Malawi

Malaria Indicator Survey

2012

Malawi
Malaria Indicator Survey
2012

Ministry of Health
National Malaria Control Programme
Lilongwe, Malawi

MEASURE DHS
ICF International
Calverton, Maryland, U.S.A.

November 2012

USAID
FROM THE AMERICAN PEOPLE

CDC
USAID
FROM THE AMERICAN PEOPLE
President's Malaria Initiative

World Health Organization

This report presents the findings of the 2012 Malawi Malaria Indicator Survey (2012 MMIS) conducted by the National Malaria Control Programme (NMCP) of the Ministry of Health from 28 March through 15 May 2012. The government of Malawi provided financial assistance in terms of in-kind contribution of personnel, office space, and logistical support. Financial support for the survey was provided by the United States Agency for International Development (USAID) from President's Malaria Initiative funds through ICF International. ICF International also provided technical assistance, medical supplies, and equipment for the survey through the MEASURE DHS program, which is funded by USAID and is designed to assist developing countries in collecting data on fertility, family planning, and maternal and child health. The opinions expressed in this report are those of the authors and do not necessarily reflect the views of USAID.

Additional information about the 2012 Malawi MIS may be obtained from: National Malaria Control Programme, P/Bag 65, Mtunthama Drive, Lilongwe, Malawi.

Information about the MEASURE DHS project may be obtained from: ICF International, 11785 Beltsville Drive Suite 300, Calverton, MD 20705 USA (Telephone: 301-572-0200; Fax: 301-572-0999; Email: reports@ICFI.com; Internet: www.measuredhs.com).

Recommended citation:

National Malaria Control Programme (NMCP) [Malawi] and ICF International. 2012. *Malawi Malaria Indicator Survey (MIS) 2012*. Lilongwe, Malawi, and Calverton, Maryland, USA: NMCP and ICF International.

CONTENTS

TABLES AND FIGURES

PREFACE

Malaria continues to be a major public health problem in Malawi, with an estimated five million cases occurring annually. Its effects are greatest among children under age 5 and pregnant women. The Ministry of Health, in collaboration with its partners, is implementing the National Malaria Strategic Plan 2011–2015; its goal is to achieve universal coverage in the prevention and treatment of malaria towards attainment of the national vision of "All people in Malawi are free from the burden of malaria". Specifically, we strive for progress in achieving prompt and effective antimalarial drug treatment, use of insecticide-treated nets and indoor residual spraying, and prevention of malaria in pregnancy.

We have set for ourselves high coverage targets for these interventions. By setting high targets, we are confident of our ability to reach our strategic goals of reducing the incidence of malaria and deaths from malaria as well as reducing the prevalence of malarial parasites and malaria-related anaemia.

Measurement is essential for understanding progress towards these goals. Without measurement, we can only speculate on progress. The 2012 Malawi Malaria Indicator Survey is the country's second nationally representative assessment of the coverage attained by key malaria interventions. These interventions are used in combination with measures of malaria-related burden and anaemia prevalence testing among children under age 5.

Overall, there has been progress in controlling malaria. We noted a decline in malaria prevalence from the 2010 value of 43 percent to the 2012 value of 28 percent. ITN ownership remains the same since 2010 at 58 percent. We expect this coverage to increase with the mass distribution of LLINs that the Ministry undertook in mid-2012 after the fieldwork for the 2012 Malaria Indicator Survey. However, there remain some challenges: the coverage of pregnant women who receive at least two doses of intermittent preventive treatment (IPTp) has decreased from a high of 60 percent in 2010 to a moderate 54 percent in 2012. The decrease calls for a scaling up of efforts to increase IPTp coverage to prevent mothers from dying of malaria during pregnancy. Changes in antimalarial drug policy have provided challenges to increasing effective antimalarial treatment. Nevertheless, more children than before are receiving artemisinin-based combination therapy, and we expect these numbers 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 as they implement projects to surmount the challenges depicted here.

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

Dr. Charles Mwansambo
Secretary for Health

ACRONYMS

CDC	US Centers for Disease Control and Prevention
DHS	Demographic and health survey
EA	Enumeration area
EP	Expanded Programme on Immunization
IPTp	Intermittent Preventive Treatment in pregnancy
IRS	Indoor residual spraying
ITN	Insecticide-treated mosquito net
LA	Local name of Artemether-lumefantrine
LLIN	Long-lasting insecticidal net
MACEPA	Malaria Control and Evaluation Partnership in Africa
MKW	Malawian Kwacha
MERG	Monitoring and Evaluation Reference Group
MICS	Multiple Indicator Cluster Survey
MIS	Malaria Indicator 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 Nations Children's Fund
USAID	United States Agency for International Development
WBC	White blood cell
WHO	World Health Organization

MALAWI


N
Chitipa
Karonga
TANZANIA
Rumphi
Northern Region
Nkhata Bay
Mzimba
ZAMBIA
Likoma
Lake Malawi
Nkhotakota
Kasungu
MOZAMBIQUE
Ntchisi
Central Region
Dowa
Mchinji
Salima
Lilongwe
Lilongwe
Dedza
Mangochi
Ntcheu
Balaka
Machinga
Southern Region
Zomba
Neno
Mwanza
Blantyre
Phalombe
Chiradzulu
Mulanje
Thyolo
Chikhwawa
Nsanje
0
50
100
200
300
400 Kilometres

INTRODUCTION 1

1.1 COUNTRY PROFILE

1.1.1 Geography

Malawi is a sub-Saharan African country located south of the equator. It is bordered to the north and northeast by the United Republic of Tanzania; to the east, south, and southwest by the People's Republic of Mozambique; and to the west and northwest by the Republic of Zambia.

The country is 901 kilometres long and 80 to 161 kilometres wide. The total area is approximately 118,484 square kilometres, of which 94,276 square kilometres are land. The remaining area consists mostly of Lake Malawi, which is about 475 kilometres long and delineates parts of Malawi's eastern boundary with Mozambique and Tanzania.

Malawi's most striking topographic feature is the Rift Valley, which runs the entire length of the country, passing through Lake Malawi in the Northern and Central Regions to the Shire Valley in the south. The Shire River drains the water from Lake Malawi into the Zambezi River in Mozambique. To the west and south of Lake Malawi lay fertile plains and mountain ranges whose peaks range from 1,700 to 3,000 metres above sea level.

The country is divided into three regions: Northern, Central, and Southern Regions. There are 28 districts in the country: 6 districts in the Northern Region, 9 in the Central Region, and 13 in the Southern Region. Administratively, the districts are subdivided into traditional authorities (TAs), presided over by chiefs. Each TA is composed of villages, which are the smallest administrative units. The villages are presided over by village headmen.

Malawi has a tropical continental climate with maritime influences. Rainfall and temperature vary depending on altitude and proximity to the lake. From May to August, the weather is cool and dry. In September and October, the weather becomes hot. The rainy season begins in October or November and continues until April.

According to the 2008 Population and Housing Census, the population in Malawi is 13.1 million, with an intercensal population growth rate of 2.8 percent per year (Table 1.1). Population density increased from 105 persons per square kilometre in 1998 to 139 persons per square kilometre in 2008 (NSO, 2008).

1.1.2 Economy

The economy of Malawi is based primarily on agriculture, which accounts for 30 percent of the gross domestic product (GDP). The country's major exports are tobacco, tea, and sugar. They account for approximately 85 percent of Malawi's domestic exports. In 2009, the agricultural sector achieved growth of 13.9 percent and had a food surplus, due to favourable weather and the government's Farm Input Subsidy Programme (FISP). Tobacco production also was high because favourable prices were offered at auction in the 2008 marketing season. In 2010, the estimated growth in the agricultural sector slowed to 1.3 percent because of dry spells and heavy rains.

1.1.3 Health Indicators

Life expectancy at birth in Malawi is estimated at 52.3 years for women and 49.6 years for men. (NSO, 2008). Data from the 2004 MDHS and 2010 MDHS show that under-5 mortality rate has decreased from 133 deaths per 1,000 live births in 2000-2004 to 112 deaths per 1,000 live births in 2005-2010 (NSO

and ORC Macro, 2005 and NSO and ICF Macro, 2011). The maternal mortality ratio has also declined from 984 deaths per 100,000 live births in 1998-2004 (NSO and ORC Macro, 2005) to 675 deaths per 100,000 live births in 2004-2010 (NSO and ICF Macro, 2011). The adult HIV/AIDS prevalence rate is estimated at 10.6 percent (12.9 percent for women, 8.1 percent for men) (NSO and ICF Macro, 2011).

Although malnutrition among children remains high, it has diminished since 2004. The stunting rate has declined from 53 percent in 2004 to 47 percent .in 2010. At the same time, anaemia prevalence among children has declined from 73 percent to 63 percent. Among nonpregnant, nonbreastfeeding women, the percentage of women with anaemia has decreased from 46 percent in 2004 to 29 percent in 2010. Among pregnant women, the percentage with anaemia decreased from 47 percent to 38 percent (NSO and ICF Macro, 2011).

Table 1.1 shows data for demographic indicators for Malawi between 1988 and 2008.

Table 1.1 Demographic indicators

Selected demographic indicators, Malawi Population and Housing Census, 1966-2008

Indicators	Census 1998	Census 2008
Population (millions)	9,933,868	13,077,160
Intercensal growth rate	2.0	2.8
Density (pop/sq km)	105	139
Percentage of urban population	14.0	15.3
Sex ratio	96.0	94.7
Crude birth rate	37.9	39.5
Crude death rate	21.1	10.4
Life expectancy at birth Male	40.0	48.3
Female	44.0	51.4

Source: 2008 Population and Housing Census (NSO, 2008); 2010 Malawi DHS (NSO and ICF Macro, 2011)

1.2 BACKGROUND ON MALARIA IN MALAWI

Malaria is endemic throughout Malawi and continues to be a major public health problem. Malaria is the leading cause of morbidity and mortality in children under age 5 and among pregnant women. It is estimated that Malawi experiences about 6 million episodes of malaria annually (HMIS, 2011). Transmission is mainly determined by climatic factors: temperature, humidity, and rainfall. The extent and distribution of these factors influence the prevalence rate. Transmission is highest in areas of high temperature and frequent rainfall from October through April.

Efforts to control malaria are currently being scaled up through coordination of Roll Back Malaria (RBM) partners. Malaria is one of the main public health priorities within the Essential Health Package (EHP). The Ministry of Health (MoH), in collaboration with its development partners, has created the National Malaria Strategic Plan 2011-2015 (NMSP 2011-2015) (MOH, nd). The vision of the National Malaria Control Programme (NMCP) is for all people in Malawi to be free from the burden of malaria. The programme's mission is to reduce the burden of malaria to a level of no public health significance in Malawi. This can be achieved through improved diagnosis; better case, programme, vector, and supply chain management; behaviour change, communication, and advocacy; and a robust monitoring and surveillance system. The Malawi government started the first nationwide insecticide-treated net (ITN) social marketing programme in Africa in 2001. Much of the drive for the ITN programme is from the WHO three-pronged approach to malaria control and the RBM partnership. The National Malaria Control Policy recognizes the use of long-lasting insecticide-treated nets (LLINs) as an important intervention for the control of malaria in Malawi. This is described in the NMSP 2011-2015, which states that the main objective of the plan is to minimize the exposure of individuals to malaria through integrated vector management. The plan includes scaling up the procurement and distribution of LLINs, targeting one LLIN for every two people in a household, increasing awareness on appropriate use of nets, developing and distributing information and educational campaign materials, and expanding indoor residual spraying (IRS) to 12 highly endemic districts.

In 2007, the NMCP decided to switch the recommended malaria treatment regimen from sulfadoxine–pyrimethamine (SP) to artemisinin-based combination therapy (ACT). The first-line drug is artemether-lumefantrine (locally known as LA), the second line drug is amodiaquine and artesunate (ASAQ), and Quinine is used to treat severe malaria. In 2011, the NMCP revised its policy to require confirmation of a clinical diagnosis of malaria at all levels of health care, using malaria rapid diagnosis tests (RDTs) and light microscopy.

1.3 OBJECTIVES OF THE MALAWI MALARIA INDICATOR SURVEY

Effective monitoring and evaluation is needed in order to assess national scale-up efforts under implementation and to measure progress toward select targets and goals. Evidence of progress in rolling out malaria interventions to affected communities in Malawi has come from several data sources, including the 2004 and 2010 Malawi Demographic and Health Surveys (MDHS), the 2006 Multiple Indicator Cluster Survey (MICS), and smaller-scale household surveys such as the 2001, 2004, and 2008 RBM surveys funded by the Global Fund and the 2010 Malaria Indicator Survey (MIS).

The Roll Back Malaria Monitoring & Evaluation Reference Group (RBM-MERG), a global technical advisory group providing monitoring and evaluation guidance for malaria control programmes, recommends that the MIS be conducted every two years within six weeks of the end of the rainy season in countries with endemic malaria transmission patterns, especially those in sub-Saharan Africa. For these reasons, in 2012, the NMCP conducted the second nationwide Malaria Indicator Survey in Malawi. The 2012 MIS used a standard set of instruments and protocol developed by RBM-MERG. These tools are largely based on the collective experience gained from the DHS and MIS surveys and are presented as a package of materials to promote standardized survey management and data collection methodology. The package also includes standardized measurement of malaria parasite and anaemia prevalence among target populations to derive the malaria-related burden at the community level.

The key objectives of the 2012 MIS were to:

- Measure the level of ownership and use of mosquito nets
- Assess coverage of the intermittent preventive treatment for pregnant women
- Identify treatment practices, including the use of specific antimalarial medications to treat malaria among children under 5
- Measure the prevalence of malaria and anaemia among children age 6-59 months
- Assess knowledge, attitudes, and practices of malaria in the adult population
- Measure trends in key malaria indicators since the 2010 MDHS

The 2012 MIS was designed to produce most of the key malaria indicators for the country as a whole, for urban and rural areas separately, and for each of three regions in Malawi: Northern, Central, and Southern.

1.4 METHODOLOGY OF THE 2012 MALAWI MALARIA INDICATOR SURVEY

The 2012 MIS was carried out from April to May 2012, covering a nationally-representative sample of 3,500 households. All women age 15-49 years in the selected households were eligible for individual interviews and were asked questions about malaria prevention during pregnancy and treatment of childhood fever. In addition, the survey included testing for anaemia and malaria among children age 6-59 months using a finger prick blood sample. The results of anaemia and malaria rapid diagnostic testing were available immediately and were provided to the children's parents or guardians. Thick blood smears were collected in the field and carried to the Public Health Laboratory at the Community Health Sciences Unit in Lilongwe where they were tested for the presence of malaria parasites.

1.4.1 Survey Organization

The 2012 Malawi MIS was implemented by the National Malaria Control Program under the MoH. The NMCP was responsible for general administrative management of the survey, including overseeing the day-to-day operations; establishing and hosting meetings of the Steering Committee; designing the survey instruments and supporting documentation; and developing the survey protocol and ensuring its approval by the Malawi National Health Sciences Research Committee prior to the data collection. In addition, the NMCP was responsible for administering all the funds for the local costs of the survey and for keeping adequate accounts and providing office space for the survey operations and data processing. The NMCP recruited and monitored field personnel through the District Health Offices (DHOs) and provided artemether-lumefantrine (LA) for treating children who tested positive for malaria in the field.

The National Statistical Office (NSO) assisted in the household listing in the selected enumeration areas (EAs). As part of this exercise, they drew up the necessary maps, recorded the geographic coordinates of each EA, and listed the households in the selected EAs.

Technical assistance was provided by ICF International, who assisted with the adaptation of RBM- MERG approved survey instruments, overall survey design, questionnaire design, field staff training, and field work monitoring. In addition to training the interviewers, ICF International also provided training of the health technicians in the collection of biomarkers for anaemia testing, as well as rapid diagnostic testing and preparing thick blood smears for testing of malaria. Finally, ICF International provided technical assistance in data processing, data analysis, and report preparation.

Financial support for the survey was provided by the U.S. President's Malaria Initiative (PMI) through the U.S. Agency for International Development (USAID).

1.4.2 Sample Design

The 2012 MIS sample was designed to produce most of the key indicators for the country as a whole, for urban and rural areas separately, and for each of three regions in Malawi.

To improve the precision of the trend analysis, the 2012 MIS was conducted in the same 140 enumeration areas (EAs) selected for the 2010 MIS. The survey utilized a two-stage sample design (see Appendix A for details). The first stage involved selecting 140 clusters with probability proportional to size from the list of approximately 12,474 EAs covered in the 2008 National Population and Housing Census. The EA size was the number of residential households in the EA recorded in the census. Among the 140 clusters selected, 44 were in urban areas and 96 were in rural areas. 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 urban-rural residence and required a final weighting adjustment to provide valid estimates for every domain of the survey. In the second stage, in each of the selected EAs, 25 households were selected, using systematic sampling, from a list of households in the EA.

All women age 15-49 years who were either permanent residents of the selected households or visitors present in the household on the night before the survey were eligible to be interviewed. In addition, all children age 6-59 months who were listed in the household were eligible for anaemia and malaria testing.

1.4.3 Questionnaires

Three questionnaires were used in the 2012 Malaria MIS: a Household Questionnaire, a Biomarker Questionnaire, and a Woman's Questionnaire. The Household and Woman's questionnaires were based on the model MIS questionnaires developed by the RBM and DHS programs, as well as the 2010 MIS. The model questionnaires were modified to reflect relevant issues of malaria in Malawi in

consultation with the Steering Committee, the NMCP, and staff from ICF International. The questionnaires were translated into the two main local languages of Malawi: Chichewa and Tumbuka.

The **Household Questionnaire** was used to list all the usual members and visitors in the selected households. Some basic information was collected on the characteristics of each person listed, including age, sex, and relationship to the head of the household. The main purpose of the Household Questionnaire was to identify women who were eligible for the individual interview and children age 6-59 months who were eligible for anaemia and malaria testing. The Household Questionnaire also collected information on characteristics of the household's dwelling unit, such as the source of water, type of toilet facilities, materials used for the floor, roof, and walls of the house, ownership of various durable goods, and ownership and use of mosquito nets.

The **Biomarker Questionnaire** was used to record haemoglobin measurements for children age 6-59 months and results of malaria testing for children under age 5 years. The questionnaire was filled in by the health technician and transcribed into the tablet computer by the team supervisor.

The **Woman's Questionnaire** was used to collect information from all women age 15-49 years and covered the following topics:

- Background characteristics (age, residential history, education, literacy, religion, dialect)
- Full reproductive history and child mortality
- Prenatal care and preventive malaria treatment for most recent birth
- Prevalence and treatment of fever among children under 5
- Knowledge about malaria (symptoms, causes, ways to prevent it, and types of antimalarials)
- Cost incurred for the treatment of fever in children

No formal field pretest was done for the survey questionnaires because most of the MIS questions had been included in previous surveys in Malawi and the field staff had experience with anaemia and malaria testing in the field and with the use of PDAs for data collection.

1.4.4 Anaemia and Malaria Testing

The 2012 MIS incorporated three biomarkers. Finger prick blood samples were collected from children age 6-59 months to perform on-the-spot testing for anaemia and malaria, and to prepare thick blood smears that were to be read in the laboratory to determine the presence of malaria parasitemia. Each data collection team included two laboratory technicians who were responsible for the malaria and anaemia testing and preparing blood smear slides. Each field team also included two community health nurses who served as interviewers. In addition to conducting field interviews, they were responsible for dispensing malaria medications according to the appropriate treatment guidelines. Verbal informed consent for testing of children was obtained from the child's parent or guardian at the end of the household interview. The protocol for the blood specimen collection and analysis was approved by ICF International's Institutional Review Board as well as by the National Health Sciences Research Committee in Malawi.

Anaemia testing. Because of the strong correlation between malaria infection and anaemia, the MIS included anaemia testing for children age 6-59 months. After obtaining informed consent from the child's parent or guardian, blood samples were collected using a single-use, spring-loaded, sterile lancet to make a finger prick. Laboratory technicians then collected a drop of blood on a microcuvette from the finger prick. Haemoglobin analysis was carried out on site using a battery-operated portable HemoCue analyzer, which produces results in less than one minute. Results were given to the child's parent or guardian verbally and in written form. Children who had a haemoglobin level under 8 g/dl (severe

anaemia) were recommended to be taken to a health facility for follow-up care. They were given a referral letter with the haemoglobin reading to show staff at the health facility. Results of the anaemia test were recorded on the Biomarker Questionnaire as well as in an anaemia brochure that included information about the causes and prevention of anaemia and was given to the child's parent/guardian by the community health nurses.

Rapid malaria testing. Another major objective of the 2012 Malawi MIS was to provide information about the extent of malaria infection among children age 6-59 months. Using the same finger prick used for anaemia testing, a drop of blood was tested immediately using the SD Bioline rapid diagnostic test (RDT), which tests for *Plasmodium falciparum*. The test includes a loop applicator that comes in a sterile packet. A tiny volume of blood is captured on the applicator and placed in the well of the device. Results are available in 15 minutes. The results were provided to the child's parent/guardian both orally and in a form, and were recorded in the Biomarker Questionnaire.

Children who tested positive for malaria using the rapid diagnostic test were offered a full course of medicine according to standard procedures for malaria treatment in Malawi. To ascertain the correct dose, the nurse on each team was instructed to ask about any medications the child might already be taking. S/he then weighed the child using a portable scale and provided the appropriate dose of the antimalarial LA along with instructions on how to administer the medicine to the child.

Malaria microscopy. In addition to the Bioline rapid test, a thick blood smear was taken for all children tested in the field to be tested in the laboratory for the presence of malaria parasites. Each blood smear slide was given a bar code label, with a duplicate label attached to the Biomarker Questionnaire on the line showing consent for that child. A third copy of the same bar code label was affixed to a Blood Sample Transmittal Form, which accompanied the blood samples from the field to the laboratory. The blood smears were dried and packed carefully in the field. They were periodically collected in the field along with the completed questionnaires and transported to the Public Health Laboratory at the Community Health Sciences Unit in Lilongwe for logging in, microscopic reading, and determination of malaria infection.

1.4.5 Training

The NMCP in collaboration with the DHOs identified 20 interviewers (1 male and 19 females), 20 laboratory technicians (13 males and 7 females), and 10 field team supervisors (9 males and 1 female). In addition, 7 national supervisors from NMCP, Public Health Laboratory, and other stakeholders were identified for overall supervision.

The participants attended a two-week interviewer and supervisor training which took place from 6-23 March 2012 at Kalikuti Hotel in Lilongwe. All the field staff participated in a one-week joint training session, focusing on how to fill out the Household and Woman‘s Questionnaires, mock interviews, and interviewing techniques, as well as on how to locate selected households. Two quizzes were administered to assess how well the participants absorbed the training materials.

During the second week of training, two sessions were done in parallel, one for the interviewers and field supervisors and one for the laboratory technicians. The training of interviewers and field supervisors focused on the use of PDAs for data collection, assigning of households to interviewers using computer tablets, sharing of data among interviewers and supervisors, and submission of data to the central data processing centre at NMCP.

The training of laboratory technicians focused on preparation of blood samples and testing for anaemia using the HemoCue equipment and malaria testing using SD Bioline RDT. The training involved presentation, discussion, and actual testing for anaemia and malaria. The technicians were trained in identifying children eligible for testing, administering informed consent, conducting the anaemia and malaria rapid testing, and making a proper thick blood smear. They were also trained in storing the blood

slides, recording test results on the Biomarker Questionnaire, and providing the results to the parents/guardian of the children tested. Finally, the laboratory technicians received a briefing on the epidemiology of malaria in Malawi and correct treatment protocols.

All participants took part in a field practice exercise in households living close to the training site. Finally, all field staff received specific instructions on how to calculate the correct dose of antimalarial medications for children who tested positive for malaria, using the portable scales to determine the child's weight. Health technicians were also trained on how to record children's anaemia and malaria results on the respective brochures and how to fill in the referral slip for any child who was found to be severely anaemic.

1.4.6 Fieldwork

Ten teams were organized for field data collection. Each team consisted of one field supervisor, two community health nurses as interviewers, two laboratory technicians, and one driver. The national supervisors were paired; one to focus on the interviewing and the other to perform laboratory procedures.

The NMCP arranged for printing the questionnaires, manuals, consent forms, and other field forms. It also assisted with fieldwork logistics such as obtaining backpacks, identification cards, umbrellas, and other field supplies.

Field data collection for the 2012 Malawi MIS started on April 2, 2012. In order to allow for maximum supervision, all ten teams were visited by the national supervisors at least once in the first two weeks. Fieldwork was completed by mid-May of 2012.

1.4.7 Laboratory Testing

Prior to the start of the field staff training, an ICFI staff person worked with the laboratory technicians at the Community Health Sciences Unit of the Public Health Laboratory (PHL) to ensure that all supplies were received in proper shape.

For the malaria parasitemia, all microscopic slides were stained with Giemsa and read by laboratory technicians at the PHL. 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. When 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. For quality control, all slides were read by a second laboratory technician, and a third reviewer settled any discrepant readings. In addition, 10 percent of the slides were re-read independently at Kamuzu Central Hospital laboratory to ascertain the quality of microscopy reading at the PHL.

1.4.8 Data Processing

Data for the 2012 Malawi MIS was collected through questionnaires programmed onto personal data assistants (PDAs). The PDAs were programmed by ICFI data processing specialists and loaded with the Household, Biomarker, and Woman's Questionnaires in English and the two main local languages. They were Bluetooth-enabled to facilitate electronic transfer of files, e.g., data from the Household Questionnaires transferred among survey team members and transfer of completed questionnaires to the team supervisor's tablets. The field supervisors transferred data on a daily basis to the central data processing using the Internet. To facilitate communication and monitoring, each field worker was assigned a unique identification number.

The Census Survey Processing Software (CSPro) was used for data editing, weighting, cleaning, and tabulation. In the NMCP central office, data received from the supervisor's tablets were registered and checked against any inconsistencies and outliers. Data editing and cleaning included range checks and structure and internal consistency checks. Any anomalies were communicated to the respective team through their team supervisor. The corrected results were resent to the central processing unit.

1.5 RESPONSE RATES

Table 1.2 shows that of the 3,500 households selected for the sample, 3,432 were occupied at the time of fieldwork. Sixty-eight dwellings were abandoned and, therefore, were not included in the response rate. Among the occupied households, 3,404 were successfully interviewed, yielding a total household response rate of 99 percent. In the interviewed households, 2,955 eligible women were identified to be eligible for individual interview and 2,906 were successfully interviewed, yielding a response rate of 98 percent.

Table 1.2 Results of the household and individual interviews

Number of households, number of interviews, and response rates, according to residence (unweighted), Malawi 2012

	Residence		
Result	Urban	Rural	Total
Household interviews			
Households selected	1,100	2,400	3,500
Households occupied	1,069	2,363	3,432
Households interviewed	1,055	2,349	3,404
Household response rate[1]	98.7	99.4	99.2
Interviews with women age 15-49			
Number of eligible women	1,047	1,908	2,955
Number of eligible women interviewed	1,027	1,879	2,906
Eligible women response rate[2]	98.1	98.5	98.3

[1] Households interviewed/households occupied
[2] Respondents interviewed/eligible respondents

CHARACTERISTICS OF HOUSEHOLDS AND WOMEN

2

Key Findings

- Eight in ten households and 81 percent of the population have access to improved sources of water.
- One in six households uses an improved latrine facility, while 79 percent use a nonimproved facility.
- In Malawi, only 7 percent of households have electricity.
- Fifteen percent of households own a bank account (46 percent in urban areas and 10 percent in rural areas).
- Two in three women age 15-49 in Malawi are literate.

This chapter provides a descriptive summary of basic demographic and socioeconomic characteristics of the households and the women living within them who were interviewed in the 2012 Malawi Malaria Indicator Survey (MMIS). A household is defined by the survey as a person or a group of persons, related or unrelated, who live and eat from the same pot. The Household Questionnaire collects information on age, sex, and relationship to the head of the household for all usual residents and visitors who spent the night preceding the interview (see Appendix E). This method of data collection allows analysis of the results for either the *de jure* or the *de facto* populations. The Household Questionnaire also obtains information on housing facilities, (e.g., source of water supply, sanitation facilities) and household possessions. Selected items are used to create an index of relative wealth for the household, which is described later in this chapter. This chapter also profiles the women who live in the household and their basic characteristics, including age at the time of the survey, religion, ethnicity, residence, education, literacy, and wealth.

The information presented in this chapter is intended to facilitate interpretation of the key demographic, socioeconomic, and health indicators presented later in the report. It is also intended to assist in the assessment of the representativeness of the survey sample.

2.1 HOUSEHOLD ENVIRONMENT

The physical characteristics of the dwelling in which a household lives are important determinants of the health status of household members, especially children. They can also be used as indicators of the socioeconomic status of households. Results are presented both in terms of households and of the *de jure* population.

2.1.1 Drinking Water

One of the Millennium Development Goals (MDGs) that Malawi and other countries have adopted is to increase the percentage of the population with sustainable access to an improved water source in both urban and rural areas (United Nations General Assembly, 2001). Improved water sources include piped water; water from a public standpipe, tube well, or borehole; and water from a protected well or spring. Water that must be fetched from an improved source may be contaminated during transport or storage. Thus, a long distance to an improved source of water may limit the quantity of suitable drinking water available to a household.

