria prevention by 2010.
4. At least 80% of children under five and pregnant women sleep under ITNs by 2010.

In order to assess national scale-up efforts implemented over the five years, several surveys were conducted, including the Multiple Indicator Cluster Survey (MICS) supported by the United Nations Children's Fund in 2006 and other household surveys such as the Malaria Alert Centre (MAC) anaemia and parasitaemia surveys. Although the MICS provided information and data on coverage of interventions, malaria prevalence data from the MAC were limited to eight districts of Malawi. To inform the development of the upcoming strategic plan, the NMCP conducted the National Malaria Indicator Survey (MIS) in 2010 to provide a current and comprehensive outlook on the country's malaria burden while reviewing the gains made and areas for acceleration of the malaria control interventions as delineated in the NMSP. The MIS serves as both an evaluation tool and baseline for the NMSP 2011–2015 and is based on a standard set of instruments and a protocol developed by the Roll Back Malaria Monitoring and Evaluation Reference Group (RBM MERG), a global technical advisory group providing monitoring and evaluation guidance to malaria control programmes.

Malawi's MIS 2010 had the following objectives:

1. To measure coverage of the core malaria interventions included in the NMSP 2005–2010 including ITNs, indoor residual spraying (IRS), and antimalarial medication.
2. To assess malaria parasitaemia prevalence among children under 5 years of age.
3. To assess the status of anaemia among children ages 6–59 months.
4. To assess disparities in malaria intervention coverage, and malaria parasite and anaemia prevalence among the surveyed population by location and other background characteristics.

Survey Organization

The 2010 MIS was coordinated by the NMCP which was responsible for general administrative management of the survey activities. These activities included oversight of day-to-day operations, establishing meetings of the Steering Committee, design of the survey and protocol and ensuring its approval by the National Health Services Research Committee prior to data collection, assuming responsibility for recruiting, training and mentoring field staff, and providing necessary medications for field activities. The NMCP led the data processing activities, report writing, and data dissemination. The District Health Offices provided community health nurses and laboratory assistants who formed the ten field teams. To facilitate communication between all stakeholders, while improving survey design and broadening acceptance and ownership of the MIS, the NMCP organized a Steering Committee, which comprised members who met periodically to provide recommendations on project design and questionnaires, monitor progress of activities and review survey results.

The National Statistics Office (NSO) assisted the NMCP in the design of the MIS, particularly in the areas of sample design and selection. The NSO provided the necessary maps and lists of households in the selected sampling points while providing geographic coordinates for the selected sample points.

Technical assistance was provided by MACEPA, the World Health Organization, Epidemiology Unit, the National Public Health Laboratory, the US Centers for Disease Control and Prevention (CDC), the US President's Malaria Initiative (PMI), and MAC.

Sample design

The MIS 2010 covered the household population of Malawi. The design for the survey was a representative probability sample to produce estimates for the country as a whole and for regional, urban, and rural domains separately.

Sampling frame

Malawi is administratively divided into three regions (Northern, Central, and Southern) and each region is in turn subdivided into districts. In 2008, the NSO carried out a Housing and Population Census. Each district unit was subdivided into enumeration areas (EAs) classified into urban and rural. The census demarcated a total of 12,569 EAs and these were utilized as the sampling frame for the 2010 MIS. EAs are the smallest statistical unit of measure that has information on the population and number of households; the number of households in each EA was used as a measure of size for selecting primary sampling units.

Sample size determination

The sample size for this survey was calculated with the assumption that future cross-sectional surveys will be conducted for comparison with these results. The standard approach for MIS sample size determination in accordance with RBM MERG recommendations is based on an expected 33% reduction in anaemia prevalence for children 6 to 59 months, where malaria-related anaemia burden is concentrated in infancy and early childhood[1]. Several studies have been conducted to determine the prevalence of anaemia in Malawi. For sample size determination, the 2010 MIS utilized estimates from the 2007 MAC household survey, which was conducted in eight districts and found that the prevalence of severe anaemia (hemoglobin <8gm/dl) in children was 13.7%. The sample size for the MIS was determined using 95% confidence limits, 80% power, a design effect of 2.00, and 20% adjustment for non-response (from household refusals or abandoned households) with an estimated 77% of households with a child under age five[2]). Based on these criteria, a 15% relative standard error required at least 1,800 households in the rural areas of the country, where prevalence estimates were 13.7% for severe anaemia and 19% for parasitaemia in children under age five. A representative sample of 3,500 of households from a total of 140 clusters was selected for the MIS and a uniform sample of 25 households was allocated to each cluster. The intention was to provide comparable estimates of key malaria indicators including prevalence of anaemia in children aged 6 to 59 months.

The first stage sampling of 140 EAs, of which 96 were from rural areas and 44 from urban areas, was conducted by the NSO using a systematic random sample selection of the 2008 census sampling frame. EAs for the MIS were selected from each of six strata determined by region and urban/rural status. The selection of the EAs within regions was done proportionately to the regional population. Urban/rural EAs were not allocated proportional to their respective population size; rather, urban areas were over-sampled in order to produce reliable estimates for that domain, and therefore weighting was required during analysis to correct for differential probabilities of selection. Sample selection is described further in Appendix A.

Second-stage sampling was conducted using personal digital assistants (PDAs) fitted with global positioning systems (GPS) by digitally enumerating all households in the selected EAs during fieldwork. A simple random sample of 25 households per EA was selected with the aid of the PDAs. Every attempt was made to conduct interviews in the 25 selected households and up to three visits were made to ascertain compliance in case of absence of all households' members (or any household members in the case of malaria parasite testing) to minimize potential bias.

Survey Population

The survey targeted all selected households in the EAs. For each household, the head of the household was interviewed to obtain information on the household members, ages, socio-economic status and availability of malaria-related commodities. From the listed household members, children under age 5 years were identified and a blood sample was collected through finger prick for parasitaemia testing; children ages 6 to 59 months were tested for anaemia. The testing and treatment algorithm is described in the text below. After obtaining informed consent, all women from the household listing aged 15 to 49 years were interviewed using a separate women's questionnaire to capture information on reproductive history, malaria in pregnancy, management of fever and malaria, access to treatment, and knowledge of malaria.

[1] Korenromp EL, Armstrong-Schellenberg J, Williams B, Nahlen B, and RW Snow. Impact of malaria control on childhood anemia in Africa – A quantitative review. *Tropical Medicine and International Health* 2004; 9 (10): 1050-1065. 35.

[2] National Statistics Office. *Malawi Demographic and Health Survey.* 2004. Zomba.

Personal Digital Assistants (PDAs)

PDAs were used for household listing, second stage sample selection, recording of questionnaire results, and recording of biomarker testing results. Questionnaires were pre-programmed into the PDAs to eliminate the need for paper transcribing and to allow for greater efficiency with interviewing, data cleaning and tabulation. For the purposes of the household listing and to facilitate data entry at the time of the interview, all household names were recorded into the PDA. Each individual was assigned a unique identification code at the time of questionnaire administration. The names of respondents and households members were kept strictly confidential and were not associated with the results in any way or available to anyone except the MIS team. The Dell Axim X51 PDA was used. Programming of the questionnaire was done for the Windows Mobile 5.0 operating system using Visual Basic and SQL Mobile by the CDC.

Questionnaires

The 2010 MIS adapted the RBM MERG's household and women's questionnaires. These can be found in Appendix D.

The household questionnaire was used to list all usual members (de jure) and visitors who spent the night (de facto) preceding the survey in the selected households. The following basic characteristics were collected for each member of the household: age, sex, education, and relationship to the head of the household. The household questionnaire was also used to identify women who were eligible to answer the women's questionnaire and to identify children under five years of age for anaemia and parasitaemia testing. Malaria-specific issues covered in the household questionnaire included queries on ITNs including household possession, net treatment status, and use of nets among all household members as well as status of IRS. Other questions in the household survey relate to the household economic level and physical characteristics of the dwelling.

The women's questionnaire was used to collect information from all eligible women aged 15 to 49. The following topics were included:

- Background characteristics such as education level, asset-based wealth index information.
- Reproductive and birth history, pregnancy status.
- General malaria knowledge and sources of information.
- IPT for pregnant women.
- Fever prevalence among children under five years of age and fever treatment with antimalarial drugs.

Malaria parasite and anaemia testing

All laboratory technicians recruited for the MIS received standardized training to conduct finger pricks for malaria parasitaemia among children under age five years and anaemia among those aged six to 59 months. After obtaining informed consent from the child's parent or guardian, the finger was cleaned with an alcohol swab and then blood samples were collected using a new sterile lancet for each child. The first drop of blood was wiped from the finger, the second drop was used to prepare a thick blood film, the third drop was used in the HemoCue® photometer to determine the child's haemoglobin concentration, and the fourth drop was applied to a malaria rapid diagnostic test (RDT) strip to guide treatment decisions for parasitaemic children. Results from the anaemia testing and RDTs were available immediately to the parents or caregivers for the child. A final blood drop was placed on filter paper for polymerase chain reaction analysis in the future. All stained slides were read by two independent laboratory technicians at the Community Health Science's Unit of the National Public Health Laboratory (NPHL) and were masked from RDT results. The slide reading was completed within six weeks of fieldwork finalization. Discrepant results between microscopy and RDTs were re-analyzed by a third laboratory technician for final validation.

Treatment algorithm

Results from the Malawi-approved RDT, SD Bioline Malaria Pf®, were used to guide treatment of parasitaemic children during the survey. When children were found with haemoglobin levels of less than 8g/dl and a negative RDT, the parent or guardian was given written results, and the child was referred to a health centre for an appropriate treatment. Presumptive treatment of helminthic infections with mebendazole was only given to children at least 12 months of age as per the Integrated Management of Childhood Illnesses guidelines in Malawi by the survey nurse.

Children with positive RDT results and without clinical evidence of severe malaria classification received immediate treatment for malaria using an artemisin-containing combination antimalarial treatment, Coartem®, according to Malawi national treatment guidelines. Treatment was administered by recruited community nurses, who were members of each field team. Children clinically assessed by the survey nurse and established as having severe malaria were transported immediately to the nearest health centre. Those already treated with Coartem® within the past two weeks were also referred to the nearest facility for further evaluation.

HemoCue® and RDT testing was performed according to manufacturer recommendations.

Slide examination

All microscopic slides were stained with Giemsa and read by laboratory technicians at the NPHL as previously described. Asexual stage parasites were counted against at least 200 white blood cells (WBCs), and parasite densities were calculated assuming 8,000 WBCs/dl of blood. Where there were less than 10 parasites per 100 fields, the slides were read up to a threshold of 500+ WBCs. Blood smears were considered negative if no parasites were found after counting 200 fields. Quality assurance was addressed with a crosscheck evaluation of all positives and *all* negatives from each group. As mentioned above, discordant results were re-read by a third laboratory technician.

Community sensitization

In order to prepare surveyed communities for upcoming fieldwork, a series of community sensitization measures was implemented. These included a general informational letter to all traditional leaders for selected EAs, district assemblies, and the police. These documents included information on the purpose, procedures, and importance of household participation. Additionally, a series of radio spots was developed in two predominant local languages (Chichewa and Tumbuka) and aired on both national and local community radio stations. The Ministry of Health also published press releases in local papers.

Training, pre-test, and field work

Data collection for the MIS took place in March and April 2010. Ten interviewing teams of five fieldworkers each were formed to carry out the fieldwork. Each team was comprised of at least two community nurses, two laboratory technicians, and one mapper from the NSO. The laboratory technicians and nurses were selected by District Health Management Teams from districts represented within the sampling frame, with the intent of having field staff from, or from as close as possible to, selected EAs. The nurses were responsible for conducting household interviews, and the laboratory technicians tested the children and prepared blood slides in the field. Each team was assigned to 14 EAs.

Training was conducted for two weeks beginning the first week of March 2010. Sixty-five individuals were identified for fieldwork, including 22 community nurses, 22 laboratory technicians, 10 mappers from NSO, and 11 supervisors. The training schedule included sessions on survey background, questioning methods, the questionnaire, testing procedures, and second-stage cluster-level sampling of households. PDAs were introduced to the field staff on the first day of training and were used throughout all the training sessions to familiarize participants with each procedure associated with use of the PDA.

A field pretest of all survey procedures was done at the end of the training week in four selected EAs near the training centre. All participants were pre-arranged into groups corresponding to their fieldwork assignments. During the pretest each team practiced performing the household listing in a given EA, joining listed households from different PDAs, randomly selecting 25 households, conducting interviews, and testing of laboratory procedures.

Data management and analysis

Data were collected through questionnaires that were programmed on PDAs. Every evening, information collected through PDAs was compiled in a backup storage card (SD) located externally to the PDA. Following completion of data collection, the complete household listing and household interview files were extracted from the PDAs and storage cards and converted into Microsoft Access database files with conversion software programmed by the CDC. Data cleaning, verification, and merging were conducted in Microsoft Access; these files were exported to STATA 11.0 for analysis, weighting, and creation of report tables.

Weighting was conducted at the analysis phase to account for the unequal probability of selection of households across the sample. The weights, which were calculated as the inverse of the probability of selection of a given unit, corrected for the difference in probability of selection due to design and to a change in the number of households per EA from 2008 census estimates. Weighting formulas are described in further detail in Appendix A.

Ethical approval, ethics, and confidentiality

Participation in the survey was voluntary. Individual consent was obtained before beginning the household and women's surveys and blood draws. Consent for children under five years of age was obtained from the guardian or parent. For all other respondents under the age of 18 who were not married at the time of the interview and still living with their parents or guardians, permission and consent was obtained both from the individual and from the guardian or parent for the interview. Guardians were informed about the general purpose and the possible risks and benefits in the local language. See consent forms in Appendix E.

As previously described, children testing positive by RDT or who had anaemia were treated according to the Malawi Government's guidelines on the treatment of malaria infection and anaemia, respectively. In an effort to maintain confidentiality, participant's data were linked to a unique identifier, and names were removed during data cleaning. Any leftover blood specimens from the finger pricks were immediately destroyed and discarded.

Malawi's National Health Research Committee and the CDC reviewed and approved the protocol prior to data collection.

Chapter 2: Characteristics of households and women respondents

This chapter summarizes basic demographic and socioeconomic characteristics of the surveyed household population. A household was defined as a person or group of persons, related or not, living together in one dwelling unit, under one household head, and sharing a common source of food. Background characteristics include age, place of residence, sex, household socioeconomic status and housing characteristics. The criteria used to form the wealth index are based on work done previously by the World Bank and ORC Macro. Household questionnaires collected information on all usual residents and visitors who spent the night prior to the survey in the household.

Response rates

Table 1 shows that of the 3,500 households selected for the sample, 3,496 were occupied (i.e., had people living there) at the time of fieldwork. Four dwellings were found to be abandoned and therefore incapable of response. Of the occupied households, 3,478 were successfully interviewed, yielding a national household response rate of 99.5%. Among households interviewed, 3,235 eligible women were identified and 2,891 were successfully interviewed, yielding a response rate of 89.4%. The primary reason for non-response was failure to locate respondents despite numerous attempts to visit the home. There were 2,523 children under five years of age living in these households, from whom 2,061 samples (haemoglobin and/or blood slide) were successfully obtained, representing a response rate of 81.7%. Of the 18.3% of children from whom a biomarker measurement was not obtained, 12.1% of children were not available for testing, and 6.2% represent refusals.

Table 1. Response rates
Household, woman, and biomarker response rates according to residence (Malawi MIS 2010)

	Residence		
Responses	**Urban**	**Rural**	**Total**
Household interviews			
Households selected	1,100	2,400	3,500
Households occupied	1,097	2,399	3,496
Households interviewed	1,091	2,387	3,478
Household response rate (%)	99.5	99.5	99.5
Interviews with women age 15–49			
Number of eligible women	1,208	2,027	3,235
Number of eligible women interviewed	1,029	1,862	2,891
Women response rate (%)	85.2	91.9	89.4
Biomarker results for children <5			
Number of children <5	744	1,779	2,523
Number with biomarker result	566	1,495	2,061
Biomarker response rate (%)	76.1	84.0	81.7

Household population

The results of the household population distribution by five-year age groups and by place of residence are shown in **Table 2**. The surveyed population is young, and there are slightly more women than men (51.6% and 48.4%, respectively). Children under five years old constitute nearly 18% of the population and those under the age of fifteen close to half (47.5%). Only 4% of the population is 65 years or older.

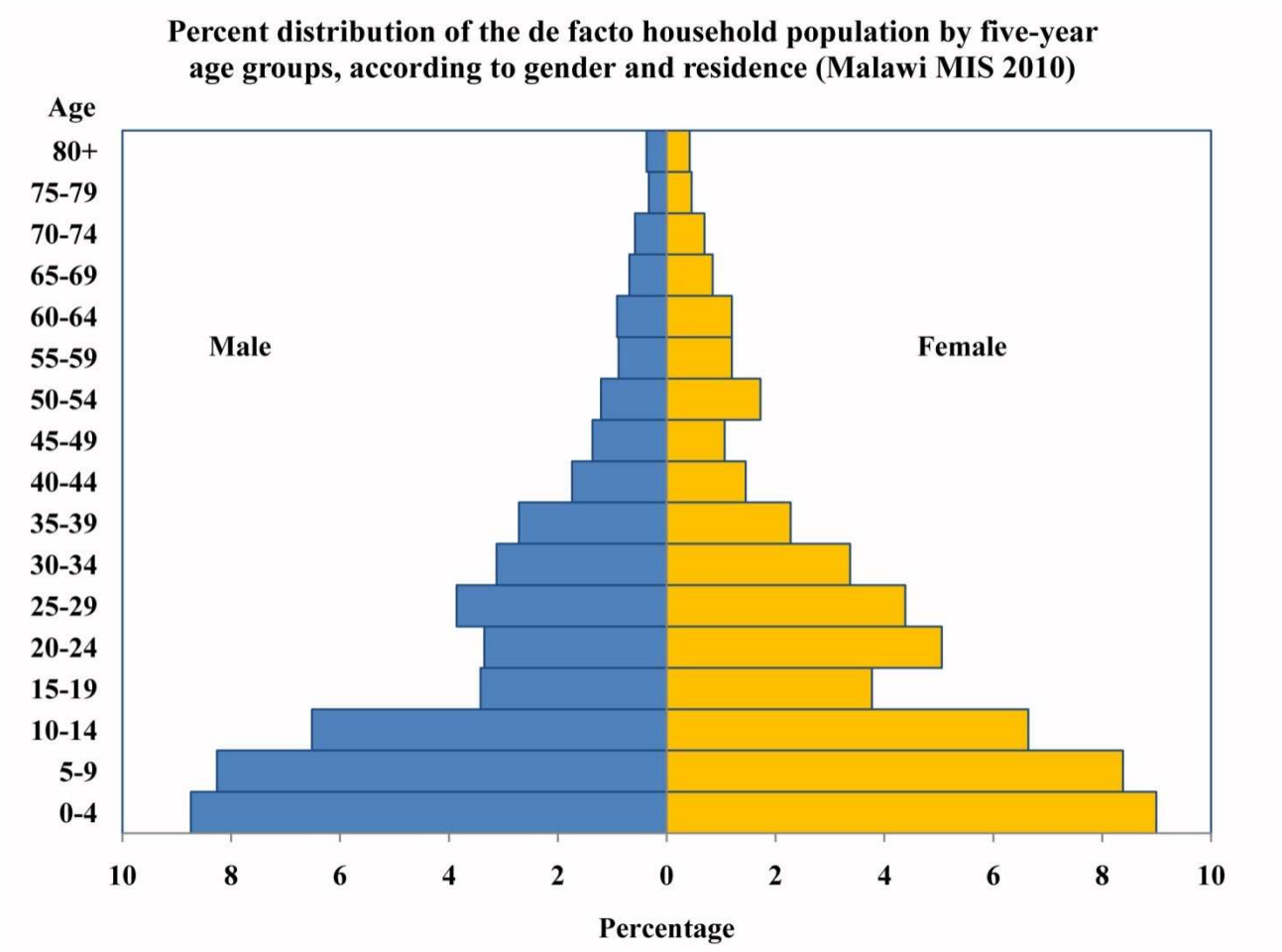
Table 2. Household population by age, sex, and residence

Percent distribution of the de facto household population by five-year age groups, according to gender and residence (Malawi MIS 2010)

	Urban			Rural			Total		
Age	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
0–4	15.0	15.9	15.5	18.8	17.6	18.1	18.2	17.3	17.8
5–9	14.5	15.1	14.8	17.7	16.3	17.0	17.2	16.2	16.6
10–14	12.4	12.6	12.5	13.8	12.8	13.3	13.6	12.8	13.2
15–19	8.7	9.9	9.3	6.8	6.8	6.8	7.1	7.3	7.2
20–24	9.1	11.6	10.3	6.6	9.5	8.1	7.0	9.7	8.4
25–29	9.9	11.7	10.8	7.6	7.9	7.8	8.0	8.4	8.2
30–34	9.1	6.9	8.1	6.0	6.4	6.2	6.5	6.5	6.5
35–39	6.6	4.1	5.3	5.5	4.4	4.9	5.7	4.4	5.0
40–44	4.2	2.4	3.3	3.5	2.9	3.2	3.6	2.8	3.2
45–49	3.1	2.2	2.6	2.8	2.0	2.4	2.8	2.1	2.4
50–54	2.2	2.6	2.4	2.6	3.4	3.0	2.5	3.3	2.9
55–59	1.2	1.5	1.3	1.9	2.4	2.2	1.8	2.3	2.1
60–64	1.5	1.4	1.5	2.0	2.5	2.2	1.9	2.3	2.1
65–69	0.9	0.7	0.8	1.5	1.8	1.6	1.4	1.6	1.5
70–74	0.8	0.9	0.9	1.3	1.4	1.4	1.2	1.3	1.3
75–79	0.3	0.2	0.2	0.8	1.0	0.9	0.7	0.9	0.8
80+	0.5	0.3	0.4	0.8	0.9	0.9	0.8	0.8	0.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	1,015	1,050	2,065	5,895	6,422	12,317	6,910	7,472	14,382

Figure 1 shows the population pyramid of the surveyed population. The wide base and rapid decrease with age is representative of a youthful population with high fertility and high mortality. There is a notable gap between the percentage of males and females aged 20 to 24.