Table 2.1 shows the percent distribution of households and the de jure population by source of drinking water and time to obtain drinking water, according to residence. The results show that 81 percent of both the households and the population have access to improved sources of water. In urban areas, 93 percent of the households have access to improved sources of water compared with 79 percent of households in rural areas. Piped water to the dwelling or to a public tap is the main source of drinking water for households in urban areas (70 percent), whereas in rural areas the main source of drinking water is a tube well or borehole (60 percent). Overall, 54 percent of households draw water from a tube well or a borehole. The most commonly used non-improved source of water is an unprotected dug well (14 percent).

Thirty-three percent of households have a source of drinking water on the premises. Availability is substantially higher in urban households (48 percent) than in rural households (31 percent). Twenty-four percent of the households take 30 minutes or longer to travel round trip to obtain water; 27 percent of these households are in the rural areas and 8 percent are in the urban areas.

Table 2.1 Household drinking water

Percent distribution of households and de jure population by source of drinking water and time to obtain drinking water, according to residence, Malawi 2012

	Households			Population		
Characteristic	Urban	Rural	Total	Urban	Rural	Total
Source of drinking water						
Improved source	92.6	78.7	80.7	91.9	78.8	80.7
Piped into dwelling	13.2	1.1	2.9	13.9	1.1	3.0
Piped to yard/plot	21.8	1.5	4.5	20.7	1.5	4.3
Public tap/standpipe	34.9	9.8	13.5	34.7	9.0	12.7
Tube well or borehole	18.3	60.0	53.9	18.4	61.0	54.9
Protected well	4.0	5.7	5.5	3.9	5.8	5.6
Protected spring	0.3	0.5	0.5	0.2	0.4	0.3
Non-improved source	6.9	17.8	16.2	7.5	17.6	16.1
Unprotected well	6.7	14.9	13.7	7.4	15.0	13.9
Unprotected spring	0.1	2.9	2.5	0.1	2.6	2.2
Other source	0.0	0.1	0.0	0.0	0.0	0.0
Missing	0.6	3.5	3.0	0.6	3.6	3.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Percentage using any improved source of drinking water	92.6	78.7	80.7	91.9	78.8	80.7
Time to obtain drinking water (round trip)						
Water on premises	47.7	30.5	33.0	48.0	30.1	32.7
Less than 30 minutes	41.7	37.9	38.5	40.8	38.3	38.7
30 minutes or longer	7.9	26.8	24.0	8.5	26.9	24.3
Don't know/missing	2.7	4.8	4.5	2.7	4.7	4.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number	502	2,902	3,404	2,035	12,144	14,179

2.1.2 Household Sanitation Facilities

Increasing the percentage of the population with access to improved sanitation in both urban and rural areas is another indicator of the MDGs. Households without proper sanitation facilities have a higher risk of diseases such as dysentery, diarrhoea, and typhoid fever than do those with improved sanitation facilities. Improved sanitation technologies are defined as follows: connection to a public sewer, connection to a septic system, pour-flush latrine, simple pit latrine with a slab, or ventilated, improved pit latrine. According to the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation of 2005 (WHO/UNICEF, 2005), a household is classified as having an improved toilet if the toilet is used only by members of one household (i.e., it is not shared with other households) and if the facility used by the household separates the waste from human contact.

Table 2.2 shows that only 15 percent of households use an improved latrine facility, while 79 percent use a non-improved facility. Households in urban areas are notably more likely than those in rural areas to use improved, non-shared facilities (32 percent compared with 13 percent). The most commonly used improved, non-shared toilet facility is the pit latrine with slab (10 percent of all households). Only 2

percent of households use a facility that flushes to a piped sewer system and is not shared. This proportion is much higher among urban households (13 percent) than among rural households (less than 1 percent).

Table 2.2 Household sanitation facilities

Percent distribution of households and de jure population by type of toilet/latrine facilities, according to residence, Malawi 2012

	Households			Population		
Type of toilet/latrine facility	Urban	Rural	Total	Urban	Rural	Total
Improved, not shared facility	31.9	12.5	15.4	32.7	13.4	16.2
Flush/pour flush to piped sewer system	13.3	0.4	2.3	13.9	0.4	2.3
Ventilated improved pit (VIP) latrine	5.9	2.8	3.2	5.0	2.8	3.1
Pit latrine with slab	12.7	9.3	9.8	13.8	10.2	10.7
Shared facility[1]	13.1	4.1	5.5	12.4	3.2	4.5
Flush/pour flush to piped sewer system	0.4	0.0	0.1	0.3	0.0	0.0
Ventilated improved pit (VIP) latrine	1.3	1.2	1.2	1.4	1.1	1.1
Pit latrine with slab	11.4	2.8	4.1	10.8	2.1	3.3
Composting toilet	0.0	0.1	0.1	0.0	0.1	0.1
Non-improved facility	55.0	83.3	79.2	54.9	83.4	79.3
Pit latrine without slab/open pit	51.0	65.9	63.7	51.0	67.1	64.8
Hanging toilet/hanging latrine	0.0	0.3	0.3	0.0	0.3	0.2
No facility/bush/field	3.6	16.1	14.3	3.4	15.1	13.5
Other	0.5	1.0	0.9	0.5	0.9	0.9
Total						
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number	502	2,902	3,404	2,035	12,144	14,179

[1] Facilities that would be considered improved if they were not shared by two or more households.

2.1.3 Housing Characteristics

Table 2.3 presents information on household characteristics such as electricity, flooring material, number of all rooms, and rooms used for sleeping, and use of various types of fuel for cooking. These characteristics reflect the household's socioeconomic situation and may influence environmental conditions that have a direct bearing on household members' health and welfare.

In Malawi, only 7 percent of households have electricity. The proportion of households with electricity is much higher in urban areas (37 percent) than in rural areas (2 percent). Earth or sand is the most common flooring material, used by 75 percent of all households. As expected, rural households are substantially more likely to have floors made of earth or sand (83 percent) than urban households (29 percent). Overall, 22 percent of the households have floors made of cement. Use of cement floors is more common among households in urban areas than in rural areas (66 percent compared with 14 percent).

The number of rooms a household uses for sleeping is an indicator not only of a household's socioeconomic level but also of crowding in the household, which can facilitate the spread of disease. In the 2012 MMIS, household respondents were asked how many rooms were used for sleeping, regardless of whether they were bedrooms. Forty percent of the households have two rooms for sleeping, while 18 percent have three or more rooms for sleeping. There are slight urban-rural differences in the number of rooms used for sleeping.

In addition, respondents were asked about the number of sleeping spaces. Forty-one percent of the households have two sleeping spaces, while 26 percent have three or more sleeping spaces in the house. Households in the rural areas are more likely to have two sleeping spaces than households in the urban areas (42 and 34 percent, respectively), while urban households are more likely to have three or more sleeping spaces than rural households (38 and 24 percent, respectively).

Table 2.3 shows that wood is the fuel most commonly used for cooking, reported by 87 percent of households. Use of wood is about three times as common in rural areas (96 percent) as in urban areas (35 percent). Ten percent of all households interviewed use charcoal for cooking; 54 percent in urban areas compared with 3 percent in rural areas. Ninety-eight percent of all households use solid fuel for cooking, 89 percent in urban areas and 99 percent in rural areas.

Table 2.3 Household characteristics

Percent distribution of households by housing characteristics and percentage using solid fuel for cooking, according to residence, Malawi 2012

Housing characteristic	Residence		Total
	Urban	Rural	
Electricity			
Yes	37.1	2.3	7.4
No	62.9	97.7	92.6
Total	100.0	100.0	100.0
Flooring material			
Earth, sand	28.5	82.5	74.5
Dung	2.9	2.8	2.8
Broken bricks	0.0	0.0	0.0
Parquet, polished wood	0.1	0.1	0.1
Vinyl, asphalt strips	0.0	0.1	0.1
Ceramic tiles	1.7	0.1	0.3
Cement	65.8	14.4	22.0
Carpet	1.0	0.1	0.2
Total	100.0	100.0	100.0
Rooms			
One	11.4	9.8	10.1
Two	25.1	30.0	29.3
Three or more	63.5	60.2	60.6
Total	100.0	100.0	100.0
Rooms used for sleeping			
One	38.2	43.3	42.5
Two	34.5	40.4	39.5
Three or more	27.3	16.3	17.9
Total	100.0	100.0	100.0
Sleeping spaces			
None	3.5	2.8	2.9
One	24.7	30.9	30.0
Two	33.5	42.0	40.7
Three or more	38.3	24.4	26.4
Total	100.0	100.0	100.0
Cooking fuel			
Electricity	11.0	0.6	2.1
Charcoal	54.1	2.7	10.2
Wood	34.6	96.1	87.1
Straw/shrubs/grass	0.0	0.3	0.2
Other fuel	0.2	0.0	0.0
No food cooked in household	0.3	0.3	0.3
Total	100.0	100.0	100.0
Percentage using solid fuel for cooking[1]	88.7	99.1	97.5
Number	502	2,902	3,404

[1] Includes coal/lignite, charcoal, wood/straw/shrubs/grass, and animal dung

2.2 HOUSEHOLD POSSESSIONS

The availability of durable consumer goods is a good indicator of a household's socioeconomic status. Moreover, particular goods have specific benefits. For instance, having access to a radio or a television exposes household members to innovative ideas; a refrigerator prolongs the wholesomeness of foods; and a means of transport allows greater access too many services away from the local area.

Table 2.4 shows by place of residence the percentages of households possessing or owning various household effects, means of transport, agricultural land, livestock/farm animals, and bank account. Overall, 49 percent of households own a radio. Households in urban areas are more likely than those in rural areas to own a radio (66 percent compared with 46 percent). Nine percent of the households own a television; 39 percent in urban areas and 4 percent in rural areas. A mobile telephone is owned by 38 percent of households (75 percent in urban areas and 32 percent in rural areas). Finally, 4 percent of households have a refrigerator; 23 percent in urban areas compared with only 1 percent in rural areas.

Table 2.4 Household possessions

Percentage of households possessing various household effects, means of transportation, agricultural land and livestock/farm animals by residence, Malawi 2012

Possession	Residence		Total
	Urban	Rural	
Household effects			
Radio	66.3	45.8	48.8
Television	39.0	3.8	9.0
Mobile telephone	74.7	31.6	38.0
Non-mobile telephone	6.1	0.8	1.6
Refrigerator	22.6	1.2	4.3
Means of transport			
Bicycle	23.9	44.4	41.4
Motorcycle/scooter	2.3	0.8	1.0
Car/truck	7.5	0.7	1.7
Ownership of agricultural land	33.7	88.3	80.2
Ownership of farm animals[1]	23.2	59.6	54.3
Ownership of bank account	45.9	10.1	15.4
Number	502	2,902	3,404

[1] Cattle, cows, bulls, horses, donkeys, goats, sheep or chickens

Table 2.4 also shows the proportions of households owning various means of transport. Forty-one percent of the households own a bicycle (24 percent in urban areas and 44 percent in rural areas). Only 1 percent of households own a motorcycle or scooter, and 2 percent own a car or truck. Ownership of a car or truck is higher among urban than rural households (8 percent versus 1 percent).

Agricultural land is owned by 80 percent of all households (88 percent in rural areas and 34 percent in urban areas), and farm animals are owned by 54 percent of households (60 percent in rural areas and 23 percent in urban areas). Fifteen percent of households own a bank account (46 percent in urban areas and 10 percent in rural areas).

2.3 WEALTH INDEX

The wealth index is a background characteristic that is used as a proxy for the long-term standard of living of the household. It is based on data about the household's ownership of durable goods; dwelling characteristics; source of drinking water; toilet facilities; and other characteristics that are indicators of a household's socioeconomic status. To construct the index, each of these assets is assigned a weight (factor score) generated through principal component analysis, and the resulting asset scores are standardized in relation to a standard normal distribution, with a mean of zero and standard deviation of one (Gwatkin et al., 2000). Each household is then assigned a score for each asset, and the scores are summed for each household. Individuals are ranked according to the total score of the household in which they reside. The sample is then divided into quintiles from one (lowest) to five (highest). A single asset index is developed on the basis of data from the entire country sample, and this index is used in all the tabulations presented.

Table 2.5 shows the distribution of the *de jure* household population into five wealth quintiles based on wealth index by residence and region. These distributions indicate the degree to which wealth is evenly (or unevenly) distributed by geographic area. The urban population is much more likely to fall in the higher wealth quintiles than the rural population. Seventy-five percent of the population in urban areas is in the highest quintile compared with only 11 percent of the population in rural areas. On the other hand, only 4 percent of the urban population falls in the lowest wealth quintile, compared with 23 percent of the rural population. Variations are also observed regionally, with the Central Region having the highest percentage of population in the lowest quintile (27 percent) compared with the other two regions (15 to 16 percent) and the lowest percentage in the highest quintile (16 percent) compared with the other two regions (22 to 23 percent).

Table 2.5 Wealth quintiles

Percent distribution of the de jure population by wealth quintiles, and the Gini Coefficient, according to residence and region, Malawi 2012

Residence/region	Wealth quintile					Total	Number of persons	Gini coefficient
	Lowest	Second	Middle	Fourth	Highest			
Residence								
Urban	4.0	2.7	3.7	14.9	74.7	100.0	2,035	28.2
Rural	22.6	23.0	22.7	20.9	10.8	100.0	12,144	42.5
Region								
Northern	15.8	16.2	22.2	23.4	22.4	100.0	1,901	34.9
Central	26.9	23.0	16.8	16.9	16.3	100.0	6,060	40.3
Southern	14.5	18.3	22.4	22.0	22.8	100.0	6,219	47.0
Total	20.0	20.0	20.0	20.0	20.0	100.0	14,179	40.3

2.4 POPULATION BY AGE AND SEX

Age and sex are important demographic variables and are the primary basis of demographic classification. Table 2.6 shows the distribution of the *de facto* household population in the 2012 Malawi MIS by five-year age groups, according to sex and residence.

A total of 14,087 people were enumerated in the survey, and they were almost equally divided by sex; the overall sex ratio is 919 males per 1,000 females. The sex ratio[1] in urban areas is 1,007 males per 1,000 females and in rural areas it is 906 males to 1,000 females. Eighty-six percent of the population lives in rural areas.

The population age structure shows a substantially larger proportion of persons in younger age groups than in older age groups for each sex (Figure 2.1). This reflects the relatively youthful age structure of the population of Malawi and indicates a population with high fertility. Forty-nine percent of the population is under age 15, while 46 percent is between age 15 and 64. Four percent of the population is age 65 or older.

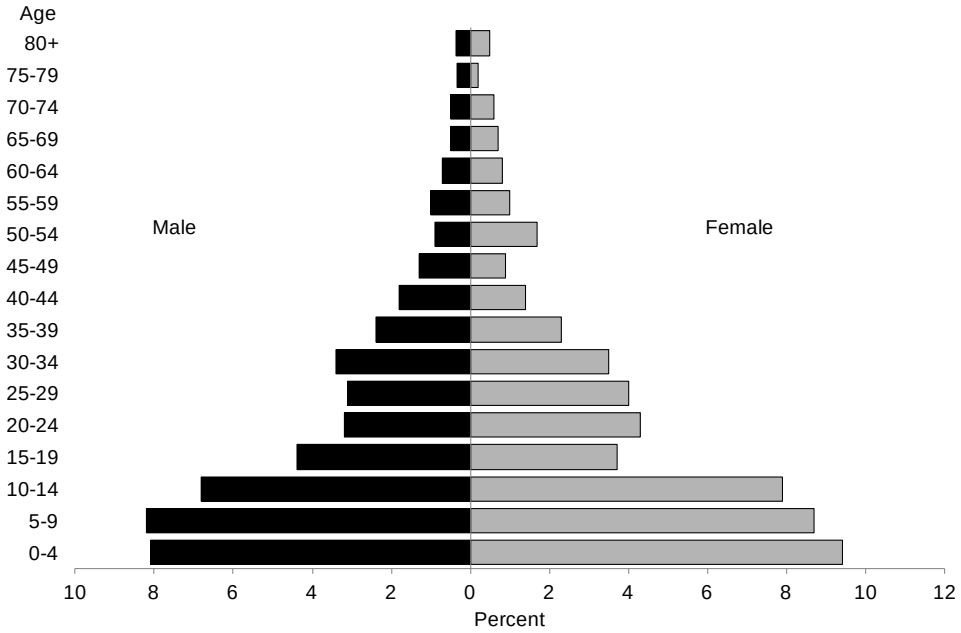
Table 2.6 Household population by age, sex, and residence

Percent distribution of the de facto household population by five-year age groups, according to sex and residence, Malawi 2012

Age	Urban			Rural					
	Male	Female	Total	Male	Female	Total	Male	Female	Total
<5	14.7	16.7	15.7	17.2	18.2	17.7	16.8	18.0	17.4
5-9	14.0	13.8	13.9	17.7	17.1	17.4	17.2	16.6	16.9
10-14	12.7	12.9	12.8	14.5	15.5	15.0	14.2	15.1	14.7
15-19	9.8	9.2	9.5	9.1	6.9	7.9	9.2	7.2	8.2
20-24	7.8	11.5	9.7	6.6	7.7	7.2	6.8	8.2	7.5
25-29	9.8	10.1	9.9	5.8	7.4	6.6	6.4	7.7	7.1
30-34	9.6	8.7	9.2	6.6	6.4	6.5	7.1	6.7	6.9
35-39	6.1	4.7	5.4	4.8	4.4	4.6	5.0	4.4	4.7
40-44	4.5	2.8	3.7	3.6	2.6	3.1	3.8	2.6	3.2
45-49	2.7	2.1	2.4	2.8	1.7	2.2	2.8	1.7	2.2
50-54	2.0	2.8	2.4	1.9	3.4	2.7	1.9	3.3	2.7
55-59	2.3	1.9	2.1	2.1	1.9	2.0	2.1	1.9	2.0
60-64	1.6	1.1	1.3	1.6	1.7	1.6	1.6	1.6	1.6
65-69	0.7	0.5	0.6	1.2	1.6	1.4	1.1	1.4	1.3
70-74	0.3	0.4	0.4	1.3	1.2	1.2	1.1	1.1	1.1
75-79	0.6	0.4	0.5	0.7	0.4	0.6	0.7	0.4	0.5
80 +	0.1	0.4	0.3	0.9	1.1	1.0	0.8	1.0	0.9
Don't know/missing	0.7	0.1	0.4	1.7	0.9	1.2	1.5	0.8	1.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	1,017	1,009	2,027	5,732	6,329	12,061	6,749	7,339	14,087

[1] Sex ratio is the demographic concept that measures the proportion of males to females in a given population. It is usually measured as the number of males per 100 females.

Figure 2.1 **Percent distribution of the de facto household population by five-year age groups, according to gender, Malawi MIS 2012**



2.5 HOUSEHOLD COMPOSITION

Table 2.7 presents information on the household composition, including the sex of the head of the household and the household size. These characteristics are important because they are associated with the welfare of the household. Female-headed households are, for example, typically poorer than male-headed households. Economic resources are often more limited in large households. Moreover, where the size of the household is large, crowding can lead to health problems.

Table 2.7 shows that households in Malawi are predominantly headed by men (72 percent), a common finding in most African countries. The proportion of households headed by women is higher in rural areas than in urban areas (29 percent and 21 percent, respectively).

Table 2.7 Household composition

Percent distribution of households by sex of head of household and by household size and mean size of household, according to residence, Malawi 2012

	Residence		
Characteristic	Urban	Rural	Total
Household headship			
Male	78.7	71.1	72.2
Female	21.3	28.9	27.8
Total	100.0	100.0	100.0
Number of usual members			
0	0.1	0.0	0.0
1	8.6	8.0	8.1
2	13.5	13.7	13.7
3	21.9	19.0	19.4
4	17.8	18.4	18.3
5	16.7	15.7	15.8
6	9.7	12.2	11.9
7	6.4	7.0	6.9
8	2.6	3.7	3.5
9+	2.6	2.3	2.3
Total	100.0	100.0	100.0
Mean size of households	4.1	4.2	4.2
Number of households	502	2,902	3,404

Note: Table is based on de jure household members, i.e., usual residents

Overall, the mean size of a household in Malawi is four persons, with most households having between two and six members.

2.6 CHARACTERISTICS OF FEMALE RESPONDENTS

2.6.1 General Characteristics

Table 2.8 presents the distribution of women age 15-49 by selected background characteristics. The proportion of women is 18 to 21 percent for the youngest age groups up to age 29, after which it declines as age increases; this reflects the comparatively young age structure of the population.

The proportion of women age 15-49 living in rural areas is much higher (83 percent) than those living in urban areas (18 percent). By region, the smallest percentage of women lives in the Northern Region (14 percent) compared with 42 percent in the Central Region and 44 percent in the Southern Region.

The overwhelming majority of Malawian women belong to the various denominations of Christianity (74 percent). Sixteen percent are Muslim, 1 percent have no religion, and 9 percent report belonging to other religions.

The largest ethnic group is Chewa (36 percent), followed by Yao (17 percent) and Lomwe (16 percent).

Eighteen percent of women age 15-49 have never been to school. Sixty-one percent have primary education and 19 percent have secondary education. Only 1 percent of women have an education beyond secondary school.

Roughly one-fifth of respondents fall into each wealth quintile, with slightly more women in the highest quintile (23 percent).

Table 2.8 Background characteristics of respondents

Percent distribution of women age 15-49 by selected background characteristics, Malawi 2012

Background characteristic	Weighted percent	Number of women: Weighted number	Number of women: Unweighted number
Age			
15-19	18.3	532	537
20-24	20.8	605	643
25-29	20.3	589	585
30-34	17.5	508	494
35-39	11.6	337	325
40-44	7.2	209	194
45-49	4.3	126	128
Religion			
Catholic	19.1	555	551
CCAP	14.2	412	471
Anglican	2.7	78	93
Seventh day advent./Baptist	7.1	207	235
Other christian	30.9	897	885
Muslim	15.9	462	420
No religion	1.0	28	20
Other	9.2	267	231
Ethnic group			
Chewa	36.0	1,047	951
Tumbuka	11.7	340	403
Lomwe	16.3	475	435
Tonga	1.5	43	59
Yao	16.7	484	464
Sena	3.1	89	87
Nkhonde	1.3	38	48
Ngoni	9.2	267	310
Other	4.2	123	149
Residence			
Urban	17.5	507	1,027
Rural	82.5	2,399	1,879
Region			
Northern	14.0	406	517
Central	42.0	1,222	1,150
Southern	44.0	1,279	1,239
Education			
No education	18.2	529	434
Primary	61.3	1,780	1,665
Secondary	19.2	558	736
More than secondary	1.3	38	71
Wealth quintile			
Lowest	19.9	578	468
Second	18.1	526	422
Middle	19.4	564	469
Fourth	19.3	561	524
Highest	23.3	678	1,023
Total 15-49	100.0	2,906	2,906

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.
na = Not applicable

2.6.2 Education Attainment of Women

Education is a key determinant of the lifestyle and status an individual enjoys in a society. Studies have consistently shown that educational attainment has a strong effect on health behaviours and attitudes. Generally, the higher the level of education a woman has attained, the more knowledgeable she is about the use of health facilities, family planning methods, and the health management of her children.

Table 2.9 shows the percent distribution of women age 15-49 by highest level of schooling attended or completed, and median years completed, according to background characteristics. The results show that 51 percent of women age 15-49 have attended primary school and 11 percent have completed it. Additionally, 13 percent of women have some secondary education and 8 percent have completed it. As mentioned above, only 1 percent of women have more than secondary education.

Younger women have higher levels of education than older women. For example, only 8 percent of women age 15-24 have no education compared with 37 percent of women age 45-49. Similarly, 18 percent of women age 15-24 have some secondary education compared with just 4 percent of women age 45-49.

The Central Region has the highest proportion of women with no education (23 percent) compared with 17 percent in the Southern Region and 6 percent in the Northern Region.

Table 2.9 also shows the correlation between education and economic status. Results show that the poorer a woman is, the less likely she is to have an education; 29 percent of women in the lowest wealth quintile have no education compared with 8 percent of women in the highest wealth quintile.

Overall, the median number of years of education among women age 15-49 is 5.1 years. The median number of years of education decrease steadily with age. The median number of years of education for urban women is higher (8.2 years) than the median for rural women (4.5 years). The median number of years of education also varies across regions, with the Northern Region having the highest number of completed years (6.4) compared with 4.7 and 4.9 years for Central and Southern Regions, respectively. The median number of years of education increases notably with wealth.

Table 2.9 Educational attainment

Percent distribution of women age 15-49 by highest level of schooling attended or completed, and median years completed, according to background characteristics, Malawi 2012

Background characteristic	Highest level of schooling						Total	Median years completed	Number of women
	No education	Some primary	Completed primary[1]	Some secondary	Completed secondary[2]	More than secondary			
Age									
15-24	7.9	53.0	12.9	18.3	7.1	0.9	100.0	6.2	1,137
15-19	4.1	53.8	16.2	20.4	5.2	0.4	100.0	6.6	532
20-24	11.2	52.3	10.0	16.5	8.7	1.3	100.0	5.8	605
25-29	14.0	53.7	10.7	13.2	7.0	1.4	100.0	5.2	589
30-34	23.3	48.1	7.9	11.4	7.4	1.9	100.0	4.4	508
35-39	32.4	48.7	7.2	5.9	3.8	1.9	100.0	3.0	337
40-44	39.7	41.2	11.7	3.9	2.3	1.3	100.0	2.1	209
45-49	37.3	45.0	9.1	4.3	3.3	1.0	100.0	2.0	126
Residence									
Urban	6.7	29.2	13.0	26.1	19.1	5.8	100.0	8.2	507
Rural	20.6	55.1	10.2	10.2	3.5	0.3	100.0	4.5	2,399
Region									
Northern	5.6	56.6	15.1	15.6	5.7	1.4	100.0	6.4	406
Central	23.3	46.9	10.8	12.9	4.8	1.2	100.0	4.7	1,222
Southern	17.3	52.2	9.1	12.2	7.7	1.4	100.0	4.9	1,279
Wealth quintile									
Lowest	28.8	59.5	6.3	4.6	0.8	0.0	100.0	2.9	578
Second	24.0	60.5	7.8	6.1	1.7	0.0	100.0	3.8	526
Middle	20.2	55.3	15.4	7.9	1.3	0.0	100.0	4.8	564
Fourth	12.8	54.9	12.7	14.4	5.2	0.0	100.0	5.6	561
Highest	7.5	27.9	11.1	28.5	19.3	5.6	100.0	8.6	678
Total	18.2	50.6	10.7	13.0	6.2	1.3	100.0	5.1	2,906

[1] Completed 8th grade at the primary level
[2] Completed 4th grade at the secondary level

2.6.3 Literacy of Women

Knowing the level and distribution of literacy among the population is an important factor in design and delivery of health messages and interventions. In this part of the survey, female respondents who had only primary education were shown a card with a short sentence in Chewa and Tumbuka and asked to read the complete sentence or part of it to assess their literacy. The percentage of women who are considered literate includes those who could read the entire card or part of a sentence and women who had secondary or higher education. Table 2.10 shows the distribution of female respondents by level of schooling attended and literacy, and the percentage literate, according to background characteristics.

The results show that, overall, 68 percent of women age 15-49 in Malawi are literate. Younger women are more literate that older women; 76 percent of women age 15-24 are literate compared with 45 percent of women age 45-49. Urban-rural differences also exist: 88 percent of urban women are literate compared with 64 percent of rural women. The proportion of women who are literate is lowest in the Central Region (63 percent) and in the lowest wealth quintile (48 percent).

Table 2.10 Literacy

Percent distribution of women age 15-49 by level of schooling attended and level of literacy, and percentage literate, according to background characteristics, Malawi 2012

Background characteristic	Secondary school or higher	No schooling or primary school: Can read a whole sentence	No schooling or primary school: Can read part of a sentence	No schooling or primary school: Cannot read at all	Total	Percentage literate[1]	Number of women
Age							
15-24	26.2	41.2	10.1	22.5	100.0	77.5	1,137
15-19	25.9	46.1	7.9	20.1	100.0	79.9	532
20-24	26.5	36.9	12.0	24.6	100.0	75.4	605
25-29	21.6	38.7	11.2	28.4	100.0	71.6	589
30-34	20.6	32.1	10.6	36.6	100.0	63.4	508
35-39	11.7	32.0	12.2	44.1	100.0	55.9	337
40-44	7.4	31.7	10.4	50.5	100.0	49.5	209
45-49	8.6	29.4	6.6	55.4	100.0	44.6	126
Residence							
Urban	51.1	30.1	7.2	11.7	100.0	88.3	507
Rural	14.1	38.3	11.2	36.4	100.0	63.6	2,399
Region							
Northern	22.7	45.2	13.8	18.3	100.0	81.7	406
Central	18.9	34.2	9.9	37.0	100.0	63.0	1,222
Southern	21.3	36.7	10.1	31.9	100.0	68.1	1,279
Wealth quintile							
Lowest	5.4	29.8	12.3	52.5	100.0	47.5	578
Second	7.7	34.9	12.6	44.7	100.0	55.3	526
Middle	9.2	46.4	11.3	33.2	100.0	66.8	564
Fourth	19.6	44.1	11.9	24.4	100.0	75.6	561
Highest	53.5	30.4	5.7	10.5	100.0	89.5	678
Total	20.5	36.8	10.5	32.1	100.0	67.9	2,906

[1] Refers to women who attended secondary school or higher and women who can read a whole sentence or part of a sentence

MALARIA PREVENTION 3

Key Findings

- More than half (55 percent) of Malawian households own at least one insecticide-treated net (ITN), and almost one-fifth (19 percent) of households have at least one ITN for every two people that stayed in the house the night before the survey.
- Nearly four in ten people (37 percent) has access to an ITN. This means 37 percent of Malawians could sleep under a mosquito net if every net in a household were used by two people.
- Forty-one percent of the population slept under an ITN the night before the survey, while 56 percent of children and 51 percent of pregnant women slept under an ITN the previous night.
- More than half (54 percent) of pregnant women received intermittent preventive treatment (IPTp) for malaria, that is, at least two doses of SP/Fansidar with at least one dose received during an antenatal care visit, which occurred during the most recent pregnancy.