Figure 1: Age pyramid of MIS sampled population (Malawi MIS 2010)



Household composition

Table 3 presents the household composition among those surveyed. Nationally, 72.6% of households are headed by males, and 27.4% are headed by females. The distribution of the number of usual household members is similar in rural and urban areas. Nationally, most households have between 2 and 5 members, with an average household size of 4.1 members.

Table 3. Household composition
Percent distribution by sex of head of household and by household size, according to residence (Malawi MIS 2010)

	Residence		
Household Characteristic	**Urban**	**Rural**	**Total**
	(1)	(2)	(3)
Sex of household head			
Male	80.9	71.3	72.6
Female	19.1	28.7	27.4
Number members			
1	8.2	7.6	7.6
2	11.3	14.3	13.9
3	16.6	20.9	20.3
4	19.0	18.8	18.9
5	15.9	16.7	16.6
6	13.5	10.8	11.1
7	7.6	5.9	6.2
8	4.5	2.4	2.7
9+	3.4	2.6	2.7
Total	100.0	100.0	100.0
Number of households	468	3,010	3,478
Average household size	4.4	4.1	4.1

Household characteristics

Table 4 shows that while 32.9% of urban households have electricity, only 2% of rural households have electricity. Nationally, the most common sources of drinking water are tube well or bore hole (52.4%), followed by unprotected well (13.7%) and public tap/stand pipe (12.1%). In rural areas, the most common sources of drinking water are tube wells or bore holes (58.3%) and unprotected wells (14.9%). Urban households' most common water sources are public tap/stand pipe (39.7%) and piped into yard/plot (18.2%). Both tube well or bore hole and water piped into the dwelling were reported as a primary water source by 14.8% of urban households. The most common toilet facilities reported in households were pit latrines with slabs (50.3%), followed by pit latrine without slabs (32.2%), and no facility/bush/field (11.6%). While the vast majority of rural households have earthen floors (87.1%), most urban households have cement floors (64.1%).

Table 4. Household characteristics
Percent distribution of households by household characteristics, according to residence (Malawi MIS 2010)

	Residence		
Household Characteristic	**Urban**	**Rural**	**Total**
	(1)	(2)	(3)
Electricity			
Yes	32.9	2.0	6.2
No	67.1	98.0	93.8
Drinking water source			
Piped into dwelling	14.8	1.3	3.1
Piped into yard/plot	18.2	1.4	3.7
Protected spring	0.5	0.5	0.5
Protected well	5.7	9.6	9.1
Public tap/standpipe	39.7	7.9	12.1
Surface water	0.6	4.1	3.6
Tube well or borehole	14.8	58.3	52.4
Unprotected spring	0.2	2.0	1.8
Unprotected well	5.5	14.9	13.7
Sanitation			
Bucket toilet	0.1	0.0	0.0
Composting toilet	0.4	0.6	0.5
Flush to piped sewer	5.3	0.0	0.7
Flush to pit latrine	0.3	0.2	0.2
Flush to septic tank	7.9	0.5	1.5
Flush to somewhere else	0.1	0.0	0.0
Hanging toilet/hanging latrine	0.3	0.0	0.0
No facility/bush/field	2.1	13.1	11.6
Pit latrine with slab	59.2	48.9	50.4
Pit latrine without slab	22.8	33.6	32.2
Ventilated improved pit latrine	1.0	1.6	1.5
Other	0.5	1.5	1.4
Flooring Material			
Carpet	1.1	0.2	0.3
Cement	64.1	11.7	18.7
Ceramic tiles	0.6	0.0	0.1
Dung	0.7	0.4	0.5
Earth/sand	33.1	87.1	79.9
Palm/bamboo	0.1	0.1	0.1
Parquet or polished	0.0	0.1	0.0
Other	0.3	0.4	0.4
Total	100.0	100.0	100.0
Number	468	3,010	3,478

Household durable goods

Table 5 shows that just over half of Malawian households surveyed (52.2%) possess a radio, 42.7% of households own a bicycle, and 31.5% possess a telephone or cell phone. The results show greater bicycle ownership in rural (45.5%) versus urban (25.2%) settings while more urban households own a telephone (cell or landline) (65.5%) than do rural households (26.2%).

Table 5. Household durable goods
Percentage of households possessing various durable consumer goods, by residence (Malawi MIS 2010)

	Residence		
Household durable goods	**Urban**	**Rural**	**Total**
	(1)	(2)	(3)
Radio	67.8	49.8	52.2
Television	29.2	3.6	7.1
Telephone or cell phone	65.5	26.2	31.5
Refrigerator	14.8	1.0	2.8
Bicycle	25.2	45.5	42.7
Motorcycle	1.1	0.8	0.8
Car/truck	4.5	0.2	0.8
None of the above	17.4	32.7	30.7
Number of households	468	3,010	3,478

Characteristics of women respondents

Eligible women ages 15 to 49 were interviewed using the women's questionnaire. **Table 6** shows that the majority (61.5%) of women surveyed were between the ages of 15 and 29. The majority of women surveyed lived in rural areas (84.3%), and nearly two-thirds of women reported at least a primary level of education (62.7%).

Table 6. Background characteristics of women respondents
Distribution of women ages 15 to 49 by background characteristics (Malawi MIS 2010)

Background characteristics	Percentage	Number
	(1)	(2)
Age		
15–19	16.2	454
20–24	24.2	679
25–29	21.1	591
30–34	15.9	446
35–39	10.8	304
40–44	7.1	198
45–49	4.8	136
Residence		
Urban	15.7	440
Rural	84.3	2,368
Region		
Northern	11.4	321
Central	42.6	1,195
Southern	46.0	1,292
Education		
None	18.6	522
Primary	62.7	1,761
Secondary	17.5	491
Higher	1.2	34
Total	100.0	2,808

Wealth Index

A wealth index was constructed based on household characteristics and ownership of durable goods in order to estimate the relative standard of living of each household. To construct the index, each factor was assigned a weight generated through principal component analysis, and the resulting factor scores were standardized in relation to the normal distribution. The factor scores were summed for each household and then multiplied by the number of members in the household to produce a weight representative of the population. The sample was then divided into quintiles from one (lowest) to five (highest) based upon these weights. The wealth quintiles are used in the tabulations presented within this report.

Table 7 shows the distribution of the urban, rural, and regional populations by wealth quintile. A greater proportion (28.1%) of the surveyed population was in the lowest wealth quintile and only 17.4% of the surveyed population was in the highest quintile. Urban respondents were likely to be in the highest wealth quintile than their rural counterparts. Sixty-five percent of the surveyed population in urban areas was in the highest wealth quintile compared to 10.0% in rural areas. Regional variations were also observed; the Central region had a higher percentage of respondents in the largest wealth quintile compared to the other two regions (32.3% in the Central region, 25.5% in the Southern region, and 22.9% in the Northern region).

Table 7. Distribution of population
Population distribution by residence (urban/rural), region, and wealth quintile (Malawi MIS 2010)

	Wealth Quintile						
Domain	**Lowest**	**Second**	**Middle**	**Fourth**	**Highest**	**Total**	**Number**
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Residence							
Urban	4.1	3.2	7.5	20.2	65.0	100.0	468
Rural	31.8	17.0	23.1	18.1	10.0	100.0	3,010
Region							
Northern	22.9	13.2	20.8	22.2	20.9	100.0	386
Central	32.3	19.5	19.4	15.1	13.7	100.0	1,457
Southern	25.5	11.6	22.5	20.5	19.9	100.0	1,635
Total	28.1	15.1	21.0	18.4	17.4	100.0	3,478

Chapter 3: Coverage of key malaria interventions

This chapter describes the population coverage rates of the primary malaria control interventions. Malaria control efforts in Malawi have focused on scaling up these interventions, which include the ownership and use of ITNs and long-lasting insecticide-treated nets (LLINs), providing prompt effective treatment with Artemether-Lumefantrine within 24 hours of onset of symptoms, and IPT for pregnant women. Cross-cutting interventions such as behavior change communication have been critical as well for increasing knowledge of prevention and rapid case identification and management.

In addition to these interventions, the NMSP 2005–2010 included the implementation of an IRS pilot programme to document operational, logistical, and human resource requirements for IRS scale-up. In response to this, the Government of Malawi, with support from PMI, launched a successful pilot in Nkhotakota District from 2007 to 2009. The government has integrated lessons from this pilot and will expand the IRS programme, in partnership with PMI, to spray a total of seven high prevalence districts along the lakeshore and in the Shire Valley to cover a total population of 2.7 million people living in roughly 650,000 structures.

Ownership of mosquito nets and ITNs

The ownership and use of both treated and untreated mosquito nets is the primary prevention strategy for reducing malaria transmission in Malawi. The ITN policy includes free distribution of ITNs for children born in health facilities, children attending their first visit under the Expanded Program on Immunization (EPI) if an ITN was not received at birth, and pregnant women at their first visit to an antenatal care (ANC) clinic. In the last two years, over 5 million nets have been distributed in Malawi.

All household heads in the MIS were asked if they owned mosquito nets and, if so, how many and what type. **Table 8** shows that among the surveyed population, 63.4% of all households owned at least one net, 62.0% of households owned at least one ever-treated net, and 27.9% owned more than one net. Nearly 60% of households had at least one ITN, and 23.6% of khhouseholds had more than one ITN. The average number of ITNs per household was 0.9, compared to an average of 1.0 treated or untreated nets.

Close to 70% (68.9%) of households in urban areas reported owning at least one net, compared to 62.5% of households in rural areas**.** Fifty-one percent of households in urban areas reported having at least one ITN, compared to 59.3% of households in rural areas. Household net and ITN ownership was slightly higher in the Southern region (net: 66.6%, ITN: 58.8%). Wealthier households were more likely to own ITNs: while 65.3% of the wealthiest households owned at least one ITN, only 52.5% of the poorest households owned at least one ITN.

Table 8. Ownership of mosquito nets

Percentage of households with at least one and more than one mosquito net (treated or untreated), ever-treated net, and insecticide treated net (ITN), and average number of nets of each type per household, by background characteristics (Malawi MIS 2010)

Background Characteristic	Percentage of households with		Average number of nets per household	Percentage of households with		Average number of ever-treated nets per household	Percentage of households with		Average number of ITNs per household	Number of households
	At least one net	More than one net		At least one ever-treated net	More than one ever-treated net		At least one ITN	More than one ITN		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Residence										
Urban	68.9	41.3	1.4	66.5	38.0	1.3	51.0	25.2	1.0	468
Rural	62.5	25.6	1.0	61.3	24.6	0.9	59.3	23.4	0.9	3,010
Region										
Northern	58.2	32.3	1.1	58.2	31.8	1.1	54.1	28.2	1.0	386
Central	61.1	25.3	1.0	60.1	24.8	1.0	58.5	23.4	0.9	1,457
Southern	66.6	29.2	1.1	64.6	26.6	1.0	58.8	22.7	0.9	1,635
Wealth index										
Lowest	54.7	15.2	0.7	53.7	14.9	0.7	52.5	14.4	0.7	976
Second	54.0	18.0	0.8	53.5	16.6	0.7	51.1	16.4	0.7	525
Middle	65.6	25.8	1.0	64.4	24.8	1.0	62.8	23.6	0.9	730
Fourth	66.0	31.7	1.1	64.5	29.8	1.1	60.6	27.9	1.0	641
Highest	80.0	55.6	1.8	77.2	51.8	1.6	65.3	40.3	1.3	606
Total	63.4	27.9	1.0	62.0	26.4	1.0	58.2	23.6	0.9	3,478

Ownership of LLINs

LLINs are factory-manufactured and do not require additional treatment, allowing for a longer period of effective prevention. In February 2008, the national net policy was amended to include distribution of LLINs to all children under five years attending health facilities. The NMCP's aim is to achieve universal coverage with LLINs, defined as one net for every two people in 2011.

Table 9 shows that nationally, 54.0% of households owned at least one LLIN, and 21.3% of households had more than one LLIN. As with ITNs, ownership of at least one LLIN was greater in rural households (56.6%) than in urban households (37.4%). Rural households were slightly more likely to own more than one LLIN. Similarly, households in the Northern region (28.2%) and wealthier households (31.7%) were the most likely to own more than one LLIN.

Table 9. Household ownership of LLINs
Percentage of households with at least one and more than one LLIN, and average number of LLINs per household, by background characteristics (Malawi MIS 2010)

Background characteristic	Percentage of households with at least one LLIN	Percentage of households with more than one LLIN	Average number of LLINs per household	Number of households
	(1)	(2)	(3)	(4)
Residence				
Urban	37.4	16.6	0.7	468
Rural	56.6	22.1	0.9	3,010
Region				
Northern	54.1	28.2	1.0	386
Central	56.0	21.9	0.9	1,457
Southern	52.1	19.2	0.8	1,635
Wealth index				
Lowest	50.5	13.6	0.7	976
Second	48.3	15.7	0.7	525
Middle	61.9	23.5	0.9	730
Fourth	56.1	25.5	0.9	641
Highest	52.7	31.7	1.0	606
Total	54.0	21.3	0.8	3,478

Use of mosquito nets by children under five years of age

Children under five years of age are considered the most vulnerable to severe complications of malaria infection due to their lack of acquired immunity. **Table 10** shows the use of mosquito nets by children under the age of five years. Close to 60% of those children slept under a mosquito net the night before the survey, 55.4% slept under an ITN, and 51.8% slept under an LLIN.

Among households with at least one ITN, 80.7% of children slept under an ITN, suggesting that targeted distribution of nets in Malawi has been largely effective. There was no variation by gender in the use of ITNs and conventional nets. Children in rural settings were slightly more likely to use ITNs (56.6%) than those in urban settings (47.3%), and similarly, LLIN use was higher in rural areas than urban areas (53.9% and 37.0%, respectively). Additionally, children under three years of age were more likely to use any type of net for sleeping than children three years of age and older.

Table 10. Use of mosquito nets by children
Percentage of children under age five years who slept under a mosquito net, an ever-treated net, an ITN or an LLIN the night preceding the survey, by background characteristics (Malawi MIS 2010)

Background characteristic	Percentage of children under five years of age who slept under a net last night	Percentage of children under five years of age who slept under an ever-treated net last night	Percentage of children under five years of age who slept under an ITN last night	Percentage of children who slept under an LLIN last night	Percentage who slept under an ITN, among those in households with at least one ITN	Number of children
	(1)	(2)	(3)	(4)	(5)	(6)
Age (in years)						
<1	61.7	60.2	57.7	55.8	81.1	489
1	64.6	63.2	60.6	55.9	84.5	518
2	62.5	60.8	57.6	53.8	82.5	564
3	53.4	52.1	49.8	45.6	76.6	506
4	55.3	53.3	50.8	47.5	77.7	476
Sex						
Male	59.6	58.2	55.6	52.0	80.8	1,258
Female	59.6	57.9	55.3	51.6	80.6	1,295
Residence						
Urban	61.6	59.0	47.3	37.0	78.3	319
Rural	59.3	57.9	56.6	53.9	81.0	2,234
Region						
Northern	51.2	50.9	48.3	48.3	75.8	323
Central	59.7	58.6	57.5	55.0	84.5	1,040
Southern	61.8	59.5	55.6	50.0	78.6	1,190
Wealth index						
Lowest	54.2	53.3	52.9	50.3	81.3	749
Second	55.4	53.4	52.0	49.9	79.3	389
Middle	61.8	59.6	58.1	57.4	80.8	597
Fourth	61.0	60.2	58.5	54.4	81.8	429
Highest	69.6	66.0	56.2	45.2	79.3	389
Total	59.6	58.0	55.4	51.8	80.7	2,553

Use of nets by women of reproductive age (15 to 49 years) and pregnant women
In order to prevent complications from malaria in pregnancy such as anaemia, low birth weight, and trans-placental parasitaemia, the NMCP encourages all pregnant women to sleep under ITNs.

Table 11 shows that 50.8% of all women of reproductive age (15 to 49 years) and 49.4% of pregnant women slept under an ITN the night before the survey. Use of an ITN was higher among rural women (52.1%) than urban women (43.6%). Use of an ITN among pregnant women in rural settings was greater (50.3%) than among pregnant women in urban areas (41.6%).

Table 11. Use of mosquito nets by women ages 15-49 and pregnant women

Percentage of all women ages 15 to 49 who slept under any mosquito net, an ever-treated net, or ITN the night preceding the survey, by background characteristics (Malawi MIS 2010)

Background	Percentage of women who slept under a net last night	Percentage of women who slept under an ever-treated net last night	Percentage of women who slept under an ITN last night	Number of women	Percentage of pregnant women who slept under a net last night	Percentage of pregnant women who slept under an ever-treated net last night	Percentage of pregnant women who slept under an ITN last night	Number of pregnant women
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Residence								
Urban	61.1	57.4	43.6	440	53.5	50.6	41.6	30
Rural	55.3	53.8	52.1	2368	54.5	51.6	50.3	267
Region								
Northern	48.5	48.2	44.7	321	43.7	43.7	39.2	33
Central	56.6	55.3	54.0	1195	55.3	54.1	53.0	125
Southern	57.7	54.9	49.3	1292	56.2	51.1	48.7	139
Wealth index								
Lowest	49.2	48.5	48.0	707	54.4	54.4	54.4	73
Second	48.7	48.0	45.8	402	47.4	47.4	46.4	51
Middle	58.2	56.8	55.2	567	56.1	54.0	52.2	65
Fourth	58.1	56.0	53.1	525	55.8	52.2	48.5	64
Highest	65.8	61.6	51.1	607	57.8	46.9	41.9	44
Mother's education								
None	53.3	52.3	51.1	522	50.1	47.8	46.9	55
Primary	54.2	52.5	49.6	1761	50.8	48.9	46.4	193
Secondary	65.3	62.6	55.1	491	72.6	65.4	63.7	48
Higher	69.2	63.1	42.5	34	*	*	*	1
Total	56.2	54.3	50.8	2,808	54.4	51.5	49.4	297

*number of unweighted cases <25

Women with secondary education and those with no education were most likely to have slept under an ITN the night before the survey (55.1% and 51.1%, respectively). Women in the highest three wealth quintiles were more likely to have slept under an ITN than those in the lowest two quintiles.

IRS

Nationally, IRS has not yet been fully implemented as a malaria prevention method. IRS activities have been limited to a pilot in Nkhota kota district and limited private spraying in Blantyre city, though the pilot programme is expanding to a total of seven districts in 2010. **Table 12** shows the limited coverage of IRS in the country. Less than 2% of all households had been sprayed in the past 12 months.

Table 12. Percentage of households receiving IRS in the previous 12 months
The percentage of households sprayed by the government and the number of sprayed households; all by district, residence, and wealth index (Malawi MIS 2010)

	Percentage of households sprayed within the last 12 months	Number of households	Among sprayed households, those sprayed by government	Number of households sprayed
District				
Nkhota kota	83.0	75	94.6	58
Blantyre city	3.6	347	*	12
All others	0.1	3,056	*	6
Residence				
Urban	2.8	468	43.2	31
Rural	1.7	3,010	95.8	45
Wealth index				
Lowest	1.8	976	*	16
Second	1.6	525	*	8
Middle	1.2	730	*	8
Fourth	1.3	641	*	9
Highest	3.4	606	66.1	35
Total	1.8	3,478	84.9	76

* Number of unweighted cases <25

Use of IPT by pregnant women

IPT during pregnancy has been the standard of care in Malawi since 1993. The policy guidelines for IPT require a pregnant mother to take at least two treatment doses of an effective antimalarial drug during routine antenatal care visits. The drug used for IPT in pregnancy is sulphadoxine-pyrimethamine (SP).

Table 13 presents the results for use of IPT by pregnant women during the last birth in the five years preceding the survey. Nearly eighty-three percent (82.9%) of mothers reported taking any antimalarial during the last pregnancy, with 60.1% receiving the recommended two or more doses of IPT during an ANC visit.

Regional variations were not substantial, though poorer women (54.2% in the lowest quintile versus 63.2% in the highest quintile) and less educated women (55% without any formal education versus 79.3% with greater than secondary education) were less likely to receive two doses of IPT coverage.

Table 13. Use of IPT by pregnant women

Percentage of mothers who took any antimalarial drugs for prevention during pregnancy, percentage who took one or two or more doses of SP/Fansidar, and percentage who received one or two or more doses of SP/Fansidar during an antenatal care visit for the last pregnancy leading to a live birth in the two years preceding the survey, by background characteristics (Malawi MIS 2010)

Background characteristic	Percentage of mothers who took any antimalarial drug for prevention during their last pregnancy	Percentage of mothers who took any IPT	Percentage of mothers who took 2+ doses of IPT	Percentage of mothers who received any IPT during an ANC visit	Percentage of mothers who received 2+ doses of IPT at least one of which was during an ANC visit	Number of mothers
	(1)	(2)	(3)	(4)	(5)	(6)
Residence						
Urban	83.4	79.5	59.2	79.5	59.2	300
Rural	80.0	83.2	60.6	82.9	60.3	1,871
Region						
Northern	86.6	86.2	59.4	86.2	59.1	238
Central	81.7	81.7	60.7	81.2	60.2	908
Southern	83.2	82.8	60.3	82.7	60.3	1,025
Wealth index						
Lowest	81.9	81.5	54.5	81.3	54.2	577
Second	81.6	81.6	65.2	81.2	64.5	327
Middle	81.2	81.1	60.3	80.8	60.3	463
Fourth	84.2	84.2	61.7	84.2	61.7	401
Highest	86.1	85.5	63.6	85.1	63.2	403
Mother's education						
None	77.4	76.9	55.3	76.6	55.0	457
Primary	82.9	82.7	59.6	82.4	59.3	1,397
Secondary	90.8	90.8	70.6	90.8	70.6	299
Higher	90.0	89.6	79.3	89.6	79.3	18
Total	82.9	82.7	60.4	82.4	60.1	2,171

Case management of childhood fever

Malaria case management is one of the key strategic areas for malaria control in Malawi. Most malarial fevers occur at home and prompt and effective treatment is critical to prevent severe morbidity and mortality related to malaria. Though the current malaria policy is under review to comply with the revised WHO guidelines, children under five years of age with fever continue to be given presumptive treatment within 24 hours of onset of fever; this policy will continue until laboratory diagnostic capacity is scaled up markedly to allow for universal diagnosis of all age groups.

Table 14 shows that 39.2% of children under five years of age had a fever two weeks preceding the survey, with a greater proportion of children having fever in rural areas (41.1%) than in urban areas (24.9%). Children in the lowest wealth quintile experienced more fevers (45.0%) than those in the highest wealth quintile (27.4%).

Children in the highest wealth quintile were more likely to seek treatment from a health care provider on the same or next day as well as take an antimalarial drug the same or next day. Slightly more than thirty-seven percent (37.1%) of children in the highest wealth quintile took an antimalarial drug on the same or next day compared to 21.3% of children in the lowest quintile. Nearly forty-three percent (42.9%) of children in the highest wealth quintile sought care on the same or next day of fever onset compared to 19.6 of those in the lowest quintile. Somewhat surprisingly, children from the fourth wealth quintile were the least likely (16.3%) to take an antimalarial drug on the same/next day.

Table 14. Prevalence and prompt treatment of fever

Percentage of children under five years of age with fever in the two weeks preceding the survey and among them the percentage who took an antimalarial drug, took an antimalarial drug the same/next day, and sought treatment from a facility/health provider the same/next day, by background characteristics (Malawi MIS 2010)

Background characteristic	Percentage of children with fever in last 2 weeks	Number of children under age 5*	Percentage who reported having finger or heel stick	Percentage who took an antimalarial drug	Percentage who took an antimalarial drug the same/next day	Percentage who sought treatment from a health provider same/next day	Number of children with fever
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Age (in months)							
<12	31.6	434	9.9	37.6	29.1	36.1	137
12–23	47.4	466	7.3	35.2	21.9	31.9	221
24–35	44.6	493	7.2	26.1	18.1	20.8	220
36–47	35.9	405	8	32.4	26.5	21.0	145
48–59	34.1	369	3.3	22.5	15.4	24.8	126
Sex							
Male	38.5	1,087	7.8	31.2	20.5	26.1	419
Female	39.8	1,080	6.7	30.6	23.2	27.4	430
Residence							
Urban	24.9	257	18.0	46.0	39.1	39.8	64
Rural	41.1	1,910	6.3	29.6	20.5	25.7	785
Region							
Northern	24.9	270	6.2	30.3	25.2	34.3	67
Central	40.8	887	4.4	29.9	25.4	26.6	362
Southern	41.5	1,010	9.8	31.8	18.3	25.7	420

Continued

Table 14. Prevalence and prompt treatment of fever

Percentage of children under age five years with fever in the two weeks preceding the survey and among them the percentage who took an antimalarial drug, took an antimalarial drug the same/next day, and sought treatment from a facility/health provider the same/next day, by background characteristics (Malawi MIS 2010)

Background characteristic	Percentage of children with fever in last 2 weeks	Number of children under age 5	Percentage who reported having finger or heel stick	Percentage who took an antimalarial drug	Percentage who took an antimalarial drug the same/next day	Percentage who sought treatment from a health provider same/next day	Number of children with fever
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Wealth index							
Lowest	45.0	648	6.6	27.9	21.3	19.6	292
Second	40.9	323	2.5	31.5	23.5	31.9	132
Middle	40.2	504	5.7	29.3	18.6	27.7	203
Fourth	36.2	370	12.0	33.8	16.3	25.4	134
Highest	27.4	322	12.7	41.1	37.1	42.9	88
Total	39.2	2,167	7.2	30.9	21.9	26.8	849

Type and timing of antimalarial drugs

According to Malawi's revised malaria treatment policy, introduced in December 2007, all fevers are to be treated with ACTs provided free of charge in all health facilities. ACTs are being introduced at the community level through "village health clinics."

Table 15 indicates that 27.6% of children under age five years with fever took Artemether-lumefrantrine (commonly known as LA in Malawi), 3.0% took quinine, and 0.3% took SP; nearly 20% took LA, 1.7% took quinine, and 0.2% took SP on the same or next day. LA was more commonly taken in rural areas compared to urban (37.5% and 26.8%, respectively), and it also was more likely to be taken on the same or next day in rural areas compared to urban (31.2% and 19.0%, respectively).

Table 15. Type and timing of antimalarial drugs
Among children under five with fever and/or convulsions in the two weeks preceding the survey, percentage who took first-line drug, second-line drug, or other antimalarial drugs and percentage who took each type of drug the same/next day after developing fever and/or convulsions, by background characteristics (Malawi MIS 2010)

	Percentage of children who took drug			**Percentage of children who took drug the same/next day**			
Background characteristic	**LA**	**Quinine**	**SP**	**LA**	**Quinine**	**SP**	**Number of children with fever**
	(1)	(2)	(3)	(5)	(6)	(7)	(8)
Age (in months)							
<12	33.6	4.1	0.0	26.6	2.5	0.0	137
12–23	32.4	2.1	0.7	20.7	0.9	0.2	221
24–35	23.3	2.7	0.0	17.8	0.2	0.0	220
36–47	26.7	4.9	0.9	20.7	4.9	0.9	145
48–59	21.1	1.4	0.0	14.0	1.4	0.0	126
Sex							
Male	27.1	3.2	0.4	19.1	1.3	0.1	419
Female	28.0	2.3	0.3	20.7	2.2	0.3	430
Residence							
Urban	26.8	2.6	0.3	19.0	1.3	0.2	64
Rural	37.5	7.7	0.8	31.2	7.1	0.8	785
Region							
Northern	24.0	6.3	0.0	21.0	4.2	0.0	67
Central	26.1	3.6	0.1	23.3	2.0	0.1	362
Southern	29.4	1.9	0.6	16.8	1.1	0.3	420
Wealth Index							
Lowest	26.6	0.9	0.4	20.9	0.4	0.0	292
Second	25.3	6.2	0.0	20.0	3.6	0.0	132
Middle	26.6	1.7	0.0	17.8	0.9	0.0	203
Fourth	29.0	4.9	0.0	14.2	2.1	0.0	134
Highest	34.2	4.9	2.0	31.2	4.9	2.0	88
Total	27.6	3.0	0.3	19.9	1.7	0.2	849

Source of antimalarial drugs

Table 16 shows the various sources of antimalarial drugs. The main source of antimalarial drugs used by children under age five years was government health facilities (63.1%) compared to 16.8% from private facilities. Children were more likely to have received LA from government health facilities (68.7%) than private (12.7%) and other sources (5.0%). Quinine was more likely to have been obtained from private health facilities (46.9%) than from government facilities (28.1%).

Table 16. Source of antimalarial drugs

Percent distribution of antimalarial drugs given to children under age five years with fever in the two weeks preceding the survey, by source of the drugs (Malawi MIS 2010)

Drug name	Already had drug at home	Government health facility/worker	Private health facility/ worker	Extension	Shop	Don't Know	Other	Total	Number of children who took drug
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
LA	9.3	68.7	12.7	2.3	0.4	1.5	5.0	100.0	259
Quinine	9.4	28.1	46.9	0.0	9.4	0.0	6.3	100.0	32
SP/Fansidar	14.3	14.3	28.6	0.0	14.3	0.0	28.6	100.0	7
All antimalarial drugs	9.4	63.1	16.8	2.0	1.7	1.3	5.7	100.0	298

Chapter 4: Malaria parasite and anaemia prevalence

One of the primary objectives of Malawi's MIS 2010 was to assess malaria parasite and anaemia prevalence in children aged 6 to 59 months. Parasitaemia rates are indicative of the level of infection in the population, while anaemia rates reflect a common and important manifestation of the disease. These indicators can be used to assess the impact of malaria control interventions. Parasitaemia was determined by slide microscopy; any anaemia was defined as haemoglobin (Hb) less than 11 g/dl, while severe anaemia was defined as a haemoglobin level less than 8 g/dl.

Table 17 presents the prevalence of malaria, anaemia, and severe anaemia in children under five years of age. Nationally, the malaria parasite prevalence rate in this population was 43.3%. Parasitaemia rates increased with age: the highest rate occurred among children aged 48 to 59 months (48.5%), while for the youngest children the parasitaemia rate was over ten percentage points lower (35.6%). Much higher parasitaemia rates occurred among children in rural areas (46.9%) than among children in urban settings (14.7%). Further, parasite prevalence was highest in the Central region (49.7%) and lowest in the Northern region (22.8%). Malaria parasitaemia rates were strongly influenced by wealth status: over one-half of children in the lowest two wealth quintiles had malaria, while only roughly one in five children in the highest wealth quintile were parasitaemic (22.5%).

The percentage of children with any anaemia (Hb <11g/dl) was 69.7%, with younger children (<12 months) experiencing the highest levels of anaemia (81.5%). Children in the Southern region had the highest levels of anaemia (73.5%) while those in the Northern region had the lowest anaemia levels (54.8%). The national prevalence of severe anaemia was 12.3%. While parasitaemia rates increased with age, rates of severe anaemia were much higher in the youngest age group (19.9%) and dropped to 3.6% in children ages 48 to 59 months old. Rates of severe anaemia in rural children were over three times those in urban children, and while children in the Northern region experienced very little severe anaemia (1.3%), greater than 13% of children in the Central and Southern regions had severe anaemia. Finally, similarly to parasitaemia rates, severe anaemia was highly influenced by wealth status: the rate in children in the lowest wealth quintile was 17.2% while the rate in the wealthiest children was less than 5%.

Table 17. Malaria parasite prevalence and anaemia in children under age five years

Among children under five , percentage with malaria parasites, mean haemoglobin (Hb) values, standard deviation of haemoglobin values, and percentage with any anaemia (less than 11 grams/decilitre) and severe anaemia (less than 8 grams/decilitre), by background characteristics (Malawi MIS 2010)

Background characteristic	Percentage with malaria parasites	Number of children with matching blood slides	Mean haemoglobin value	Standard error of haemoglobin	Percentage of children with any anaemia (<11 gm/dl)	Percentage of children with severe anaemia (<8 gm/dl)	Number of children with Hb value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Age (in months)							
<12	35.6	301	9.5	.13	81.5	19.9	308
12–23	41.0	450	9.5	.12	78.7	17.2	471
24–35	43.3	487	9.9	.10	73.6	13.6	510
36–47	46.2	426	10.3	.10	61.3	8.5	448
48–59	48.5	408	10.8	.10	55.1	3.6	424
Sex							
Male	45.1	1,026	9.9	.08	70.9	12.9	1,084
Female	41.5	1,046	10.0	.07	68.4	11.7	1,077
Residence							
Urban	14.7	232	10.7	.09	56.1	4.2	244
Rural	46.9	1,840	9.9	.07	71.4	13.3	1,917
Region							
Northern	22.8	218	10.8	.15	54.8	1.3	227
Central	49.7	856	10.0	.11	69.1	13.5	923
Southern	42.3	998	9.8	.10	73.5	13.6	1,011
Wealth Index							
Lowest	51.4	613	9.7	.11	74.7	17.2	656
Second	52.4	309	9.8	.14	74.0	13.9	336
Middle	46.8	491	10.0	.12	72.4	11.9	495
Fourth	34.5	353	10.2	.10	65.0	8.8	359
Highest	22.5	306	10.6	.09	55.5	4.8	315
Total	43.3	2,072	10.0	.07	69.7	12.3	2,161

Household ITN possession and use can reduce both malaria and severe anaemia rates. In the MIS 2010 sample, as shown in **Figure 2**, children in households with no ITNs experienced the highest parasitaemia and severe anaemia rates. The highest rates of parasitaemia were observed among older children (ages 24 to 59 months) in households without an ITN (49.1%); rates were lower among same-age children in households with greater than one ITN (43.0%), and among their younger counterparts in houses with no ITN (39.5%) and in houses with at least 1 ITN (38.6%). Severe anaemia was also more prevalent in households that did not own an ITN, and by contrast was more pronounced in the younger age group. While 23.3% of children under 24 months of age in households with no ITN had severe anaemia, 16.4% of these younger children in households with at least one ITN had severe anaemia. Severe anaemia rates were lower among older children in households with no ITN (9.9%), and lowest among older children in households with greater than 1 ITN (6.0%).

Figure 2. Parasitaemia and severe anaemia prevalence rates according to household ITN ownership and age of child (<24 months or 24 to 59 months [Malawi MIS 2010])

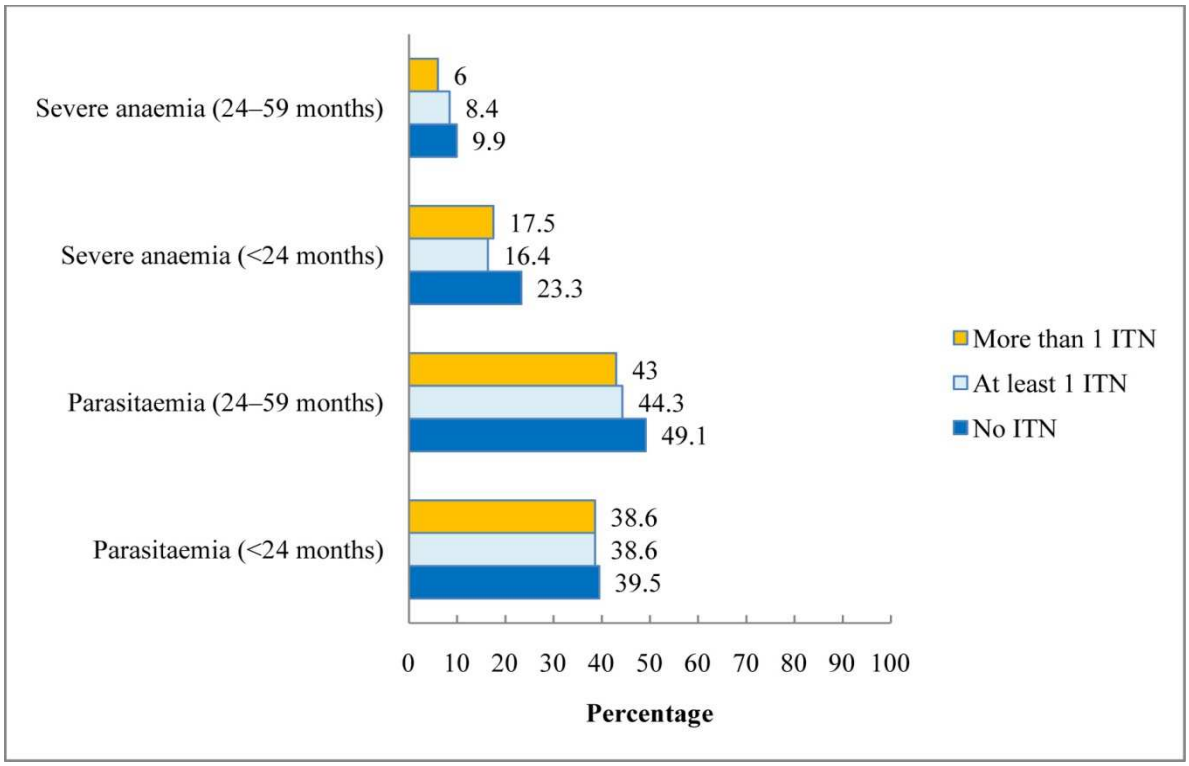
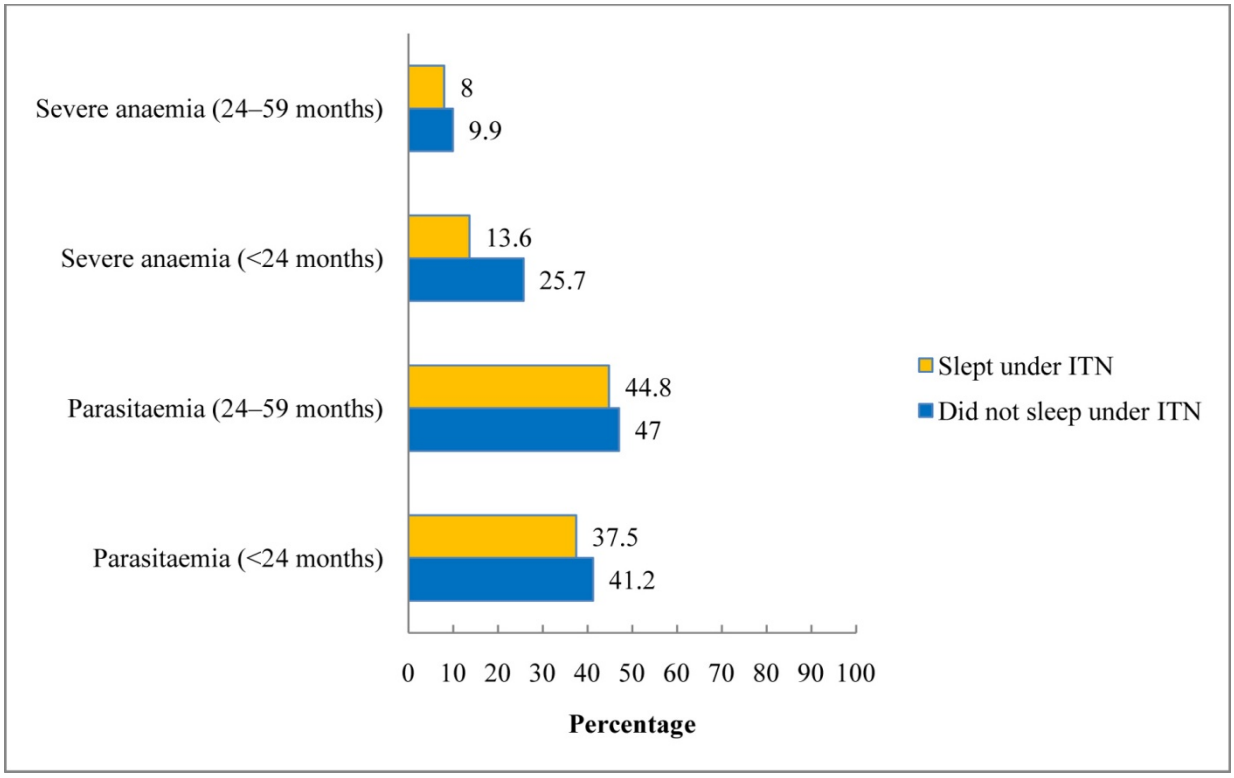


Figure 3 shows parasitaemia and severe anaemia (<8 gm/dl) prevalence rates according to whether a child slept under an ITN or not. Children who did not sleep under an ITN the previous night had uniformly higher rates of both parasitaemia and severe anaemia compared to those who did sleep under an ITN the previous night. Older children who did not sleep under an ITN had higher rates of parasitaemia than those who slept under an ITN (47.0% and 44.8%, respectively), and a similar difference was observed among their younger counterparts (41.2% and 37.5%, respectively). The highest rates of severe anaemia (25.7%) were observed in younger children who did not sleep under an ITN, whereas rates were much lower among younger children who slept under an ITN (13.6%). Lower rates of severe anaemia were observed for older children, but the difference between those not sleeping under an ITN and those sleeping under an ITN was less profound (9.9% and 8.0%, respectively).

Figure 3. Parasitaemia and severe anaemia (<8 gm/dl) prevalence rates according to whether the child slept under an ITN or not, by age of child <24 months or 24 to 59 months (Malawi MIS 2010)



Chapter 5: General malaria knowledge

Improving general knowledge of malaria causes, symptoms, and methods of prevention is necessary to ensure rapid, appropriate treatment, while developing a culture of prevention behavior in the population. Data were collected from women aged 15 to 49 years on their general malaria knowledge. **Table 18** presents data on respondents' awareness of malaria, its primary symptom (fever), its route of transmission, and nets as a tool for prevention.

The majority of women had heard of malaria (95.6%), with no substantial difference across regions, urban and rural areas, wealth index, or education level. Three quarters (75.6%) of women accurately recognized fever as a symptom of malaria; slightly more women from rural areas (75.9%) were able to report this knowledge than urban women (73.6%).

Recognition of mosquitoes as the vector for malaria transmission is essential for consistent and successful use of prevention tools. Greater than four-fifths (87.7%) of women reported that mosquito bites cause malaria. More urban women (93.2%) were aware that mosquito bites cause malaria than rural women (86.6%). Women from the highest wealth quintile (95.0%) were more aware of mosquito transmission than women in lower wealth quintiles. Knowledge rose with education level: while 82.3% of women without any formal education recognized the transmission source, almost all (98.6%) of women with the highest education did so. Women in the Southern region had the highest knowledge of mosquito transmission (90.5%).

Knowledge of prevention methods (use of mosquito nets) is paramount to effective malaria control. The overall knowledge of the use of mosquito nets as a prevention method was 86.9% among the surveyed women. Urban women were more likely to be aware of nets as a prevention method than rural women (89.0% and 86.5%, respectively).