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 (known in Malawi as LA); within 24 hours of onset of symptoms, and intermittent preventive treatment in pregnancy (IPTp) 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.

3.1 VECTOR CONTROL

Untreated nets and window screening have long been considered useful protection methods against mosquitoes and other insects (Lindsay and Gibson, 1988). Nets reduce the human-vector contact by acting as a physical barrier and thus reducing the number of bites from infective vectors (Bradley et al., 1986). However, nets and screens are often not well fitted or are torn, thus allowing mosquitoes to enter or feed on the part of the body adjacent to the netting fabric during the night (Lines et al., 1987). The problem of ill-used nets and screens provides one of the motives for impregnating them with a fast-acting insecticide that will repel or kill mosquitoes before or shortly after feeding (Lines et al., 1987; Hossain and Curtis, 1989).

The treatment of nets has been made possible by the availability of synthetic pyrethroids, the only insecticides currently used for treatment of nets. This class of insecticides was developed to mimic the insecticidal compounds of the natural pyrethrum. Currently, ITNs are regarded as a promising malaria control tool, and when used by all or most members of the community can reduce malaria transmission. ITNs have been shown to reduce malaria transmission by as much as 90 percent under trial conditions (Lengeler, 2004). ITNs also reduce malaria morbidity and mortality. Long-lasting insecticidal nets (LLINs) are a subset of ITNs. An LLIN is a factory-treated mosquito net made with netting material that has insecticide incorporated within or bound around the fibers. The net must retain its effective biological

activity without re-treatment for repeated washes, for three years of use under field conditions (WHO/Global Malaria Program, 2007). The current generation of LLINs lasts three to five years, after which point the net should be replaced. Vector control, specifically the ownership and use of ITNs, is one of the key interventions in malaria control. Under the current National Malaria Strategic Plan, the goal is for Malawi to have at least 80 percent of people living in malaria risk areas using appropriate malaria prevention interventions by 2015 (NMCP, nd).

3.1.1 Ownership of Mosquito Nets

The ownership and use of treated mosquito nets is the primary prevention strategy for reducing malaria transmission in Malawi. The LLINs policy includes free distribution of LLINs for children born in health facilities and for pregnant women at their first visit to an antenatal care (ANC) clinic. In addition, the LLIN distribution policy also includes giving a free LLIN to children attending their first clinic visit under the Expanded Program on Immunization (EPI) if an LLIN was not received at birth. In the past five years, over six million ITNs have been distributed countrywide in Malawi.

To assess household net ownership, all households in the 2012 MIS were asked if they owned mosquito nets and, if so, how many. To determine the type of net in the household, interviewers were instructed to observe the nets or ask the respondent the type of net he or she owns. Table 3.1 provides information on the percentage of households that own at least one mosquito net (any net, an ITN, and an LLIN), the average number of nets per household, and the percentage of households with at least one net per every two people who slept in the household the previous night, according to background characteristics.

Table 3.1 Household possession of mosquito nets

Percentage of households with at least one mosquito net (treated or untreated), insecticide-treated net (ITN), and long-lasting insecticidal net (LLIN); average number of nets, ITNs, and LLINs per household; and percentage of households with at least one net, ITN, and LLIN per two persons who stayed in the household last night, by background characteristics, Malawi 2012

Background Characteristic	Percentage of households with at least one mosquito net			Average number of nets per household			Number of house-holds	Percentage of households with at least one net for every two persons who stayed in the household last night[1]			Number of house-holds with at least one person who stayed in the household last night
	Any mosquito net	Insecticide-treated mosquito net (ITN)[2]	Long-lasting insect-cidal net (LLIN)	Any mosquito net	Insecticide-treated mosquito net (ITN)[2]	Long-lasting insect-cidal net (LLIN)		Any mosquito net	Insecticide-treated mosquito net (ITN)[2]	Long-lasting insect-cidal net (LLIN)	
Residence											
Urban	63.8	56.5	54.5	1.1	0.9	0.9	502	28.0	20.8	19.7	502
Rural	58.8	54.8	54.4	0.9	0.8	0.8	2,902	20.9	18.7	18.2	2,900
Region											
Northern	65.5	63.7	63.7	1.2	1.1	1.1	403	22.6	20.9	20.9	403
Central	59.6	56.7	56.1	1.0	0.9	0.9	1,427	23.1	21.2	20.5	1,424
Southern	57.9	51.3	50.4	0.8	0.7	0.7	1,574	20.8	16.5	16.0	1,574
Wealth quintile											
Lowest	48.9	46.6	46.6	0.7	0.6	0.6	730	16.4	16.2	15.5	728
Second	56.9	54.2	54.0	0.8	0.8	0.8	684	18.1	16.2	16.2	684
Middle	56.8	53.7	52.9	0.9	0.8	0.8	678	20.2	18.4	18.2	677
Fourth	62.6	56.7	56.6	1.0	0.9	0.9	642	20.3	17.2	17.1	642
Highest	73.5	64.8	62.6	1.4	1.2	1.1	670	35.5	27.1	25.6	670
Total	59.5	55.0	54.4	0.9	0.8	0.8	3,404	22.0	19.0	18.5	3,402

[1] De facto household members
[2] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment (LLIN) or a net that has been soaked with insecticide within the past 12 months

Table 3.1 shows that 60 percent of all households own at least one mosquito net of any type, 55 percent of households own at least one ITN, and 54 percent own at least one LLIN. Almost all nets in Malawi are LLINs. On average, Malawian households own 0.8 ITNs or LLINs per household, compared with an average of 0.9 of any type of net per household.

As seen in Table 3.1, ITN ownership is only slightly higher in urban households compared with rural households. Fifty-seven percent of households in the urban areas reported having at least one ITN compared with 55 percent of households in the rural areas. By region, household ownership of ITNs is

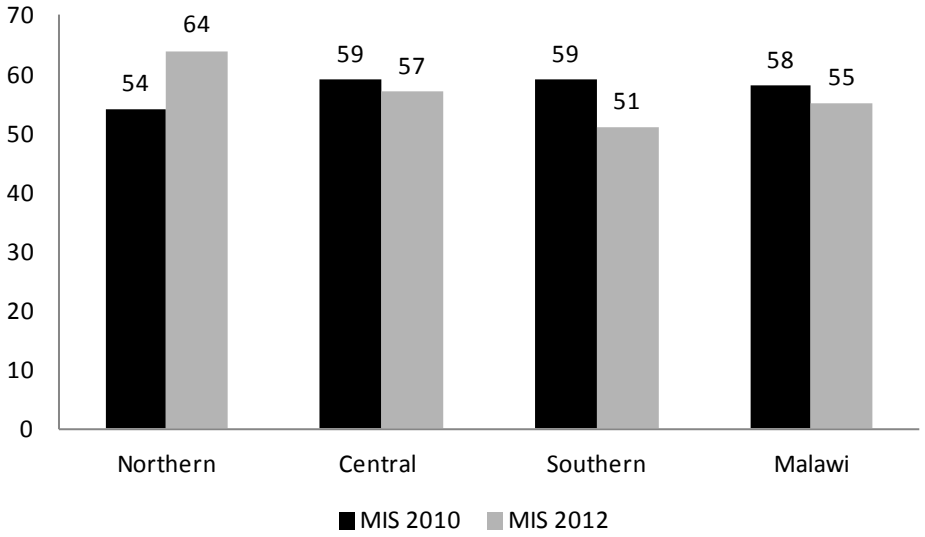
slightly higher in the Northern Region than in other regions. For example, 64 percent of households in the Northern Region own an ITN compared with 57 percent in the Central Region and 51 percent in the Southern Region. Wealthier households are more likely to own mosquito nets than households in lower wealth quintiles. Sixty-fix percent of the households in the highest wealth quintile own an ITN; in contrast, less than half of households (47 percent) in the lowest wealth quintile own at least one ITN.

Although mosquito net ownership is an important indication of the success of a Vector Control Program, it is also important to determine if a household has a sufficient number of nets for those sleeping within the home. By assuming that each net is shared by two people in the household, universal net coverage within the population can be measured. Table 3.1 also shows the percentage of households with at least one mosquito net for every two persons who stayed in the household the night before interview.

Overall, 19 percent of households in Malawi have reached universal ITN coverage; that is, less than one in five households has at least one ITN for every two persons who slept in the household the night before the survey. Universal ITN coverage is a little higher among urban households compared with rural households (21 percent and 19 percent, respectively). Seventeen percent of households in the Southern region have at least one ITN for every two people, compared with 21 percent of households in the Northern and Central regions. By wealth quintile, the highest proportion of households to have reached universal ITN coverage is found within the highest wealth quintile.

Figure 3.1 compares ownership of at least one ITN among households, as measured in Malawi's two Malaria Indicator Surveys, by national total and regional levels. At the national level, ownership of ITN has decreased within the past two years from 58 percent measured in 2010 to 55 percent measured in the current survey. A decrease in ITN ownership has been observed within the Central and Southern Regions between the two surveys. Within the Northern region, on the other hand, ITN ownership has increased by 18 percent within the past two years (from 54 percent in 2010 to 64 percent in 2012).

Figure 3.1 **Percentage of households that own at least one ITN**



3.1.2 Indoor Residual Spraying

Indoor residual spraying (IRS) is another vector control intervention used to control malaria transmission. IRS is the spraying of the interior walls and ceilings of a dwelling with long-lasting insecticide. It reduces the transmission of malaria by killing adult female mosquitoes when they rest on the walls of the dwelling after feeding. The IRS programme within Malawi is not national; rather it is focused within the following seven districts: Karonga and Nkhatabay (Northern region), Nkhotakota and Salima

(Central Region), Mangochi, Chikhwawa and Nsanje (Southern Region). To obtain information on the prevalence of indoor residual spraying, all households interviewed in the 2012 MMIS were asked whether the interior walls of their dwelling had been sprayed to protect against mosquitoes during the 12-month period before the survey and, if so, who had sprayed the dwelling. The percentage of households with IRS in the past 12 months is presented in Table 3.2.

Table 3.2 Indoor residual spraying against mosquitoes

Percentage of households in which someone has come into the dwelling to spray the interior walls against mosquitoes (IRS) in the past 12 months, and the percentage of households with at least one ITN and/or IRS in the past 12 months, by background characteristics, Malawi, 2012

Background Characteristic	Percentage of households with IRS[1] in the past 12 months	Percentage of households with at least one ITN[2] and/or IRS in the past 12 months	Number of households	Among households with IRS]super 1 in the past 12 months, percentage with walls painted or plastered after IRS	Number of households with IRS[1] in the past 12 months
Residence					
Urban	4.1	57.7	502	3.3	21
Rural	9.3	58.1	2,902	4.1	269
Region					
Northern	14.3	66.2	403	3.5	57
Central	3.7	57.3	1,427	7.2	52
Southern	11.5	56.7	1,574	3.2	180
Wealth quintile					
Lowest	5.7	49.4	730	(12.6)	42
Second	7.9	57.7	684	(2.0)	54
Middle	10.6	56.6	678	5.0	72
Fourth	10.9	61.0	642	0.5	70
Highest	7.8	66.6	670	2.5	52
Total	8.5	58.1	3,404	4.0	290

Note: Figures in parentheses are based on 25-49 unweighted cases.
[1] Indoor residual spraying (IRS) is limited to spraying conducted by a government, private or non-governmental organization
[2] An insecticide-treated net (ITN) is (1) a factory-treated net that does not require any further treatment (LLIN), or (2) a pretreated net obtained within the past 12 months, or (3) a net that has been soaked with insecticide within the past 12 months

Table 3.2 shows that 9 percent of all households in Malawi were sprayed in the past 12 months. By residence, rural households are more than twice as likely as urban households to have had IRS (9 percent compared with 4 percent). Among the regions, a higher proportion of households in the Northern region (14 percent) have been sprayed compared with households in the other regions. While there is no apparent pattern by wealth quintile, households in the middle and fourth quintile are the most likely to have been sprayed. Among households with IRS in the past 12 months, 4 percent had their walls painted or plastered after being sprayed**.**

Most of the spraying in the past 12 months was done by a government worker (84 percent), followed by a private company (14 percent). A small proportion of households were sprayed by someone from a nongovernmental organization (2 percent). All of the households in the lowest quintile were sprayed by a government worker, while 42 percent of households in the highest wealth quintile were sprayed by a private company (data not shown).

Table 3.2 also shows which households are covered by any vector control intervention;.by combining IRS with use of an ITN, it is possible to look at a combined indicator of malaria protection at the household level. Overall, 58 percent of households are protected either by owning an ITN or having received IRS in the past 12 months. There is no urban-rural difference in the percentage of households with at least one ITN and/or IRS in the past 12 months (58 percent). Households in the Northern Region, on the other hand, aremore likely to have at least one ITN and/or IRS in the past 12 months (66 percent) compare with those in the Central and Southern Regions (57 percent each). The proportion of households covered

by this vector control intervention increases with wealth quintile, from half of the households in the lowest quintile to two-thirds of the households in the highest quintile.

3.2. ACCESS TO MOSQUITO NETS

The 2012 MMIS presents data on access to an ITN, measured by the proportion of the population that could sleep under an ITN if each ITN in the household were used by up to two people. Coupled with mosquito net usage, ITN access can provide useful information on the magnitude of the behavioural gap in ITN ownership and use, or, in other words, the proportion of the population with access to an ITN but not using it. If the difference between these indicators is substantial, the program may need to focus on behaviour change and how to identify the main drivers/barriers to ITN use in order to design an appropriate intervention. This analysis helps ITN programs determine whether they need to achieve higher ITN coverage, promote ITN use, or both. Table 3.3 shows percent distribution of the *de facto* household population by number of ITNs the household owns, according to number of persons who stayed in the household the night before the survey.

Table 3.3 Access to an insecticide-treated net (ITN)

Percent distribution of the de facto household population by number of ITNs the household owns, according to number of persons who stayed in the household the night before the survey, Malawi 2012

	Number of persons who stayed in the household the night before the survey								
Number of ITNs	1	2	3	4	5	6	7	8+	Total
0	62.6	57.0	46.0	42.2	41.4	38.1	36.3	29.4	41.1
1	36.1	35.3	41.4	34.7	31.3	30.0	27.2	25.4	32.3
2	0.7	5.7	11.3	18.3	20.1	19.8	20.4	23.9	17.6
3	0.6	0.6	1.2	4.3	4.9	7.4	11.9	14.2	6.3
4	0.0	1.0	0.1	0.5	1.9	3.3	2.8	4.0	1.9
5	0.0	0.3	0.1	0.1	0.3	0.5	1.4	0.8	0.5
6	0.0	0.0	0.0	0.0	0.1	0.8	0.0	2.2	0.4
7+	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	280	969	1,971	2,526	2,593	2,402	1,627	1,719	14,087
Percent with access to an ITN[1]	37.4	43.0	40.2	40.5	35.8	35.3	33.8	33.2	37.2

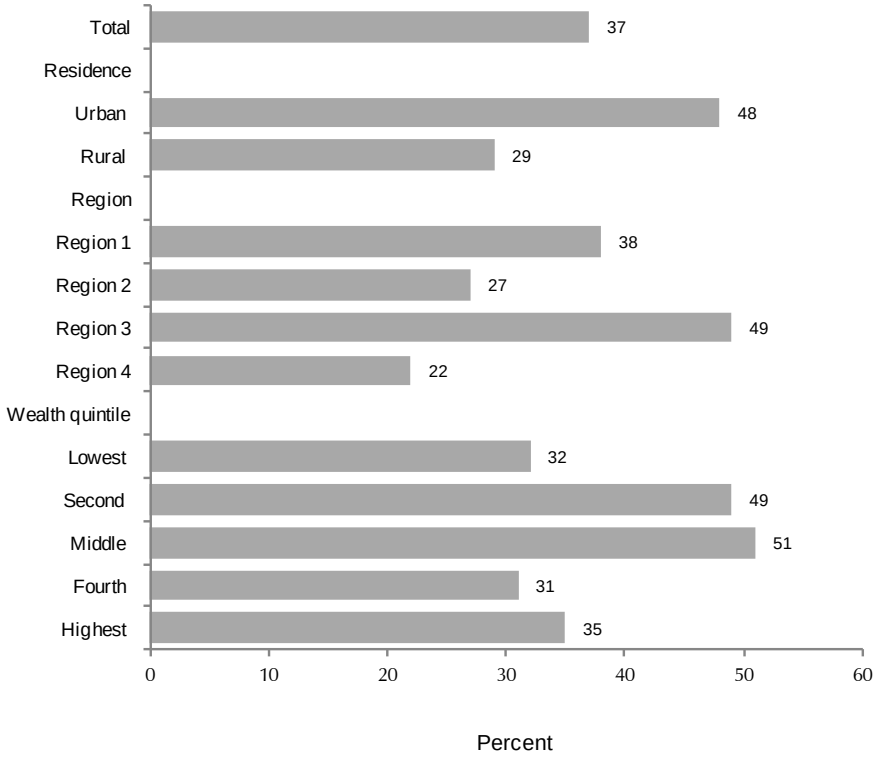
[1] Percentage of the de facto household population who could sleep under an ITN if each ITN in the household were used by up to two people

As shown in Table 3.3, the majority of Malawians do not have access to an ITN. Two in five people (41 percent) slept in homes with no ITN the night before the survey and therefore were not able to use an ITN. Three in ten individuals (32 percent) stayed in households that own at least one ITN, while two in ten (18 percent) slept in households that own two ITNs. Only 6 percent of the Malawians slept in a home with three ITNs and 2 percent of the population slept in homes with four ITNs. Very few individuals slept in homes with more than five ITNs.

Overall, 37 percent of the population could sleep under an ITN if each ITN in the household were to be used by up to two people. As expected, the proportion of persons with access to an ITN tends to decrease as household size increases. Access to an ITN is highest for households with two persons staying in the household the night before the survey (43 percent), followed by 3 to 4 persons sleeping in the household (40 – 41 percent). ITN access steadily decreases thereafter.

Figure 3.2 shows the percentage of the population with access to an ITN in the household, by residence and wealth quintile. People living in urban areas are more likely to have access to an ITN than their rural counterparts (40 percent and 37 percent respectively). Residents of the Northern Region are more likely to have access to an ITN (44 percent) compared with those in Central and Southern Regions (39 percent and 33 percent, respectively). Access to an ITN increases with increasing wealth; ranging from 31 percent for households in the lowest quintile to 48 percent for households in the highest quintile.

Figure 3.2 **Percentage of the de facto population with access to an ITN in the household**



[1] Percentage of the de facto household population who could sleep under an ITN if each ITN in the household were used by up to two people

3.2.1 Use of Mosquito Nets by Household Population

Mosquito net coverage of the entire population is necessary to accomplish large reductions in the malaria burden. Although vulnerable groups, such as children under age 5 and pregnant women, should still be prioritized, the equitable and communal benefits of wide-scale ITN use by older children and adults should be promoted and evaluated by national malaria control programs (Killeen, 2007). The 2012 MMIS asked about use of mosquito nets by household members during the night before the survey. These data are shown on Table 3.4.

Table 3.4 shows that 45 percent of the household population slept under any net the night before the survey, 41 percent slept under an ITN, and 40 percent slept under an LLIN. Forty-six percent of Malawians, however, were covered by a vector control intervention the night before the survey; that is they either slept under an ITN or slept in a dwelling sprayed with IRS in the past 12 months.

ITN use among the general population is highest for children under five (56 percent) compared with other age groups. Women and girls (43 percent) are more likely than men and boys (39 percent) to have slept under an ITN the previous night. There is no difference between ITN use among those living in urban and rural residences (41 percent). By region, however, ITN use is the highest among people living in the Central region (44 percent). ITN use steadily increases as wealth also increases. For example, 36 percent of those in the lowest wealth quintile slept under an ITN the previous night compared with 46 percent of those in the highest wealth quintile.

Table 3.4 Use of mosquito nets by persons in the household

Percentage of the de facto household population who slept the night before the survey under a mosquito net (treated or untreated), under an insecticide-treated net (ITN), under a long-lasting insecticidal net (LLIN), and under an ITN or in a dwelling in which the interior walls have been sprayed against mosquitoes (IRS) in the past 12 months; and among the de facto household population in households with at least one ITN, the percentage who slept under an ITN the night before the survey, by background characteristics, Malawi 2012

	Household population					Household population in households with at least one ITN[1]	
	Percentage who slept under any net last night	Percentage who slept under an ITN[1] last night	Percentage who slept under an LLIN last night	Percentage who slept under an ITN[1] last night or in a dwelling sprayed with IRS[2] in the past 12 months	Number	Percentage who slept under an ITN[1] last night	Number
Age (in years)							
<5	60.5	56.0	55.4	59.5	2,495	84.1	1,663
5-14	32.6	30.3	29.9	35.7	4,410	52.1	2,563
15-34	46.5	42.2	41.4	46.2	4,174	71.7	2,458
35-39	52.5	47.8	47.2	51.2	1,432	81.4	841
50+	41.8	37.7	37.5	42.4	1,419	75.4	710
Sex							
Male	42.4	39.1	38.5	43.8	6,749	66.7	3,955
Female	46.8	42.7	42.1	47.0	7,339	72.1	4,346
Residence							
Urban	48.4	40.8	38.9	43.1	2,027	67.9	1,218
Rural	44.1	41.0	40.6	45.9	12,061	69.8	7,083
Region							
Northern	44.0	43.2	43.2	49.6	1,879	61.5	1,318
Central	45.8	43.9	43.2	45.4	6,014	73.7	3,580
Southern	43.8	37.5	36.8	44.3	6,195	68.2	3,403
Wealth quintile							
Lowest	37.2	36.0	35.8	39.3	2,813	71.2	1,420
Second	41.8	40.0	39.9	44.9	2,809	68.7	1,635
Middle	43.8	41.2	40.6	46.5	2,835	74.5	1,567
Fourth	45.6	41.3	41.2	47.5	2,817	67.0	1,734
Highest	55.0	46.4	44.5	49.4	2,814	67.2	1,945
Total	44.7	41.0	40.4	45.5	14,087	69.5	8,301

Note: Total includes 158 household members with missing information on age.
[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment (LLIN) or a net that has been soaked with insecticide within the past 12 months
[2] Indoor residual spraying (IRS) is limited to spraying conducted by a government, private or non-governmental organization

As expected, ITN use is higher among households that own an ITN. In households that own at least one ITN, 70 percent of the population slept under an ITN the night before the survey. In households with at least one ITN, women and girls are more likely than men and boys to sleep under an ITN (72 percent and 67 percent, respectively). There is only a slight urban-rural difference in the percentage of population who utilized an ITN the night before the survey (68 percent and 70 percent, respectively). Among households that own an ITN, Central Region residents are more likely than those living in other regions to sleep under an ITN (74 percent compared with 68 percent in the Southern Region and 62 percent in the Northern Region). Three in four people in the middle wealth quintile who slept in a household that owned an ITN used an ITN the previous night. People in other wealth quintiles are less likely to use an ITN the previous night.

3.2.2 Use of Mosquito Nets by Children under Five

Children under five years of age are considered the most vulnerable to severe complications of malaria infection due to their lack of acquired immunity. Those living in areas of high malaria transmission naturally acquire immunity to the disease over time (Doolan et al., 2009). Acquired immunity is not the same as sterile immunity—that is, acquired immunity does not prevent *P. falciparum* infection but rather protects against severe disease and death. Age is an important factor in determining levels of acquired

immunity to malaria. For about six months following birth, antibodies acquired from the mother during pregnancy protect children born in areas of endemic malaria. This immunity is gradually lost and children start to develop their own immunity to malaria. The pace at which immunity develops depends on the exposure to malarial infection, and in high malaria-endemic areas, children are thought to attain a high level of immunity by their fifth birthday. Such children may experience episodes of malaria illness but usually do not suffer from severe, life-threatening malaria.

Table 3.5 shows the use of mosquito nets by children under age 5. Nationally, 56 percent of Malawian children under age 5 slept under an ITN the previous night. ITN utilization among children tends to decrease with age. For example, children less than 12 months old are 1.3 times more likely to have slept under an ITN the night before the survey compared with children age 48-59 months (63 percent and 49 percent, respectively). ITN utilization varies slightly by child's sex- boys are more likely than girls to have slept under an ITN the night before the survey (57 percent compared with 55 percent). Children in rural areas are slightly more likely than children in urban areas to use ITNs (56 percent and 54 percent, respectively). Those living in the Northern and Central Regions and those in the highest wealth quintile are more likely than others to have slept under an ITN.

Not surprisingly, ITN utilization is 1.5 times higher among children that slept in households that own at least one ITN than among children in all households. In households with at least one ITN, 84 percent of children slept under an ITN the night before the survey, an improvement from 81 percent in 2010 MIS.

Table 3.5 Use of mosquito nets by children

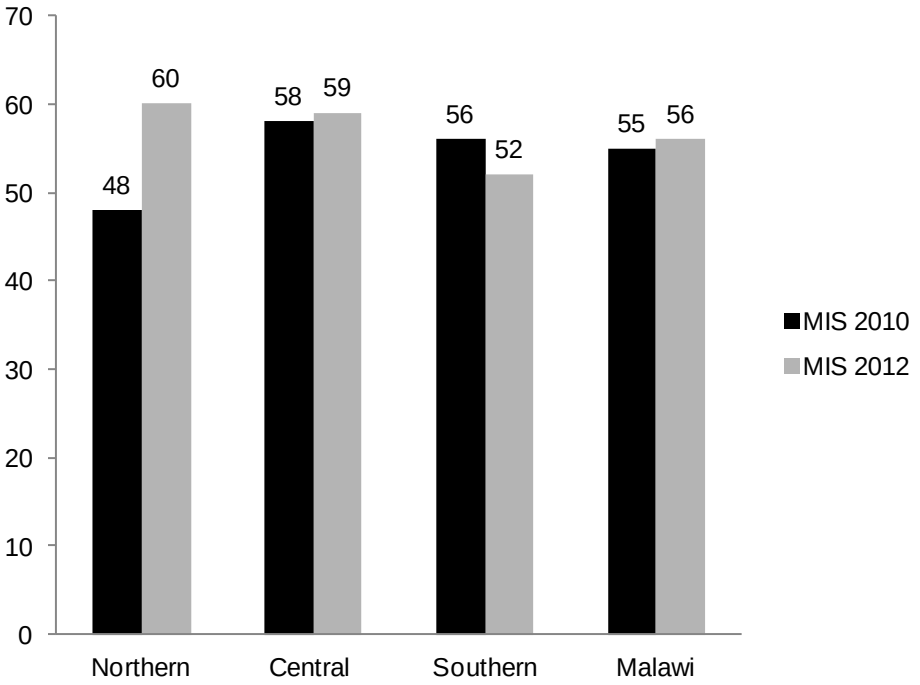
Percentage of children under five years of age who, the night before the survey, slept under a mosquito net (treated or untreated), under an insecticide-treated net (ITN), under a long-lasting insecticidal net (LLIN), and under an ITN or in a dwelling in which the interior walls have been sprayed against mosquitoes (IRS) in the past 12 months; and among children under five years of age in households with at least one ITN, the percentage who slept under an ITN the night before the survey, by background characteristics, Malawi 2012

	Children under age 5 in all households					Children under age 5 in households with at least one ITN[1]	
Background Characteristic	Percentage who slept under any net last night	Percentage who slept under an ITN[1] last night	Percentage who slept under an LLIN last night	Percentage who slept under an ITN[1] last night or in a dwelling sprayed with IRS[2] in the past 12 months	Number of children	Percentage who slept under an ITN[1] last night	Number of children
Age (in years)							
<1	66.4	62.7	62.6	64.8	476	89.0	335
1	64.6	58.3	57.7	62.9	530	87.6	352
2	60.6	55.1	54.0	57.6	499	83.8	328
3	58.3	55.3	54.3	59.7	499	83.1	332
4	52.7	48.9	48.4	52.4	492	76.2	316
Sex							
Male	60.9	57.4	57.2	61.0	1,152	83.1	796
Female	60.2	54.9	53.8	58.2	1,342	84.9	867
Residence							
Urban	60.3	54.0	51.6	54.4	320	85.5	202
Rural	60.6	56.4	55.9	60.2	2,175	83.9	1,461
Region							
Northern	60.2	59.7	59.7	63.4	348	75.5	275
Central	61.6	59.4	58.9	60.1	1,067	89.0	713
Southern	59.6	51.5	50.5	57.6	1,079	82.4	675
Wealth quintile							
Lowest	52.2	50.2	50.2	52.6	553	83.9	331
Second	59.1	56.6	56.4	60.1	563	84.1	379
Middle	60.6	56.9	55.4	60.7	509	87.7	330
Fourth	62.6	56.6	56.6	61.9	470	83.8	317
Highest	71.4	61.7	59.6	63.8	399	80.6	305
Total	60.5	56.0	55.4	59.5	2,495	84.1	1,663

Note: Table is based on children who stayed in the household the night before the interview.
[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment (LLIN) or a net that has been soaked with insecticide within the past 12 months.
[2] Indoor residual spraying (IRS) is limited to spraying conducted by a government, private or non-governmental organization

Figure 3.3 shows the use of mosquito nets by children under age 5 in the two Malawi MIS surveys. On a national level, there has been little change in ITN utilization among children in the past two year (55 and 56 percent). Variations, however, are observed within the regions. The proportion of children that slept under an ITN the previous night has decreased in the Southern Region between 2010 and 2012, from 56 percent to 52 percent. ITN utilization has remained relatively stable in the Central Region, but has increased in the Northern Region, where the proportion of children that slept under an ITN the previous night has increased by 24 percent from 48 percent in 2010 to 60 percent in 2012.