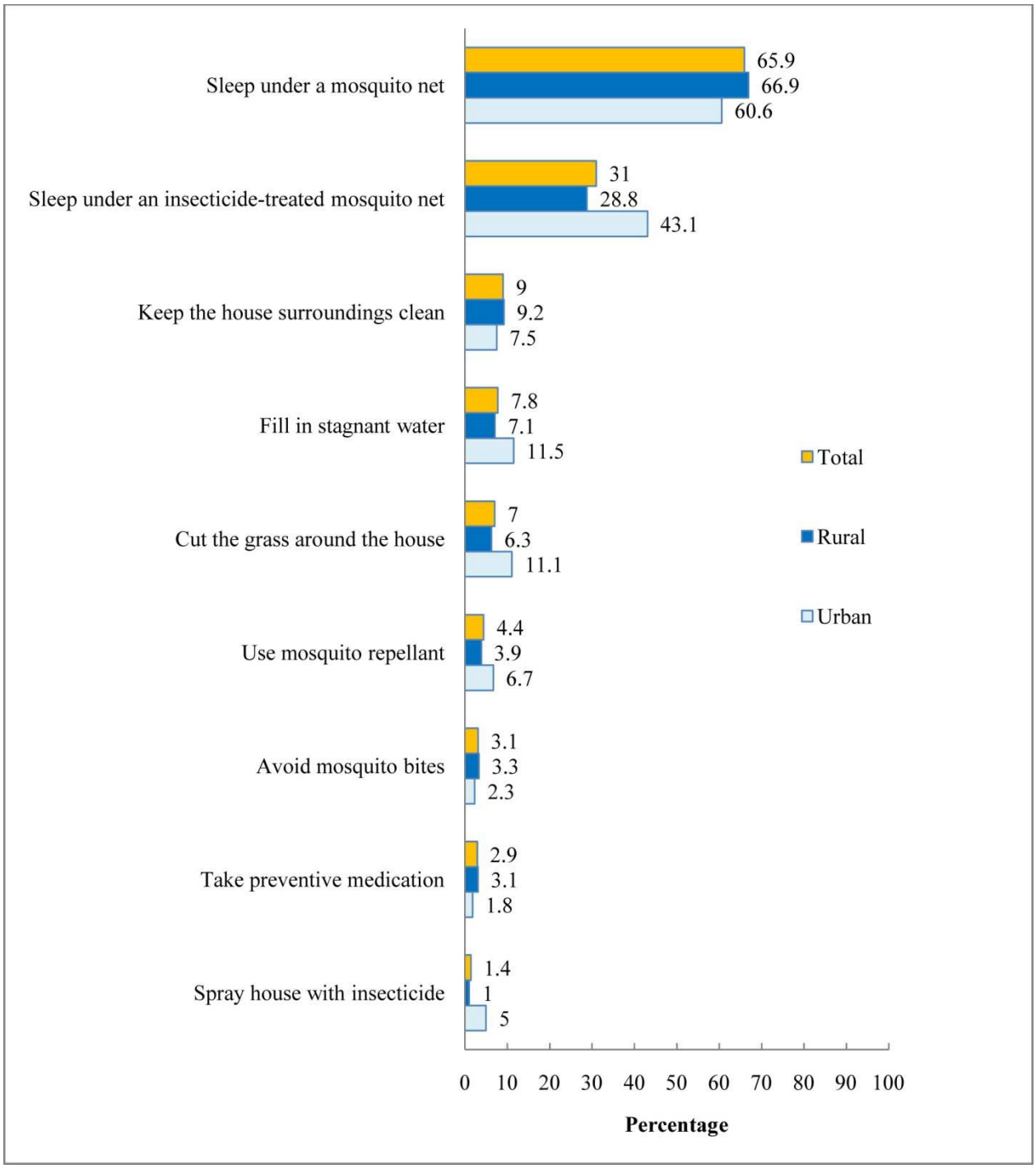
Table 18. General malaria knowledge

Among eligible women ages 15 to 49 years, the percentage who reported having heard of malaria, recognized fever as a symptom of malaria, reported mosquito bites as a cause of malaria, and reported mosquito nets (treated or untreated) as a prevention method for malaria, by background characteristics (Malawi MIS 2010)

Background characteristic	Percentage who have heard of malaria	Percentage who recognize fever as a symptom of malaria	Percentage who reported mosquito bites as a cause of malaria	Percentage who reported mosquito nets (treated or untreated) as a prevention method	Number of respondents
	(1)	(2)	(3)	(4)	(5)
Residence					
Urban	97.6	73.6	93.2	89.0	440
Rural	95.2	75.9	86.6	86.5	2,368
Region					
Northern	93.9	72.4	82.7	79.2	321
Central	93.1	78.3	85.9	86.0	1,195
Southern	98.3	73.7	90.5	89.6	1,292
Wealth index					
Lowest	94.4	77.7	87.1	85.1	707
Second	93.7	74.8	81.6	83.3	402
Middle	95.5	73.7	84.7	83.4	567
Fourth	95.7	74.4	87.7	89.3	525
Highest	98.2	76.2	95.0	92.5	607
Education					
None	94.6	78.5	82.3	82.9	522
Primary	95.0	73.6	86.6	85.9	1,761
Secondary	98.3	78.9	96.6	93.8	491
Higher	98.6	80.4	98.6	96.5	34
Total	95.6	75.6	87.7	86.9	2,808

Figure 4 highlights the percentages of women ages 15 to 49 years who reported various malaria prevention measures. Sleeping under a mosquito net was by far the most-reported measure nationally (65.9%); sleeping under an ITN was recognized by 31% of respondents nationally.

Figure 4. Among women ages 15 to 49, percentage who reported various malaria prevention measures (Malawi MIS 2010)



Malaria messaging through information, education and communication strategies

The NMCP has developed an information, education and communication strategy as one of the key components to improving uptake of malaria interventions through communicating malaria messages to vulnerable populations. Key messages to be communicated include the importance of sleeping under

ITNs, seeking treatment for fever promptly, and allowing one's house to be sprayed during spray campaigns. The 2010 MIS results will reinforce as well as guide the implementation of the IEC/BCC strategy.

Table 19 presents information on the exposure to malaria messages among women ages 15 to 49 years. Almost three-quarters of women (74.3%) responded that they had seen or heard malaria messages. More women in urban areas (86.6%) reported having seen or heard malaria messages than in rural areas (72.1%). Over ninety-seven percent (97.3%) of women in the highest education level reported having seen or heard malaria messages, compared to 67.9% of women with no formal education.

Among women who reported having seen or heard messages, the average number of months preceding the perceived messages was 4.7 months. Government hospitals and clinics were reported by women as the primary source of malaria messages, accounting for 78.9% of them. When asked about the content of the messages seen or heard, 33.8% reported seeing or hearing messages about the importance of sleeping under mosquito nets.

Table 19. Malaria messaging through information, education and communication strategies
Among eligible women ages 15 to 49 years, the percentage who reported having heard messages about malaria, and the average number of months ago the messages were heard, the percentage who reported a government hospital/clinic as the source of the malaria message, and the percentage who reported seeing/hearing a message about the importance of sleeping under a mosquito net among those who reported seeing/hearing a malaria message, by background characteristics (Malawi MIS 2010)

Background Characteristic	Percentage who have seen/heard malaria messages	Number of women	Avg. number of months ago malaria message heard	Percentage who reported government hospital/clinic as the source of malaria message	Percentage who reported seeing/hearing message about the importance of sleeping under mosquito net	Number of women
	(1)	(2)	(3)	(4)	(5)	(6)
Residence						
Urban	86.6	440	4.2	73.3	32.5	381
Rural	72.1	2,368	4.8	80.1	34.0	1,706
Region						
Northern	70.9	321	4.9	78.7	39.7	228
Central	73.9	1,195	5.2	80.7	27.3	883
Southern	75.6	1,292	4.2	77.2	38.3	976
Wealth index						
Lowest	73.2	707	5.3	85.0	27.6	518
Second	65.6	402	4.3	82.6	26.9	264
Middle	69.6	567	4.4	78.7	33.3	394
Fourth	73.6	525	4.8	80.4	41.4	386
Highest	86.5	607	4.4	70.0	38.0	525
Education						
None	67.9	522	5.8	86.4	21.5	355
Primary	72.9	1,761	4.5	80.8	34.0	1,283
Secondary	84.8	491	4.3	69.3	42.1	416
Higher	97.3	34	4.2	44.9	53.6	33
Total	74.3	2,808	4.7	78.9	33.8	2,087

Figure 5 on the following page outlines the various sources of malaria messages among women ages 15 to 49. Particularly for women in rural settings, most messages were heard or seen at a government clinic or hospital. Radio was the second most cited source for malaria messages that were seen or heard. Both radio and TV messages had a more pronounced effect in urban settings. Print media, posters, and billboard advertisements were negligible among these women as far as malaria messages that were seen or heard.

Figure 5. Among women ages 15 to 49 years who saw or heard malaria messages, the percentage who saw or heard the message from various sources (Malawi MIS 2010)

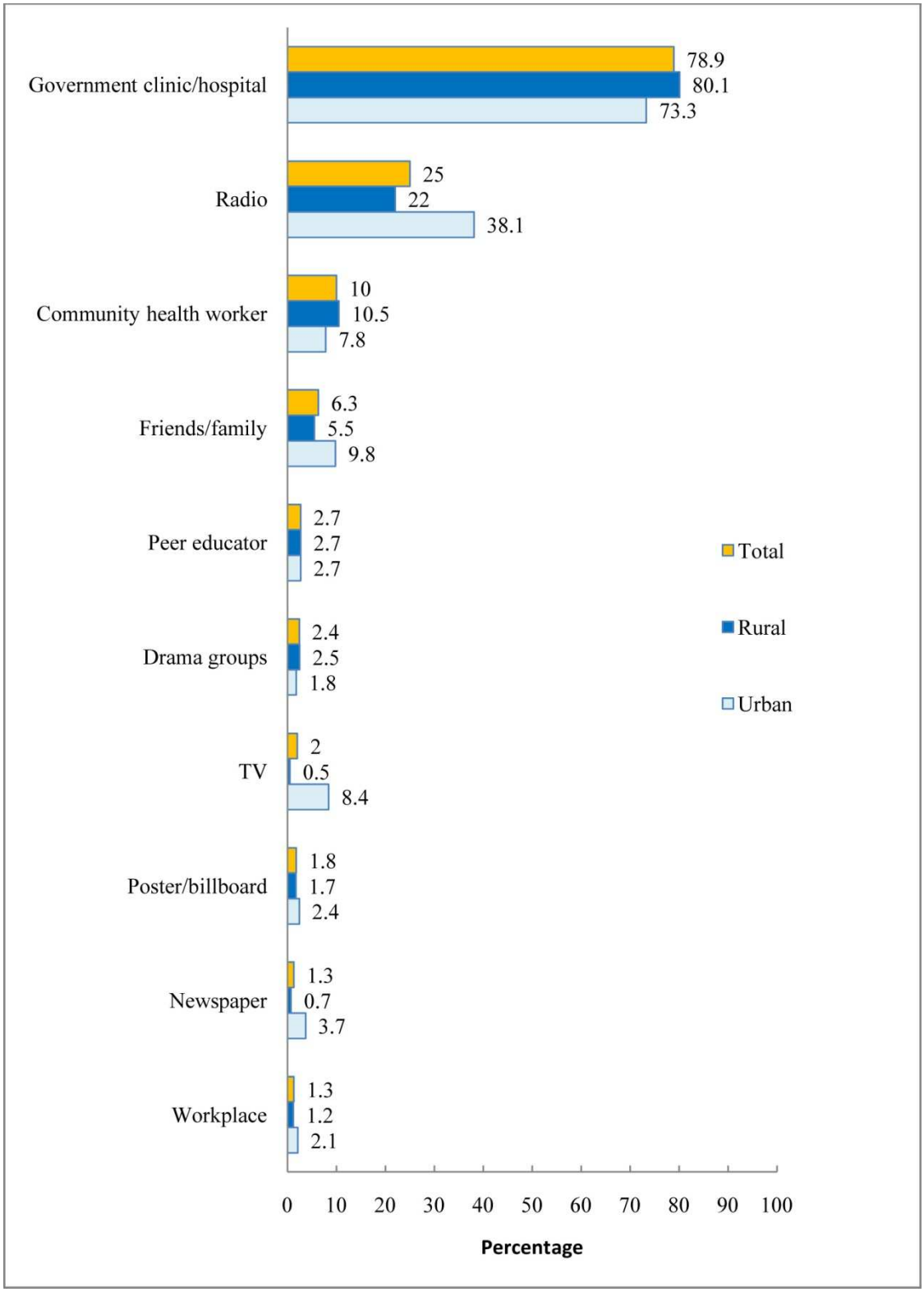
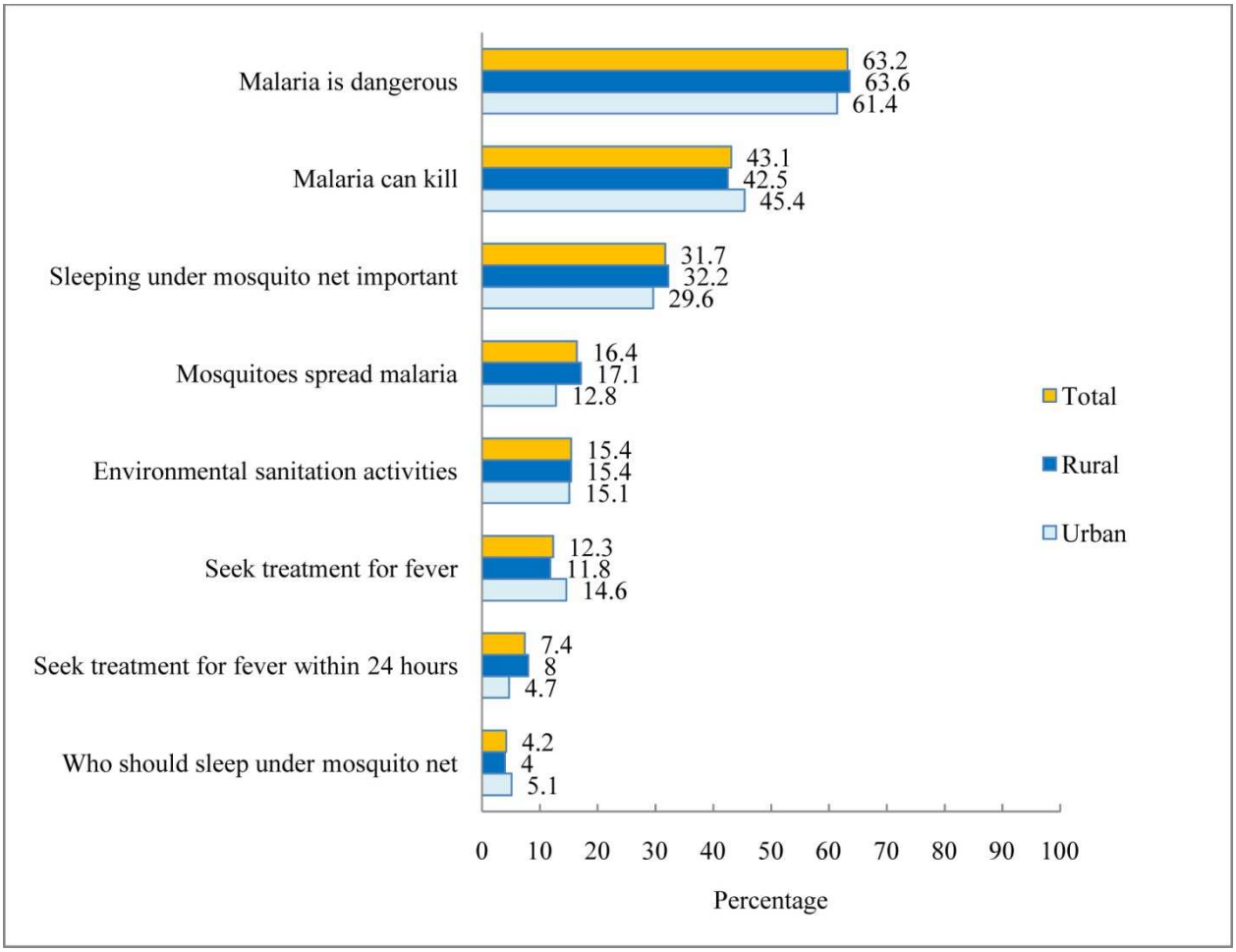


Figure 6 shows the various malaria messages heard from the different sources. The most common message is that malaria is dangerous followed by the message that malaria can kill. About one third of the women aged 15 to 49 heard the message that sleeping under mosquito net is important.

Figure 6: Among women ages 15 to 49 years who saw or heard malaria messages, the percentage who saw or heard various types of messages (Malawi MIS 2010)


Malaria is dangerous
63.2
63.6
61.4
Malaria can kill
43.1
42.5
45.4
Sleeping under mosquito net important
31.7
32.2
29.6
Mosquitoes spread malaria
16.4
17.1
12.8
Environmental sanitation activities
15.4
15.4
15.1
Seek treatment for fever
12.3
11.8
14.6
Seek treatment for fever within 24 hours
7.4
8
4.7
Who should sleep under mosquito net
4.2
4
5.1
Total
Rural
Urban
0 10 20 30 40 50 60 70 80 90 100
Percentage

Chapter 6: Cost of care for children with fever

Malaria imposes a significant cost on households. Direct cost of accessing care incurred by household is also believed to hinder early diagnosis and treatment of communicable diseases. The MIS collected information on cost of treatment for children who had fever in the two weeks preceding the survey. This section reports direct cost of malaria treatment which is defined as spending on consultation, drugs, tests, transport, and food.[3]

Table 20 shows that 38.2% of children who had fever and sought treatment reported direct expenditures toward accessing treatment. The mean cost of direct treatment was 274 Malawian Kwacha (MKW), which in July 2010 terms was approximately US $1.83. More households in urban areas incurred direct costs for treatment of fever compared to their rural counterparts (42.2% and 37.8%, respectively). A small percentage of children who sought treatment for fever in a public health facility incurred direct cost. About 55% of children who sought treatment in a private hospital paid for it, while 81.5% of those that sought treatment for fever by a traditional healer paid. The mean direct cost for all fever cases that paid for treatment was 274 MKW (US$1.83). The mean cost of treatment was highest in pharmacies or other shops (536 MKW or US $3.57). The highest wealth quintile spent more compared to lowest group (US$2.22 and US$1.79, respectively).

Table 20: Direct costs incurred by households for obtaining malaria treatment for children <5 years

Among children with fever in the two weeks before the survey and who sought treatment for the fever, percent distribution of those for whom treatment was paid for and mean cost of treatment by place of treatment (Malawi MIS 2010**)**

Background characteristic	Number of children who sought treatment for fever	Percentage of children who paid out-of-pocket for treatment	Mean cost among those who paid (MKW*)
	(1)	(2)	(3)
Age of children			
<1	96	33.4	387 ($2.58)
1	142	39.5	291 ($1.94)
2	115	38.8	271 ($1.81)
3	85	47.4	170 ($1.13)
4	62	29.6	224 ($1.49)
Residence			
Urban	110	42.2	357 ($2.38)
Rural	390	37.8	265 ($1.77)
Region			
Northern	62	43.6	205 ($1.37)
Central	197	45.9	345 ($2.30)
Southern	241	31.5	213 ($1.42)

* Malawi Kwacha (1US$=MKW150)

[3] http://www.rollbackmalaria.org/cmc_upload/0/000/015/363/RBMInfosheet_10.pdf accessed on 20th August 2010.

Continued

Table 20: Direct costs incurred by households for obtaining malaria treatment for children <5 years

Among children with fever in the two weeks before the survey and who sought treatment for the fever, percent distribution of those for whom treatment was paid for and mean cost of treatment by place of treatment (Malawi MIS 2010**)**

Background characteristic	Number of children who sought treatment for fever	Percentage of children who paid out-of-pocket for treatment	Mean cost among those who paid (MKW*)
	(1)	(2)	(3)
Wealth index			
Lowest	124	36.7	268 ($1.79)
Second	70	38.8	168 ($1.12)
Middle	120	39.9	330 ($2.20)
Fourth	81	28.1	217 ($1.45)
Highest	105	49.8	333 ($2.22)
Source of care*			
Public Hospital	142	18.7	427 ($2.85)
Health centre or rural health post	198	16.5	221 ($1.47)
Private	78	55.4	268 ($1.79)
Traditional	96	81.5	41 ($0.27)
Pharmacy or shop	86	78.4	536 ($3.57)
Total	500	38.2	274 ($1.83)

* Malawi Kwacha (1US$=MKW150)

** Multiple sources possible

Chapter 7: Lessons learnt

The Malawi 2010 MIS used techniques, methods, and tools adapted from the RBM MERG methodology, while borrowing proficiencies from similar assessments in other countries. While Malawi has experience in utilizing PDA technology as a survey data collection tool, this exercise represented the first time a malaria-specific PDA-based survey has been carried out, complete with biomarker data, on a national scale. To guide future endeavors while documenting successes and challenges, a review of lessons learnt throughout this survey process is provided.

Survey planning and timeline

While discussions had been ongoing, detailed survey planning began only three months prior to fieldwork activities. This left limited time for completion of all preparatory aspects such as logistics and supply ordering, sample selection (so as not to interfere with other planned survey activities, i.e., the DHS), authorisation for activities (such as seconding of staff), and coordination of efforts with all stakeholders. However, once activities were confirmed, a coordinator from the NMCP was identified and a Steering Committee was established to guide the process with the necessary consultative and collaborative meetings prior to fieldwork activities.

Sample selection

Field staff reported that EA boundaries were not always clearly demarcated and thus posed a problem during field activities. PDA-assisted EA boundary markers would prove very helpful in preventing teams from listing houses in neighboring EAs.

In some cases field staff were not aware that empty—but intact—households should be included in the household listing and only excluded at the interview stage if the occupants could not be located.

Some teams were informed that if they did not manage to interview all the selected houses in an EA, they could move on to the next EA and "top up" there. Similarly, this occurred with listing. When two teams lost data, instead of re-listing all the households, they only re-listed some of the houses to reach an expected number.

Questionnaire design

Programming of the questionnaire—though facilitated by a seasoned programmer well versed with the RBM methodology—still required debugging to allow for ease of administration and use of the questionnaires in the field.

PDA issues

Challenges with PDAs were mostly limited to hardware or software. Overall, staff performed technically well in using the PDAs in the field. This was based on selecting staff with prior computer experience. Despite thorough testing of the programme during training, issues arose with respect to skip segments during questionnaire administration as well as synchronization with storage cards. GPS signals were lost at times requiring re-listing of households. Maintaining a charge for the PDAs also posed a challenge particularly for teams in more remote settings. One PDA also ran out of memory during fieldwork.

For future PDA-assisted fieldwork, field teams should be allocated an extra storage card each to deal with memory issues and in the case of lost cards.

The PDAs were programmed with incomplete EA numbers, which allowed for some duplication of EA identification. Records were ultimately matched by date and place name. However, because there was no drop-down menu for the EA number or place name during listing, place names varied widely in spelling and often the village name the respondent gave (which may or may not have been consistent with 2008 census demarcations) was utilized instead of the place name of the EA.

Training

While supervisors were adequate, numerous field teams suggested that they would have benefited from increased supervision particularly during early administration of field activities. A supervision checklist to be used during follow-up would have aided this effort.

The importance of filling out fieldwork tracking forms, with numbers of households listed, selected, and interviewed per date and EA, should be focused upon in greater detail.

Logistics

Particularly for field teams deployed in the Northern region, heavy rainfall created difficult conditions for survey administration.

Appendix A: Sample design

Introduction

The design of the Malawi National Malaria Indicator Survey (MIS) utilized a representative probability sample to produce estimates for the country as a whole, urban and rural separately, and for the Northern, Central, and Southern regions separately. Overall, a representative probability sample of 3,500 households was selected for the MIS.

Sampling frame and stratification

Malawi is administratively divided into three regions and 28 districts. Each district is subdivided into traditional authorities. For statistical purposes, each traditional authority is subdivided into standard enumeration areas (SEAs). The 2008 census demarcated these SEAs and determined the number of households in each one. In total, Malawi has 12,569 SEAs. The number of households in each SEA was used as a measure of size for selecting primary sampling units. Therefore, the sampling frame of this survey is the list of SEAs developed from the 2008 population census, stratified by region, urban, and rural strata.

Sample allocation and selection

The total sample of 140 SEAs and 3,500 households was allocated among regions in proportion to the population of each region according to the 2008 census results. Urban areas were over-sampled within regions in order to produce robust estimates for that domain. Therefore, the MIS sample was not proportional to the population for residence (urban-rural area) and required a final weighing adjustment to provide valid estimates for every domain of survey. Adjustments to the proportional distribution were made as shown in **Table A1**.

Table A1. Sample and total population proportions by strata (Malawi MIS 2010)

Region	Urban	Rural	Total
Northern			
Population proportion	0.015	0.100	0.115
Sample proportion	0.043	0.107	0.150
# HHs sampled	150	375	525
Central			
Population proportion	0.063	0.355	0.418
Sample proportion	0.136	0.264	0.400
# HHs sampled	475	925	1,400
Southern			
Population proportion	0.065	0.403	0.468
Sample proportion	0.136	0.314	0.450
# HHs sampled	475	1,100	1,575
Total			
Population HH proportion	0.142	0.858	1
Sample proportion	0.314	0.686	1
# HHs sampled	1,100	2,400	3,500

The MIS sample was selected using a stratified two-stage cluster design. The first-stage sampling units were the SEAs. Once the households were allocated to the different strata, the number of SEAs to be selected was calculated based on an average cluster take of 25 completed interviews of all respondents. SEAs were selected systematically with probability proportional to the number of households. **Table A2, A3, and A4** show the distribution of sample clusters by urban and rural for each district in the Northern, Central, and Southern regions. A map of the location of the clusters appears in **Figure A1**.

Table A2. Distribution of SEAs by Urban/Rural for districts in Northern Region (Malawi MIS 2010)

District	Urban	Rural	Total EAs
Chitipa	1	2	3
Karonga	1	3	4
Mzimba	0	7	7
Mzuzu City	4	0	4
Nkhatabay	0	1	1
Rumphi	0	2	2
Total	**6**	**15**	**21**

Table A3. Distribution of SEAs by Urban/Rural for districts in Central Region (Malawi MIS 2010)

District	Urban	Rural	Total EAs
Dedza	1	6	7
Dowa	0	4	4
Kasungu	1	5	6
Lilongwe	0	9	9
Lilongwe City	15	0	15
Mchinji	0	3	3
Nkhota kota	1	2	3
Ntcheu	0	3	3
Ntchisi	0	1	1
Salima	1	4	5
Total	**19**	**37**	**56**

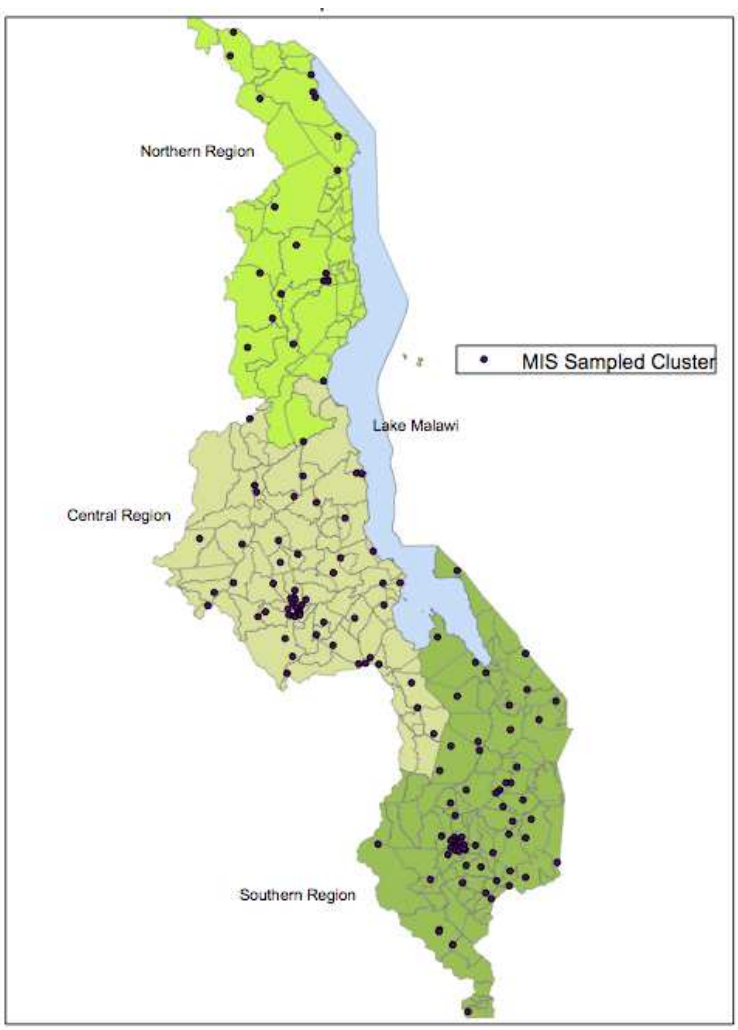
Table A4. Distribution of SEAs by Urban/Rural for districts in Southern Region (Malawi MIS 2010)

District	Urban	Rural	Total EAs
Balaka	0	3	3
Blantyre	0	4	4
Blantyre city	14	0	14
Chikwawa	1	3	4
Chiradzulu	0	2	2
Machinga	1	4	5
Mangochi	1	7	8
Mulanje	0	5	5
Nsanje	0	2	2

Continued

District	Urban	Rural	Total EAs
Phalombe	0	3	3
Thyolo	0	5	5
Zomba	0	6	6
Zomba city	2	0	2
Total	**19**	**44**	**63**

Figure A1: Location of selected clusters from the 2010 MIS sample (Malawi MIS 2010)



Selection of clusters

The following steps were used to select the SEAs in each stratum:

(i) Calculate the sampling interval, *I*, for each stratum

$$I_h = \frac{\sum_{i=1}^{N_h} M_{hi}}{a_h}$$

where M_{hi} is the number of households in SEA *i* and stratum *h*, $\sum_{i=1}^{N_h} M_{hi}$ is the size of the stratum (total number of households in the stratum according to the 2008 census) and *a* is the number of SEAs to be selected in the stratum.

(ii) Calculate the cumulated size of each SEA.

(iii) Calculate the sampling numbers

$$R, R+I, R+2I, ..., R + (a\text{-}1)I,$$

where R is a random number between 1 and *I*.

(iv) Compare each sampling number with the cumulated sizes of the SEAs.

The first SEA whose cumulated size is equal to or greater than the random number generated in (iii) was selected. The next SEA to be selected was the one with cumulated size equal to or greater than *R+I*. Each of the remaining SEAs were selected using the same procedure, making sure to add *I* at each subsequent selection (as in Equation 4).

Selection of households

A frame of households was determined by listing all the households in all the selected SEAs. Upon completion of household listing, the household lists were given new household numbers, which were sampling serial numbers assigned to each household in the cluster. The sampling numbers were assigned sequentially within each SEA starting from 1. The total number of households in the SEA was equal to the last serial number assigned.

In summary, the following steps were used to select the households:

1. The sampling interval for each category was calculated

$$I = \frac{B}{b}$$

where *B* is the number of households listed in the selected SEA and *b* is the number of households to be selected in that SEA.

2. A random number (R) between 1 and the interval *I* was generated; the first selection will hence be R.
3. The interval to the random number to get the next selection was added.
4. The interval was repeatedly added until the desired sample size was achieved.

Estimation procedure

Weights

The Malawi MIS sample was not self-weighted. Due to the disproportional allocation of the sample to the different strata, sampling weights were required to ensure that the sample was representative at the national level. The sampling probabilities at first-stage selection of SEAs and probabilities of selecting the households were used to calculate the weights. The weights of the sample were equal to the inverse of the probability of selection.

The probability of selecting cluster *i* was calculated as:

$$P_{hi} = \frac{a_h M_{hi}}{\frac{N_h}{\sum_{i=1} M_{hi}}}.$$

The weight or boosting factor is, thus, given as:

$$w_{hi} = \frac{1}{P_{hi}}$$

where P_{hi} is the first-stage sampling probability of (SEA), a_h is the number of SEAs selected in stratum h, M_{hi} is the size (households according to the census frame) of the i^{th} SEA in stratum h, and ΣM_{hi} is the total size of stratum h.

The selection probability of the household was calculated as:

$$p_h = \frac{n_h}{N_h}$$

where n_h is the number of households selected from stratum h and N_h is the total number of households in stratum h.

Let y_{hij} be an observation on variable *Yy* for the j^{th} household in the i^{th} SEA of the h^{th} stratum. Then the estimated total for the h^{th} stratum is:

$$y_h = \sum_{i=1}^{a_h} \sum_{j=1}^{n_h} w_{hi} y_{hij}$$

where, y_h is the estimated total for the h^{th} stratum., w_{hi} is the weight for the j^{th} household in the I^{th} SEA of the h^{th} stratum, i=1-a_h is the number of selected clusters in the stratum, and j=1-n_h is the number of sample households in the stratum. The national estimate is given by:

$$y = \sum_{h=1}^{H} y_h$$

where y is the national estimate, h=1, …, H is the total number of strata. For this survey, H = 6 (urban/rural for each of three regions taken as a separate domain).

Appendix B: Standard errors for selected indicators

Indicator/subpopulation	Estimate	SE	CI-	CI+	RSE	Unweighted N	Weighted N
Proportion of HHs with at least one ITN							
Urban	.510	.030	.450	.570	.059	1,091	468
Rural	.593	.020	.554	.632	.034	2,387	3,010
Total	.582	.017	.547	.616	.029	3,478	3,478
Proportion of children <5 who slept under an ITN							
Urban	.473	.030	.414	.532	.063	744	319
Rural	.566	.023	.521	.611	.041	1,779	2,234
Total	.554	.020	.514	.594	.036	2,523	2,553
Proportion of pregnant women who slept under an ITN							
Urban	.416	.067	.283	.548	.161	66	30
Rural	.503	.038	.428	.579	.076	213	267
Total	.494	.035	.425	.564	.071	279	297
Proportion of children with fever who took antimalarial same/next day							
Urban	.391	.061	.272	.511	.156	143	64
Rural	.205	.022	.160	.249	.107	600	785
Total	.219	.021	.176	.261	.096	743	849
Proportion of children with severe anaemia							
Urban	.042	.010	.022	.061	.238	566	244
Rural	.133	.012	.110	.156	.090	1,495	1,917
Total	.123	.011	.102	.144	.089	2,061	2,161

SE = Standard Error, CI- = 95% Confidence interval, lower bound (Estimate – 1.96(SE)), CI+ = 95% Confidence interval, upper bound (Estimate + 1.96(SE)), RSE = Relative Standard Error (SE/Estimate)

Appendix C: Survey personnel

Survey coordination, management, and data analysis

John Zoya	Ministry of Health
Doreen Ali	Ministry of Health
Ben Chilima	Ministry of Health
James Mwaisemba	Ministry of Health
Bertha Simwaka	PATH MACEPA
Christopher Lungu	PATH MACEPA
Adam Bennett	PATH MACEPA
Misheck Luhanga	Ministry of Health
Jessica Oyugi	CDC/PMI
Wilfred Dodoli	World Health Organization
Samson Katikiti	World Health Organization
Khoti Gausi	World Health Organization
Jobiba Chinkhumba	Malaria Alert Centre, College of Medicine

Sample design and selection

Deric Zanera	National Statistics Office

Laboratory training and analysis staff

Rudia Lungu	Ministry of Health
Abelo Phiri	Ministry of Health
James Kaphiyo	Ministry of Health

National Supervisors

Madalitso Luka	Malaria Alert Centre, College of Medicine
Alinafe Chibwana	Malaria Alert Centre, College of Medicine
Andrew Jamali	National Statistics Office
Petros Chirambo	National Malaria Control Programme
Thoko Sambakusi	Ministry of Health
Ishmael Gondwe	National Statistics Office
Dubulao Moyo	Ministry of Health
Evans Kaunda	Ministry of Health

Fieldwork teams leaders

Magret C. Nyirenda	Ministry of Health
Veronica Mkwanda	Ministry of Health
Kandakuone Makamo	Ministry of Health
Moses Gondwe	Ministry of Health
Beatrice Lobeni	Ministry of Health
Amos Maenje	Ministry of Health
Ayena Chanza	Ministry of Health
Hastings Soka	Ministry of Health
Beatrice Kamanga	Ministry of Health
Lucious Chabuka	Ministry of Health

Interviewers

Sarah J. Msowoya
Grossvenor Msiska
Tobias Alidu
John Kaunda
Alice Msukwa
Stanley Munthali
John Nyirenda
Diana Mwanyongo

Aaron Chitseko
R. Kwalira
Davie Manda
Sandram Kamwendo
Selina Nlashi
Kingsley Laija
Immaculate Mhango
Doris Namanja
Millen Chirwa
Bernadetta Mazibuko
Francis Kalonga
Stanley Silungwe
Jack Mabvuka
Charity Banda
Maclean Changadeya
Simon Kasonya
Ceaser Chilunga
Damson Kasawa
Limbani Banda
Jane Mercy Somanje
Fausta Mainje
Cedric Biliwita
Olive Muhoko
Lucia Mangatema
Evelyn Zambasa
Harry Milala
Eda Lipipi
Jean Mkandawire
Mr Fred Kaloza
Simon Maleka
Tobias Maonga
Freda Bandawe
Alinafe Kananji
Violet Maliza

Appendix D: Questionnaires

Malawi Malaria Indicator Survey 2010

Household Questionnaire

March 2010

MALAWI MALARIA INDICATOR SURVEY 2010
MALAWI GOVERNMENT

MINISTRY OF HEALTH

NATIONAL STATISTICAL OFFICE

IDENTIFICATION

PLACE NAME _____

NAME OF HOUSEHOLD HEAD _____

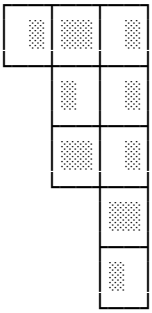
CLUSTER NUMBER .....

HOUSEHOLD NUMBER .....

REGION .....

URBAN/RURAL (URBAN=1, RURAL=2) .....

LARGE CITY/SMALL CITY/TOWN/COUNTRYSIDE .....
(LARGE CITY=1, SMALL CITY=2, TOWN=3, COUNTRYSIDE=4)



INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE	_____	_____	_____	DAY MONTH YEAR
INTERVIEWER'S NAME	_____	_____	_____	NAME
RESULT*	_____	_____	_____	RESULT
NEXT VISIT: DATE	_____	_____		TOTAL NO. OF VISITS
TIME	_____	_____		

*RESULT CODES:

1	COMPLETED
2	NO HOUSEHOLD MEMBER AT HOME OR NO COMPETENT RESPONDENT AT HOME AT TIME OF VISIT
3	ENTIRE HOUSEHOLD ABSENT FOR EXTENDED PERIOD OF TIME
4	POSTPONED
5	REFUSED
6	DWELLING VACANT OR ADDRESS NOT A DWELLING
7	DWELLING DESTROYED
8	DWELLING NOT FOUND
9	OTHER _____

_____
_____
_____
(SPECIFY)

TOTAL PERSONS IN HOUSEHOLD

TOTAL ELIGIBLE WOMEN

LINE NUMBER OF RESPONDENT TO HOUSEHOLD QUESTIONNAIRE

SUPERVISOR	OFFICE EDITOR	KEYED BY
NAME _____		
DATE _____		

[1] The following guidelines should be used to categorize urban sample points: “Large cities” are national capitals and places with over 1 million in population (Lilongwe and Blantyre); “small cities” are places with between 50,000 and 1 million in population; the remaining urban sample points are “towns.”

HOUSEHOLD LISTING

Now we would like some information about the people who usually live in your household or who are staying with you now.

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	ELIGIBLE WOMEN	CURRENTLY PREGNANT?
	Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with the head of the household.	What is the relationship of (NAME) to the head of the household?*	Is (NAME) male or female?	Does (NAME) usually live here?	Did (NAME) stay here last night?	How old is (NAME)?	CIRCLE LINE NUMBER OF ALL WOMEN AGE 15-49	FOR ELIGIBLE WOMEN, ASK: Is (NAME) currently pregnant?
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
			M F	YES NO	YES NO	IN YEARS		YES NO/DK
01			1 2	1 2	1 2		01	1 2
02			1 2	1 2	1 2		02	1 2
03			1 2	1 2	1 2		03	1 2
04			1 2	1 2	1 2		04	1 2
05			1 2	1 2	1 2		05	1 2
06			1 2	1 2	1 2		06	1 2
07			1 2	1 2	1 2		07	1 2
08			1 2	1 2	1 2		08	1 2
09			1 2	1 2	1 2		09	1 2
10			1 2	1 2	1 2		10	1 2

* CODES FOR Q.3 RELATIONSHIP TO HEAD OF HOUSEHOLD:
01 = HEAD
02 = WIFE/HUSBAND
03 = SON OR DAUGHTER
04 = SON-IN-LAW OR DAUGHTER-IN-LAW
05 = GRANDCHILD
06 = PARENT
07 = PARENT-IN-LAW
08 = BROTHER OR SISTER
09 = OTHER RELATIVE
10 = ADOPTED/FOSTER/ STEPCHILD
11 = NOT RELATED
98 = DON'T KNOW

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	ELIGIBLE WOMEN	CURRENTLY PREGNANT?
	Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with the head of the household.	What is the relationship of (NAME) to the head of the household?*	Is (NAME) male or female?	Does (NAME) usually live here?	Did (NAME) stay here last night?	How old is (NAME)?	CIRCLE LINE NUMBER OF ALL WOMEN AGE 15-49	FOR ELIGIBLE WOMEN, ASK: Is (NAME) currently pregnant?
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
			M F	YES NO	YES NO	IN YEARS		YES NO/DK
11			1 2	1 2	1 2		11	1 2
12			1 2	1 2	1 2		12	1 2
13			1 2	1 2	1 2		13	1 2
14			1 2	1 2	1 2		14	1 2
15			1 2	1 2	1 2		15	1 2
16			1 2	1 2	1 2		16	1 2
17			1 2	1 2	1 2		17	1 2
18			1 2	1 2	1 2		18	1 2
19			1 2	1 2	1 2		19	1 2
20			1 2	1 2	1 2		20	1 2

TICK HERE IF CONTINUATION SHEET USED ☐

Just to make sure that I have a complete listing:

1) Are there any other persons such as small children or infants that we have not listed? YES ☐—> ENTER EACH IN TABLE NO ☐

2) In addition, are there any other people who may not be members of your family, such as domestic servants, lodgers or friends who usually live here? YES ☐—> ENTER EACH IN TABLE NO ☐

3) Are there any guests or temporary visitors staying here, or anyone else who stayed here last night, who have not been listed? YES ☐—> ENTER EACH IN TABLE NO ☐

QUESTIONS ABOUT ECONOMIC ACTIVITIES FOR ALL HOUSEHOLD MEMBERS			
9. Name of the household member	9a. Does (NAME) usually work?	9b Was [NAME] absent from work during the last 7 days?	9c. What was the main reason [NAME] did not work the last 7 days?
1.	YES ..... 1 NO ..... 2 (If No skip 9b, 9d,9e,9f)	YES ..... 1 NO ..... 2 (If 2 go to 9c)	No work available .....1 Seasonal inactivity.....2 Student.....3 Household/family.....4 Too old/Too young .....5 Sickness.....6 Other reasons specify.....7_____
2	YES ..... 1 NO ..... 2 (If NO skip 9b, 9c,9d,9e)	YES ..... 1 NO ..... 2 (If 2 go to 9c)	No work available .....1 Seasonal inactivity.....2 Student.....3 Household/family.....4 Too old/Too young .....5 Sickness.....6 Other reasons specify.....7_____
3	YES ..... 1 NO ..... 2 (If NO skip 9b, 9c,9d,9e)	YES ..... 1 NO ..... 2 (If 2 go to 9c)	No work available .....1 Seasonal inactivity.....2 Student.....3 Household/family.....4 Too old/Too young .....5 Sickness.....6 Other reasons specify.....7_____
4	YES ..... 1 NO ..... 2 (If NO skip 9b, 9c,9d, 9e)	YES ..... 1 NO ..... 2 (If 2 go to 9c)	No work available .....1 Seasonal inactivity.....2 Student.....3 Household/family.....4 Too old/Too young .....5 Sickness.....6 Other reasons specify.....7_____
5	YES ..... 1 NO ..... 2 (If NO skip 9b, 9c,9d,9e)	YES ..... 1 NO ..... 2 (If 2 go to 9c)	No work available .....1 Seasonal inactivity.....2 Student.....3 Household/family.....4 Too old/Too young .....5 Sickness.....6 Other reasons specify.....7_____