Figure 3.3 **Trend in use of ITN by children under age, 2010-2012**



3.2.3 Use of Mosquito Nets by Pregnant Women

Pregnancy suppresses immunity and women in their first pregnancies are especially at increased risk for severe malaria compared with other adults. In addition, malaria in pregnant women is frequently associated with the development of anaemia; it also interferes with the maternal-fetus exchange, leading to low-birth-weight infants. 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 an ITN (NMCP, nd).

Table 3.6 shows the use of mosquito nets by pregnant women by background characteristics. Overall, half of pregnant women in Malawi (51 percent) slept under an ITN the previous night. ITN utilization among pregnant women is highest among those women living in rural areas (51 percent) and among those with no education (56 percent).

Table 3.6 Use of mosquito nets by pregnant women

Percentages of pregnant women age 15-49 who, the night before the survey, slept under a mosquito net (treated or untreated), under an insecticide-treated net (ITN), under a long-lasting insecticidal net (LLIN), and under an ITN or in a dwelling in which the interior walls have been sprayed against mosquitoes (IRS) in the past 12 months; and among pregnant women age 15-49 in households with at least one ITN, the percentage who slept under an ITN the night before the survey, by background characteristics, Malawi 2012

	Among pregnant women age 15-49 in all households					Among pregnant women age 15-49 in households with at least one ITN[1]	
Background Characteristic	Percentage who slept under any net last night	Percentage who slept under an ITN[1] last night	Percentage who slept under an LLIN last night	Percentage who slept under an ITN[1] last night or in a dwelling sprayed with IRS[2] in the past 12 months	Number of women	Percentage who slept under an ITN[1] last night	Number of women
Residence							
Urban	50.7	46.6	43.7	46.6	38	68.6	26
Rural	56.5	51.4	50.8	52.6	213	80.7	136
Region							
Northern	(46.1)	(46.1)	(46.1)	(48.5)	32	(58.9)	25
Central	53.6	50.7	49.1	50.7	108	83.5	66
Southern	60.4	52.0	51.4	53.5	110	81.4	70
Education							
No education	59.4	55.9	55.9	55.9	37	86.1	24
Primary	55.4	50.9	50.1	52.3	169	77.6	111
Secondary	49.9	43.3	41.6	43.3	41	75.8	23
Wealth quintile							
Lowest	(49.2)	(49.2)	(46.9)	(49.2)	60	(80.6)	37
Second	(56.5)	(52.1)	(52.1)	(53.5)	54	(82.2)	34
Middle	62.1	57.9	57.9	57.9	53	(74.9)	41
Fourth	(57.5)	(45.2)	(45.2)	(49.8)	36	*	19
Highest	54.0	47.0	44.6	47.0	46	72.8	30
Total	55.6	50.7	49.7	51.7	250	78.8	161

Note: Total includes 4 women with more than secondary education. Table is based on women who stayed in the household the night before the interview. Figures in parentheses are based on 25-49 unweighted cases. An asterisk denotes a figure based on fewer than 25 unweighted cases that has been suppressed.

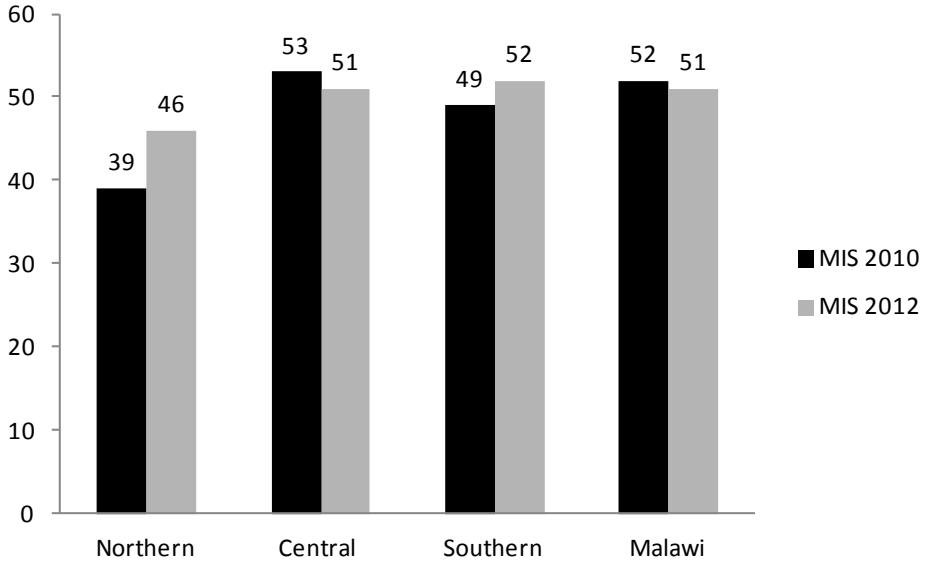
[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment (LLIN) or a net that has been soaked with insecticide within the past 12 months.

[2] Indoor residual spraying (IRS) is limited to spraying conducted by a government, private or non-governmental organization

As expected, use of ITN is considerably higher for women who live in households that own at least one ITN than for women in all households. Overall, 79 percent of pregnant women who live in households with at least one ITN slept under an ITN the night before the survey compared with 51 percent of women in all households. Variations in ITN utilization by pregnant women in households with at least one ITN by background characteristics are similar to those found in all households.

Figure 3.4 shows trends of ITN utilization among pregnant women on a national and regional level. At the national level, there has been little change in ITN use among pregnant women (49 percent measured in 2010 compared with 51 percent in 2012). Likewise, regional trends in the Central and Southern Regions are small. ITN utilization among pregnant women in the Central Region has decreased from 53 percent in 2010 to 51 percent in 2012. In the Southern region, on the other hand, ITN utilization among pregnant women has only slightly increased within the past two years- from 51 percent to 52 percent. Use of mosquito net by pregnant women in the Northern Region cannot be compared due to the small number of pregnant women within this region interviewed in 2012.

Figure 3.4 **Trend in use of ITN by pregnant women age 15-49, 2010 - 2012**



3.3 INTERMITTENT PREVENTIVE TREATMENT OF MALARIA IN PREGNANCY

As explained previously, in areas of high malaria transmission, by the time an individual reaches adulthood, she or he has acquired immunity that protects against severe disease. However, pregnant women—especially those pregnant for the first time—frequently regain their susceptibility to malaria. Although malaria in pregnant women may not manifest itself as either febrile illness or severe disease, it is frequently the cause of mild to severe anaemia. In addition, malaria during pregnancy can interfere with the maternal-fetus exchange that occurs at the placenta, leading to the delivery of low-birth-weight infants.

Intermittent preventive treatment of malaria (IPTp) during pregnancy has been the standard of care in Malawi since 1993. The national policy guidelines for IPTp 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) (NMCP, nd).

In the 2012 MMIS, women who had a live birth in the two years preceding the survey were asked several questions regarding the time they were pregnant with their most recent birth. They were asked if anyone told them during their pregnancy that pregnant women need to take medicine to keep them from getting malaria. They were also asked if they had taken any drugs to prevent getting malaria during that pregnancy and, if so, which drug. If the respondent did not know the name of the drug she took, interviewers were instructed to show her some examples of common antimalarials. They also were instructed to probe to see if she took three big, white tablets at the health facility (indicative of SP/Fansidar). If respondents had taken SP/Fansidar, they were further asked how many times they took it and whether they had received it during a prenatal care visit. IPTp data are presented in Table 3.7.

Table 3.7 Prophylactic use of antimalarial drugs and use of Intermittent Preventive Treatment (IPTp) by women during pregnancy

Percentage of women age 15-49 with a live birth in the two years preceding the survey who, during the pregnancy preceding the last birth, took any antimalarial drug for prevention, who took one dose of SP/Fansidar, and who received Intermittent Preventive Treatment (IPTp)[1], by background characteristics, Malawi 2012

Background Characteristic	Percentage who took any antimalarial drug	SP/Fansidar		Intermittent preventive treatment[1]		Number of women with a live birth in the two years preceding the survey
		Percentage who took any SP/Fansidar	Percentage who received any SP/Fansidar during an ANC visit	Percentage who took 2+ doses of SP/Fansidar	Percentage who took 2+ doses of SP/Fansidar and received at least one during ANC visit	
Residence						
Urban	80.7	79.0	78.3	56.0	55.6	123
Rural	77.5	77.1	75.9	53.5	52.8	867
Region						
Northern	84.1	82.9	82.9	61.6	61.6	133
Central	74.4	73.6	71.2	51.3	49.9	418
Southern	79.4	79.3	78.9	53.8	53.8	439
Education						
No education	69.0	69.0	69.0	50.2	50.2	194
Primary	79.0	78.3	76.5	53.7	52.8	646
Secondary	84.5	84.2	84.2	58.7	58.7	145
Wealth quintile						
Lowest	68.6	68.4	68.4	46.7	46.7	236
Second	78.7	77.2	76.3	56.9	56.0	228
Middle	79.8	79.8	78.0	57.3	57.3	201
Fourth	81.3	81.3	80.2	45.6	44.4	179
Highest	84.8	83.7	81.1	65.6	64.4	147
Total	77.9	77.4	76.2	53.8	53.2	990

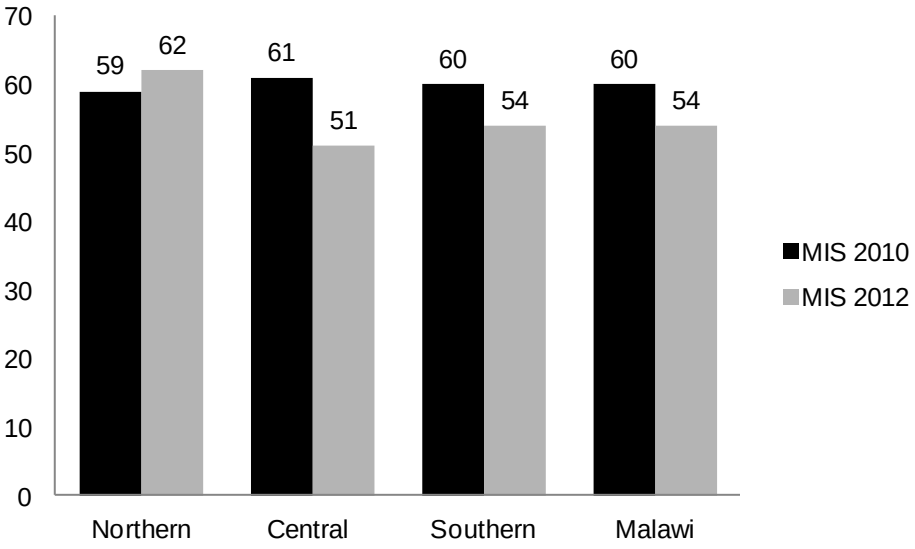
Note: Total includes 5 women with more than secondary education. An asterisk denotes a figure based on fewer than 25 unweighted cases that has been suppressed.
[1] IPTp: Intermittent preventive treatment during pregnancy is preventive treatment with two or more doses of SP/Fansidar.

Table 3.7 shows that nearly 4 in 5 pregnant women (78 percent) took an antimalarial drug during their last pregnancy. The majority of pregnant women who took any antimalarial drug—77 percent of women—took at least one dose of SP/Fansidar during their pregnancy; almost all of these women received the SP/Fansidar at an ANC visit. More than half of women (54 percent) reported taking two or more doses of SP/Fansidar during their last pregnancy, or received IPTp. Almost all of the women who took at least two doses of SP/Fansidar received at least one dose during an antenatal care (ANC) visit

Urban women are slightly more likely than rural women to have taken an antimalarial drug during pregnancy (81 percent relative to 78 percent). Among the regions, women living in the Northern region (84 percent) are more likely than those living elsewhere to have taken an antimalarial drug during their last pregnancy. The proportion of pregnant women that took an antimalarial drug increases with both education and wealth. For example, women in the wealthiest households are more likely than other women to take an antimalarial drug during pregnancy. Differentials in the use of SP/Fansidar across subgroups of women are similar to those in any antimalarial drug.

Figure 3.5 compares IPTp use among women in the past two years. On a national level, the overall use of IPTp during pregnancy in MIS 2012 is lower than that recorded in the 2010 MIS (54 percent compared with 60 percent). As regards to adherence to the recommended prevention measures for pregnant women, the proportion of women who received two or more doses of SP during pregnancy has decreased since 2010 in the Central and Southern Regions. Uptake up IPTp in the Northern Region, conversely, has increased from 59 percent in 2010 to 62 percent in 2012. The overall reduction in IPTp could be due to stock out of SP for IPTp during the period of 2011-2012.

Figure 3.5 **Percentage of pregnant women who gave birth in the two years before the survey who received two or more doses of SP**



3.4 PREFERENCE FOR COLOUR AND SHAPE OF MOSQUITO NET

The 2012 MMIS respondents who did not have a mosquito net were asked about their colour and shape preference for mosquito nets. Table 3.8 shows non-net owner's colour preference of mosquito nets and Table 3.9 shows shape preference.

Table 3.8 shows that more than half (56 percent) of households interviewed prefer blue mosquito nets, and almost 2 in 5 households (38 percent) interviewed prefer green mosquito nets. Only 4 percent of households interviewed prefer white nets, while very few households prefer red, black, or any other colour of net. Blue nets are more preferred by urban households, while green is the preferred colour in rural areas. Preference for net colour varies by region. Respondents in the Northern region are more likely to prefer blue nets, while households in the Central region prefer green nets. Net colour also has an association with the household's wealth. Preference for blue nets increases with the household's wealth quintile, while preference for green nets is highest among households in the lowest quintile.

Table 3.8 Preference for colour of mosquito net

Percent distribution of households with no mosquito nets by preference for colour of mosquito net, by background characteristics, Malawi 2012

Background Characteristic	Blue	Green	Red	White	Black	Other	DK/No preference	Total	Number of households
Residence									
Urban	75.3	18.0	0.2	6.2	0.4	0.0	0.0	100.0	182
Rural	52.5	40.4	0.8	4.1	0.2	1.3	0.8	100.0	1,197
Region									
Northern	62.0	32.6	0.0	2.6	0.6	2.2	0.0	100.0	139
Central	50.5	41.0	0.4	5.0	0.3	1.7	1.1	100.0	577
Southern	58.4	35.4	1.1	4.1	0.0	0.5	0.4	100.0	662
Wealth quintile									
Lowest	49.8	43.3	1.5	3.3	0.3	1.4	0.4	100.0	373
Second	50.4	42.5	0.3	2.4	0.3	2.4	1.7	100.0	295
Middle	56.3	37.2	0.0	5.3	0.0	1.3	0.0	100.0	293
Fourth	58.4	34.4	1.4	4.5	0.3	0.0	1.1	100.0	240
Highest	70.6	21.3	0.2	8.0	0.0	0.0	0.0	100.0	178
Total	55.5	37.5	0.7	4.3	0.2	1.2	0.7	100.0	1,378

Table 3.9 shows that 55 percent of households prefer conical-shaped nets and 44 percent prefer rectangular-shaped nets. Conical nets are more popular among urban households (79 percent), while rectangular nets are the preferred shape in rural areas (47 percent). Households in the Southern region are more likely than in other regions to prefer conical nets (63 percent), while rectangular nets are more preferred in the Central region (51 percent) than in other regions. Preference for conical nets increases with wealth quintile, from 46 percent for households in the lowest quintile to 80 percent for households in the highest quintile. Preference for rectangular nets decreases with wealth. Fifty-four percent of households in the lowest wealth quintiles prefer rectangular nets compared with 20 percent of households in the highest wealth quintile.

Table 3.9 Preference for shape of mosquito net

Percent distribution of households with no mosquito nets by preference for shape of mosquito net, by background characteristics, Malawi 2012

Background Characteristic	Conical	Rectangular	DK/No preference	Total	Number of households
Residence					
Urban	78.8	21.2	0.0	100.0	182
Rural	51.5	47.1	1.4	100.0	1,197
Region					
Northern	52.1	45.5	2.4	100.0	139
Central	47.2	50.9	1.9	100.0	577
Southern	62.5	37.1	0.4	100.0	662
Wealth quintile					
Lowest	46.1	53.5	0.4	100.0	373
Second	46.7	49.8	3.4	100.0	295
Middle	53.5	45.7	0.8	100.0	293
Fourth	62.6	36.3	1.1	100.0	240
Highest	80.2	19.8	0.0	100.0	178
Total	55.1	43.7	1.2	100.0	1,378

MANAGEMENT OF FEVER AND ANAEMIA AND MALARIA IN CHILDREN

4

Key Findings

- One-third (32 percent) of Malawian children had a fever in the two weeks prior to the survey. Of these children, half sought advice or treatment and one-fifth had blood taken from a finger or heel for testing.
- Among children that had a fever, 3 in 10 took ACT, the recommended malaria treatment in Malawi.
- An overwhelmingly large proportion of children under age 5 with fever who received antimalarials for treatment were given artemether-lumefantrine-(LA) (91 percent), while 9 percent were given quinine, 2 percent received SP/Fansidar, and less than one percent of children with a fever took chloroquine.
- Fewer than 1 in 10 children (9 percent) have severe anaemia (hemoglobin <8g/dL).
- Analysis of blood smears by microscopy revealed a somewhat lower prevalence: 28 percent of children age 6-59 months.

Chapter 4 of the 2012 MMIS presents data to assess treatment implementation and health outcomes of the National Malaria Control Program. Data that are presented show the prevalence and cost of treatment of fever in household members as well as the prevalence, diagnosis, and treatment of fever in children. Data are also presented showing the prevalence of severe anaemia, defined as haemoglobin levels <8g/dL, and malaria infection in children age 6-59 months.

4.1 PREVALENCE, DIAGNOSIS, AND PROMPT TREATMENT OF CHILDREN WITH FEVER

Malaria case management, including the identification, diagnosis, and rapid treatment of all malaria cases with appropriate and effective antimalarial drugs, is one of the key strategic goals for malaria control in Malawi. Fever is a major manifestation of malaria and other acute infections in children. Most malarial fevers occur at home, and prompt and effective treatment is critical to prevent morbidity and mortality related to malaria. The 2012 MMIS asked mothers whether their children under age 5 had had a fever in the two weeks preceding the survey and, if so, whether any treatment was sought. Questions were also asked about blood testing, the types of drugs given to the child, and how soon and for how long the drugs were taken.

Table 4.1 shows the percentage of children under age 5 who had fever in the two weeks preceding the survey and, among those children under age 5 with fever, the percentage for whom advice or treatment was sought from a health facility, provider, or pharmacy, the percentage of such children who had a drop of blood taken from a finger- or heel-prick (presumably for a malaria test), the percentage who took ACT or any antimalarial drugs, and the percentage who took drugs on the same or next day.

Table 4.1 Prevalence, diagnosis, and prompt treatment of children with fever

Percentage of children under age 5 with fever in the two weeks preceding the survey; and among children under age 5 with fever, the percentage for whom advice or treatment was sought from a health facility, provider, or pharmacy, the percentage who had blood taken from a finger or heel, the percentage who took artemisinin-based combination therapy (ACT), the percentage who took ACT the same or next day following the onset of fever, the percentage who took antimalarial drugs, and the percentage who took the drugs the same or next day following the onset of fever, by background characteristics, Malawi, 2012

	Among children under age 5:		Among children under age 5 with fever:						
Background Characteristic	Percentage with fever in the two weeks preceding the survey	Number of children	Percentage for whom advice or treatment was sought from a health facility, provider or pharmacy[1]	Percentage who had blood taken from a finger or heel for testing	Percentage who took ACT	Percentage who took ACT same or next day	Percentage who took antimalarial drugs	Percentage who took antimalarial drugs same or next day	Number of children
Age (in months)									
<12	25.4	467	56.1	22.9	21.0	16.9	24.8	20.7	119
12-23	37.2	522	58.3	29.0	34.9	24.9	38.9	28.0	194
24-35	37.3	472	54.5	18.9	36.0	26.0	37.9	27.9	176
36-47	31.8	448	36.5	12.3	25.9	17.5	27.2	18.7	142
48-59	26.2	452	39.3	19.6	24.2	16.3	28.2	20.3	118
Sex									
Male	33.2	1,096	50.7	22.6	29.5	20.7	32.8	23.7	364
Female	30.5	1,266	49.2	19.5	29.7	21.5	32.3	24.0	386
Residence									
Urban	25.6	309	70.9	34.5	26.4	19.0	31.1	23.1	79
Rural	32.7	2,052	47.4	19.4	29.9	21.4	32.7	23.9	671
Region									
Northern	24.5	329	46.7	21.8	23.4	20.5	25.1	22.1	81
Central	33.0	1,009	47.3	18.1	24.0	17.4	27.4	20.6	333
Southern	32.9	1,024	53.3	23.7	36.5	24.9	39.4	27.4	336
Mother's education									
No education	35.1	488	38.2	14.7	23.9	16.2	24.3	16.7	171
Primary	31.9	1,542	51.1	20.5	30.0	21.6	33.1	24.4	491
Secondary	26.8	318	65.5	34.8	39.3	28.5	44.4	33.6	85
More than secondary	14.0	13	100.0	100.0	0.0	0.0	76.9	76.9	2
Wealth quintile									
Lowest	33.9	546	40.9	20.9	27.9	21.1	31.7	24.6	185
Second	34.0	516	49.2	19.8	32.4	20.5	32.7	20.7	175
Middle	33.4	483	40.0	12.6	20.9	17.1	23.3	19.5	161
Fourth	31.3	440	56.9	22.0	36.7	24.0	40.8	27.3	138
Highest	24.0	377	76.7	37.0	31.9	25.1	37.6	30.7	91
Total	31.7	2,362	49.9	21.0	29.6	21.1	32.5	23.8	750

[1] Excludes market, shop, and traditional practitioner

Table 4.1 shows that one-third (32 percent) of children under age 5 had fever during the two weeks preceding the survey, with a higher proportion of rural children (33 percent) than urban children (26 percent) having fever. Male children were slightly more likely than female children to have had fever in the last two weeks (33 percent and 31 percent, respectively), while the prevalence of fever was highest among those age 12-35 months. Children from the Northern Region and those whose mothers had at least a secondary education were less likely than other children to have had fever in the two weeks before the survey. Children in the highest wealth quintile were less likely to have experienced fever (24 percent) than those in other wealth quintiles (31 percent or higher).

Among children with fever, one in two (50 percent) were taken to a health facility, provider, or pharmacy for advice or treatment. Treatment seeking behaviour tends to decrease with children's age; children less than age 36 months are more likely to be taken for treatment than older children. Urban children are 1.5 times more likely than rural children to have been taken to a health facility, provider, or pharmacy for advice or treatment (71 percent compared with 47 percent). The proportion of children who were taken for treatment is higher in the Southern Region than in other regions (53 percent compared with 47 percent). Care seeking for children with fever generally increases with the mother's education and wealth quintile. For example, treatment for fever was sought for two-thirds (66 percent) of children whose mothers have had at least a secondary education and 77 percent of children in the highest wealth quintile compared with almost four in ten children whose mothers have had no education (38 percent) and 41 percent of children in the lowest quintile.

In the 2012 MMIS, mothers were asked whether children under age 5 with fever had blood taken from a finger or heel for testing, presumably for diagnostic purposes. It should be noted that the question did not ask which test was conducted. Although the blood could have been taken for malaria testing, it could also have been taken for anaemia or other tests. The mother may or may not have known the reason for which blood was taken from her child. Overall, 21 percent of children with fever had a heel or finger prick; this is three times higher than the percentage of children with reported blood taken in the 2010 MMIS (7 percent). The increase in the percentage of children who had finger or heel prick is likely due to the new policy that calls for universal diagnosis of people with fever before malaria treatment is provided (http://pmi.gov/countries/mops/fy12/malawi_mop_fy12.pdf).

The percentage varies by subgroup of children and follows a pattern similar to that observed among differentials of children taken for advice or treatment; it is highest among children age 12-23 months, it is higher for children in urban areas than in rural areas, and highest for children in the Southern Region compared with other regions. The likelihood that a child had blood taken increases with both mother's education and wealth quintile. For example, the proportion of children who had blood taken from a finger or heel for testing increases from 15 percent for children whose mother have no education to 21 percent of children whose mothers have a primary education to 35 percent for children whose mothers attended secondary school.

Table 4.1 also presents the percentage of children with fever that received prompt treatment. Overall, 3 in 10 children (30 percent) with fever took artemisinin-based combination therapies (ACTs), the recommended treatment for malaria in Malawi. In Malawi, the most common ACT is artemether-lumefantrine, locally known as LA. Of those children with fever, one in five (21 percent) took an ACT within 24 hours of onset of fever, or during the recommended timeframe. By age, children 12-35 months are more likely than others to have taken an ACT, while there is no difference in ACT use by child's sex. Children in the rural areas (30 percent) are more likely than children in the urban areas (26 percent) to take an ACT. Among the regions, children living in the Southern (37 percent) Region are about 1.5 times more likely to have taken an ACT compared with children in the Central Region (24 percent) or Northern Region (23 percent). The proportion of children that took an ACT increases with increased education of mothers, but shows no relationship to wealth quintile.

Variation by background characteristics among the percentage of children that took an ACT the same or next day are similar to the differentials observed for children that took an ACT. There is no notable difference by residence in the proportion of children who took an ACT within the same or next day after onset of fever (31 percent in urban areas and 33 percent in rural areas). The percentage of children with fever treated with ACT has a positive relationship with the mother's education; it is lowest for children with an uneducated mother (24 percent) and increases with the mother's education to 39 percent for children of mothers who have secondary education.

4.2 MALARIA CASE MANAGEMENT AMONG CHILDREN

Details on the types and timing of antimalarial drugs given to children to treat fever are presented in Table 4.2. When interpreting the results, it is important to remember that the information is based on reports from the mothers of the ill children, many of whom may not have known the specific drug given to the child.

As shown in Table 4.2, an overwhelmingly large proportion of children under age 5 with fever who took an antimalarial drug were given LA (91 percent), while 9 percent were given quinine, 2 percent were given SP/Fansidar, and less than one percent of children with a fever that took an antimalarial drug were given chloroquine. These findings show little change since 2010, when 89 percent of children under age 5 with fever who took an antimalarial were given LA, 10 percent were given quinine, and 1 percent took SP/Fansidar (NMCP, nd).

Among children with fever that took an antimalarial drug, nearly two-thirds (65 percent) took LA the same or next day after the onset of fever, or within the recommended period of time. Variations in type or timing of antimalarial drugs use by background characteristics should be interpreted with caution because the number of cases presented in the table is small. Children from rural areas are more likely than children from urban areas to have taken LA for treatment of fever (92 percent and 83 percent, respectively). Comparison with data in the 2010 MMIS based on children with fever who took antimalarial drugs shows that the pattern of treatment has not changed much since 2010; 65 percent of children took LA the same or next day (NMCP, nd).