9. Name of the household member	9d. For whom did [NAME] work in the main job?	9e. How was [NAME] paid in the main job?	9f. How much were the wages?
1.	Private business ..... 1 Private individual..... 2 Parastatal ..... 3 Public/Government ..... 4 Mission/NGO ..... 5 Self employed..... 6 Mlimi..... 7 Estate 8	Mlimi – not paid .....1 Wages, salary.....2 Payment in kind.....3 Casual (hourly/daily), Ganyu.....4 Unpaid family business worker .....5 Self-employed .....6 Tenant.....7	K_____
2	Private business ..... 1 Private individual..... 2 Parastatal ..... 3 Public/Government ..... 4 Mission/NGO ..... 5 Self employed..... 6 Mlimi..... 7 Estate 8	Mlimi – not paid .....1 Wages, salary.....2 Payment in kind.....3 Casual (hourly/daily), Ganyu.....4 Unpaid family business worker .....5 Self-employed .....6 Tenant.....7	K_____

3	Private business .....1 Private individual.....2 Parastatal .....3 Public/Government .....4 Mission/NGO .....5 Self employed.....6 Mlimi.....7 Estate 8	Mlimi – not paid .....1 Wages, salary.....2 Payment in kind.....3 Casual (hourly/daily), Ganyu.....4 Unpaid family business worker .....5 Self-employed .....6 Tenant.....7	K_____
4	Private business .....1 Private individual.....2 Parastatal .....3 Public/Government .....4 Mission/NGO .....5 Self employed.....6 Mlimi.....7 Estate 8	Mlimi – not paid .....1 Wages, salary.....2 Payment in kind.....3 Casual (hourly/daily), Ganyu.....4 Unpaid family business worker .....5 Self-employed .....6 Tenant.....7	K_____
5	Private business .....1 Private individual.....2 Parastatal .....3 Public/Government .....4 Mission/NGO .....5 Self employed.....6 Mlimi.....7 Estate 8	Mlimi – not paid .....1 Wages, salary.....2 Payment in kind.....3 Casual (hourly/daily), Ganyu.....4 Unpaid family business worker .....5 Self-employed .....6 Tenant.....7	K_____

9g	Did your household sell any crops last month?	YES .....1 NO 2	IF 2 GO 9i
9h	If Yes for 16 F, How much did your household get from the crops sold?	CROP INCOME K :	
9i	Did your household sell any livestock last month?	YES .....1 NO 2	IF 2 GO to 10i
9j	How much if any did your household get from the livestock sold?	LIVESTOCK INCOME K :	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
10	What is the main source of drinking water for members of your household?[1]	PIPED WATER PIPED INTO DWELLING.....11 PIPED INTO YARD/PLOT .....12 PUBLIC TAP/STANDPIPE.....13 TUBE WELL OR BOREHOLE ……..…. 21 DUG WELL PROTECTED WELL .....31 UNPROTECTED WELL.....32 WATER FROM SPRING PROTECTED SPRING.....41 UNPROTECTED SPRING.....42 RAINWATER ……..…….51 TANKER TRUCK.....61 CART WITH SMALL TANK.....71 SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/ IRRIGATION CHANNEL.....81 BOTTLED WATER.....91 OTHER _____ 96 (SPECIFY)	
11	What kind of toilet facilities does your household use?[1]	FLUSH OR POUR FLUSH TOILET FLUSH TO PIPED SEWER SYSTEM.....11 FLUSH TO SEPTIC TANK …….. 12 FLUSH TO PIT LATRINE…….. 13 FLUSH TO SOMEWHERE ELSE . 14 FLUSH, DON'T KNOW WHERE . …. 15 PIT LATRINE VENTILATED IMPROVED PIT LATRINE (VIP)…….. 21 PIT LATRINE WITH SLAB…… 22 PIT LATRINE WITHOUT SLAB/ OPEN PIT……23 COMPOSTING TOILET……31 BUCKET TOILET……41 HANGING TOILET/HANGING LATRINE…… 51 NO FACILITY/BUSH/FIELD……..61 OTHER _____ 96 (SPECIFY)	
12	Does your household have:[2] Electricity? A radio? A television? A telephone? A refrigerator?	YES NO ELECTRICITY .....1 2 RADIO.....1 2 TELEVISION .....1 2 TELEPHONE.....1 2 REFRIGERATOR.....1 2	
13	What type of fuel does your household mainly use for cooking?	ELECTRICITY .....01 LPG/NATURAL GAS .....02 BIOGAS .....03 KEROSENE .....04 COAL/LIGNITE.....05 CHARCOAL .....06 FIREWOOD/STRAW .....07 DUNG.....08 OTHER _____ 96 (SPECIFY)	

[1] Coding categories to be developed locally and revised based on the pretest; however, the broad categories must be maintained.
[2] Additional indicators of socioeconomic status should be added, especially to distinguish among lower socioeconomic classes.

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
14a	MAIN MATERIAL OF THE FLOOR.[1] RECORD OBSERVATION.	NATURAL FLOOR EARTH/SAND .....11 DUNG.....12 RUDIMENTARY FLOOR WOOD PLANKS.....21 PALM/BAMBOO.....22 FINISHED FLOOR PARQUET OR POLISHED WOOD.....31 VINYL OR ASPHALT STRIPS.....32 CERAMIC TILES.....33 CEMENT.....34 CARPET.....35 OTHER _____ 96 (SPECIFY)	
14b	MAIN MATERIAL OF THE WALL.[1] RECORD OBSERVATION.	NATURAL WALL NO WALLS.....11 CANE/STICKS/BAMBOO/REED..12 RUDIMENTARY WALL BAMBOO/WOOD WITH MUD.....21 STONE WITH MUD .....22 UNCOVERED ABODE.....23 PLYWOOD .....24 CARTON .....25 FINISHED WALL CEMENT.....31 STONE WITH LIME/CEMENT.....32 BRICKS .....33 CEMENT BLOCKS .....34 COVERED ADOBE .....35 WOOD PLANKS/SHINGLES.....36 OTHER _____ 96 (SPECIFY)	
14c	MAIN MATERIAL OF THE ROOF.[1] RECORD OBSERVATION.	NATURAL ROOF THATCH/LEAF.....11 STICKS AND MUD.....12 RUDIMENTARY ROOF RUSTIC MAT/PLASTIC SHEET .....21 REED/BAMBOO.....22 WOOD PLANKS.....23 FINISHED WALL CORRUGATED IRON .....31 WOOD.....32 CALAMINE/CEMENT FIBER.....33 CEMENT/CONCRETE .....34 ROOFING SHINGLES.....35 OTHER _____ 96 (SPECIFY)	
14d	TYPE OF WINDOWS RECORD OBSERVATION.	YES NO ANY WINDOWS 1 2 WINDOWS WITH GLASS 1 2 WINDOWS WITH SCREENS 1 2 WINDOWS WITH CURTAINS OR SHUTTERS 1 2	
14e	How many separate rooms are in this household? INCLUDE ALL ROOMS, INCLUDING KITCHEN, TOILET, SLEEPING ROOMS, SALON, etc.	NUMBER OF ROOMS ☐☐ L	

14f	How many rooms in this household are used for sleeping? INCLUDE ONLY ROOMS WHICH ARE USUALLY USED FOR SLEEPING.	NUMBER OF SLEEPING ROOMS ☐☐	
14g	How many separate sleeping spaces are there in your household? INCLUDE ALL SLEEPING SPACES, INCLUDING IF THERE IS MORE THAN ONE SLEEPING SPACE IN EACH ROOM USED FOR SLEEPING.	NUMBER OF SLEEPING SPACES ☐☐	
15	Does any member of your household own: A bicycle? A motorcycle or motor scooter? A car or truck?	YES NO BICYCLE 1 2 MOTORCYCLE/SCOOTER 1 2 CAR/TRUCK 1 2	
15a	At any time in the past 12 months, has anyone sprayed the interior walls of your dwelling against mosquitoes?[2]	YES 1 NO 2 DON'T KNOW 8	→ 16
15b	How many months ago was the house sprayed?[2] IF LESS THAN ONE MONTH, RECORD '00' MONTHS AGO.	MONTHS AGO ☐☐	
15c	Who sprayed the house?[2]	GOVERNMENT WORKER/PROGRAM 1 PRIVATE COMPANY 2 HOUSEHOLD MEMBER 3 OTHER _____ 6 (SPECIFY) DON'T KNOW 8	
15d	At any time in the past 12 months, have the walls in your dwelling been plastered or painted?	YES 1 NO 2 DON'T KNOW 8	→ 16
15e	How many months ago were the walls plastered or painted? IF LESS THAN ONE MONTH, RECORD '00' MONTHS AGO.	MONTHS AGO ☐☐	
16	Does your household have any mosquito nets that can be used while sleeping?	YES 1 NO 2	→ 27
17	How many mosquito nets does your household have? IF 7 OR MORE NETS, RECORD '7'.	NUMBER OF NETS ☐	
17a	Has anyone in your household ever sold or given away a mosquito net?	YES, SOLD A MOSQUITO NET 1 YES, GAVE AWAY A MOSQUITO NET 2 NO 3 DON'T KNOW 4 REFUSED 5	

[1] Categories to be developed locally and revised based on the pretest; however, the broad categories must be maintained. In some countries, it may be desirable to ask an additional question on the material of walls or ceilings.

[2] This question should be deleted in countries that do not have an indoor residual spraying program for mosquitoes.

		NET # 1	NET #2	NET #3
18	ASK RESPONDENT TO SHOW YOU THE NET(S) IN THE HOUSEHOLD. IF MORE THAN THREE NETS, USE ADDITIONAL QUESTIONNAIRE(S).	OBSERVED..................1 NOT OBSERVED................. 2	OBSERVED ....1 NOT OBSERVED 2	OBSERVED..................1 NOT OBSERVED................. 2
19	How long ago did your household obtain the mosquito net?	MOS AGO [ ][ ] MORE THAN 3 YEARS AGO 95	MOS AGO [ ][ ] MORE THAN 3 YEARS AGO 95	MOS AGO [ ][ ] MORE THAN 3 YEARS AGO……95
20	OBSERVE OR ASK THE BRAND OF MOSQUITO NET. IF BRAND IS UNKNOWN, AND YOU CANNOT OBSERVE THE NET, SHOW PICTURES OF TYPICAL NET TYPES/BRANDS TO RESPONDENT.	'PERMANENT' NET[1] Permanet……….11 Olyset………….12 Other/Don't Know……16 (SKIPTO 24) 'PRETREATED' NET[2] ICONET………..21 Fennet………….22 KO Nets………..23 Safinet…………24 Other/Don't Know….. 26 (SKIPTO 22) OTHER……………….31 DON'T KNOW BRAND……………..98	'PERMANENT' NET[1] Permanet. ………11 Olyset…………..12 Other/Don't Know…16 (SKIPTO 24) 'PRETREATED' NET[2] Salam Enkilfe.21 Fennet……….22 KO Nets……..23 Other/Don't Know….26 (SKIPTO 22) OTHER …………….31 DON'T KNOW BRAND …………..98	'PERMANENT' NET[1] Permanet……….11 Olyset…………..12 Other/Don't Know……16 (SKIPTO 24) 'PRETREATED' NET[2] Salam Enkilfe….21 Fennet………….22 KO Nets………..23 Other/Don't Know….. 26 (SKIP TO 22) OTHER……………..31 DON'T KNOW BRAND………..98
24a	Where did you obtain the net?	GOVERNMENT CLINIC/HOSPITAL NEIGHBORHOOD HEALTH COMMITTEE (NHC) COMMUNITY HEALTH WORKER (CHW) / AGENT RETAIL SHOP PHARMACY WORKPLACE OTHER (SPECIFY)__________ DON'T KNOW	GOVERNMENT CLINIC/HOSPITAL NEIGHBORHOOD HEALTH COMMITTEE (NHC) COMMUNITY HEALTH WORKER (CHW) / AGENT RETAIL SHOP PHARMACY WORKPLACE OTHER (SPECIFY)_______ DON'T KNOW	GOVERNMENT CLINIC/HOSPITAL NEIGHBORHOOD HEALTH COMMITTEE (NHC) COMMUNITY HEALTH WORKER (CHW) / AGENT RETAIL SHOP PHARMACY WORKPLACE OTHER (SPECIFY)__________ DON'T KNOW
24b	Did you purchase the net?	YES…...........................1 NO.(skip to 21)….........2 NOT SURE…................8	YES ….............................1 NO.(skip to 21)….........2 NOT SURE…................8	YES…...........................1 NO.(skip to 21)….........2 NOT SURE…................8
24c	How much did you pay for the net when it was purchased?	In Kwacha................ [ ][ ]	In Kwacha .... [ ][ ]	In Kwacha................ [ ][ ]
21	When you got the net, was it already factory-treated with an insecticide to kill or repel mosquitos?	YES..............................1 NO................................2 NOT SURE...................8	YES..........................1 NO ....2 NOT SURE 8	YES..............................1 NO................................2 NOT SURE...................8
22	Since you got the mosquito net, was it ever soaked or dipped in a liquid to repel mosquitoes or bugs?	YES..............................1 NO................................2 (SKIP TO 24) NOT SURE...................8	YES..........................1 NO ....2 (SKIP TO 24) NOT SURE 8	YES..............................1 NO................................2 (SKIP TO 24) NOT SURE...................8
23	How long ago was the net last soaked or dipped? IF LESS THAN 1 MONTH AGO, RECORD >00'	MOS AGO [ ][ ]	MOS AGO [ ][ ]	MOS AGO [ ][ ]

	MONTHS. IF LESS THAN 2 YEARS AGO, RECORD MONTHS AGO. IF '12 MONTHS AGO' OR '1 YEAR AGO,' PROBE FOR EXACT NUMBER OF MONTHS.	MORE THAN 2 YEARS AGO .... 95 NOT SURE..............98	MORE THAN 2 YEARS AGO...........95 NOT SURE 98	MORE THAN 2 YEARS AGO .... 95 NOT SURE..............98
28a	Where was the net soaked or dipped?	HOME…………………1 GOVERNMENT CLINIC/HOSPITAL…..2 RETAIL SHOP………..3 PHARMACY………….4 WORKPLACE………..5 OTHER (SPECIFY)_______.....6 DON'T KNOW……….7	HOME GOVERNMENT CLINIC/HOSPITAL RETAIL SHOP PHARMACY WORKPLACE OTHER (SPECIFY)_______ DON'T KNOW	HOME GOVERNMENT CLINIC/HOSPITAL RETAIL SHOP PHARMACY WORKPLACE OTHER (SPECIFY)__________ DON'T KNOW
28b	Did you pay to soak or dip the net?	YES..............................1 NO.(skip to 24).............2 NOT SURE..................8	YES...........................1 NO.(skip to 24)...........2 NOT SURE................8	YES..............................1 NO.(skip to 24)..............2 NOT SURE..................8
28c	How much did you pay to soak or dip the net?	In Kwacha.................. ☐☐	In Kwacha .... ☐☐	In Kwacha.................. ☐☐
28d	PLEASE RECORD OR ASK THE GENERAL CONDITION OF THE NET.	1 Good (no holes) 2 Fair (no holes that fit a torch battery) 3 Poor (1-4 holes that fit a torch battery) 4 Unsafe (>5 Holes that fit a torch battery) 5 Unused (still in package) 98 Unknown	1 Good (no holes) 2 Fair (no holes that fit a torch battery) 3 Poor (1-4 holes that fit a torch battery) 4 Unsafe (>5 Holes that fit a torch battery) 5 Unused (still in package) 98 Unknown	1 Good (no holes) 2 Fair (no holes that fit a torch battery) 3 Poor (1-4 holes that fit a torch battery) 4 Unsafe (>5 Holes that fit a torch battery) 5 Unused (still in package) 98 Unknown
28e	PLEASE RECORD OR ASK THE COLOR OF THE NET.	1. Green 2. Blue 3. Red 4. White 5. Black Other ________	1. Green 2. Blue 3. Red 4. White 5. Black Other ________	1. Green 2. Blue 3. Red 4. White 5. Black Other ________
28f	PLEASE RECORD OR ASK THE SHAPE OF THE NET.	1. Conical 2. Rectangular 3. Other ________	1. Conical 2. Rectangular 3. Other ________	1. Conical 2. Rectangular 3. Other ________
28g	Is the net hanging for sleeping? PLEASE OBSERVE OR ASK IF THE NET IS HANGING	YES..............................1 NO................................2	YES ... .1 NO 2	YES..............................1 NO................................2

"Permanent" is a factory treated net that does not require any further treatment.
[2] "Pretreated" is a net that has been pretreated, but requires further treatment after 6-12 months.

		NET # 1	NET #2	NET #3
25	Who slept under this mosquito net last night? RECORD THE RESPECTIVE LINE NUMBER FROM THE HOUSEHOLD SCHEDULE.	NAME ___________ LINE NO [ ][ ] NAME ___________ LINE NO [ ][ ] NAME ___________ LINE NO [ ][ ] NAME ___________ LINE NO [ ][ ] NAME ___________ LINE NO [ ][ ]	NAME ___________ LINE NO [ ][ ] NAME ___________ LINE NO [ ][ ] NAME ___________ LINE NO [ ][ ] NAME ___________ LINE NO [ ][ ] NAME ___________ LINE NO [ ][ ]	NAME ___________ LINE NO [ ][ ] NAME ___________ LINE NO [ ][ ] NAME ___________ LINE NO [ ][ ] NAME ___________ LINE NO [ ][ ] NAME ___________ LINE NO [ ][ ]
26		GO BACK TO 18 FOR NEXT NET; OR, IF NO MORE NETS, GO TO 27.	GO BACK TO 18 FOR NEXT NET; OR, IF NO MORE NETS, GO TO 27.	GO BACK TO 18 IN THE FIRST COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE NETS, GO TO 27.

HAEMOGLOBIN MEASUREMENT

CHECK COLUMN (7) OF HOUSEHOLD LISTING: RECORD THE LINE NUMBER, NAME AND AGE OF ALL CHILDREN UNDER AGE 6. THEN ASK THE DATE OF BIRTH.

CHILDREN UNDER AGE 6 YEARS				HAEMOGLOBIN MEASUREMENT OF CHILDREN BORN IN 2000[1] OR LATER			
LINE NUMBER FROM COL. (1)	NAME FROM COL. (2)	AGE FROM COL. (7)	What Is (NAME's) date of birth? COPY MONTH AND YEAR OF BIRTH FROM 215 IN MOTHER'S BIRTH HISTORY AND ASK DAY. FOR CHILDREN NOT INCLUDED IN ANY BIRTH HISTORY, ASK DAY, MONTH AND YEAR.	LINE NUMBER OF PARENT/ADULT RESPONSIBLE FOR THE CHILD RECORD '00' IF NOT LISTED IN HOUSEHOLD SCHEDULE	READ CONSENT STATEMENT TO PARENT/ADULT RESPONSIBLE FOR THE CHILD CIRCLE CODE AND SIGN	HAEMOGLOBIN LEVEL (G/DL)	RESULT 1 MEASURED 2 NOT PRESENT 3 REFUSED 4 OTHER
(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
			DAY MONTH YEAR		GRANTED REFUSED 1 SIGN_____ NEXT LINE← 2		
					1 SIGN_____ NEXT LINE← 2		
					1 SIGN_____ NEXT LINE← 2		
					1 SIGN_____ NEXT LINE← 2		
					1 SIGN_____ NEXT LINE← 2		
					1 SIGN_____ NEXT LINE← 2		

[1] For fieldwork beginning in 2006, 2007 or 2008, the year should be 2001, 2002 or 2003, respectively.

TICK HERE IF CONTINUATION SHEET USED ☐

CONSENT STATEMENT: As part of this survey, we are studying anaemia among children. Anaemia is a serious health problem that results from poor nutrition or diseases such as malaria. This survey will assist the government to develop programs to prevent and treat these important health problems.

We request that all children born in 2000[1] or later participate in the anaemia testing part of this survey and give a few drops of blood from a finger. The test uses disposable sterile instruments that are clean and completely safe. The blood will be analyzed with new equipment and the results of the test will be given to you right after the blood is taken. The results will be kept confidential.

May I now ask that (NAME OF CHILD[REN]) participate in the anaemia test. However, if you decide not to

NOTE:
In countries where some enumeration areas are higher than 1,000 meters, altitude information should be collected in a separate form for each enumeration area higher than 1,000 meters so that the anaemia estimates can be adjusted appropriately.

		have him/her/them tested, it is your right and we will respect your decision. Now please tell me if you agree to have the test(s) done.	

35	CHECK 33: NUMBER OF CHILDREN WITH HAEMOGLOBIN LEVEL BELOW 7 G/DL ONE OR MORE ☐ → GIVE EACH PARENT/ADULT RESPONSIBLE FOR THE CHILD THE RESULT OF THE HAEMOGLOBIN MEASUREMENT, AND CONTINUE WITH 36.[1] NONE ☐ → GIVE EACH PARENT/ADULT RESPONSIBLE FOR THE CHILD THE RESULT OF THE HAEMOGLOBIN MEASUREMENT AND END THE HOUSEHOLD INTERVIEW.
36	We detected a low level of haemoglobin in the blood of [NAME OF CHILD(REN)]. This indicates that (NAME OF CHILD(REN) has/have developed severe anaemia, which is a serious health problem. We would like to inform the doctor at _____ about the condition of [NAME OF CHILD(REN)]. This will assist you in obtaining appropriate treatment for the condition. Do you agree that the information about the level of haemoglobin in the blood of [NAME OF CHILD(REN)] may be given to the doctor?

NAME OF CHILD WITH HAEMOGLOBIN BELOW 7 G/DL	NAME OF PARENT/RESPONSIBLE ADULT	AGREES TO REFERRAL?
		YES……1 NO……2
		YES……1 NO……2
		YES……1 NO……2
		YES……1 NO……2
		YES……1 NO……2
		YES……1 NO……2
		YES……1 NO……2
		YES……1 NO……2
		YES……1 NO……2
		YES……1 NO……2

[1] If more than one child is below 7 g/dl, read statement in Q.36 to each parent/adult responsible for a child who is below the cutoff point.

Malawi Malaria Indicator Survey 2010

Women's Questionnaire

March 2010

March 2010

MALAWI MALARIA INDICATOR SURVEY 2010
WOMEN'S QUESTIONNAIRE

MINISTRY OF HEALTH

NATIONAL STATISTICS OFFICE

IDENTIFICATION[1]

PLACE NAME _____

NAME OF HOUSEHOLD HEAD _____

CLUSTER NUMBER .....

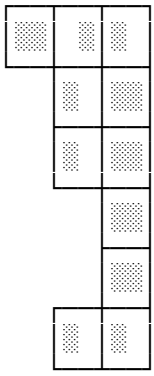
HOUSEHOLD NUMBER .....

REGION .....

URBAN/RURAL (URBAN=1, RURAL=2) .....

LARGE CITY/SMALL CITY/TOWN/RURAL[2] .....
(LARGE CITY=1, SMALL CITY=2, TOWN=3, COUNTRYSIDE=4)

NAME AND LINE NUMBER OF WOMAN _____



INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE	_____	_____	_____	DAY / MONTH / YEAR
INTERVIEWER'S NAME	_____	_____	_____	NAME
RESULT*	_____	_____	_____	RESULT
NEXT VISIT: DATE	_____	_____		
TIME	_____	_____		TOTAL NO. OF VISITS

*RESULT CODES:

1 COMPLETED	4 REFUSED	7 PARTLY _____	OTHER
2 NOT AT HOME	5 COMPLETED		
3 POSTPONED	6 INCAPACITATED		(SPECIFY)

SUPERVISOR	OFFICE EDITOR	KEYED BY
NAME _____		
DATE _____		

[1] This section should be adapted for country-specific survey design.

[2] The following guidelines should be used to categorize urban sample points: “Large cities” are national capitals and places with over 1 million population; “small cities” are places with between 50,000 and 1 million population; and the remaining urban sample points are “towns”.

SECTION 1. RESPONDENT'S BACKGROUND

INTRODUCTION AND CONSENT

INFORMED CONSENT

Hello. My name is _____ _____ and I am working with Ministry of Health. The Ministry of Health through the National Malaria Control Programme in collaboration with, the World Health Organisation, UNICEF, College of Medicine, Medicine for Malaria Venture, PMI & USAID, PATH Malaria Control and Evaluation Partnership in Africa (MACEPA), and malaria control partners want to learn how well malaria prevention program is working in Malawi. We would like to ask you some questions about you and your children, the history of children to whom you may have given birth, bednet use in your home, and also some general questions about your child[ren]'s health. We would appreciate your participation in this survey. The information you provide will help the government to plan health services. The survey usually takes between 10 and 20 minutes to complete. Whatever information you provide will be kept confidential and will not be shown to other persons who are not investigators as part of this survey.

Participation in this survey is voluntary and you can choose not to answer any individual question or all of the questions.

At this time, do you want to ask me anything about the survey? If you have any questions or clarification pertaining to this survey please feel free to ask the field nurse or the medical officer in charge in the field whose name and contact information is given below. (Mrs Doreen Ali, Deputy Director Preventive Health Services on 0999957246/0888873131 or Dr. Charles. Mwansambo, 0888826946, 01756380.

At this time, do you want to ask me anything about the survey?
May I begin the interview now?

Signature of interviewer: _____

Date: _____

RESPONDENT AGREES TO BE INTERVIEWED .....1 ↓ RESPONDENT DOES NOT AGREE TO BE INTERVIEWED ....2 —<END

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
101	RECORD THE TIME.	HOUR ..... ▒▒ MINUTES ..... ▒▒	
102	In what month and year were you born?	MONTH ..... ▒▒ DON'T KNOW MONTH ..... 98 YEAR ..... ▒▒▒▒ DON'T KNOW YEAR 9998	
103	How old were you at your last birthday? COMPARE AND CORRECT 102 AND/OR 103 IF INCONSISTENT.	AGE IN COMPLETED YEARS. ▒▒	
104	Have you ever attended school?	YES ..... 1 NO 2	—<108
105	What is the highest level of school you attended: primary, secondary, or higher?[1]	PRIMARY ..... 1 SECONDARY ..... 2 HIGHER..... 3	
106	What is the highest (grade/form/year) you completed at that level?[1]	GRADE..... ▒▒	
107	CHECK 105: PRIMARY ☐ SECONDARY OR HIGHER ☐		—<109

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
	↓		

[1] Revise according to the local education system.

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
108	Now I would like you to read this sentence to me. SHOW CARD TO RESPONDENT.[1] IF RESPONDENT CANNOT READ WHOLE SENTENCE, PROBE: Can you read any part of the sentence to me?	CANNOT READ AT ALL ..... 1 ABLE TO READ ONLY PARTS OF SENTENCE ..... 2 ABLE TO READ WHOLE SENTENCE ..... 3 NO CARD WITH REQUIRED LANGUAGE_____ 4 (SPECIFY LANGUAGE) BLIND/VISUALLY IMPAIRED……..5	
109	What is your religion?	CATHOLIC CCAP Pentecostal MUSLIM TRADITIONAL OTHER _____(specify)	
110	What tribe do you belong to?	Chewa ……1 Tumbuka……2 Lomwe……3 Yao……..4 Tonga……..5 Mang'anja……...6 Sena……..7 Nkhonde……...8 OTHER _____(specify)	

[1]Each card should have four simple sentences appropriate to the country (e.g., "Parents love their children," "Farming is hard work," "The child is reading a book," "Children work hard at school"). Cards should be prepared for every language in which respondents are likely to be literate.

Section 2. REPRODUCTION

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
201	Now I would like to ask about all the births you have had during your life. Have you ever given birth?	YES..... 1 NO 2	<206
202	Do you have any sons or daughters to whom you have given birth who are now living with you?	YES..... 1 NO 2	<204
203	How many sons live with you? And how many daughters live with you? IF NONE, RECORD '00'.	SONS AT HOME..... ▒▒ DAUGHTERS AT HOME..... ▒▒	
204	Do you have any sons or daughters to whom you have given birth who are alive but do not live with you?	YES..... 1 NO 2	<206
205	How many sons are alive but do not live with you? And how many daughters are alive but do not live with you? IF NONE, RECORD '00'.	SONS ELSEWHERE..... ▒▒ DAUGHTERS ELSEWHERE... ▒▒	
206	Have you ever given birth to a boy or girl who was born alive but later died? IF NO, PROBE: Any baby who cried or showed signs of life but did not survive?	YES..... 1 NO 2	<208
207	How many boys have died? And how many girls have died? IF NONE, RECORD '00'.	BOYS DEAD..... ▒▒ GIRLS DEAD ..... ▒▒	
208	SUM ANSWERS TO 203, 205, AND 207, AND ENTER TOTAL.	NONE.....00 TOTAL..... ▒▒	<345
209	CHECK 208: Just to make sure that I have this right: you have had in TOTAL _____ births during your life. Is that correct? YES ↓ NO → PROBE AND CORRECT 201-208 AS NECESSARY.		
210	CHECK 208: ONE BIRTH ☐ Was this child born in the last six years? IF NO, CIRCLE '00.' TWO OR MORE BIRTHS ☐ How many of these children were born in the last six years?	NONE.....00 TOTAL IN LAST SIX YEARS..... ▒▒	<345

211 Now I would like to record the names of all your births in the last six years, whether still alive or not, starting with the most recent one you had.
RECORD NAMES OF ALL BIRTHS IN THE LAST 6 YEARS IN 212. RECORD TWINS AND TRIPLETS ON SEPARATE LINES.

212 What name was given to your (most recent/previous) birth? (NAME)	213 Were any of these births twins?	214 Is (NAME) a boy or a girl?	215 In what month and year was (NAME) born? PROBE: What is his/her birthday?	216 Is (NAME) still alive?	217 IF ALIVE: How old was (NAME) at his/her last birthday? RECORD AGE IN COMPLETED YEARS.	218 IF ALIVE Is (NAME) living with you?	219 IF ALIVE: RECORD HOUSEHOLD LINE NUMBER OF CHILD (RECORD '00' IF CHILD NOT LISTED IN HOUSEHOLD).	220 Were there any other live births between (NAME) and (NAME OF BIRTH ON PREVIOUS LINE)?
01	SING ...1 MULT ..2	BOY...1 GIRL..2	MONTH YEAR	YES.....1 NO .....2 (NEXT BIRTH)	AGE IN YEARS	YES.....1 NO.....2	LINE NUMBER (NEXT BIRTH)	
02	SING ...1 MULT ..2	BOY...1 GIRL..2	MONTH YEAR	YES.....1 NO .....2 (GO TO 220)	AGE IN YEARS	YES.....1 NO.....2	LINE NUMBER	YES .....1 NO 2
03	SING ...1 MULT ..2	BOY...1 GIRL..2	MONTH YEAR	YES.....1 NO .....2 (GO TO 220)	AGE IN YEARS	YES.....1 NO.....2	LINE NUMBER	YES .....1 NO 2
04	SING ...1 MULT ..2	BOY...1 GIRL..2	MONTH YEAR	YES.....1 NO .....2 (GO TO 220)	AGE IN YEARS	YES.....1 NO.....2	LINE NUMBER	YES .....1 NO 2
05	SING ...1 MULT ..2	BOY...1 GIRL..2	MONTH YEAR	YES.....1 NO .....2 (GO TO 220)	AGE IN YEARS	YES.....1 NO.....2	LINE NUMBER	YES .....1 NO 2
06	SING ...1 MULT ..2	BOY...1 GIRL..2	MONTH YEAR	YES.....1 NO .....2 (GO TO 220)	AGE IN YEARS	YES.....1 NO.....2	LINE NUMBER	YES .....1 NO 2
07	SING ...1 MULT ..2	BOY...1 GIRL..2	MONTH YEAR	YES.....1 NO .....2 (GO TO 220)	AGE IN YEARS	YES.....1 NO.....2	LINE NUMBER	YES .....1 NO 2

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
221	Have you had any live births since the birth of (NAME OF MOST RECENT BIRTH)? IF YES, RECORD BIRTH(S) IN BIRTH TABLE.	YES.....1 NO.....2	
222	COMPARE 210 WITH NUMBER OF BIRTHS IN HISTORY ABOVE AND MARK: NUMBERS ARE SAME ☐ NUMBERS ARE DIFFERENT ☐ (PROBE AND RECONCILE) CHECK: FOR EACH BIRTH: YEAR OF BIRTH IS RECORDED. FOR EACH LIVING CHILD: CURRENT AGE IS RECORDED.		☐☐
223	CHECK 215 AND ENTER THE NUMBER OF BIRTHS IN 2005[1] OR LATER. IF NONE, RECORD '0'.		☐☐
224	Are you pregnant now?	YES.....1 NO.....2 UNSURE.....8	<226
225	How many months pregnant are you? RECORD NUMBER OF COMPLETED MONTHS.	MONTHS..... ☐☐	
226	CHECK 223: ONE OR MORE BIRTHS IN 2005[1] OR LATER ☐ NO BIRTHS IN 2005 OR LATER ☐		<345

[1]For fieldwork beginning in 2010 the year should be 2005.

SECTION 3: GENERAL MALARIA KNOWLEDGE / PRACTICES

250	HAVE YOU EVER HEARD OF AN ILLNESS CALLED MALARIA?	YES.....1 NO.....2	IF 2, SKIP TO 264
251	CAN YOU TELL ME THE MAIN SIGNS OR SYMPTOMS OF MALARIA? MULTIPLE RESPONSES POSSIBLE PROBE ONCE (ANYTHING ELSE?)	FEVER……..1 FEELING COLD……..2 HEADACHE……..3 NAUSEA AND VOMITING…….4 DIARRHEA……..5 DIZZINESS……..6 LOSS OF APPETITE……7 BODY ACHE OR JOINT PAIN…….8 PALE EYES……..9 SALTY TASTING PALMS……..10 BODY WEAKNESS……11 REFUSING TO EAT OR DRINK……12 OTHER (SPECIFY)_____.....13 DON'T KNOW……14	
252	IN YOUR OPINION, WHAT CAUSES MALARIA? MULTIPLE RESPONSES POSSIBLE PROBE ONCE (ANYTHING ELSE?)	MOSQUITO BITES……1 EATING IMMATURE SUGARCANE...2 EATING COLD SIMA……3 EATING OTHER DIRTY FOOD……..4 DRINKING DIRTY WATER……..5 GETTING SOAKED WITH RAIN…….6 COLD OR CHANGING WEATHER….7 WITCHCRAFT……..8 OTHER (SPECIFY) _____....9 DON'T KNOW.....10	
253	HOW CAN SOMEONE PROTECT THEMSELVES AGAINST MALARIA? MULTIPLE RESPONSES POSSIBLE PROBE ONCE (ANYTHING ELSE?)	SLEEP UNDER A MOSQUITO NET……..1 SLEEP UNDER A INSECTICIDE TREATED MOSQUITO NET…….....2 USE MOSQUITO REPELLANT……..3 AVOID MOSQUITO BITES……4 TAKE PREVENTIVE MEDICATION.....5 SPRAY HOUSE WITH INSECTICIDE……6 USE MOSQUITO COILS……..7 CUT THE GRASS AROUND THE HOUSE……8 FILL IN PUDDLES (STAGNANT WATER)……9 KEEP HOUSE SURROUNDINGS CLEAN……10 BURN LEAVES……11 DON'T DRINK DIRTY WATER……..12 DON'T EAT BAD FOOD (IMMATURE SUGARCANE/LEFTOVER FOOD)……..13 PUT MOSQUITO SCREENS ON THE WINDOWS……14 DON'T GET SOAKED WITH RAIN……..15 OTHER (SPECIFY)_____.....16 DON'T KNOW……..17	
254	WHAT ARE THE DANGER SIGNS AND SYMPTOMS OF MALARIA? MULTIPLE RESPONSES POSSIBLE PROBE ONCE (ANYTHING ELSE?)	SEIZURE / CONVULSIONS……..1 GOES UNCONSCIOUS……..2 ANY FEVER……..3 VERY HIGH FEVER……..4 STIFF NECK……..5 WEAKNESS……..6 NOT ACTIVE……..7 CHILLS/SHIVERING……8 NOT ABLE TO EAT……..9 VOMITING……10 FAINTING……..11 CRYING ALL THE TIME……12 RESTLESS, WON'T STAY STILL……13	

		DIARRHEA……14 OTHER(SPECIFY:_____)…..15 DON'T KNOW……16	
255	IN YOUR OPINION, WHICH PEOPLE ARE MOST AFFECTED BY MALARIA IN YOUR COMMUNITY? MULTIPLE RESPONSES POSSIBLE PROBE ONCE (ANYTHING ELSE?)	CHILDREN .....1 ADULTS .....2 PREGNANT WOMEN .....3 OLDER ADULTS .....4 EVERYONE .....5 OTHER (SPECIFY)_____.....6 DON'T KNOW ...7	
256	HAVE YOU EVER HEARD OR SEEN ANY MESSAGES / INFORMATION ABOUT MALARIA?	YES.....1 NO.....2	IF 2, SKIP TO 260
257	WHERE DID YOU SEE OR HEAR THESE MESSAGES/INFORMATION? MULTIPLE RESPONSES POSSIBLE PROBE ONCE (ANYTHING ELSE?)	GOVERNMENT CLINIC/HOSPITAL.....1 COMMUNITY HEALTH WORKER.....2 FRIENDS/FAMILY.....3 WORKPLACE.....4 DRAMA GROUPS.....5 PEER EDUCATORS .....6 POSTERS/BILLBOARDS .....7 ON TV .....8 ON THE RADIO.....9 IN THE NEWSPAPER .....10 OTHER (SPECIFY) _____.....11 DON'T KNOW 12	
258	HOW LONG AGO DID YOU SEE OR HEAR THESE MESSAGES?	MONTHS ☐	
259	WHAT TYPE OF MALARIA MESSAGES/INFORMATION DID YOU SEE OR HEAR? MULTIPLE RESPONSES POSSIBLE PROBE ONCE (ANYTHING ELSE?)	MALARIA IS DANGEROUS.....1 MALARIA CAN KILL.....2 MOSQUITOES SPREAD MALARIA .....3 SLEEPING UNDER MOSQUITO NET IMPORTANT .....4 WHO SHOULD SLEEP UNDER MOSQUITO NET.....5 SEEK TREATMENT FOR FEVER.....6 SEEK TREATMENT FOR FEVER WITHIN 24 HOURS/PROMPTLY .....7 IMPORTANCE OF HOUSE SPRAYING .....8 NOT PLASTERING WALLS AFTER SPRAYING.....9 ENVIRONMENTAL SANITATION ACTIVITIES. .....10 OTHER(SPECIFY) ..... 11 DON'T KNOW 12	
260	HAS ANYONE EVER PROVIDED YOU WITH EDUCATION / INFORMATION ON MALARIA **AT YOUR HOME**?	YES.....1 NO.....2	IF 2, SKIP TO 264
261	FROM WHOM DID YOU RECEIVE THIS EDUCATION / INFORMATION **AT YOUR HOME**? PROBE, BUT DO NOT PROVIDE ANSWERS	HEALTH CARE WORKER.....1 COMMUNITY HEALTH WORKER.....2 FRIENDS/FAMILY.....3 EMPLOYER .....4 PEER EDUCATORS .....5 OTHER (SPECIFY)_____.....6 DON'T KNOW 7	
262	HOW LONG AGO DID SOMEONE VISIT YOUR HOME TO PROVIDE EDUCATION / INFORMATION **AT YOUR HOME**?	MONTHS..... ☐	
263	WHAT TYPE OF INFORMATION/EDUCATION ABOUT MALARIA DID YOU RECEIVE **AT YOUR HOME**? PROBE, BUT DO NOT PROVIDE ANSWERS. MULTIPLE ANSWERS POSSIBLE. POSSIBLE ANSWERS INCLUDE:	MALARIA IS DANGEROUS.....1 MALARIA CAN KILL.....2 MOSQUITOES SPREAD MALARIA .....3 SLEEPING UNDER MOSQUITO NET IMPORTANT .....4 WHO SHOULD SLEEP UNDER MOSQUITO NET.....5 SEEK TREATMENT FOR FEVER.....6 SEEK TREATMENT FOR FEVER WITHIN 24 HOURS/PROMPTLY 7	

		IMPORTANCE OF HOUSE SPRAYING .....8 NOT PLASTERING WALLS AFTER SPRAYING.....9 ENVIRONMENTAL SANITATION ACTIVITIES.....10 OTHER(SPECIFY) .....11 DON'T KNOW 12	
264	HAS THE COMMUNITY HEALTH WORKER IN YOUR VILLAGE EVER HELPED HANG A MOSQUITO NET IN THIS HOUSE?	YES.....1 NO.....2 DON'T KNOW 3	
265	HAVE ANY MOSQUITO NETS IN THIS HOUSE BEEN USED FOR ANY REASON OTHER THAN SLEEPING?	YES.....1 NO.....2	IF 2 SKIP TO 267
266	WHAT WAS IT USED FOR? PROBE, BUT DO NOT PROVIDE ANSWERS. MULTIPLE ANSWERS POSSIBLE. POSSIBLE ANSWERS INCLUDE:	FISHING……1 COVERING / PROTECTION…….2 SCREENS FOR WINDOWS……..3 CLOTHING, WEDDING VEILS……..4 OTHER_____..5 DON"T KNOW……..6	
267	WHAT MOSQUITO NET COLOR DO YOU PREFER? PROBE, BUT DO NOT PROVIDE ANSWERS. MULTIPLE ANSWERS POSSIBLE. POSSIBLE ANSWERS INCLUDE:	BLUE……1 GREEN……2 RED……..3 WHITE……4 BLACK……5 OTHER _____...6	
268	WHAT MOSQUITO NET SHAPE DO YOU PREFER? PROBE, BUT DO NOT PROVIDE ANSWERS. MULTIPLE ANSWERS POSSIBLE. POSSIBLE ANSWERS INCLUDE:	CONICAL……..1 RECTANGULAR……2 OTHER _____.....3	
269	IN GENERAL, HOW OFTEN DO YOUR CHILDREN SLEEP UNDER A MOSQUITO NET?	ALWAYS ……1 SOMETIMES……2 NEVER……3	
270	WHY DO THE CHILDREN WHO SLEEP IN THIS HOUSE SOMETIMES NOT SLEEP UNDER A MOSQUITO NET? MULTIPLE RESPONSES PROBE ONCE (ANYTHING ELSE?)	THEY ALWAYS DO SLEEP UNDER NET……..1 TOO HOT……2 TOO COLD……..3 CHILD CRIES……4 CHILD AFRAID……..5 NOT ENOUGH NETS……..6 NET NOT HUNG UP……7 USED BY ADULTS……8 NET NOT USED WHEN TRAVELING……9 NET WORN OUT / POOR CONDITION...10 NETS BAD FOR CHILDERS' HEALTH…11 OTHER (SPECIFY)_____ _____....12 DON'T KNOW……13	

Section 3A. PREGNANCY AND INTERMITTENT PREVENTIVE TREATMENT

301	ENTER IN 302 THE NAME AND SURVIVAL STATUS OF THE MOST RECENT BIRTH. Now I would like to ask you some questions about your last pregnancy that ended in a live birth, in the last 6 years.		
302	FROM QUESTIONS 212 AND 216 (LINE 01)	LAST BIRTH NAME _____ LIVING ☐ DEAD ☐	
303	When you were pregnant with (NAME), did you see anyone for antenatal care?[1] IF YES: Whom did you see? Anyone else? PROBE FOR THE TYPE OF PERSON AND RECORD ALL PERSONS SEEN.	HEALTH PROFESSIONAL DOCTOR ..... A NURSE/MIDWIFE ..... B AUXILIARY NURSE ..... C OTHER PROVIDERS TRADITIONAL BIRTH ATTENDANT ..... D OTHER _____ X (SPECIFY) NO ONE ..... Y	
304	During this pregnancy, did you take any drugs in order to prevent you from getting malaria?	YES ..... 1 NO ..... 2 DON'T KNOW 8	☐ →310
305	Which drugs did you take to prevent malaria?[2] RECORD ALL MENTIONED. IF TYPE OF DRUG IS NOT DETERMINED, SHOW TYPICAL ANTIMALARIAL DRUGS TO RESPONDENT.	SP/FANSIDAR ..... A CHLOROQUINE ..... B OTHER _____ X (SPECIFY) DON'T KNOW ..... Z	
306	CHECK 305: DRUGS TAKEN FOR MALARIA PREVENTION	CODE "A" CIRCLED ☐ CODE "A" NOT CIRCLED _____	→310
307	How many times did you take SP/Fansidar during this pregnancy?	TIMES ..... ☐☐	

[1]Coding categories to be developed locally and revised based on the pretest; however, the broad categories must be maintained. Include all drugs or drug combinations that are commonly given as separate categories.