Table 4.2 Type and timing of antimalarial drugs used

Among children under age 5 with fever in the two weeks preceding the survey who took any antimalarial medication, the percentage who took specific antimalarial drugs and the percentage who took each type of drug the same or next day after developing fever, by background characteristics, Malawi 2012

Background Characteristic	Percentage of children who took drug:					Percentage of children who took drug the same or next day:					Number of children with fever who took anti-malarial drug
	SP/ Fansidar	Chloro-quine	Quinine	AA/ASAQ	LA (Coartem)	SP/ Fansidar	Chloro-quine	Quinine	AA/ASAQ	LA (Coartem)	
Age (in months)											
<12	(0.0)	(3.3)	(12.0)	(0.0)	(84.7)	(0.0)	(3.3)	(12.0)	(0.0)	(68.1)	30
12-23	1.6	0.0	11.6	0.0	89.8	0.0	0.0	9.2	0.0	64.0	75
24-35	2.6	0.0	2.4	0.0	95.0	2.6	0.0	2.4	0.0	68.8	67
36-47	(3.6)	(0.0)	(6.8)	(0.9)	(94.5)	(3.6)	(0.0)	(4.5)	(0.9)	(63.3)	39
48-59	(0.0)	(0.0)	(14.3)	(0.0)	(85.7)	(0.0)	(0.0)	(14.3)	(0.0)	(57.6)	33
Sex											
Male	3.6	0.0	9.1	0.3	89.7	2.6	0.0	8.3	0.3	63.0	119
Female	0.0	0.8	8.4	0.0	91.9	0.0	0.8	7.0	0.0	66.6	125
Residence											
Urban	(0.0)	(0.0)	(15.1)	(1.5)	(83.4)	(0.0)	(0.0)	(13.2)	(1.5)	(59.7)	25
Rural	2.0	0.4	8.0	0.0	91.6	1.4	0.4	7.0	0.0	65.4	219
Region											
Northern	(0.0)	(4.8)	(6.5)	(1.8)	(91.6)	(0.0)	(4.8)	(6.5)	(1.8)	(79.8)	20
Central	1.5	0.0	13.1	0.0	87.8	1.5	0.0	11.6	0.0	63.7	91
Southern	2.2	0.0	6.1	0.0	92.7	1.3	0.0	5.0	0.0	63.3	132
Mother's education											
No education	(0.0)	(0.0)	(1.8)	(0.0)	(98.2)	(0.0)	(0.0)	(1.8)	(0.0)	(66.7)	42
Primary	2.7	0.6	9.0	0.2	90.3	1.9	0.6	7.4	0.2	65.1	163
Secondary	(0.0)	(0.0)	(11.5)	(0.0)	(88.5)	(0.0)	(0.0)	(11.5)	(0.0)	(64.1)	38
More than secondary	*	*	*	*	*	*	*	*	*	*	1
Wealth quintile											
Lowest	(2.4)	(0.0)	(13.3)	(0.0)	(88.1)	(2.4)	(0.0)	(11.1)	(0.0)	(66.6)	59
Second	(0.0)	(0.0)	(3.2)	(0.6)	(98.6)	(0.0)	(0.0)	(0.8)	(0.6)	(62.0)	57
Middle	(0.0)	(0.0)	(12.8)	(0.0)	(89.7)	(0.0)	(0.0)	(12.8)	(0.0)	(73.4)	38
Fourth	(5.3)	(0.0)	(4.8)	(0.0)	(90.0)	(3.1)	(0.0)	(4.8)	(0.0)	(58.9)	56
Highest	(0.0)	(2.9)	(12.2)	(0.0)	(85.0)	(0.0)	(2.9)	(12.2)	(0.0)	(66.7)	34
Total	1.8	0.4	8.7	0.1	90.8	1.3	0.4	7.6	0.1	64.8	244

Note: Figures in parentheses are based on 25-49 unweighted cases. An asterisk denotes a figure based on fewer than 25 unweighted cases that has been suppressed.
ACT = Artemisinin-based combination therapy

4.3 ANAEMIA AND MALARIA PREVALENCE AMONG CHILDREN

As with many countries in sub-Sahara African, malaria is the leading cause of death in Malawi among children under age 5. With high transmission of malaria experienced in Malawi throughout the year, partial immunity develops within the first two years of life. Many people however, including children, may have malaria parasites in their blood without showing any signs of infection. Such asymptomatic infection not only contributes to further transmission of malaria but also increases the risk of anaemia among the infected individuals. Anaemia associated with malaria is a major cause of morbidity and mortality, making prevention and treatment of malaria among children and pregnant women even more critical.

A total of 2,183 children age 6-59 months living in households randomly selected for the 2012 MMIS were eligible for haemoglobin and malaria testing. The HemoCue system was used to measure the concentration of haemoglobin in the blood obtained from a finger prick. The SD Bioline Malaria Ag P.f rapid diagnostic test (RDT) was used to detect malaria in the blood from the same finger prick. Both tests were carried out in the field.

Table 4.3 Coverage of testing for anaemia and malaria in children

Percentage of eligible children age 6-59 months who were tested for anaemia and for malaria, by background characteristics (unweighted), Malawi 2012

Background characteristic	Percentage tested for: Anaemia	Malaria with RDT	Malaria by microscopy	Number of children eligible
Age (in months)				
6-8	86.4	86.4	86.4	125
9-11	97.2	95.3	97.2	107
12-17	96.1	96.1	96.1	257
18-23	98.0	97.6	97.6	247
24-35	96.9	96.7	96.7	486
36-47	98.8	98.6	98.2	487
48-59	97.7	97.7	97.0	474
Sex				
Male	97.1	97.0	96.8	1,025
Female	96.8	96.5	96.4	1,158
Residence				
Urban	96.0	95.5	96.1	596
Rural	97.3	97.2	96.7	1,587
Region				
Northern	98.4	98.4	98.4	379
Central	97.2	96.9	96.7	861
Southern	96.1	95.9	95.7	943
Mother's education				
No education	97.2	97.2	96.7	361
Primary	96.9	96.7	96.5	1,225
Secondary	98.0	97.7	98.0	350
More than secondary	94.7	94.7	94.7	19
Wealth quintile				
Lowest	97.5	97.5	97.3	404
Second	97.6	97.6	96.9	423
Middle	96.8	96.5	96.3	400
Fourth	96.4	96.1	96.1	411
Highest	96.5	96.0	96.3	545
Total	96.9	96.7	96.6	2,183

Table 4.3 shows the coverage of anaemia and malaria testing in children age 6-59 months. Of the 2,183 children eligible for haemoglobin and malaria testing, 97 percent were tested for anaemia and malaria. As shown in the table, the coverage levels are uniformly high across background characteristics.

4.3.1 Anaemia Prevalence among Children

Anaemia, defined as a reduced level of haemoglobin in blood, decreases the amount of oxygen reaching the tissues and organs of the body and reduces their capacity to function. Anaemia is associated with impaired motor and cognitive development in children. The main causes of anaemia in children are malaria and inadequate intake of iron, folate, vitamin B_{12}, or other nutrients. Malaria accounts for a significant proportion of anaemia in children under age 5 in Malawi. Other causes of anaemia include intestinal worms and sickle cell disease. Anaemia is a serious public health problem in Malawi. In this survey, severe anaemia was defined as a haemoglobin (Hb) level less than 8 grams per decilitre (g/dl).

Table 4.4 shows that 9 percent of children age 6-59 months are severely anaemic; that is, they have a haemoglobin level less than 8 g/dl. Although anaemia is a serious public health problem in Malawi, severe anaemia has decreased from 12 percent as measured in the 2010 MMIS. Children age 9-11 months (17 percent) are the most likely to be severely anaemic compared with other children, and in general, prevalence of severe anaemia decreases with age. Male children are more likely than female children to be severely anaemic (11 percent and 8 percent, respectively). Rural children are twice as likely as urban children to have severe anaemia (10 percent and 5 percent, respectively). By region, children who live in the Central Region are more likely to be severely anaemic than children in other areas. The proportion of children with severe anaemia decreases with an increase in mother's education and wealth status. For example, 12 percent of children whose mothers have no education are severely anaemic relative to 5 percent of children whose mothers have at least a secondary education. Likewise, the prevalence of severe anaemia decreases steadily from a high of 12 percent of children in the lowest wealth quintile to a low of 4 percent of children in the highest wealth quintile.

Table 4.4 Hemoglobin <8.0 g/dl in children

Percentage of children age 6-59 months with hemoglobin lower than 8.0 g/dl, by background characteristics, Malawi 2012

Background characteristic	Hemoglobin < 8.0 g/dl	Number of children
Age (in months)		
6-8	13.0	105
9-11	16.6	106
12-17	12.9	266
18-23	11.0	246
24-35	9.4	485
36-47	7.3	494
48-59	4.1	484
Sex		
Male	10.5	1,014
Female	7.5	1,172
Residence		
Urban	4.7	279
Rural	9.5	1,907
Region		
Northern	5.2	306
Central	10.5	930
Southern	8.5	949
Mother's education		
No education	11.7	411
Primary	9.2	1,254
Secondary	4.7	268
More than secondary	*	11
Wealth quintile		
Lowest	12.2	476
Second	11.7	507
Middle	6.9	436
Fourth	7.8	413
Highest	4.1	354
Total	8.9	2,186

Note: Table is based on children who stayed in the household the night before the interview. Prevalence of anaemia is based on hemoglobin levels and is adjusted for altitude using CDC formulas (CDC, 1998). Hemoglobin is measured in grams per deciliter (g/dl). An asterisk denotes that an estimate is based on fewer than 25 unweighted cases and has been suppressed.
[1] Includes children whose mothers are deceased.
[2] For women who are not interviewed, information is taken from the Household Questionnaire. Excludes children whose mothers are not listed in the Household Questionnaire.

4.3.2 Malaria Prevalence among Children

In the 2012 MMIS, malaria prevalence among children age 6-59 months was measured using microscopy. Laboratory technicians prepared thick blood smears that were brought back to the Public Health Laboratory at CHSU for microscopic examination. Blood smears with parasites were classified as malaria positive. In order to be able to treat infected children, it was also necessary to test the children using RDT to have instant results in the field. To do this, laboratory technicians used the SD Bioline Malaria Ag P.f RDT to diagnose malaria from finger prick blood samples. Children who tested positive for the presence of *P. falciparum* by the RDT were offered treatment with LA. Table 4.5 below presents the results of both tests.

Based on the RDT, 43 percent of children age 6-59 months in Malawi tested positive for malaria. Analysis of blood smears by microscopy revealed a lower prevalence of malaria: 28 percent of children tested positive for malaria according to microscopy. Regardless of which diagnostic test was used, malaria prevalence generally increases with age, is independent of gender, and decreases with mother's education level and with household wealth.

Table 4.5 Prevalence of malaria in children

Percentage of children age 6-59 months classified in two tests as having malaria, by background characteristics, Malawi 2012

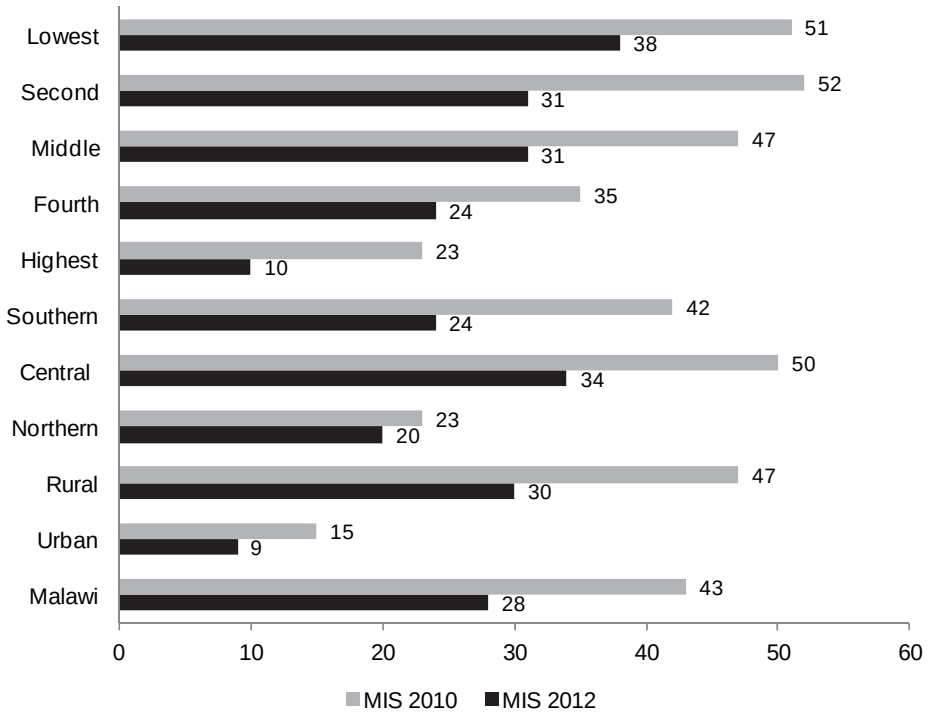
	Malaria prevalence according to RDT		Malaria prevalence according to microscopy	
Background characteristic	RDT positive	Number of children tested	Microscopy positive	Number of children tested
Age (in months)				
6-8	35.9	105	21.1	105
9-11	31.7	105	18.4	106
12-17	31.6	266	20.0	266
18-23	39.0	245	22.4	243
24-35	46.1	483	30.9	478
36-47	46.7	494	30.0	488
48-59	50.0	484	32.7	480
Sex				
Male	42.8	1,013	27.0	1,010
Female	43.8	1,169	28.3	1,157
Residence				
Urban	13.3	278	9.4	280
Rural	47.7	1,904	30.4	1,887
Region				
Northern	32.6	306	19.8	306
Central	51.3	929	34.4	916
Southern	39.1	947	23.9	944
Mother's education				
No education	52.9	411	34.0	403
Primary	44.0	1,251	29.2	1,246
Secondary	22.2	268	12.0	268
More than secondary	13.1	11	0.0	11
Wealth quintile				
Lowest	60.5	476	37.6	475
Second	48.7	507	30.8	499
Middle	43.6	434	31.1	433
Fourth	38.4	412	23.9	412
Highest	18.1	353	10.1	348
Total	43.4	2,182	27.7	2,167

Malaria prevalence measured by microscopy is 3.2 times higher in rural areas (30 percent) than in urban areas (9 percent). By region, malaria prevalence according to microscopy is highest in the Central Region (34 percent) relative to the malaria prevalence in the Northern Region (20 percent) or Southern Region (24 percent).

The differences in malaria prevalence observed between the RDTs microscopy are not unexpected. Microscopic detention of malaria is dependent on the visualization of stained parasites under a microscope, whereas the diagnosis of malaria by RDT relies on the interaction between a parasite antigen present in the blood and an antibody in the RDT formulation. Although the microscopic examination of blood smears is the method of choice for the detection of malaria parasites and has long been considered the gold standard for the clinical diagnosis when performed under optimal conditions, poor microscopy has long been recognized in practice in countries with high burdens of malaria such as in sub-Saharan Africa (WHO, 2000). Thus, comparing malaria results from microscopy with those from RDTs should be done with caution. In comparison to microscopy, RDTs have the advantage of being quick and easy to use, but are less sensitive (Wongsrichanalai et. al., 2007). The SD Bioline Ag P.f RDT, like many other commercially available RDTs, detects the P. falciparum-specific, histidine-rich protein-2 (HRP-2) rather than the parasite itself. Because HRP-2 remains in the blood for up to a month following parasite clearance with antimalarials (Moody, 2002), in areas highly endemic for P. falciparum malaria, its persistence could account for the observation that a higher malaria prevalence was detected using RDTs than microscopy.

Figure 4.1 shows the changes in malaria prevalence based on the microscopy results since 2010. At the national level, the prevalence declined from 43 percent to 28 percent.

Figure 4.1 **Prevalence of Malaria Based on Microscopy Results among Children under Age 5**



MALARIA KNOWLEDGE 5

Key Findings

- Knowledge of malaria among women in Malawi is widespread (94 percent).
- Nearly nine in ten women are aware that mosquito bites cause malaria.
- One in four Malawian women reported having seen or heard messages about malaria in the last six months.
- The most commonly cited source of information about malaria is a government clinic or hospital (49 percent), followed by the radio (42 percent) and community health workers (15 percent).

One objective of the 2012 MMIS was to assess general knowledge about malaria. All women who were interviewed as a part of the survey were asked if they had ever heard of malaria and, if they responded yes, they were asked a series of questions about their knowledge of signs and symptoms, causes, and preventive measures.

5.1 KNOWLEDGE OF MALARIA

Table 5.1 presents, by background characteristics, the percentages of women who have heard of malaria. Also shown are the percentages of these women with general knowledge of malaria symptoms, causes, and prevention methods.

Knowledge of malaria among women in Malawi is widespread; 94 percent of women have heard of malaria, with some variation across subgroups of women. Women in both the youngest and oldest age cohorts are the least likely to have heard of malaria compared with women in the other age groups. Urban women, women with the highest level of education, and women in the highest wealth quintile are more likely than other women to have heard of malaria. By region, women living in the Southern Region are the least likely to have heard of malaria compared with women living in the Northern Region and the Central Region.

Table 5.1 General knowledge of malaria

Percentage of women age 15-49 who reported having heard of malaria, percentage who can recognize fever as a sign of malaria, percentage who reported mosquito bites as the cause of malaria, and percentage who reported that sleeping under a mosquito net can protect against malaria, by background characteristics, Malawi 2012

Background characteristics	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 as a prevention method[1]	Number of women
Age					
15-19	91.5	62.4	81.7	82.1	532
20-24	94.1	83.3	86.7	86.2	605
25-29	95.4	82.5	90.9	91.1	589
30-34	93.6	82.5	87.2	88.1	508
35-39	95.8	82.8	88.5	88.9	337
40-44	95.3	78.0	89.9	91.0	209
45-49	91.1	74.5	81.0	83.3	126
Residence					
Urban	98.1	84.1	94.1	93.6	507
Rural	93.0	77.1	85.4	86.0	2,399

Continued...

Table 5.1—*Continued*

Background characteristics	Percentage who have heard of malaria	Percentage who recognized fever as a symptom of malaria	Percentage who reported mosquito bites as a cause of malaria	Percentage who reported mosquito nets as a prevention method[1]	Number of women
Region					
Northern	97.0	81.8	89.7	89.2	406
Central	88.8	76.7	81.2	81.1	1,222
Southern	97.9	78.8	91.5	92.7	1,279
Education					
No education	85.2	72.5	74.7	76.0	529
Primary	95.0	78.1	87.2	87.5	1,780
Secondary	98.5	84.0	96.5	96.6	558
More than secondary	100.0	86.5	100.0	98.1	38
Wealth quintile					
Lowest	88.1	74.4	77.2	78.3	578
Second	91.5	77.6	84.8	85.3	526
Middle	96.4	77.3	88.4	88.6	564
Fourth	94.8	77.5	88.1	88.1	561
Highest	98.0	83.9	94.6	94.7	678
Total	93.9	78.3	86.9	87.3	2,906

[1] Treated or untreated nets

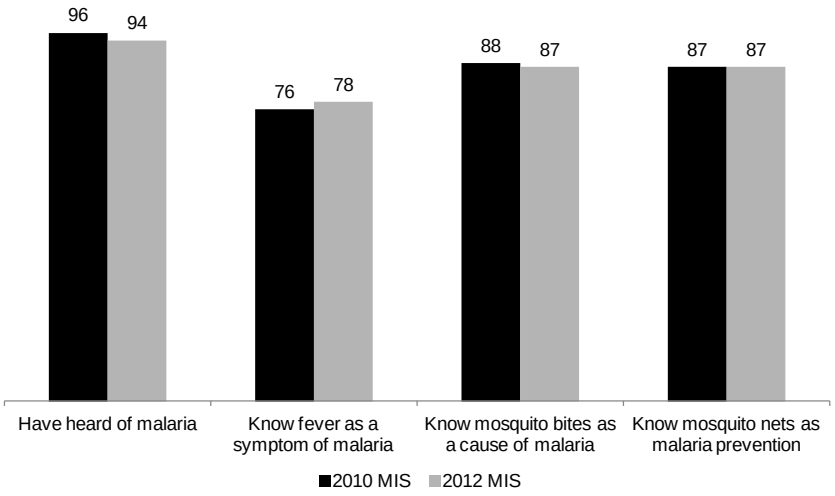
When asked to name the main symptoms of malaria, nearly four in five Malawian women (78 percent) mention fever. Variations in knowledge of fever as a malaria symptom among women are similar to variations found among women who have heard of malaria.

Awareness that mosquitoes are the vectors for malaria transmission is key to the design of prevention programs, and overall, knowledge that a mosquito bite causes malaria is high in Malawi (87 percent of women). Similar to other data presented, the differentials in knowledge across subgroups of women show the same pattern as the other two knowledge indicators.

Use of a mosquito net is vital to the prevention of malaria. Women in the survey were also asked about various ways to protect themselves from getting malaria. At the national level, 87 percent of women say that the use of mosquito nets can prevent malaria. The pattern observed for the other three indicators holds for this indicator as well.

Comparison with results of the 2010 MMIS shows that knowledge of malaria has changed little in the past two years (Figure 5.1).

Figure 5.1 **Trends in knowledge about malaria**



5.2 EXPOSURE TO MALARIA MESSAGES

The National Malaria Control Program (NMCP) has developed an information, education, and communication strategy to better communicate malaria messages to vulnerable populations. Key messages include the importance of sleeping under ITNs, seeking prompt treatment for fever, and allowing one's house to be sprayed.

In the 2012 MMIS, women were asked if they had seen or heard messages or information about malaria in the six months preceding the survey. If they answered yes, the women were asked how long ago they had seen or heard the most recent message, the source of message, and the content of the message. These questions differ from those asked in the 2010 MMIS, which did not have a time reference for exposure to malaria messages. For this reason, results from the 2012 MMIS are not comparable to those of the 2010 MMIS.

Table 5.2 shows the percentages, by background characteristics, of women who had seen or heard a malaria message in the last six months; among those women, it also shows the average number of months before the survey that the message was heard, the percentage of those reporting a government clinic or hospital as the message source, and the percentage who reported seeing or hearing a message about the importance of sleeping under a mosquito net.

Table 5.2 Messages about malaria

Percentage of women age 15-49 who have seen or heard messages or information about malaria in the last six months and, among those who heard or saw messages, the average number of months ago the last malaria messages were seen or heard, the percentage reporting a government hospital/clinic as the source of information, and the percentage who reported having seen or heard a message about the importance of sleeping under a mosquito net, by background characteristics, Malawi 2012

			Among women who have seen or heard malaria messages in last six months			
Background characteristics	Percentage who have seen or heard malaria messages in last six months	Number of women	Average number of months ago the malaria message was seen or heard	Percentage who reported government hospital/clinic as the source of the malaria message	Percentage who reported having seen or heard a message about the importance of sleeping under a mosquito net	Number of women
Age						
15-19	21.6	532	1.6	37.6	39.4	115
20-24	26.2	605	1.4	51.2	42.1	159
25-29	27.2	589	1.3	51.8	47.7	161
30-34	29.9	508	1.6	53.8	41.4	152
35-39	22.7	337	1.5	50.2	44.1	77
40-44	24.2	209	1.8	47.0	35.8	51
45-49	16.9	126	*	*	*	21
Residence						
Urban	34.3	507	1.3	39.6	51.5	174
Rural	23.4	2,399	1.5	52.0	39.3	561
Region						
Northern	34.5	406	1.4	48.2	41.2	140
Central	22.8	1,222	1.5	40.5	39.0	278
Southern	24.8	1,279	1.5	56.9	45.4	317
Education						
No education	12.8	529	2.1	50.6	37.4	68
Primary	22.4	1,780	1.4	55.6	39.7	400
Secondary	43.5	558	1.4	38.6	46.2	243
More than secondary	64.9	38	(0.9)	(42.0)	(56.6)	25
Wealth quintile						
Lowest	14.2	578	1.8	53.5	45.2	82
Second	18.5	526	1.6	53.3	38.6	97
Middle	23.0	564	1.5	60.1	34.1	130
Fourth	28.4	561	1.5	61.0	41.9	160
Highest	39.2	678	1.2	33.6	46.7	266
Total	25.3	2,906	1.5	49.1	42.2	735

Note: Figures in parentheses are based on 25-49 unweighted cases. An asterisk denotes a figure based on fewer than 25 unweighted cases that has been suppressed.

One-quarter of Malawian women reported having seen or heard messages about malaria in the last six months. Exposure to malaria messages is 1.5 times higher in urban areas than in rural areas (34 percent and 23 percent, respectively). A higher proportion of women living in the Northern Region (35 percent) reported having listened to or heard malaria messages in the prior six months compared with women from other regions. Exposure to malaria messages increases as both education and wealth also increase. For example, 13 percent of women with no education saw or heard a malaria message in the six months before the survey compared with 22 percent of women with primary education, 44 percent of women with secondary education, and 65 percent of women with more than secondary education. Similarly, women in the highest wealth quintile are almost three times more likely than those in the lowest quintile to have seen or heard a malaria message (39 percent and 14 percent). When asked about the time since they heard the message in the past six months, on average, women say that the last time they heard a message on malaria was about 1.5 months before the survey.

Table 5.2 also shows the percentage of women that report a government clinic or hospital as the source of the malaria messages. Almost half (49 percent) of women that had seen or heard a malaria message cited a government hospital or clinic as the source. Higher proportions of women living in rural areas and living in the Southern Region report a government facility as the source of a malaria message compared with their counterparts. By age cohort, women in the youngest cohort are the least likely to cite a government clinic or hospital as the malaria message source. Those associated with the highest wealth quintile were the least likely to report a public source for information about malaria compared with women in lower wealth quintiles.

Women who say that they heard or saw messages on malaria were asked about the type of messages they heard or saw. Table 5.2 shows that four of five women (44 percent) reported seeing or hearing a message about the importance of sleeping under a mosquito net to prevent malaria. The likelihood of seeing or hearing messages about the importance of using a mosquito net is higher in the urban than in the rural areas and in the Southern Region than in other regions. Exposure to net utilization messages tends to increase with level of educational attainment; however, there is no apparent pattern observed by age or wealth quintile.

Table 5.3 shows the places that women said they saw or heard malaria messages. The most commonly cited source is a government clinic or hospital (49 percent), followed by the radio (42 percent) and community health workers (15 percent). One in ten women exposed to a message reported that they saw or heard the message from a friend or family member. Only 3 percent of women exposed to a malaria message said that they saw or heard the message on the television, whereas about 1 percent of women exposed to a malaria message reported seeing or hearing the message at the workplace, from drama groups, from peer educators, on a billboard, or from the newspaper.

Table 5.3 Media exposure to malaria messages

Percentage of women age 15-49 who have seen or heard a message about malaria in the past 6 months through specific sources of media, by background characteristics, Malawi 2012

Background characteristics	Govt. clinic/ hospital	Community health worker	Friends/ family	Workplace	Drama groups	Peer educators	Poster/ Billboard	Television	Radio	News paper	Other	Number of women
Age												
15-19	37.6	6.1	10.3	1.2	1.8	6.1	2.3	1.2	53.4	3.4	3.2	115
20-24	51.2	16.5	9.0	0.3	0.5	0.4	0.2	2.3	42.2	0.0	1.7	159
25-29	51.8	19.4	7.5	0.2	0.0	0.0	0.9	2.7	32.2	2.2	2.3	161
30-34	53.8	13.6	8.8	0.5	2.8	0.6	0.5	4.5	42.8	0.3	1.5	152
35-39	50.2	23.7	6.8	1.5	0.8	0.0	0.0	3.6	39.1	0.8	0.0	77
40-44	47.0	6.1	11.0	3.4	0.0	0.0	5.7	6.4	46.3	0.0	1.6	51
45-49	*	*	*	*	*	*	*	*	*	*	*	21
Residence												
Urban	39.6	7.9	7.9	0.9	1.7	3.8	2.0	11.6	57.7	1.2	0.9	174
Rural	52.0	17.0	9.2	0.8	0.9	0.6	0.8	0.5	37.2	1.1	2.1	561
Region												
Northern	48.2	14.6	13.6	0.0	0.0	1.9	0.0	3.8	30.0	0.0	3.4	140
Central	40.5	14.4	12.2	1.1	2.7	1.7	2.9	5.0	49.4	2.7	1.0	278
Southern	56.9	15.3	3.8	0.9	0.1	0.8	0.0	1.2	40.9	0.3	1.8	317
Education												
No education	50.6	24.4	4.8	2.6	5.3	0.0	4.2	0.0	25.4	0.0	0.0	68
Primary	55.6	14.9	11.0	0.3	0.1	1.3	0.0	0.8	33.4	0.7	2.8	400
Secondary	38.6	13.0	7.3	0.9	1.5	2.0	1.6	4.8	59.4	2.0	0.9	243
More than secondary	(42.0)	(6.6)	(1.8)	(3.3)	(0.0)	(0.0)	(4.8)	(32.4)	(56.7)	(3.5)	(0.0)	25
Wealth quintile												
Lowest	53.5	17.0	14.4	0.0	5.9	0.0	0.0	0.0	21.6	4.8	5.1	82
Second	53.3	21.7	12.6	1.2	0.0	0.0	0.0	0.0	25.9	0.0	1.6	97
Middle	60.1	15.1	5.7	0.0	0.0	1.9	3.5	0.0	30.7	1.1	0.6	130
Fourth	61.0	17.6	8.4	1.1	0.3	1.8	0.0	0.0	34.3	0.0	1.6	160
Highest	33.6	9.9	7.6	1.1	0.9	1.7	1.3	8.6	64.4	1.2	1.6	266
Total	49.1	14.9	8.9	0.8	1.1	1.4	1.1	3.1	42.0	1.1	1.8	735

Note: Figures in parentheses are based on 25-49 unweighted cases. An asterisk denotes a figure based on fewer than 25 unweighted cases that have been suppressed.

Rural women are more likely than urban women to have seen or heard a malaria message at a government clinic (52 percent and 40 percent, respectively), whereas urban women are more likely than rural women to have seen or heard a malaria message on the radio (58 percent and 37 percent, respectively). Community health workers are more commonly cited as a message source by rural women than by women in urban areas. On the other hand, women in urban areas have higher exposure from the television compared with rural women.

REFERENCES

Gwatkin, D., S. Rutstein, K. Johnson, R. Pande, and A. Wagstaff, (2000). *Socioeconomic Differences in Health, Nutrition, and Population in Bangladesh.* Washington. DC*:* World Bank.

Moody, A. 2002. "Rapid Diagnostic Tests for Malaria Parasites." *Clinical Microbiology Review* 15:66-78

National Malaria Control Programme (NMCP), Ministry of Health [Malawi]. nd. *Malawi National Malaria Indicator Survey 2010*. Lilongwe, Malawi: NMCP.

National Malaria Control Programme (NMCP), Ministry of Health [Malawi]. nd. *National Malaria Strategic Plan 2011-2015: Toward Universal Access*. Lilongwe, Malawi: NMCP.

National Statistical Office (NSO) [Malawi]. 2008. *Malawi Population and Housing Census*. Lilongwe, Malawi: NSO.

National Statistical Office (NSO) and ICF Macro. 2011. *Malawi Demographic and Health Survey 2010*. Zomba, Malawi, and Calverton, Maryland, USA: NSO and ICF Macro.

National Statistical Office (NSO) [Malawi] and ORC Macro. 2005. *Malawi Demographic and Health Survey* 2004. Calverton, Maryland: NSO and ORC Macro.

National Statistical Office (NSO) and UNICEF. 2008. *Malawi Multiple Indicator Cluster Survey 2006.* Lilongwe, Malawi: NSO.

United Nations General Assembly. 2001. *Road Map towards the Implementation of the United Nations Millennium Declaration: Report of the Secretary-General.* New York: United Nations General Assembly.

WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation. 2005. *Water for Life: Making it Happen.* Geneva: World Health Organization and United Nations Children's Fund.

Wongsrichanalai, Chansuda et. al., 2007. "A Review of Malaria Diagnostic Tools: Microscopy and Rapid Diagnostic Test (RDT)." *Am J Trop Med Hyg*. 77 (6) Suppl 119-127.

SAMPLE DESIGN APPENDIX A

A.1 SAMPLING FRAME AND STRATIFICATION

Malawi is administratively divided into 3 regions and 28 districts. The 2012 MMIS sample was designed to provide estimates for the country as a whole, for urban and rural areas separately, and for each of the regions:

Northern Region: Chitipa, Karonga, Likoma, Mzimba, Nkhata Bay, and Rumphi

Central Region: Dedza, Dowa, Kasungu, Lilongwe, Mchinji, Nkhotakota, Ntcheu, Ntchisi, and Salima

Southern Region: Balaka, Blantyre, Chikhwawa, Chiradzulu, Machinga, Mangochi, Mulanje, Mwanza, Neno, Nsanje, Mwanza, Neno, Nsanje, Phalombe, Thyolo, and Zomba

Each district is subdivided into traditional authorities. For statistical purposes, each traditional authority is subdivided into standard enumeration areas (SEAs). The 2008 National Population and Housing Census demarcated these SEAs and determined the number of households in each one. The sampling frame of the 2012 MMIS is the list of SEAs developed from the 2008 census, stratified by region and urban and rural strata.

To improve the precision of the trend analysis, the 2012 MMIS was conducted in the same 140 standard enumeration areas (SEAs) selected for the 2010 MMIS.

A.2 SAMPLE ALLOCATION AND SELECTION

Sample Allocation

To meet the objective of providing reliable estimates for key indicators of the sample domains, a total sample of 140 SEAs—44 in urban areas and 96 in rural areas— and 3,500 households was allocated among regions in proportion to the 2008 population of each region. Urban areas were over-sampled within regions in order to produce robust estimates for that domain. Therefore, the MMIS sample was not proportional to the population for residence (urban-rural area) and required a final weighting adjustment to provide valid estimates for every domain of the survey. Adjustments to the proportional distribution were made as shown in Table A1.

Table A.1 Sample and total population proportion by stratum, 2012 Malawi MIS

	Northern			Central			Southern			Malawi		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Population proportion	0.015	0.100	0.115	0.063	0.355	0.418	0.065	0.403	0.468	0.142	0.858	1.000
Sample proportion	0.043	0.107	0.150	0.136	0.264	0.400	0.136	0.314	0.450	0.314	0.686	1.000
Number of selected households	150	375	525	475	925	1,400	475	1,100	1,575	1,100	2,400	3,500

The SEAs were selected with probability proportional to size from a list of approximately 12,474 SEAs covered in the 2008 census. The SEA size was the number of residential households recorded in the census. 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.

In the second stage, 25 households were selected in each selected SEA using systematic sampling from a list of households in the SEA. Because it has been almost four years since the census, a fresh household listing was undertaken before the survey was fielded. The National Statistical Office (NSO) assisted in listing the households in the SEAs. As part of this exercise, the listing teams also drew up the necessary maps and recorded the geographic coordinates of each SEA.

Tables A.2, A.3, and A.4 show the distribution of sample clusters by urban and rural locations for each district in the Northern, Central, and Southern Regions. A map of the location of the clusters appears in Figure A.1.

Table A.2 Distribution of SEAs by Urban/Rural location for districts in Northern Region, 2012 Malawi MIS

District	Urban	Rural	Total
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

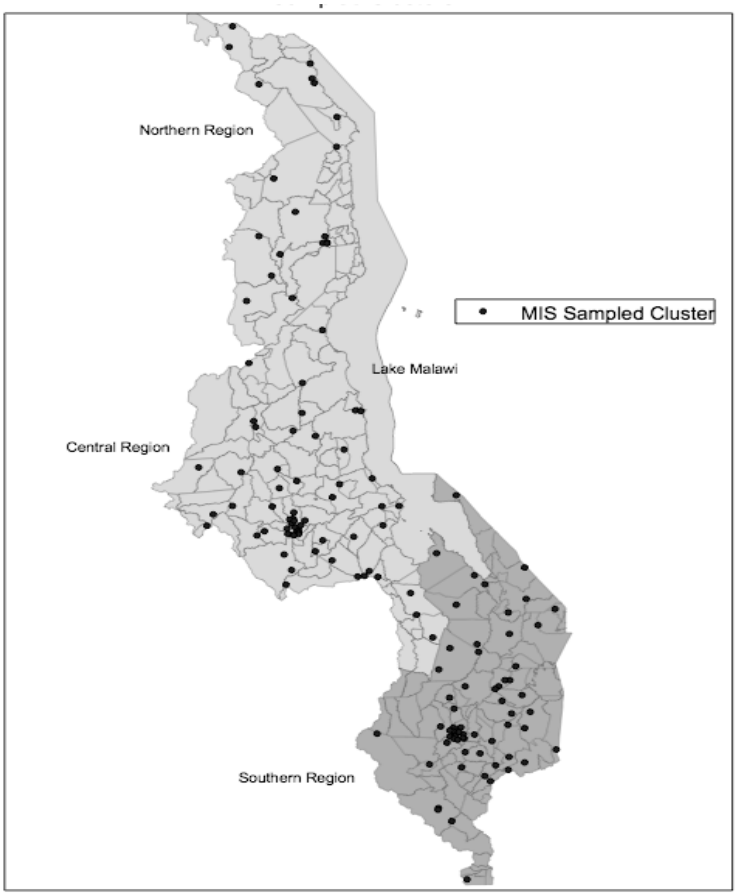
Table A.3 Distribution of SEAs by Urban/Rural location for districts in Central Region, 2012 Malawi MIS

District	Urban	Rural	Total
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 A.4 Distribution of SEAs by Urban/Rural location for districts in Southern Region, 2012 Malawi MIS

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

Figure A.1 **Location of selected SEAs in the 2012 Malawi MIS**



Selection of Clusters

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

- Calculate the sampling interval, *I*, for each stratum

$$I_h = \frac{\sum M_{hi}}{a_h}$$

where M_{hi} is the number of households in SEA *i* and stratum *h*,

$\sum M_{hi}$ 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.

- Calculate the cumulated size of each SEA.

- Calculate the sampling numbers

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

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

- Compare each sampling number with the cumulated sizes of the SEAs.

The first SEA with a cumulated size equal to or immediately 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 immediately greater than *R+I*. Each of the remaining SEAs was selected using the same procedure, making sure to add *I* at each subsequent selection (as in Equation iii).

A.3 SELECTION OF HOUSEHOLDS

The frame of households was obtained from the listing of all households in the selected SEAs. Upon completion of household listing, the households were given new 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:

- 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.

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

A.4 ESTIMATION PROCEDURE

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 SEA *i* was calculated as:

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

The household selection probability in SEA *i* from stratum *h* is:

$$p_{hi} = \frac{n_{hi}}{N_{hi}}$$

The overall household weight or inflation factor is:

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

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*, ΣM_{hi} is the total size of stratum *h*, n_{hi} is the number of households selected in i^{th} SEA from stratum *h*, and N_{hi} is the total number of households listed in i^{th} SEA from stratum *h*.

Let y_{hij} be an observation on variable *y* for the j^{th} household in the i^{th} SEA from the h^{th} stratum.

Then the estimated total for the h^{th} stratum is:

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

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, a_h is the number of selected SEAs in the h^{th} stratum, and n_h is the number of sample households in the h^{th} stratum. The national estimate (y) is given by:

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

y_h is the stratum estimate, where h varies from 1 to *H* (is the total number of strata). In this survey, $H = 6$ (urban and rural areas for each of the three regions). Each of the three regions is considered a separate domain.

A.5 SAMPLE IMPLEMENTATION

Table A.5 Sample implementation: Women

Percent distribution of households and eligible women by results of the household and individual interviews, and household, eligible women and overall women response rates, according to urban-rural residence and region (unweighted), Malawi MIS 2012

	Residence		Region			
Result	Urban	Rural	Northern	Central	Southern	Total
Selected households						
Completed (C)	95.9	97.9	97.3	96.0	98.3	97.3
Household present but no competent respondent at home (HP)	0.8	0.1	0.0	0.6	0.1	0.3
Refused (R)	0.4	0.5	0.0	0.6	0.4	0.4
Dwelling not found (DNF)	0.1	0.0	0.0	0.1	0.1	0.1
Household absent (HA)	0.9	0.5	1.1	0.8	0.3	0.6
Dwelling vacant/address not a dwelling (DV)	1.6	0.8	1.5	1.6	0.4	1.1
Dwelling destroyed (DD)	0.3	0.2	0.0	0.2	0.3	0.2
Other (O)	0.0	0.0	0.0	0.0	0.1	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of sampled households	1,100	2,400	525	1,400	1,575	3,500
Household response rate (HRR)[1]	98.7	99.4	100.0	98.6	99.4	99.2
Eligible women						
Completed (EWC)	98.1	98.5	99.6	97.2	98.9	98.3
Not at home (EWNH)	1.3	1.2	0.2	2.5	0.5	1.3
Refused (EWR)	0.5	0.1	0.0	0.2	0.4	0.2
Incapacitated (EWI)	0.1	0.2	0.2	0.1	0.2	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of women	1,047	1,908	519	1,183	1,253	2,955
Eligible women response rate (EWRR)[2]	98.1	98.5	99.6	97.2	98.9	98.3
Overall women response rate (OWRR)[3]	96.8	97.9	99.6	95.9	98.3	97.5

[1] Using the number of households falling into specific response categories, the household response rate (HRR) is calculated as:

$$\frac{100 * C}{C + HP + P + R + DNF}$$

[2] The eligible women response rate (EWRR) is equivalent to the percentage of interviews completed (EWC)
[3] The overall women response rate (OWRR) is calculated as:
OWRR = HRR * EWRR/100

ESTIMATES OF SAMPLING ERRORS APPENDIX B

The estimates from a sample survey are affected by two types of errors: nonsampling errors and sampling errors. Nonsampling errors are the results of mistakes made in implementing data collection and data processing, such as failure to locate and interview the correct household, misunderstanding of the questions on the part of either the interviewer or the respondent, and data entry errors. Although numerous efforts were made during the implementation of the 2012 Malawi Malaria Indicator Survey (Malawi MIS) to minimize this type of error, nonsampling errors are impossible to avoid and difficult to evaluate statistically.

Sampling errors, on the other hand, can be evaluated statistically. The sample of respondents selected in the 2012 Malawi MIS is only one of many samples that could have been selected from the same population, using the same design and expected size. Each of these samples would yield results that differ somewhat from the results of the actual sample selected. Sampling errors are a measure of the variability among all possible samples. Although the degree of variability is not known exactly, it can be estimated from the survey results.

Sampling error is usually measured in terms of the *standard error* for a particular statistic (mean, percentage, etc.), which is the square root of the variance. The standard error can be used to calculate confidence intervals within which the true value for the population can reasonably be assumed to fall. For example, for any given statistic calculated from a sample survey, the value of that statistic will fall within a range of plus or minus two times the standard error of that statistic in 95 percent of all possible samples of identical size and design.

If the sample of respondents had been selected as a simple random sample, it would have been possible to use straightforward formulas for calculating sampling errors. However, the 2012 Malawi MIS sample is the result of a multi-stage stratified design, and, consequently, it was necessary to use more complex formulae. Sampling errors are computed in either ISSA or SAS, using programs developed by ICF International. These programs use the Taylor linearization method of variance estimation for survey estimates that are means, proportions, or ratios like the ones in the Malawi MIS survey.

The Taylor linearization method treats any percentage or average as a ratio estimate, $r = y/x$, where y represents the total sample value for variable y, and x represents the total number of cases in the group or subgroup under consideration. The variance of r is computed using the formula given below, with the standard error being the square root of the variance:

$$SE^2(r) = var(r) = \frac{1-f}{x^2}\sum_{h=1}^{H}\left[\frac{m_h}{m_h-1}\left(\sum_{i=1}^{m_h} z_{hi}^2 - \frac{z_h^2}{m_h}\right)\right]$$

in which

$$z_{hi} = y_{hi} - rx_{hi} \text{ , and } z_h = y_h - rx_h$$

where h represents the stratum that varies from 1 to H,
m_h is the total number of clusters selected in the h^{th} stratum,
y_{hi} is the sum of the weighted values of variable y in the i^{th} cluster in the h^{th} stratum,
x_{hi} is the sum of the weighted number of cases in the i^{th} cluster in the h^{th} stratum, and
f is the overall sampling fraction, which is so small that it is ignored.

In addition to the standard error, the design effect (DEFT) for each estimate is also calculated. The design effect is defined as the ratio between the standard error using the given sample design and the standard error that would result if a simple random sample had been used. A DEFT value of 1.0 indicates that the sample design is as efficient as a simple random sample, while a value greater than 1.0 indicates the increase in the sampling error due to the use of a more complex and less statistically efficient design. Relative standard errors and confidence limits for the estimates are also calculated.

Sampling errors for the 2012 Malawi MIS are calculated for selected variables considered to be of primary interest. The results are presented in this appendix for the country as a whole, for urban and rural areas, and for the three regions in the country: Northern, Central, and Southern. For each variable, the type of statistic (mean, proportion, or rate) and the base population are given in Table B.1. Tables B.2 through B.7 present the value of the statistic (R), its standard error (SE), the number of unweighted (N) and weighted (WN) cases, the design effect (DEFT), the relative standard error (SE/R), and the 95 percent confidence limits (R±2SE), for each variable. The sampling errors for mortality rates are presented for the five-year period preceding the survey for the whole country and for the ten-year period preceding the survey by residence and region. The DEFT is considered undefined when the standard error considering a simple random sample is zero (when the estimate is close to 0 or 1). In the case of the total fertility rate, the number of unweighted cases is not relevant, as there is no known unweighted value for woman-years of exposure to childbearing.

The confidence interval (e.g., as calculated for *child has fever in last two weeks* can be interpreted as follows: the overall average from the national sample is 0.317, and its standard error is 0.013. Therefore, to obtain the 95 percent confidence limits, one adds and subtracts twice the standard error to the sample estimate, i.e., 0.317±2×0.013. There is a high probability (95 percent) that the *true* average number of children ever born to all women age 40 to 49 is between 0.291 and 0.344.

For the total sample, the value of the DEFT, averaged over all variables, is 1.8. This means that, due to multi-stage clustering of the sample, the average standard error is increased by a factor of 1.8 over that in an equivalent simple random sample.

Table B.1 List of selected variables for sampling errors, Malawi 2012

Variable	Type of Estimate	Base population
No education	Proportion	All women 15-49
Secondary education or higher	Proportion	All women 15-49
Owns at least 1 insecticide-treated net (ITN)	Proportion	Households
Child slept under an ITN last night	Proportion	Children under 5 in households
Pregnant woman slept under an ITN last night	Proportion	All women 15-49 in households
Received 2+ doses of SP/Fansidar during antenatal visits	Proportion	Last birth of women 15-49 with live births last 2 years
Child has fever in last two weeks	Proportion	Child under 5 in women's birth history
Child sought care/treatment from a health facility	Proportion	Child under 5 with fever in last 2 weeks
Child took ACT	Proportion	Child under 5 with fever in last 2 weeks who received any antimalarial drugs
Child 6-59 months has severe anaemia (haemoglobin <8.0 g/dl)	Proportion	Child 6-59 months tested for anaemia
Child 6-59 months has malaria (based on rapid test)	Proportion	Children 6-59 months tested (rapid test) for malaria
Child 6-59 months has malaria (based on microscopy)	Proportion	Children 6-59 months tested (on microscopy) for malaria

Table B.2 Sampling errors: National sample, Malawi 2012

Variable	R	SE	N-UNWE	N-WEIG	DEFT	SE/R	R-2SE	R+2SE
No education	0.182	0.015	2906	2906	2.040	0.080	0.153	0.211
Secondary education or higher	0.205	0.018	2906	2906	2.429	0.089	0.169	0.242
Owns at least 1 insecticide-treated net (ITN)	0.550	0.020	3404	3404	2.326	0.036	0.511	0.590
Child slept under an ITN last night	0.559	0.024	2421	2496	2.376	0.043	0.511	0.607
Pregnant woman slept under an ITN last night	0.507	0.037	252	250	1.182	0.074	0.432	0.581
Received 2+ doses of SP/Fansidar during antenatal visits	0.532	0.020	921	990	1.218	0.038	0.492	0.572
Child has fever in last two weeks	0.317	0.013	2218	2362	1.297	0.041	0.291	0.344
Child with sought care/treatment from a health facility	0.499	0.028	676	750	1.471	0.055	0.444	0.554
Child took ACT	0.296	0.021	676	750	1.215	0.070	0.254	0.337
Child 6-59 months has severe anemia	0.089	0.009	2116	2186	1.474	0.104	0.070	0.107
Child 6-59 months has malaria (rapid test)	0.434	0.029	2111	2182	2.465	0.068	0.375	0.493
Children 6-59 months has malaria (on microscopy)	0.277	0.022	2108	2167	2.114	0.079	0.233	0.321

Table B.3 Sampling errors: Urban sample, Malawi 2012

Variable	R	SE	N-UNWE	N-WEIG	DEFT	SE/R	R-2SE	R+2SE
No education	0.067	0.011	1027	507	1.370	0.160	0.046	0.088
Secondary education or higher	0.511	0.034	1027	507	2.152	0.066	0.444	0.578
Owns at least 1 insecticide-treated net (ITN)	0.565	0.024	1055	502	1.599	0.043	0.516	0.614
Child slept under an ITN last night	0.540	0.036	654	320	1.862	0.067	0.467	0.612
Pregnant woman slept under an ITN last night	0.466	0.057	80	38	1.014	0.122	0.352	0.580
Received 2+ doses of SP/Fansidar during antenatal visits	0.556	0.040	239	123	1.230	0.071	0.477	0.636
Child has fever in last two weeks	0.256	0.030	601	309	1.649	0.117	0.196	0.316
Child sought care/treatment from a health facility	0.709	0.036	150	79	0.982	0.051	0.637	0.781
Child took ACT	0.264	0.047	150	79	1.299	0.177	0.171	0.358
Child 6-59 months has severe anemia	0.047	0.013	572	279	1.510	0.284	0.020	0.074
Child 6-59 months has malaria (rapid test)	0.133	0.032	569	278	2.079	0.238	0.070	0.197
Children 6-59 months has malaria (on microscopy)	0.094	0.022	573	280	1.674	0.232	0.050	0.138

Table B.4 Sampling errors: Rural sample, Malawi 2012

Variable	R	SE	N-UNWE	N-WEIG	DEFT	SE/R	R-2SE	R+2SE
No education	0.206	0.017	1879	2399	1.817	0.082	0.173	0.240
Secondary education or higher	0.141	0.017	1879	2399	2.167	0.124	0.106	0.175
Owns at least 1 insecticide-treated net (ITN)	0.548	0.023	2349	2902	2.231	0.042	0.502	0.594
Child slept under an ITN last night	0.562	0.027	1767	2177	2.278	0.048	0.509	0.616
Pregnant woman slept under an ITN last night	0.514	0.043	172	213	1.114	0.083	0.429	0.599
Received 2+ doses of SP/Fansidar during antenatal visits	0.528	0.022	682	867	1.159	0.042	0.484	0.573
Child has fever in last two weeks	0.327	0.014	1617	2052	1.163	0.044	0.298	0.355
Child sought care/treatment from a health facility	0.474	0.030	526	671	1.334	0.063	0.415	0.534
Child took ACT	0.299	0.023	526	671	1.105	0.076	0.254	0.345
Child 6-59 months has severe anemia	0.095	0.010	1544	1907	1.353	0.110	0.074	0.116
Child 6-59 months has malaria (rapid test)	0.477	0.032	1542	1904	2.238	0.067	0.413	0.542
Children 6-59 months has malaria (on microscopy)	0.304	0.024	1535	1887	1.925	0.080	0.255	0.353

Table B.5 Sampling errors: Northern Region sample, Malawi 2012

Variable	R	SE	N-UNWE	N-WEIG	DEFT	SE/R	R-2SE	R+2SE
No education	0.056	0.011	517	406	1.128	0.204	0.033	0.079
Secondary education or higher	0.227	0.037	517	406	1.990	0.162	0.154	0.300
Owns at least 1 insecticide-treated net (ITN)	0.637	0.038	511	403	1.789	0.060	0.561	0.714
Child slept under an ITN last night	0.597	0.033	419	346	1.395	0.056	0.531	0.664
Pregnant woman slept under an ITN last night	0.461	0.096	39	32	1.187	0.208	0.269	0.653
Received 2+ doses SP/Fansidar, during anatenatal visits	0.616	0.052	160	133	1.357	0.085	0.511	0.721
Child has fever in last two weeks	0.245	0.033	386	329	1.459	0.135	0.179	0.312
Child sought care/treatment from a health facility	0.467	0.063	100	81	1.240	0.135	0.341	0.593
Child took ACT	0.234	0.037	100	81	0.828	0.158	0.160	0.308
Child 6-59 months has severe anemia	0.052	0.016	373	306	1.277	0.316	0.019	0.085
Child 6-59 months has malaria (rapid test)	0.326	0.071	373	306	2.601	0.219	0.183	0.468
Children 6-59 has malaria (on microscopy)	0.198	0.046	373	306	2.128	0.235	0.105	0.290

Table B.6 Sampling errors: Central Region sample, Malawi 2012

Variable	R	SE	N-UNWE	N-WEIG	DEFT	SE/R	R-2SE	R+2SE
No education	0.233	0.024	1150	1222	1.939	0.104	0.185	0.282
Secondary education or higher	0.189	0.027	1150	1222	2.321	0.142	0.136	0.243
Owns at least 1 insecticide-treated net (ITN)	0.567	0.039	1344	1427	2.913	0.069	0.488	0.646
Child slept under an ITN last night	0.593	0.044	969	1069	2.799	0.075	0.504	0.681
Pregnant woman slept under an ITN last night	0.507	0.059	103	108	1.197	0.117	0.389	0.626
Received 2+ doses SP/Fansidar, during antenatal visits	0.499	0.029	363	418	1.115	0.059	0.440	0.558
Child has fever in last two weeks	0.330	0.017	891	1009	1.085	0.052	0.296	0.364
Child sought care/treatment from a health facility	0.473	0.039	299	333	1.372	0.083	0.395	0.552
Child took ACT	0.240	0.029	299	333	1.184	0.120	0.183	0.298
Child 6-59 months has severe anemia	0.105	0.018	837	930	1.618	0.167	0.070	0.140
Child 6-59 months has malaria (rapid test)	0.513	0.046	834	929	2.443	0.089	0.422	0.604
Children 6-59 months has malaria (on microscopy)	0.344	0.037	833	916	2.165	0.108	0.269	0.418

Table B.7 Sampling errors: Southern Region sample, Malawi 2012

Variable	R	SE	N-UNWE	N-WEIG	DEFT	SE/R	R-2SE	R+2SE
No education	0.173	0.019	1239	1279	1.786	0.111	0.135	0.212
Secondary education or higher	0.213	0.030	1239	1279	2.569	0.140	0.154	0.273
Owns at least 1 insecticide-treated net (ITN)	0.513	0.020	1549	1574	1.535	0.038	0.474	0.552
Child slept under an ITN last night	0.514	0.029	1033	1081	1.837	0.056	0.457	0.572
Pregnant woman slept under an ITN last night	0.520	0.055	110	110	1.144	0.105	0.411	0.630
Received 2+ doses SP/Fansidar, during antenatal visits	0.538	0.031	398	439	1.250	0.058	0.476	0.601
Child has fever in last two weeks	0.329	0.021	941	1024	1.350	0.065	0.286	0.372
Child sought care/treatment from a health facility	0.533	0.045	277	336	1.556	0.084	0.443	0.622
Child took ACT	0.365	0.030	277	336	1.091	0.082	0.305	0.425
Child 6-59 months has severe anemia	0.085	0.012	906	949	1.290	0.137	0.061	0.108
Child 6-59 months has malaria (rapid test)	0.391	0.044	904	947	2.436	0.113	0.303	0.480
Children 6-59 months has malaria (on microscopy)	0.239	0.030	902	944	1.948	0.125	0.179	0.299

Table C.1 Household age distribution

Single-year age distribution of the de facto household population by sex (weighted), Malawi MIS 2012

	Women		Men	
Age	Number	Percent	Number	Percent
0	240	3.3	211	3.1
1	301	4.1	247	3.7
2	238	3.2	239	3.5
3	259	3.5	235	3.5
4	280	3.8	203	3.0
5	203	2.8	211	3.1
6	225	3.1	221	3.3
7	293	4.0	295	4.4
8	283	3.9	232	3.4
9	216	2.9	200	3.0
10	237	3.2	193	2.9
11	221	3.0	184	2.7
12	258	3.5	248	3.7
13	198	2.7	155	2.3
14	196	2.7	180	2.7
15	87	1.2	162	2.4
16	92	1.3	103	1.5
17	108	1.5	146	2.2
18	134	1.8	127	1.9
19	106	1.4	82	1.2
20	136	1.8	96	1.4
21	112	1.5	97	1.4
22	153	2.1	110	1.6
23	102	1.4	82	1.2
24	99	1.4	72	1.1
25	163	2.2	102	1.5
26	129	1.8	95	1.4
27	90	1.2	76	1.1
28	98	1.3	98	1.5
29	88	1.2	60	0.9
30	161	2.2	161	2.4
31	76	1.0	70	1.0
32	107	1.5	127	1.9
33	88	1.2	60	0.9
34	62	0.9	59	0.9
35	103	1.4	95	1.4
36	67	0.9	57	0.8
37	59	0.8	54	0.8
38	60	0.8	65	1.0
39	37	0.5	66	1.0
40	70	1.0	113	1.7
41	26	0.4	38	0.6
42	39	0.5	60	0.9
43	32	0.4	20	0.3
44	26	0.4	23	0.3
45	28	0.4	56	0.8
46	22	0.3	26	0.4
47	26	0.4	30	0.4
48	35	0.5	40	0.6
49	16	0.2	35	0.5
50	87	1.2	35	0.5
51	31	0.4	30	0.4
52	66	0.9	28	0.4
53	31	0.4	22	0.3
54	29	0.4	16	0.2
55	43	0.6	37	0.5
56	40	0.5	39	0.6
57	20	0.3	25	0.4
58	22	0.3	24	0.4
59	17	0.2	18	0.3
60	57	0.8	48	0.7
61	14	0.2	5	0.1
62	18	0.2	25	0.4
63	20	0.3	20	0.3
64	8	0.1	6	0.1
65	36	0.5	18	0.3
66	8	0.1	8	0.1
67	15	0.2	13	0.2
68	30	0.4	22	0.3
69	16	0.2	13	0.2
70+	186	2.5	172	2.5
Don't know/missing	56	0.8	103	1.5
Total	7,339	100.0	6,749	100.0

Note: The de facto population includes all residents and nonresidents who stayed in the household the night before the interview.