[2] Add response categories for additional drugs used to prevent malaria during pregnancy, if any. Repeat Questions 306-309 for any other recommended IPT drugs.

		LAST BIRTH NAME _____ _____	
308	CHECK 303: ANTENATAL CARE FROM A HEALTH PROFESSIONAL RECEIVED DURING THIS PREGNANCY?	CODE 'A', 'B', OR 'C' CIRCLED ☐ OTHER ☐	→310
309	Did you get the SP/Fansidar during an antenatal visit, during another visit to a health facility, or from some other source?	ANTENATAL VISIT ..... 1 ANOTHER FACILITY VISIT ..... 2 OTHER SOURCE _____ 6 (SPECIFY)	
310	CHECK 215 AND 216: ☐ ONE OR MORE LIVING CHILDREN ☐ NO LIVING CHILDREN BORN IN 2000[1] OR LATER ☐ BORN IN 2000[1] OR LATER		→345

[1] For fieldwork beginning in 2006, 2007, or 2008, the year should be 2001, 2002, or 2003, respectively.

SECTION 3B. FEVER IN CHILDREN

311	ENTER IN THE TABLE THE LINE NUMBER AND NAME OF EACH LIVING CHILD BORN IN 2000[1] OR LATER. (IF THERE ARE MORE THAN 2 LIVING CHILDREN BORN IN 2005[1] OR LATER, USE ADDITIONAL QUESTIONNAIRES). Now I would like to ask you some questions about the health of all your children less than 5 years old. (We will talk about each one separately.)		
312	NAME AND LINE NUMBER FROM 212	YOUNGEST CHILD LINE NUMBER..... ▒▒ NAME _____	NEXT-TO-YOUNGEST CHILD LINE NUMBER ..... ▒▒ NAME _____
313	Has (NAME) been ill with a fever at any time in the last 2 weeks?	YES ..... 1 NO ..... 2 (GO TO 313 FOR NEXT CHILD OR, IF NO MORE CHILDREN, SKIP TO 345) = DON'T KNOW 8	YES ..... 1 NO ..... 2 (GO BACK TO 313 FOR NEXT CHILD OR, IF NO MORE CHILDREN, SKIP TO 345) = DON'T KNOW 8
314	How many days ago did the fever start? IF LESS THAN ONE DAY, RECORD '00'.	DAYS AGO ..... ▒▒ DON'T KNOW.....98	DAYS AGO ..... ▒▒ DON'T KNOW.....98
315	Did you seek advice or treatment for the fever from any source?	YES ..... 1 NO ..... 2 (SKIP TO 317) =	YES ..... 1 NO ..... 2 (SKIP TO 317) =
316	Where did you seek advice or treatment?[2] Anywhere else? RECORD ALL SOURCES MENTIONED.	PUBLIC SECTOR GOVT. HOSPITAL.....A GOVT. HEALTH CENTER.....B GOVT. HEALTH POST.....C MOBILE CLINIC.....D FIELD WORKER.....E OTHER PUBLIC _____ F (SPECIFY) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC.....G PHARMACY.....H PRIVATE DOCTOR.....I MOBILE CLINIC.....J FIELD WORKER.....K OTHER PVT. MEDICAL _____ L (SPECIFY) OTHER SOURCE SHOP.....M TRAD. PRACTITIONER.....N OTHER _____ X (SPECIFY)	PUBLIC SECTOR GOVT. HOSPITAL.....A GOVT. HEALTH CENTER.....B GOVT. HEALTH POST.....C MOBILE CLINIC.....D FIELD WORKER.....E OTHER PUBLIC _____ F (SPECIFY) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/CLINIC.....G PHARMACY.....H PRIVATE DOCTOR.....I MOBILE CLINIC.....J FIELD WORKER.....K OTHER PVT. MEDICAL _____ L (SPECIFY) OTHER SOURCE SHOP.....M TRAD. PRACTITIONER.....N OTHER _____ X (SPECIFY)
316 A	How many days after the fever began did you first seek treatment for (NAME)? IF THE SAME DAY, RECORD '00'.	DAYS ..... ▒▒	DAYS ..... ▒▒
316b	How much in total on consultation fees, if any, did you spend on the treatment?	CONSULTATION ☐	
316c	How much did you spend on drugs?	DRUGCOST ☐	
316d	How far is your house from the provider you sought care for (NAME) ?	WITHIN 15KM.....A	

		MORE THAN 15 KM……B	
316e	How much did you spend on transport to and from the provider?	TRANSPORT COST ☐	
316f	Did any member of the household escort you to the provider?	Yes……..1 No……..2	
316g	How much money did you pay for the guardian's transport?	GUARDMONEY ☐	
316h	What was the source of the money (if any) you used during the child's sickness with fever?	SOURCE SALARY……...1 GANYU……2 BORROWED……3 SOLD ASSETS……4 OTHER SPECIFY……..5	
316i	Did you or other members of your household have to borrow money or sell assets in order to pay for these costs?	YES……..1 NO……..2 Yes to go Q 18, No go to Q19	
316j	Did you take any days off work in order to care for your child's sickness?	YES……1 NO……2	→ 320
316k	How many days?	DAYSOFF ☐	

[1] For fieldwork beginning in 2005, the year should be 2010.
[2] Coding categories to be developed locally and revised based on the pretest; however, the broad categories must be maintained.

		YOUNGEST CHILD NAME _____	NEXT-TO-YOUNGEST CHILD NAME _____
317a	Did (NAME) receive a finger stick or heal stick to test the fever/illness?	YES ..... 1 NO ..... 2 DON'T KNOW..... 8	YES ..... 1 NO ..... 2 DON'T KNOW..... 8
317b	Is (NAME) still sick with a fever?	YES.....1 NO.....2 DON'T KNOW.....8	YES.....1 NO.....2 DON'T KNOW.....8
318	At any time during the illness, did (NAME) take any drugs for the fever?	YES.....1 NO..... 2 (SKIP 344) =——| DON'T KNOW..... 8	YES.....1 NO.....2 (SKIP 344) =——| DON'T KNOW.....8

319	What drugs did (NAME) take?[1] Any other drugs? RECORD ALL MENTIONED. ASK TO SEE DRUG(S) IF TYPE OF DRUG IS NOT KNOWN. IF TYPE OF DRUG IS STILL NOT DETERMINED, SHOW TYPICAL ANTIMALARIAL DRUGS TO RESPONDENT.	ANTIMALARIAL LA ..... A SP/FANSIDAR ..... B QUININE ..... C OTHER ANTIMALARIAL_____ F (SPECIFY) D OTHER DRUGS ASPIRIN ..... F ACETAMINOPHEN/ PARACETAMOL ..... G IBUPROFEN ..... H OTHER _____ X (SPECIFY) DON'T KNOW ..... Z	ANTIMALARIAL LA ..... A SP/FANSIDAR ..... B QUININE ..... C OTHER ANTIMALARIAL_____ D (SPECIFY) OTHER DRUGS ASPIRIN ..... F ACETAMINOPHEN/ PARACETAMOL ..... G IBUPROFEN ..... H OTHER _____ X (SPECIFY) DON'T KNOW ..... Z
320	CHECK 319: ANY CODE A-F CIRCLED?	YES ☐ NO ☐ (GO BACK TO 317 IN NEXT COLUMN; OR IF NO MORE BIRTHS, SKIP TO 344)	YES ☐ NO ☐ (GO BACK TO 317 IN NEXT COLUMN; OR IF NO MORE BIRTHS, SKIP TO 344)
320A	CHECK 319: LA ('A') GIVEN?	CODE 'A' CIRCLED ☐ CODE 'A' NOT CIRCLED ☐ (SKIP TO 324)	CODE 'A' CIRCLED ☐ CODE 'A' NOT CIRCLED ☐ (SKIP TO 324)
321	How long after the fever started did (NAME) first take SP/Fansidar?	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER..... 2 THREE DAYS AFTER THE FEVER..3 FOUR OR MORE DAYS AFTER THE FEVER..... 4 DON'T KNOW 8	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER..... 2 THREE DAYS AFTER THE FEVER..3 FOUR OR MORE DAYS AFTER THE FEVER..... 4 DON'T KNOW 8

[1] Revise list of drugs as appropriate; however, the broad categories must be maintained. Include all drugs or drug combinations that are commonly given as separate categories.

		YOUNGEST CHILD	NEXT-TO-YOUNGEST CHILD
		NAME _____	NAME _____
322	For how many days did (NAME) take the LA? IF 7 OR MORE DAYS, RECORD '7'.	DAYS ..... ☐☐ DON'T KNOW 8	DAYS ..... ☐☐ DON'T KNOW 8

323	Did you have the LA at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE MENTIONED, ASK: Where did you get the SP/Fansidar first?	AT HOME..... 1 GOVERNMENT HEALTH FACILITY/WORKER..... 2 PRIVATE HEALTH FACILITY/WORKER..... 3 SHOP..... 4 OTHER_____6 (SPECIFY) DON'T KNOW..... 8	AT HOME .....1 GOVERNMENT HEALTH FACILITY/WORKER .....2 PRIVATE HEALTH FACILITY/WORKER .....3 SHOP.....4 OTHER_____6 (SPECIFY) DON'T KNOW.....8
323a	Did you purchase the LA?	YES..... 1 NO ..... 2 If NO, Skip to 340	YES ..... 1 NO ..... 2 If NO, Skip to 340
323b	How much did you pay for LA?	In Kwacha ☐☐	In Kwacha ☐☐
324	CHECK 319: WHICH MEDICINES?	CODE 'B' CIRCLED ☐ CODE 'B' NOT CIRCLED ☐ (SKIP TO 328)	CODE 'B' CIRCLED ☐ CODE 'B' NOT CIRCLED ☐ (SKIP TO 328)
325	How long after the fever started did (NAME) first take SP/FANSIDAR?	SAME DAY ..... 0 NEXT DAY..... 1 TWO DAYS AFTER THE FEVER..... 2 THREE DAYS AFTER THE FEVER 3 FOUR OR MORE DAYS AFTER THE FEVER..... 4 DON'T KNOW..... 8	SAME DAY .....0 NEXT DAY.....1 TWO DAYS AFTER THE FEVER.....2 THREE DAYS AFTER THE FEVER..3 FOUR OR MORE DAYS AFTER THE FEVER.....4 DON'T KNOW.....8
326	For how many days did (NAME) take SP/FANSIDAR? IF 7 OR MORE DAYS, RECORD '7'.	DAYS..... ☐ DON'T KNOW 8	DAYS..... ☐ DON'T KNOW 8
327	Did you have the SP/FANSIDAR at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE MENTIONED, ASK: Where did you get the SP/FANSIDAR ?	AT HOME..... 1 COMMUNITY HEALTH WORKER....2 GOVERNMENT HEALTH FACILITY/WORKER..... 3 PRIVATE HEALTH FACILITY/WORKER..... 4 SHOP..... 5 OTHER_____ 6 (SPECIFY) DON'T KNOW..... 8	AT HOME .....1 COMMUNITY HEALTH WORKER....2 GOVERNMENT HEALTH FACILITY/WORKER .....3 PRIVATE HEALTH FACILITY/WORKER .....4 SHOP.....5 OTHER_____ 6 (SPECIFY) DON'T KNOW.....88
327a	Did you purchase the SP/FANSIDAR?	YES..... 1 NO ..... 2 If NO, Skip to 340	YES ..... 1 NO ..... 2 If NO, Skip to 340

327b	How much did you pay for the SP/FANSIDAR?	In Kwacha ☐☐	In Kwacha ☐☐
328	CHECK 319: WHICH MEDICINES?	CODE 'C' CIRCLED ☐ CODE 'C' NOT CIRCLED ☐ (SKIP TO 332)	CODE 'C' CIRCLED ☐ CODE 'C' NOT CIRCLED ☐ (SKIP TO 332)
329	How long after the fever started did (NAME) first take Quinine?	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER..... 2 THREE DAYS AFTER THE FEVER . 3 FOUR OR MORE DAYS AFTER THE FEVER..... 4 DON'T KNOW 8	SAME DAY .....0 NEXT DAY.....1 TWO DAYS AFTER THE FEVER.....2 THREE DAYS AFTER THE FEVER..3 FOUR OR MORE DAYS AFTER THE FEVER.....4 DON'T KNOW.....8

		YOUNGEST CHILD NAME _____	NEXT-TO-YOUNGEST CHILD NAME _____
330	For how many days did (NAME) take Quinine? IF 7 OR MORE DAYS, RECORD '7'.	DAYS..... ☐☐ DON'T KNOW 8	DAYS..... ☐☐ DON'T KNOW 8
331	Did you have the Quinine at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE MENTIONED, ASK: Where did you get the Quinine first?	AT HOME..... 1 COMMUNITY HEALTH WORKER....2 GOVERNMENT HEALTH FACILITY/WORKER..... 3 PRIVATE HEALTH FACILITY/WORKER..... 4 SHOP..... 5 OTHER_____6 (SPECIFY) DON'T KNOW 8	AT HOME .....1 COMMUNITY HEALTH WORKER....2 GOVERNMENT HEALTH FACILITY/WORKER .....3 PRIVATE HEALTH FACILITY/WORKER .....4 SHOP.....5 OTHER_____6 (SPECIFY) DON'T KNOW.....8
331a	Did you purchase the Quinine?	YES..... 1 NO ..... 2 If NO, Skip to 340	YES ..... 1 NO ..... 2 If NO, Skip to 340
331b	How much did you pay for the Quinine?	In Kwacha ☐☐	In Kwacha ☐☐
332	CHECK 319: WHICH MEDICINES?	CODE 'D' CIRCLED ☐	CODE 'D' CIRCLED ☐

		CODE 'D' NOT CIRCLED ☐ (SKIP TO 336)	CODE 'D' NOT CIRCLED ☐ (SKIP TO 336)
333	How long after the fever started did (NAME) first take Quinine?	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER THE FEVER..... 2 THREE DAYS AFTER THE FEVER . 3 FOUR OR MORE DAYS AFTER THE FEVER..... 4 DON'T KNOW 8	SAME DAY .....0 NEXT DAY.....1 TWO DAYS AFTER THE FEVER.....2 THREE DAYS AFTER THE FEVER..3 FOUR OR MORE DAYS AFTER THE FEVER.....4 DON'T KNOW.....8
334	For how many days did (NAME) take Quinine? IF 7 OR MORE DAYS, RECORD '7'.	DAYS.....☐☐ DON'T KNOW 8	DAYS.....☐☐ DON'T KNOW 8
335	Did you have the Quinine at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE MENTIONED, ASK: Where did you get the Quinine first?	AT HOME..... 1 COMMUNITY HEALTH WORKER....2 GOVERNMENT HEALTH FACILITY/WORKER..... 3 PRIVATE HEALTH FACILITY/WORKER..... 4 SHOP..... 5 OTHER_____ 6 (SPECIFY) DON'T KNOW 8	AT HOME .....1 COMMUNITY HEALTH WORKER....2 GOVERNMENT HEALTH FACILITY/WORKER .....3 PRIVATE HEALTH FACILITY/WORKER .....4 SHOP.....5 OTHER_____ 6 (SPECIFY) DON'T KNOW.....8
335a	Did you purchase the Quinine?	YES..... 1 NO ..... 2 If NO, Skip to 340	YES ..... 1 NO ..... 2 If NO, Skip to 340
335b	How much did you pay for the Quinine?	In Kwacha ☐☐	In Kwacha ☐☐

336a	Was the child (NAME) admitted in the last 12 months?	YES ..... 1 NO 2	____345
336b	How much did you spend on admission if any?	FEESADMISSION [ ]	

337a	Was the child (NAME) admitted in the last 12 months?	YES .....1 NO 2	____345
337b	How much did you spend on admission if any?	FEESADMISSION [ ]	

338a	Was the child (NAME) admitted in the last 12 months?	YES .....1 NO 2	____345
338b	How much did you spend on admission if any?	FEESADMISSION [ ]	

339a	Was the child (NAME) admitted in the last 12 months?	YES .....1 NO 2	____345

339b	How much did you spend on admission if any?	FEESADMISSION	

340a	Was the child (NAME) admitted in the last 12 months?	YES .....1 NO 2	____345
340b	How much did you spend on admission if any?	FEESADMISSION	

341	RECORD THE TIME.	HOUR ..... ▒▒ MINUTES..... ▒▒

INTERVIEWER'S OBSERVATIONS

TO BE FILLED IN AFTER COMPLETING INTERVIEW

COMMENTS ABOUT RESPONDENT:

COMMENTS ON SPECIFIC QUESTIONS:

ANY OTHER COMMENTS:

SUPERVISOR'S OBSERVATIONS

NAME OF THE SUPERVISOR:_____DATE: _____

Appendix E: Consent form

National Malaria Indicator Survey
Malawi 2010

Consent Form
English

Ministry of Health
Lilongwe, Malawi

Introduction

The Ministry of Health wants to learn how well the malaria prevention programme is working in Malawi. We would like to ask you some questions about bednet use in your home, and also some general questions about your children's health.

We are also doing a survey of malaria in children. To do this, we will test children for malaria parasites in the blood. One way to test for malaria parasites in the blood includes taking a small sample of blood by finger prick and examining under a microscope and in a laboratory. Another way is to look at anaemia (low levels of blood), by taking a small sample of blood by finger prick and examining with a HemoCue® machine.

Purpose of the survey

We want to see if our country's malaria programme works. We will ask you some questions about bednet use in your home and also about your children's health. We will also see how common malaria is among young children in the community by testing for parasites in the blood and also by testing for low levels of blood. We will visit people in their homes and look at people that come to health facilities. This will help us learn how best to measure the effects of malaria control in the community.

Procedures

If you agree to take part, we will ask you a few questions, and a nurse will take a small amount of blood from your child's finger.

We will ask you questions about bednet use in your home, and about other things that are linked to malaria. We will also ask some questions about your health and about your children's health. This should only take about 30 minutes.

We will take only up to eight drops of blood from your child. One drop of blood will be wiped off. The second drop of blood will be used to test for malaria in the lab using a microscope. The third drop of blood will be used to test for low levels of blood (anaemia) here in the house. The fourth drop will be used for a rapid malaria diagnostic test here in the house. The remaining four drops of blood may be put on paper for additional laboratory analysis of malaria.

The results for low levels of blood and for the rapid malaria diagnostic test will be given to you today. If your child has low levels of blood, malaria, or history of fever, we will give you treatment. This will be the same treatment your child would get if you went to your health centre. This will cost you and your family nothing. If the nurse thinks that your child is very ill, we will assure transport to the nearest health clinic to provide your child with the necessary health care.

Lab test results will be ready after one week. If your child has malaria, a survey staff member will return to your house to give treatment for malaria to your child. This will only happen if your child has not already been treated today. Even if you do not wish to take part, you can still ask to see the nurse and get the correct treatment. Even if you do not agree to take part, if your child is ill, you should visit the nearest health clinic if your child is not better in three days or is worse over time.

Risks and Benefits

Your child will feel a pinch that lasts a few seconds when we take the blood tests. For any malaria health problem that we find, the nurse will give the treatments that the Ministry of Health suggests. These drugs are proven safe and effective, but any drugs can cause side effects in a small number of patients. The nurse will discuss these with you.

Voluntariness
It is your choice to be in this survey. It will not affect the care that the nurse will give you or your children should you wish to receive it. If you do agree to take part, your answers to all questions and your child's test results will be kept private to the extent the law allows. If you agree to take part, you can also decide not to answer any of the questions that you do not want to, and you can refuse the blood tests.

If you have any questions or clarification pertaining to this survey please feel free to contact Mrs Doreen Ali, 0889374043 or Dr D. Kathyola, 088834443.

Thank you very much for your time. Would you like to take part in this survey?

Statement of Parental Permission for malaria surveillance (signature or thumbprint required)
The above has been read to me, and I agree to let my child take part.

Signature: _____ Date: _____

Thumb print:

Participant's name: _____

For persons who cannot sign
The above consent was read and the person agreed to take part.

Signature: _____ Date: _____