Table C.2 Age distribution of eligible and interviewed women

De facto household population of women age 10-54, interviewed women age 15-49; and percent distribution and percentage of eligible women who were interviewed (weighted), by five-year age groups, Malawi MIS 2012

Age group	Household population of women age 10-54	Interviewed women age 15-49		Percentage of eligible women interviewed
		Number	Percentage	
10-14	1,111	-	-	-
15-19	528	519	18.5	98.2
20-24	602	590	21.1	98.0
25-29	569	557	19.9	98.0
30-34	495	492	17.6	99.5
35-39	325	320	11.5	98.6
40-44	193	190	6.8	98.5
45-49	128	127	4.5	99.3
50-54	243	-	-	-
15-49	2,839	2,796	100.0	98.5

Note: The de facto population includes all residents and nonresidents who stayed in the household the night before the interview. Weights for both household population of women and interviewed women are household weights. Age is based on the household questionnaire.
na = Not applicable

Table C.3 Completeness of reporting

Percentage of observations missing information for selected demographic and health questions (weighted), Malawi MIS 2012

Subject	Percentage with information missing	Number of cases
Month Only (Births in the 15 years preceding the survey)	0.51	2,841
Month and Year (Births in the 15 years preceding the survey)	0.24	2,841
Age at Death (Deceased children born in the 15 years preceding the survey)	0.00	82
Age/date at first union[1] (Ever married women age 15-49)	0.00	2,906
Respondent's education (All women age 15-49)	0.00	2,906
Diarrhea in last 2 weeks (Living children 0-59 months)	0.00	2,362
Anemia (Living children age 6-59 months from the Household Questionnaire)	3.01	2,254

[1] Both year and age missing

SURVEY PERSONNEL

APPENDIX D

STEERING COMMITTEE

Prof. Malcolm Molyneux (Chairperson)
Doreen Ali
Misheck Luhanga
Austin Gumbo
Clifton Gondwe
Jessica Oyugi
Jobiba Chinkhumba
Wilfred Dodoli
James Mwaisemba
Angela Msosa
Auja Terlouw
Kamija Phiri
Don Manthanga
Beatrice Mwagomba

Fieldwork Teams (Districts)

Team 1(Chitipa, Rumphi, Karonga, Nkhata Bay, Mzuzu City)

Field Supervisor: Kandakuone Makamo
Interviewer 1: Sarah J. Msowoya
Interviewer 2: Violet Jere
Lab Tech 1: Irack Munamie
Lab tech 2: Andrew Mzumara

Team 2 (Mzimba, Kasungu, Ntchisi)

Field Supervisor: Hastings Soka
Interviewer 1: Alice Msukwa
Interviewer 2: Diana Mwanyongo
Lab Tech 1: Joseph Phiri
Lab tech 2: Patrick Kalengo

Team 3 (Nkhotakota, Dowa, Salima, Lilongwe)

Field Supervisor: Boniface Banda
Interviewer 1: Beatrice Kamanga
Interviewer 2: Selina Nlashi
Lab tech 1: Sandram Kamwendo
Lab tech 2: Patrick Mbulaje

Team 4 (Part Lilongwe, Mchinji, Dedza, Part of Lilongwe City)

Field Supervisor: Rudia Lungu
Interviewer 1: Florence Sande
Interviewer 2: Catherine Nakoma
Lab tech 1: Judith Tasosa
Lab tech 2: Tobias Alidu

Team 5 (Lilongwe City)

Field Supervisor: James Mwaisemba
Interviewer 1: Charity Banda
Interviewer 2: Chrissie Maulidi
Interviewer: 3 Annie Kamkodo
Lab tech 1: Chifundo Banda
Lab tech 2: Dorothy Moyo

Team 6 (Dedza, Ntcheu, Machinga, Balaka)

Field Supervisor: Mcleod Mwale
Interviewer 1: Bernadette Mazibuko
Interviewer 2: Maclean Changadeya
Lab tech 1: Immaculate Mhango
Lab tech 2: Cedrick White

Team 7 (Mangochi, Zomba)

Field Supervisor: Aumi Manjolo
Interviewer 1: Jane Somanje
Interviewer 2: Doris Namanja
Lab tech 1: Limbani Banda
Lab tech 2: Joseph Gonthi

Team 8 (Part Zomba Rural, Chradzulu, Thyolo, Mulanje, Phalombe, Zomba City)

Field Supervisor: Sandy Jere
Interviewer 1: Lucia Mangatema
Interviewer 2: Evelyn Zambasa
Lab tech 1: Alick Sixpense
Lab tech 2: Mwai Luka

Team 9 (Blantyre City)

Field Supervisor: Samuel Gama
Interviewer 1: Edda Lipipa
Interviewer 2: Jean Mkandawire
Lab tech 1: Frida Bandawe
Lab tech 2: Tawfeeq Qassim

Team 10 (Blantyre Rural, Chikwawa, Nsanje)

Field Supervisor: Allan Jumbe
Interviewer 1: Ayena Chanza
Interviewer 2: Regina Juwa
Lab tech 1: Christine Kaliwo
Lab tech 2: Agness Lakudzala

Alternate Team Supervisors
Dubulao Moyo
Evans Kaunda
Clifton Gondwe
Austin Gumbo

Regional Supervisors

Biomarkers
Madingore Yassin
Gloria Chisuwo Magola
Mathews Mhone
Innocent Zungu

Interviewers
Shadeck Mulenga
John Zoya
Clifton Gondwe

National Supervisors and Coordination
Doreen Ali
Misheck Luhanga (Survey Coordinator)
Ben Chilima
John Chiphwanya
Wilfred Dodoli

Laboratory Analysis
Madingore Yassin
Gloria Chisuwo Magola
Mathews Mhone
Innocent Zungu

Data Processing Supervisors and PDA Support
Towani Manda
Daniel Chikoja

Report Authors
Doreen Ali
Misheck Luhanga
John Chiphwanya
Aumi Manjolo
James Mwaisenba
Mc Leod Mwale
Wilfred Dodoli
John Zoya
John Sande
Austin Gumbo
Rudia Lungu
Jobiba Chinkhumba

ICF International Staff
Sri Poedjastoeti (Country Manager)
Alfredo Aliaga
Alex Izmukhambetov
Dean Garrett
Nancy Johnson
Audrey Shenett
Zhuzhi Moore
Geofrey Lutwama

QUESTIONNAIRES APPENDIX E

19 March 2012

2012 MALAWI MALARIA INDICATOR SURVEY
HOUSEHOLD QUESTIONNAIRE

IDENTIFICATION

PLACE NAME _____

DISTRICT _____

CLUSTER NUMBER . . . . . | | |

HOUSEHOLD NUMBER . . . . . | | |

NAME OF HOUSEHOLD HEAD _____

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE				DAY / MONTH / YEAR
INTERVIEWER'S NAME				INT. NUMBER
RESULT*				RESULT
NEXT VISIT: DATE				TOTAL NUMBER 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 NO. OF RESPONDENT TO HOUSEHOLD QUESTIONNAIRE | |

LANGUAGE OF QUESTIONNAIRE** **ENGLISH** 4

LANGUAGE OF INTERVIEW** . . . . . |

NATIVE LANGUAGE OF RESPONDENT** . . . . . |

TRANSLATOR USED (1=NOT AT ALL; 2=SOMETIME; 3=ALL THE TIME) . . . . . |

**LANGUAGE CODES: 1 CHICHEWA 2 TUMBUKA 3 YAO 4 ENGLISH 6 OTHER _____ (SPECIFY)

HE-1

INTRODUCTION AND CONSENT

Hello. My name is _____. I am working with the Ministry of Health. We are conducting a survey about health all over Malawi. The information we collect will help the government to plan health services. Your household was selected for the survey. I would like to ask you some questions about your household. The questions usually take about 15 to 20 minutes. All of the answers you give will be confidential and will not be shared with anyone other than members of our survey team. You don't have to be in the survey, but we hope you will agree to answer the questions since your views are important. If I ask you any question you don't want to answer, just let me know and I will go on to the next question or you can stop the interview at any time.
In case you need more information about the survey, you may contact the person listed on this card.

GIVE CARD WITH CONTACT INFORMATION

Do you have any questions?
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

HE-2

HOUSEHOLD SCHEDULE

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	WOMEN AGE 15-49	CHILDREN AGE 0-5
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
	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. AFTER LISTING THE NAMES AND RECORDING THE RELATIONSHIP AND SEX FOR EACH PERSON, ASK QUESTIONS 2A-2C TO BE SURE THAT THE LISTING IS COMPLETE. THEN ASK APPROPRIATE QUESTIONS IN COLUMNS 5-10 FOR EACH PERSON.	What is the relationship of (NAME) to the head of the household? SEE CODES BELOW.	Is (NAME) male or female?	Does (NAME) usually live here?	Did (NAME) stay here last night?	How old is (NAME)? IF 95 OR MORE, RECORD '95'.	CIRCLE LINE NUMBER OF ALL WOMEN AGE 15-49	CIRCLE LINE NUMBER OF ALL CHILDREN AGE 0-5
01			M F 1 2	Y N 1 2	Y N 1 2	IN YEARS	01	01
02			1 2	1 2	1 2		02	02
03			1 2	1 2	1 2		03	03
04			1 2	1 2	1 2		04	04
05			1 2	1 2	1 2		05	05
06			1 2	1 2	1 2		06	06
07			1 2	1 2	1 2		07	07
08			1 2	1 2	1 2		08	08
09			1 2	1 2	1 2		09	09
10			1 2	1 2	1 2		10	10

CODES FOR Q. 3: RELATIONSHIP TO HEAD OF HOUSEHOLD

01 = HEAD
02 = WIFE OR 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	WOMEN AGE 15-49	CHILDREN AGE 0-5
1	2	3	4	5	6	7	8	9
	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. AFTER LISTING THE NAMES AND RECORDING THE RELATIONSHIP AND SEX FOR EACH PERSON, ASK QUESTIONS 2A-2C TO BE SURE THAT THE LISTING IS COMPLETE. THEN ASK APPROPRIATE QUESTIONS IN COLUMNS 5-10 FOR EACH PERSON.	What is the relationship of (NAME) to the head of the household? SEE CODES BELOW.	Is (NAME) male or female?	Does (NAME) usually live here?	Did (NAME) stay here last night?	How old is (NAME)? IF 95 OR MORE, RECORD '95'.	CIRCLE LINE NUMBER OF ALL WOMEN AGE 15-49	CIRCLE LINE NUMBER OF ALL CHILDREN AGE 0-5
11			M F 1 2	Y N 1 2	Y N 1 2	IN YEARS	11	11
12			1 2	1 2	1 2		12	12
13			1 2	1 2	1 2		13	13
14			1 2	1 2	1 2		14	14
15			1 2	1 2	1 2		15	15
16			1 2	1 2	1 2		16	16
17			1 2	1 2	1 2		17	17
18			1 2	1 2	1 2		18	18
19			1 2	1 2	1 2		19	19
20			1 2	1 2	1 2		20	20

TICK HERE IF CONTINUATION SHEET USED ☐

2A) Just to make sure that I have a complete listing: are there any other persons such as small children or infants that we have not listed? YES ☐ → ADD TO TABLE NO ☐

2B) 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 ☐ → ADD TO TABLE NO ☐

2C) Are there any guests or temporary visitors staying here, or anyone else who stayed here last night, who have not been listed? YES ☐ → ADD TO TABLE NO ☐

CODES FOR Q. 3: RELATIONSHIP TO HEAD OF HOUSEHOLD

01 = HEAD
02 = WIFE OR 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

HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
101	What is the main source of drinking water for members of your household?	PIPED WATER PIPED INTO DWELLING . . . . . 11 PIPED TO 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)	→ 104 → 104
102	Where is that water source located?	IN OWN DWELLING . . . . . 1 IN OWN YARD/PLOT . . . . . 2 ELSEWHERE 3	→ 104
103	How long does it take to go there, get water, and come back?	MINUTES . . . . . [ ][ ][ ] DON'T KNOW 998	
104	What kind of toilet facility do members of your household usually use?	FLUSH OR POUR FLUSH TOILET . . . . . 11 PIT LATRINE VENTILATED IMPROVED PIT LATRINE . . . . . 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)	→ 107
105	Do you share this toilet facility with other households?	YES . . . . . 1 NO 2	→ 107
106	How many households use this toilet facility?	NO. OF HOUSEHOLDS IF LESS THAN 10 . . . . . [0][ ] 10 OR MORE HOUSEHOLDS . . . . . 95 DON'T KNOW 98	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
107	Does your household have: Electricity? A radio? A television? A cellular phone? A telephone (landline)? A refrigerator?	YES NO ELECTRICITY . . . . . 1 2 RADIO . . . . . 1 2 TELEVISION . . . . . 1 2 CELL PHONE . . . . . 1 2 TELEPHONE (LANDLINE) . . . . . 1 2 REFRIGERATOR 1 2	
108	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 WOOD . . . . . 07 STRAW/SHRUBS/GRASS . . . . . 08 ANIMAL DUNG . . . . . 09 NO FOOD COOKED IN HOUSEHOLD . . . . . 95 OTHER _____ 96 (SPECIFY)	
109	MAIN MATERIAL OF THE FLOOR. RECORD OBSERVATION.	NATURAL FLOOR EARTH/SAND . . . . . 11 DUNG . . . . . 12 RUDIMENTARY FLOOR WOOD PLANKS . . . . . 21 PALM/BAMBOO . . . . . 22 BROKEN BRICKS . . . . . 23 FINISHED FLOOR PARQUET OR POLISHED WOOD . . . . . 31 VINYL OR ASPHALT STRIPS . . . . . 32 CERAMIC TILES . . . . . 33 CEMENT . . . . . 34 CARPET . . . . . 35 OTHER _____ 96 (SPECIFY)	
110	MAIN MATERIAL OF THE ROOF. RECORD OBSERVATION.	NATURAL ROOFING NO ROOF . . . . . 11 THATCH/PALM LEAF . . . . . 12 RUDIMENTARY ROOFING RUSTIC MAT . . . . . 21 PALM/BAMBOO/GRASS . . . . . 22 WOOD PLANKS . . . . . 23 CARDBOARD . . . . . 24 FINISHED ROOFING IRON SHEETS . . . . . 31 WOOD . . . . . 32 CALAMINE/CEMENT FIBER . . . . . 33 CERAMIC TILES . . . . . 34 CEMENT . . . . . 35 ROOFING SHINGLES . . . . . 36 OTHER _____ 96 (SPECIFY)	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
111	MAIN MATERIAL OF THE EXTERIOR WALLS. RECORD OBSERVATION.	NATURAL WALLS NO WALLS . . . . . 11 CANE/PALM/TRUNKS . . . . . 12 DIRT . . . . . 13 **RUDIMENTARY WALLS** BAMBOO/TREE TRUNKS WITH MUD . 21 STONE WITH MUD . . . . . 22 PLYWOOD . . . . . 23 CARDBOARD . . . . . 24 REUSED WOOD . . . . . 25 **FINISHED WALLS** CEMENT . . . . . 31 STONE WITH LIME/CEMENT . . . . . 32 BURNT BRICKS . . . . . 33 UNBURNT BRICKS . . . . . 34 CEMENT BLOCKS . . . . . 35 WOOD PLANKS . . . . . 36 OTHER _____ 96 (SPECIFY)	
112	How many rooms in this household are used for sleeping?	ROOMS . . . . . ☐☐	
112A	How many separate rooms are in this household?	ROOMS . . . . . ☐☐	
112B	How many separate sleeping spaces are there in your household?	SLEEPING SPACES . . . . . ☐☐	
113	Does any member of this 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	
114	Does any member of this household own any agricultural land?	YES . . . . . 1 NO 2	→ 116
115	How many hectares of agricultural land do members of this household own? 1 HECTARE = 2.47 ACRES 1 ACRE = 0.4 HECTARE IF 95 OR MORE, CIRCLE '950'. RECORD IN UNITS RESPONDENT USES. _____	ACRES . . . . . 1 ☐☐.☐ HECTARES . . . . . 2 ☐☐.☐ FOOTBALL PITCHES 3 ☐☐.☐ 95 OR MORE HECTARES . . . . . 9995 DON'T KNOW 9998	
116	Does this household own any livestock, herds, other farm animals, or poultry?	YES . . . . . 1 NO 2	→ 118

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
117	How many of the following animals does this household own? IF NONE, ENTER '00'. IF 95 OR MORE, ENTER '95'. IF UNKNOWN, ENTER '98'. Goats? Pigs? Cattle? Sheep? Poultry (chickens, ducks, pigeons)? Other? _____ (SPECIFY)	GOATS . . . . . [ ][ ] PIGS . . . . . [ ][ ] CATTLE . . . . . [ ][ ] SHEEP . . . . . [ ][ ] POULTRY . . . . . [ ][ ] OTHER . . . . . [ ][ ]	
118	Does any member of this household have a bank account?	YES . . . . . 1 NO 2	
119	At any time in the past 12 months, has anyone come into your dwelling to spray the interior walls against mosquitoes?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 121
119A	How many months ago was the house sprayed? IF LESS THAN 1 MONTH AGO, RECORD '00'	MONTHS . . . . . [ ][ ]	
120	Who sprayed the house?	OTHER GOVERNMENT WORKER/ PROGRAMME . . . . . 1 PRIVATE COMPANY . . . . . 2 NONGOVERNMENTAL ORGANIZATION (NGO) . . . . . 3 OTHER _____ (SPECIFY) . . . . . 6 DON'T KNOW 8	
120A	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	→ 121
120B	How many months ago were the walls plastered or painted? IF LESS THAN 1 MONTH AGO, RECORD '00'	MONTHS . . . . . [ ][ ]	
121	Does your household have any mosquito nets that can be used while sleeping?	YES . . . . . 1 NO 2	→ 122A
122	How many mosquito nets does your household have? IF 7 OR MORE NETS, RECORD '7'.	NUMBER OF NETS . . . . . [ ]	
122A	Has anyone in your household ever sold or given away a mosquito net?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	

		NET #1	NET #2	NET #3
123	ASK THE RESPONDENT TO SHOW YOU ALL THE NETS IN THE HOUSEHOLD IF MORE THAN 3 NETS, USE ADDITIONAL QUESTIONNAIRE(S).	OBSERVED ..... 1 NOT OBSERVED 2	OBSERVED ..... 1 NOT OBSERVED 2	OBSERVED ..... 1 NOT OBSERVED 2
123A	OBSERVE (OR ASK ABOUT) THE CONDITION OF THE MOSQUITO NET: DOES THE NET HAVE HOLES IN IT (HOLES THE SIZE OF THE TIP OF YOUR THUMB OR LARGER)?	YES .... 1 NO 2	YES .... 1 NO 2	YES .... 1 NO 2
123B	OBSERVE (OR ASK) THE COLOR OF THE MOSQUITO NET.	GREEN .... 01 DARK BLUE ... 02 LIGHT BLUE ... 03 RED .... 04 BLACK .... 05 WHITE .... 06 OTHER 96	GREEN .... 01 DARK BLUE ... 02 LIGHT BLUE ... 03 RED .... 04 BLACK .... 05 WHITE .... 06 OTHER 96	GREEN .... 01 DARK BLUE ... 02 LIGHT BLUE ... 03 RED .... 04 BLACK .... 05 WHITE .... 06 OTHER 96
123C	OBSERVE (OR ASK) THE SHAPE OF THE MOSQUITO NET.	CONICAL .... 1 RECTANGLE ..... 2 OTHER 6	CONICAL .... 1 RECTANGLE ..... 2 OTHER 6	CONICAL .... 1 RECTANGLE ..... 2 OTHER 6
123D	Is the net hanging for sleeping?	YES .... 1 NO 2	YES .... 1 NO 2	YES .... 1 NO 2
124	How many months ago did your household get the mosquito net? IF LESS THAN ONE MONTH AGO, RECORD '00'.	MONTHS AGO ... [ ][ ] MORE THAN 36 MONTHS AGO ... 95 NOT SURE 98	MONTHS AGO ... [ ][ ] MORE THAN 36 MONTHS AGO ... 95 NOT SURE 98	MONTHS AGO ... [ ][ ] MORE THAN 36 MONTHS AGO ... 95 NOT SURE 98
125	Is this net a long-lasting net, retreatable, or an untreated net? OBSERVE OR ASK THE BRAND/ TYPE OF MOSQUITO NET. **ITN/LONG-LASTING NET** DURANET (GREEN, SQUARE) OLYSNET (LIGHT BLUE, SQUARE) LIFENET (WHITE, SQUARE) PERMANET (GREEN, SQUARE) **CONVENTIONAL NETS: CAN BE RETREATABLE OR UNTREATED** SAFI NET (DARK BLUE, CONICAL) THERE ARE OTHER BRANDS **BE AWARE THAT MANY BRANDS MAY EXIST AND BE DISTRIBUTED BY DIFFERENT ORGANIZATIONS.**	**ITN/LONG-LASTING NET** DURANET ..... 11 OLYSET ..... 12 LIFENET ..... 13 PERMANET ... 14 OTHER/ DK BRAND ... 16 (SKIP TO 128) **RETREATABLE NET** SAFI NET ..... 21 OTHER/ DK BRAND ... 26 (SKIP TO 126) **UNTREATED NET** SAFI NET ..... 31 OTHER/ DK BRAND ... 36 **OTHER** ________ 41 (SPECIFY) **DK BRAND** 98	**ITN/LONG-LASTING NET** DURANET ..... 11 OLYSET ..... 12 LIFENET ..... 13 PERMANET ... 14 OTHER/ DK BRAND ... 16 (SKIP TO 128) **RETREATABLE NET** SAFI NET ..... 21 OTHER/ DK BRAND ... 26 (SKIP TO 126) **UNTREATED NET** SAFI NET ..... 31 OTHER/ DK BRAND ... 36 **OTHER** ________ 41 (SPECIFY) **DK BRAND** 98	**ITN/LONG-LASTING NET** DURANET ..... 11 OLYSET ..... 12 LIFENET ..... 13 PERMANET ... 14 OTHER/ DK BRAND ... 16 (SKIP TO 128) **RETREATABLE NET** SAFI NET ..... 21 OTHER/ DK BRAND ... 26 (SKIP TO 126) **UNTREATED NET** SAFI NET ..... 31 OTHER/ DK BRAND ... 36 **OTHER** ________ 41 (SPECIFY) **DK BRAND** 98
125A	When you received this net, did it come with a treatment kit?	YES .... 1 NO .... 2 NOT SURE 8	YES .... 1 NO .... 2 NOT SURE 8	YES .... 1 NO .... 2 NOT SURE 8

		NET #1	NET #2	NET #3
126	Since you got the net, was it ever soaked or dipped in a liquid to kill or repel mosquitoes?	YES .... 1 NO .... 2 (SKIP TO 128) NOT SURE 8	YES .... 1 NO .... 2 (SKIP TO 128) NOT SURE 8	YES .... 1 NO .... 2 (SKIP TO 128) NOT SURE 8
127	How many months ago was the net last soaked or dipped? IF LESS THAN ONE MONTH AGO, RECORD '00'.	MONTHS AGO ... [ ][ ] MORE THAN 24 MONTHS AGO 95 NOT SURE 98	MONTHS AGO ... [ ][ ] MORE THAN 24 MONTHS AGO . . . 95 NOT SURE 98	MONTHS AGO ... [ ][ ] MORE THAN 24 MONTHS AGO 95 NOT SURE 98
127A	Did you pay to have the net soaked or dipped?	YES .... 1 NO .... 2 (SKIP TO 128) NOT SURE 8	YES .... 1 NO .... 2 (SKIP TO 128) NOT SURE 8	YES .... 1 NO .... 2 (SKIP TO 128) NOT SURE 8
127B	How much did you pay to soak or dip the net?	COST IN KWACHA [ ][ ][ ][ ] DON'T KNOW 9998	COST IN KWACHA [ ][ ][ ][ ] DON'T KNOW 9998	COST IN KWACHA [ ][ ][ ][ ] DON'T KNOW 9998
128	Where did you obtain the net?	GOVT. CLINIC/ HOSPITAL ..... 01 NEIGHBORHOOD HEALTH COMMITTEE (NHC) .... 02 COM. HEALTH WORKER (CHW) ..... 03 SHOP ..... 04 PHARMACY ..... 05 WORKPLACE ..... 06 OTHER ______ 96 (SPECIFY) DON'T KNOW 98	GOVT. CLINIC/ HOSPITAL ..... 01 NEIGHBORHOOD HEALTH COMMITTEE (NHC) .... 02 COM. HEALTH WORKER (CHW) ..... 03 SHOP ..... 04 PHARMACY ..... 05 WORKPLACE ..... 06 OTHER ______ 96 (SPECIFY) DON'T KNOW 98	GOVT. CLINIC/ HOSPITAL ..... 01 NEIGHBORHOOD HEALTH COMMITTEE (NHC) .... 02 COM. HEALTH WORKER (CHW) ..... 03 SHOP ..... 04 PHARMACY ..... 05 WORKPLACE ..... 06 OTHER ______ 96 (SPECIFY) DON'T KNOW 98
128A	Did you purchase the net?	YES .... 1 NO .... 2 (SKIP TO 129) NOT SURE 8	YES .... 1 NO .... 2 (SKIP TO 129) NOT SURE 8	YES .... 1 NO .... 2 (SKIP TO 129) NOT SURE 8
128B	How much did you pay for the net when you purchased it?	COST IN KWACHA [ ][ ][ ][ ] DON'T KNOW 9998	COST IN KWACHA [ ][ ][ ][ ] DON'T KNOW 9998	COST IN KWACHA [ ][ ][ ][ ] DON'T KNOW 9998
129	Did anyone sleep under this mosquito net last night?	YES .... 1 NO .... 2 (SKIP TO 130C) NOT SURE 8	YES .... 1 NO .... 2 (SKIP TO 130C) NOT SURE 8	YES .... 1 NO .... 2 (SKIP TO 130C) NOT SURE 8

HE-10

		NET #1	NET #2	NET #3
129A	Who slept under this mosquito net last night? RECORD THE PERSON'S NAME AND 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. . . . .

130	ANY CHILDREN UNDER AGE 5 WHO DID NOT SLEEP UNDER A MOSQUITO NET YES ☐ NO ☐ → 131 NAME OF CHILD(REN): _____ _____	
130A	Why did (NAME OF CHILD) (and (NAME OF CHILD)) not sleep under a mosquito net last night? Any other reason? RECORD ALL MENTIONED.	TOO HOT . . . . . A TOO COLD . . . . . B CHILD CRIES . . . . . C CHILD AFRAID . . . . . D NOT ENOUGH NET . . . . . E NET NOT HUNG UP . . . . . F USED BY ADULTS . . . . . G NET NOT USED WHEN TRAVELING H NET NOT IN GOOD CONDIITION . . . . I NET BAD FOR CHILDREN'S HEALTH . . . . . J OTHER _____ X (SPECIFY)
130C	CHECK 121: NO ☐ YES ☐ → 131	
130D	You donot have a mosquito net in your house. If you have a choice, what color of mosquito net do you prefer?	BLUE . . . . . 1 GREEN . . . . . 2 RED . . . . . 3 WHITE . . . . . 4 BLACK . . . . . 5 OTHER _____ 6 (SPECIFY) DK/NO PREFERENCE 8
130E	What shape of mosquito net do you prefer?	CONICAL . . . . . 1 RECTANGULAR . . . . . 2 DK/NO PREFERENCE 8

131		NEXT NET; OR, IF NO MORE NETS, GO TO 201.	NEXT NET; OR, IF NO MORE NETS, GO TO 201.	COLUMN OF A NEW QUESTIONNAIRE; OR, IF NO MORE NETS, GO TO 201.

2012 MALAWI MALARIA INDICATOR SURVEY
WOMAN'S QUESTIONNAIRE

IDENTIFICATION

PLACE NAME _____ | | | |
DISTRICT _____ | | | |
CLUSTER NUMBER . . . . . | | | |
HOUSEHOLD NUMBER . . . . . | | |
NAME OF HOUSEHOLD HEAD _____
NAME AND LINE NUMBER OF WOMAN _____ | |

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE				DAY / MONTH / YEAR
INTERVIEWER'S NAME				INT. NUMBER
RESULT*				RESULT
NEXT VISIT: DATE				TOTAL NUMBER OF VISITS
TIME				

*RESULT CODES:

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

LANGUAGE OF QUESTIONNAIRE** **ENGLISH** — **4**
LANGUAGE OF INTERVIEW** . . . . . |
NATIVE LANGUAGE OF RESPONDENT** . . . . . |
TRANSLATOR USED (1=NOT AT ALL; 2=SOMETIME; 3=ALL THE TIME) . . . . . |

**LANGUAGE CODES: 1 CHICHEWA 2 TUMBUKA 3 YAO 4 ENGLISH 6 OTHER _____ (SPECIFY)

SUPERVISOR	OFFICE EDITOR	KEYED BY
NAME _____		

SECTION 1. RESPONDENT'S BACKGROUND

INTRODUCTION AND CONSENT

INFORMED CONSENT

Hello. My name is _____. I am working with the Ministry of Health. We are conducting a survey about health all over Malawi. The information we collect will help the government to plan health services. Your household was selected for the survey. The questions usually take about 10-20 minutes. All of the answers you give will be confidential and will not be shared with anyone other than members of our survey team. You don't have to be in the survey, but we hope you will agree to answer the questions since your views are important. If I ask you any question you don't want to answer, just let me know and I will go on to the next question or you can stop the interview at any time.

In case you need more information about the survey, you may contact the person listed on the card that has already been given to your household.

Do you have any questions? 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?	PRIMARY . . . . . 1 SECONDARY . . . . . 2 HIGHER 3	
106	What is the highest (grade/form/year) you completed at that level? IF COMPLETED LESS THAN ONE YEAR AT THAT LEVEL, RECORD '00'.	CLASS/FORM/YEAR . . . . . [ ][ ]	
107	CHECK 105: PRIMARY ☐ ↓ SECONDARY OR HIGHER ☐ →		109

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
108	Now I would like you to read this sentence to me. SHOW CARD TO RESPONDENT. 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 . . . . . 01 CCAP . . . . . 02 ANGLICAN . . . . . 03 SEVENTH DAY ADVENT./BAPTIST . . . 04 OTHER CHRISTIAN . . . . . 05 MUSLIM . . . . . 06 NO RELIGION . . . . . 07 OTHER_____ 96 (SPECIFY)	
110	What is your tribe or ethnic group?	CHEWA . . . . . 01 TUMBUKA . . . . . 02 LOMWE . . . . . 03 TONGA . . . . . 04 YAO . . . . . 05 SENA . . . . . 06 NKHONDE . . . . . 07 NGONI . . . . . 08 OTHER_____ 96 (SPECIFY)	

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. IF NONE, RECORD '00'.	TOTAL BIRTHS . . . . . [ ][ ] NONE 00	→ 224
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? TWO OR MORE BIRTHS → How many of these children were born in the last six years? IF NO CIRCLE '00.'	TOTAL IN THE LAST 6 YEARS LAST 6 YEARS . . . . . [ ][ ] NONE 00	→ 224

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 THE BIRTHS IN THE LAST 6 YEARS IN 212. RECORD TWINS AND TRIPLETS ON SEPARATE ROWS.

212 What name was given to your (most recent/previous) baby? RECORD NAME. BIRTH HISTORY NUMBER	213 Is (NAME) a boy or a girl?	214 Were any of these births twins?	215 In what month and year was (NAME) born? PROBE: When 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 HOUSE-HOLD LINE NUMBER OF CHILD (RECORD '00' IF CHILD NOT LISTED IN HOUSE-HOLD).	220 Were there any other live births between (NAME) and (NAME OF BIRTH ON PREVIOUS LINE), including any children who died after birth?
01	BOY 1 GIRL 2	SING 1 MULT 2	MONTH ☐☐ YEAR ☐☐☐☐	YES . . . . 1 NO . . . . 2 (NEXT BIRTH)	AGE IN YEARS ☐☐	YES . . . 1 NO 2	HOUSEHOLD LINE NUMBER ☐☐ (NEXT BIRTH)	
02	BOY 1 GIRL 2	SING 1 MULT 2	MONTH ☐☐ YEAR ☐☐☐☐	YES . . . . 1 NO 2 220	AGE IN YEARS ☐☐	YES . . . 1 NO 2	HOUSEHOLD LINE NUMBER ☐☐	YES . . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
03	BOY 1 GIRL 2	SING 1 MULT 2	MONTH ☐☐ YEAR ☐☐☐☐	YES . . . . 1 NO 2 220	AGE IN YEARS ☐☐	YES . . . 1 NO 2	HOUSEHOLD LINE NUMBER ☐☐	YES . . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
04	BOY 1 GIRL 2	SING 1 MULT 2	MONTH ☐☐ YEAR ☐☐☐☐	YES . . . . 1 NO 2 220	AGE IN YEARS ☐☐	YES . . . 1 NO 2	HOUSEHOLD LINE NUMBER ☐☐	YES . . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
05	BOY 1 GIRL 2	SING 1 MULT 2	MONTH ☐☐ YEAR ☐☐☐☐	YES . . . . 1 NO 2 220	AGE IN YEARS ☐☐	YES . . . 1 NO 2	HOUSEHOLD LINE NUMBER ☐☐	YES . . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
06	BOY 1 GIRL 2	SING 1 MULT 2	MONTH ☐☐ YEAR ☐☐☐☐	YES . . . . 1 NO 2 220	AGE IN YEARS ☐☐	YES . . . 1 NO 2	HOUSEHOLD LINE NUMBER ☐☐	YES . . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
07	BOY 1 GIRL 2	SING 1 MULT 2	MONTH ☐☐ YEAR ☐☐☐☐	YES . . . . 1 NO 2 220	AGE IN YEARS ☐☐	YES . . . 1 NO 2	HOUSEHOLD LINE NUMBER ☐☐	YES . . . . . 1 ADD BIRTH NO 2

WE 5

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 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.)		
223	CHECK 215: ENTER THE NUMBER OF BIRTHS IN 2006 OR LATER.	NUMBER OF BIRTHS . . . . . ☐ NONE 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 2006 OR LATER ☐ ↓ NO BIRTHS IN 2006 OR LATER OR IS BLANK ☐ →		501

SECTION 3A. PREGNANCY AND INTERMITTENT PREVENTATIVE TREATMENT

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
301	CHECK 215: ENTER IN THE TABLE THE NAME AND SURVIVAL STATUS OF THE MOST RECENT BIRTH. Now I would like to ask some questions about your last pregnancy that resulted in a live birth.		
301	FROM 212 AND 216, LINE 01:	LAST BIRTH NAME _____ LIVING ☐ DEAD ☐	
302	When you were pregnant with (NAME), did you see anyone for antenatal care for this pregnancy?	YES . . . . . 1 NO 2	→ 304
303	Whom did you see? Anyone else? PROBE TO IDENTIFY EACH TYPE OF PERSON AND RECORD ALL MENTIONED.	HEALTH PERSONNEL DOCTOR/CLINICAL OFFICER . . . A NURSE/MIDWIFE . . . . . B PATIENT ATTENDANT . . . . . C HSA . . . . . D OTHER PERSON TRADITIONAL BIRTHATTENDANT E OTHER _____ X (SPECIFY)	
304	During this pregnancy, did you take any drugs to keep you from getting malaria?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 310
305	What drugs did you take to prevent getting malaria? RECORD ALL MENTIONED. IF TYPE OF DRUG IS NOT DETERMINED, SHOW TYPICAL ANTIMALARIAL DRUGS TO RESPONDENT.	SP/FANSIDAR/NOVIDAR SP . . . . . A CHLOROQUINE . . . . . B OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
306	CHECK 305: SP/FANSIDAR TAKEN FOR MALARIA PREVENTION.	CODE 'A' CIRCLED ☐ CODE 'A' NOT CIRCLED ☐	→ 310
307	How many times did you take (SP/Fansidar or Novidar SP) during this pregnancy?	TIMES . . . . . ☐☐	
308	CHECK 303: ANTENATAL CARE FROM HEALTH PERSONNEL DURING THIS PREGNANCY	CODE 'A', 'B' OR 'C' CIRCLED ☐ OTHER ☐	→ 310
309	Did you get the (SP/Fansidar) during any antenatal care visit, during another visit to a health facility or from another source?	ANTENATAL VISIT . . . . . 1 ANOTHER FACILITY VISIT . . . . . 2 OTHER SOURCE 6	
310	Did you take the (SP/Fansidar or Novidar SP) under direct observation by the health worker each time, or did you take it at home?	DIRECT OBSERVATION . . . . . 1 AT HOME . . . . . 2 ELSEWHERE 3	
311	CHECK 215 AND 216:	ONE OR MORE LIVING CHILDREN BORN IN 2006 OR LATER ☐ NO LIVING CHILDREN BORN IN 2006 OR LATER ☐ GO TO 401	→ 501

SECTION 4. FEVER IN CHILDREN

401	CHECK 215: ENTER IN THE TABLE THE BIRTH HISTORY NUMBER, NAME, AND SURVIVAL STATUS OF EACH BIRTH IN 2006 OR LATER. ASK THE QUESTIONS ABOUT ALL OF THESE BIRTHS. BEGIN WITH THE LAST BIRTH. (IF THERE ARE MORE THAN 3 BIRTHS, USE LAST 2 COLUMNS OF ADDITIONAL QUESTIONNAIRES). Now I would like to ask some questions about the health of your children born since January 2006. (We will talk about each separately.)			
402	BIRTH HISTORY NUMBER FROM 212 IN BIRTH HISTORY	LAST BIRTH BIRTH HISTORY NUMBER ☐☐	NEXT-T0-LAST BIRTH BIRTH HISTORY NUMBER ☐☐	SECOND-FROM-LAST BIRTH BIRTH HISTORY NUMBER ☐☐
403	FROM 212 AND 216	NAME _____ LIVING ☐ DEAD ☐ (GO TO 403 IN NEXT COLUMN OR, IF NO MORE BIRTHS, GO TO 501)	NAME _____ LIVING ☐ DEAD ☐ (GO TO 403 IN NEXT COLUMN OR, IF NO MORE BIRTHS, GO TO 501)	NAME _____ LIVING ☐ DEAD ☐ (GO TO 403 IN NEXT-TO-LAST COLUMN OF NEW QUESTIONNAIRE, OR, IF NO MORE BIRTHS, GO TO 501)
404	Has (NAME) been ill with a fever at any time in the last 2 weeks?	YES . . . . . 1 NO . . . . . 2 (GO TO 403 IN NEXT COLUMN OR, IF NO MORE BIRTHS, GO TO 501) DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (GO TO 403 IN NEXT COLUMN OR, IF NO MORE BIRTHS, GO TO 501) DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (GO TO 403 IN NEXT COLUMN OR, IF NO MORE BIRTHS, GO TO 501) DON'T KNOW 8
404A	How many days ago did the fever start? IF LESS THAN ONE DAY, RECORD '00'	DAYS AGO ☐☐	DAYS AGO ☐☐	DAYS AGO ☐☐
405	Did you seek advice or treatment for the illness from any source?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 410)	YES . . . . . 1 NO . . . . . 2 (SKIP TO 410)	YES . . . . . 1 NO . . . . . 2 (SKIP TO 410)

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ________	NEXT-TO-LAST BIRTH NAME ________	SECOND-FROM-LAST BIRTH NAME ________
406	Where did you seek advice or treatment? Anywhere else? PROBE TO IDENTIFY EACH TYPE OF SOURCE. IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE. ________________ (NAME OF PLACE(S))	**PUBLIC SECTOR** GOVT HOSPITAL A GOVT HEALTH CENTER . . . . . B GOVT HEALTH POST/ OUTREACH . . . C MOBILE CLINIC . D HSA . . . . E OTHER PUBLIC F **CHAM/MISSION** HOSPITAL . . . . . G HEALTH CENTER H **PRIVATE MEDICAL SECTOR** PVT. HOSPITAL/ CLINIC . . . . J PHARMACY . . . K PVT DOCTOR . . . L MOBILE CLINIC . M HSA . . . . N OTHER PRIVATE MEDICAL . . . . . O BLM . . . . P MACRO . . . . Q YOUTH DROP IN CENTRE . . . . R **OTHER SOURCE** SHOP . . . . S TRADITIONAL PRACTITIONER T OTHER ________ X (SPECIFY)	**PUBLIC SECTOR** GOVT HOSPITAL A GOVT HEALTH CENTER . . . . . B GOVT HEALTH POST/ OUTREACH . . . C MOBILE CLINIC . D HSA . . . . E OTHER PUBLIC F **CHAM/MISSION** HOSPITAL . . . . . G HEALTH CENTER H **PRIVATE MEDICAL SECTOR** PVT. HOSPITAL/ CLINIC . . . . J PHARMACY . . . K PVT DOCTOR . . . L MOBILE CLINIC . M HSA . . . . N OTHER PRIVATE MEDICAL . . . . . O BLM . . . . P MACRO . . . . Q YOUTH DROP IN CENTRE . . . . R **OTHER SOURCE** SHOP . . . . S TRADITIONAL PRACTITIONER T OTHER ________ X (SPECIFY)	**PUBLIC SECTOR** GOVT HOSPITAL A GOVT HEALTH CENTER . . . . . B GOVT HEALTH POST/ C OUTREACH . . . MOBILE CLINIC . D HSA . . . . E OTHER PUBLIC **CHAM/MISSION** HOSPITAL . . . . . G HEALTH CENTER H **PRIVATE MEDICAL SECTOR** PVT. HOSPITAL/ CLINIC . . . . J PHARMACY . . . K PVT DOCTOR . . . L MOBILE CLINIC . M HSA . . . . N OTHER PRIVATE MEDICAL . . . . . O BLM . . . . P MACRO . . . . Q YOUTH DROP IN CENTRE . . . . R **OTHER SOURCE** SHOP . . . . S TRADITIONAL PRACTITIONER T OTHER ________ X (SPECIFY)
406A	How many days after the fever began did you first seek treatment for (NAME)?	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8
406B	How much did you spend on the treatment including consultation on fees, if any?	COST IN KWACHA [ ][ ][ ][ ][ ] FREE . . . . 99995 DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] FREE . . . . 99995 DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] FREE . . . . 99995 DON'T KNOW 99998
406C	How much did you spend on drugs?	COST IN KWACHA [ ][ ][ ][ ][ ] FREE . . . . 99995 DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] FREE . . . . 99995 DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] FREE . . . . 99995 DON'T KNOW 99998

WE-9

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____	SECOND-FROM-LAST BIRTH NAME _____
407	CHECK 406:	TWO OR MORE CODES CIRCLED / ONLY ONE CODE CIRCLED (SKIP TO 409)	TWO OR MORE CODES CIRCLED / ONLY ONE CODE CIRCLED (SKIP TO 409)	TWO OR MORE CODES CIRCLED / ONLY ONE CODE CIRCLED (SKIP TO 409)
408	Where did you first seek advice or treatment? USE LETTER CODE FROM 406.	FIRST PLACE . . .	FIRST PLACE . . .	FIRST PLACE . . .
408A	How far is your house from the (FIRST PLACE IN 408)?	LESS THAN 15 KM . 1 15 KM + ... 2	LESS THAN 15 KM . 1 15 KM + ... 2	LESS THAN 15 KM . 1 15 KM + ... 2
408B	What is the total amount that you spent for transport to and from the (FIRST PLACE IN 408)?	COST IN KWACHA FREE . . . . . 99995 DON'T KNOW 99998	COST IN KWACHA FREE . . . . . 99995 DON'T KNOW 99998	COST IN KWACHA FREE . . . . . 99995 DON'T KNOW 99998
408C	Did any member of your household go with you to the (FIRST PLACE IN 408)?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 408E)	YES . . . . . 1 NO . . . . . 2 (SKIP TO 408E)	YES . . . . . 1 NO . . . . . 2 (SKIP TO 408E)
408D	What is the total amount that you spent for his/her transport?	COST IN KWACHA FREE . . . . . 99995 DON'T KNOW 99998	COST IN KWACHA FREE . . . . . 99995 DON'T KNOW 99998	COST IN KWACHA FREE . . . . . 99995 DON'T KNOW 99998
408E	CHECK 408B and 408D:	EITHER ONE IS PAID / BOTH ARE FREE OR DK (SKIP TO 408G)	EITHER ONE IS PAID / BOTH ARE FREE OR DK (SKIP TO 408G)	EITHER ONE IS PAID / BOTH ARE FREE OR DK (SKIP TO 408G)
408F	What was the source of the payment (if any) you used during the child's sickness with fever?	INCOME . . . . . A OCCASIONAL INCOME . . . . . B BORROWED . . . . . C SALE OF ASSETS . D OTHER _____ X (SPECIFY)	INCOME . . . . . A OCCASIONAL INCOME . . . . . B BORROWED . . . . . C SALE OF ASSETS . D OTHER _____ X (SPECIFY)	INCOME . . . . . A OCCASIONAL INCOME . . . . . B BORROWED . . . . . C SALE OF ASSETS . D OTHER _____ X (SPECIFY)
408G	Did you take any days off work in order to care for your child's sickness?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 409)	YES . . . . . 1 NO . . . . . 2 (SKIP TO 409)	YES . . . . . 1 NO . . . . . 2 (SKIP TO 409)
408H	How many days?	DAYS . . .	DAYS . . .	DAYS . . .
409	At any time during the illness, did (NAME) have blood taken from his/her finger or heel for testing?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 409C) DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (SKIP TO 409C) DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (SKIP TO 409C) DON'T KNOW 8

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ________	NEXT-TO-LAST BIRTH NAME ________	SECOND-FROM-LAST BIRTH NAME ________
409A	Was the blood tested for malaria?	YES . . . . 1 NO . . . . 2 (SKIP TO 409C) ← DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (SKIP TO 409C) ← DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (SKIP TO 409C) ← DON'T KNOW 8
409B	Were you told the result?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	YES . . . . 1 NO . . . . 2 DON'T KNOW 8
409C	Is (NAME) still sick with a fever?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	YES . . . . 1 NO . . . . 2 DON'T KNOW 8
410	At any time during the illness, did (NAME) take any drugs for the illness?	YES . . . . 1 NO . . . . 2 GO TO 429) ← DON'T KNOW 8	YES . . . . 1 NO . . . . 2 GO TO 429) ← DON'T KNOW 8	YES . . . . 1 NO . . . . 2 GO TO 429) ← DON'T KNOW 8
411	What drugs did (NAME) take? Any other drugs? RECORD ALL MENTIONED.	ANTIMALARIAL DRUGS SP/FANSIDAR/ NOVIDAR SP . A CHLOROQUINE B AMODIAQUINE C QUININE . . . . D LA (COARTEM) . E ARTESUNATE . . . F AA/ASAQ (COMBINED AMODIAQUINE AND ARTE- SUNATE) . . . G OTHER ANTI- MALARIAL ________ . . . H (SPECIFY) ANTIBIOTIC DRUGS PILL/SYRUP . . . I INJECTION . . . J OTHER DRUGS ASPIRIN/ CAFENOL . . . K ACETAMINOPHEN/ PANADOL/ PARACETAMOL L IBUPROFEN . . . M OTHER ________ X (SPECIFY) DON'T KNOW . . . . . Z	ANTIMALARIAL DRUGS SP/FANSIDAR/ NOVIDAR SP . A CHLOROQUINE B AMODIAQUINE C QUININE . . . . D LA (COARTEM) . E ARTESUNATE . . . F AA/ASAQ (COMBINED AMODIAQUINE AND ARTE- SUNATE) . . . G OTHER ANTI- MALARIAL ________ . . . H (SPECIFY) ANTIBIOTIC DRUGS PILL/SYRUP . . . I INJECTION . . . J OTHER DRUGS ASPIRIN/ CAFENOL . . . K ACETAMINOPHEN/ PANADOL/ PARACETAMOL L IBUPROFEN . . . M OTHER ________ X (SPECIFY) DON'T KNOW . . . . . Z	ANTIMALARIAL DRUGS SP/FANSIDAR/ NOVIDAR SP . A CHLOROQUINE B AMODIAQUINE C QUININE . . . . D LA (COARTEM) . E ARTESUNATE . . . F AA/ASAQ (COMBINED AMODIAQUINE AND ARTE- SUNATE) . . . G OTHER ANTI- MALARIAL ________ . . . H (SPECIFY) ANTIBIOTIC DRUGS PILL/SYRUP . . . I INJECTION . . . J OTHER DRUGS ASPIRIN/ CAFENOL . . . K ACETAMINOPHEN/ PANADOL/ PARACETAMOL L IBUPROFEN . . . M OTHER ________ X (SPECIFY) DON'T KNOW . . . . . Z

WE-11

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ________	NEXT-TO-LAST BIRTH NAME ________	SECOND-FROM-LAST BIRTH NAME ________
412	CHECK 411: ANY CODE A-H CIRCLED?	YES ☐ ↓ NO ☐ (GO TO 429)	YES ☐ ↓ NO ☐ (GO TO 429)	YES ☐ ↓ NO ☐ (GO TO 429)
413	CHECK 411: SP/FANSIDAR/NOVIDAR SP ('A') GIVEN	CODE 'A' CIRCLED ☐ ↓ CODE 'A' NOT CIRCLED ☐ (SKIP TO 415)	CODE 'A' CIRCLED ☐ ↓ CODE 'A' NOT CIRCLED ☐ (SKIP TO 415)	CODE 'A' CIRCLED ☐ ↓ CODE 'A' NOT CIRCLED ☐ (SKIP TO 415)
414	How long after the fever started did (NAME) first take SP/Fansidar/Novidar SP?	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8
414A	For how many days did (NAME) take SP/Fansidar/Novidar SP?	NUMBER OF DAYS . . . ☐☐	NUMBER OF DAYS . . . ☐☐	NUMBER OF DAYS . . . ☐☐
414B	Did you have SP/Fansidar/ Novidar SP at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE ASK :Where did you get the SP/Fansidar/Novidar SP first?	HOME . . . . 1 GOVERNMENT HEALTH FACILITY/ WORKER . . . . . 2 PRIVATE HEALTH FACILITY/ WORKER . . . . . 3 SHOP . . . . 4 OTHER ________ 6 (SPECIFY) DON'T KNOW 8	HOME . . . . 1 GOVERNMENT HEALTH FACILITY/ WORKER . . . . . 2 PRIVATE HEALTH FACILITY/ WORKER . . . . . 3 SHOP . . . . 4 OTHER ________ 6 (SPECIFY) DON'T KNOW 8	HOME . . . . 1 GOVERNMENT HEALTH FACILITY/ WORKER . . . . . 2 PRIVATE HEALTH FACILITY/ WORKER . . . . . 3 SHOP . . . . 4 OTHER ________ 6 (SPECIFY) DON'T KNOW 8
414C	Did you purchase the SP/Fansidar/ Novidar SP?	YES . . . . 1 NO . . . . 2 (SKIP TO 415)	YES . . . . 1 NO . . . . 2 (SKIP TO 415)	YES . . . . 1 NO . . . . 2 (SKIP TO 415)
414D	How much did you pay for the SP/Fansidar/Novidar SP?	COST IN KWACHA ☐☐☐☐☐ DON'T KNOW 99998	COST IN KWACHA ☐☐☐☐☐ DON'T KNOW 99998	COST IN KWACHA ☐☐☐☐☐ DON'T KNOW 99998
415	CHECK 411: CHLOROQUINE ('B') GIVEN	CODE 'B' CIRCLED ☐ ↓ CODE 'B' NOT CIRCLED ☐ (SKIP TO 417)	CODE 'B' CIRCLED ☐ ↓ CODE 'B' NOT CIRCLED ☐ (SKIP TO 417)	CODE 'B' CIRCLED ☐ ↓ CODE 'B' NOT CIRCLED ☐ (SKIP TO 417)
416	How long after the fever started did (NAME) first take chloroquine?	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8

WE-12

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ______	NEXT-TO-LAST BIRTH NAME ______	SECOND-FROM-LAST BIRTH NAME ______
416A	For how many days did (NAME) take chloroquine?	NUMBER OF DAYS . . . [ ][ ]	NUMBER OF DAYS . . . [ ][ ]	NUMBER OF DAYS . . . [ ][ ]
416B	Did you have chloroquine at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE ASK :Where did you get the chloroquine first?	HOME . . . . 1 GOVERNMENT HEALTH FACILITY/ WORKER . . . . . 2 PRIVATE HEALTH FACILITY/ WORKER . . . . . 3 SHOP . . . . 4 OTHER ______ 6 (SPECIFY) DON'T KNOW 8	HOME . . . . 1 GOVERNMENT HEALTH FACILITY/ WORKER . . . . . 2 PRIVATE HEALTH FACILITY/ WORKER . . . . . 3 SHOP . . . . 4 OTHER ______ 6 (SPECIFY) DON'T KNOW 8	HOME . . . . 1 GOVERNMENT HEALTH FACILITY/ WORKER . . . . . 2 PRIVATE HEALTH FACILITY/ WORKER . . . . . 3 SHOP . . . . 4 OTHER ______ 6 (SPECIFY) DON'T KNOW 8
416C	Did you purchase the chloroquine?	YES . . . . 1 NO . . . . 2 (SKIP TO 417)	YES . . . . 1 NO . . . . 2 (SKIP TO 417)	YES . . . . 1 NO . . . . 2 (SKIP TO 417)
416D	How much did you pay for the chloroquine?	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998
417	CHECK 411: AMODIAQUINE ('C') GIVEN	CODE 'C' CIRCLED [ ] CODE 'C' NOT CIRCLED [ ] (SKIP TO 419)	CODE 'C' CIRCLED [ ] CODE 'C' NOT CIRCLED [ ] (SKIP TO 419)	CODE 'C' CIRCLED [ ] CODE 'C' NOT CIRCLED [ ] (SKIP TO 419)
418	How long after the fever started did (NAME) first take AMODIAQUINE?	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8
418A	For how many days did (NAME) takeAMODIAQUINE?	NUMBER OF DAYS . . . [ ][ ]	NUMBER OF DAYS . . . [ ][ ]	NUMBER OF DAYS . . . [ ][ ]
418B	Did you have AMODIAQUINE at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE ASK :Where did you get the AMODIAQUINE first?	HOME . . . . 1 GOVERNMENT HEALTH FACILITY/ WORKER . . . . . 2 PRIVATE HEALTH FACILITY/ WORKER . . . . . 3 SHOP . . . . 4 OTHER ______ 6 (SPECIFY) DON'T KNOW 8	HOME . . . . 1 GOVERNMENT HEALTH FACILITY/ WORKER . . . . . 2 PRIVATE HEALTH FACILITY/ WORKER . . . . . 3 SHOP . . . . 4 OTHER ______ 6 (SPECIFY) DON'T KNOW 8	HOME . . . . 1 GOVERNMENT HEALTH FACILITY/ WORKER . . . . . 2 PRIVATE HEALTH FACILITY/ WORKER . . . . . 3 SHOP . . . . 4 OTHER ______ 6 (SPECIFY) DON'T KNOW 8
418C	Did you purchase the AMODIAQUINE?	YES . . . . 1 NO . . . . 2 (SKIP TO 419)	YES . . . . 1 NO . . . . 2 (SKIP TO 419)	YES . . . . 1 NO . . . . 2 (SKIP TO 419)

WE-13

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ________	NEXT-TO-LAST BIRTH NAME ________	SECOND-FROM-LAST BIRTH NAME ________
418D	How much did you pay for the AMODIAQUINE?	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998
419	CHECK 411: QUININE ('D') GIVEN	CODE 'D' CIRCLED [ ] CODE 'D' NOT CIRCLED [ ] (SKIP TO 421)	CODE 'D' CIRCLED [ ] CODE 'D' NOT CIRCLED [ ] (SKIP TO 421)	CODE 'D' CIRCLED [ ] CODE 'D' NOT CIRCLED [ ] (SKIP TO 421)
420	How long after the fever started did (NAME) first take QUININE?	SAME DAY .... 0 NEXT DAY .... 1 TWO DAYS AFTER FEVER .... 2 THREE OR MORE DAYS AFTER FEVER .... 3 DON'T KNOW ... 8	SAME DAY .... 0 NEXT DAY .... 1 TWO DAYS AFTER FEVER .... 2 THREE OR MORE DAYS AFTER FEVER .... 3 DON'T KNOW ... 8	SAME DAY .... 0 NEXT DAY .... 1 TWO DAYS AFTER FEVER .... 2 THREE OR MORE DAYS AFTER FEVER .... 3 DON'T KNOW ... 8
420A	For how many days did (NAME) take QUININE?	NUMBER OF DAYS ... [ ][ ]	NUMBER OF DAYS ... [ ][ ]	NUMBER OF DAYS ... [ ][ ]
420B	Did you have QUININE at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE ASK :Where did you get the QUININE first?	HOME .... 1 GOVERNMENT HEALTH FACILITY/ WORKER ..... 2 PRIVATE HEALTH FACILITY/ WORKER ..... 3 SHOP .... 4 OTHER ________ 6 (SPECIFY) DON'T KNOW 8	HOME .... 1 GOVERNMENT HEALTH FACILITY/ WORKER ..... 2 PRIVATE HEALTH FACILITY/ WORKER ..... 3 SHOP .... 4 OTHER ________ 6 (SPECIFY) DON'T KNOW 8	HOME .... 1 GOVERNMENT HEALTH FACILITY/ WORKER ..... 2 PRIVATE HEALTH FACILITY/ WORKER ..... 3 SHOP .... 4 OTHER ________ 6 (SPECIFY) DON'T KNOW 8
420C	Did you purchase the QUININE?	YES .... 1 NO .... 2 (SKIP TO 421)	YES .... 1 NO .... 2 (SKIP TO 421)	YES .... 1 NO .... 2 (SKIP TO 421)
420D	How much did you pay for the QUININE?	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998
421	CHECK 411: LA (COARTEM) (E) GIVEN	CODE 'E' CIRCLED [ ] CODE 'E' NOT CIRCLED [ ] (SKIP TO 423)	CODE 'A' CIRCLED [ ] CODE 'A' NOT CIRCLED [ ] (SKIP TO 423)	CODE 'A' CIRCLED [ ] CODE 'A' NOT CIRCLED [ ] (SKIP TO 423)
422	How long after the fever started did (NAME) first take LA/COARTEM?	SAME DAY .... 0 NEXT DAY .... 1 TWO DAYS AFTER FEVER .... 2 THREE OR MORE DAYS AFTER FEVER .... 3 DON'T KNOW ... 8	SAME DAY .... 0 NEXT DAY .... 1 TWO DAYS AFTER FEVER .... 2 THREE OR MORE DAYS AFTER FEVER .... 3 DON'T KNOW ... 8	SAME DAY .... 0 NEXT DAY .... 1 TWO DAYS AFTER FEVER .... 2 THREE OR MORE DAYS AFTER FEVER .... 3 DON'T KNOW ... 8

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ______	NEXT-TO-LAST BIRTH NAME ______	SECOND-FROM-LAST BIRTH NAME ______
422A	For how many days did (NAME) take LA/COARTEM?	NUMBER OF DAYS . . . [ ][ ]	NUMBER OF DAYS . . . [ ][ ]	NUMBER OF DAYS . . . [ ][ ]
422B	Did you have LA/COARTEM at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE ASK :Where did you get the LA/COARTEM first?	HOME . . . . 1 GOVERNMENT HEALTH FACILITY/ WORKER . . . . . 2 PRIVATE HEALTH FACILITY/ WORKER . . . . . 3 SHOP . . . . 4 OTHER ______ 6 (SPECIFY) DON'T KNOW 8	HOME . . . . 1 GOVERNMENT HEALTH FACILITY/ WORKER . . . . . 2 PRIVATE HEALTH FACILITY/ WORKER . . . . . 3 SHOP . . . . 4 OTHER ______ 6 (SPECIFY) DON'T KNOW 8	HOME . . . . 1 GOVERNMENT HEALTH FACILITY/ WORKER . . . . . 2 PRIVATE HEALTH FACILITY/ WORKER . . . . . 3 SHOP . . . . 4 OTHER ______ 6 (SPECIFY) DON'T KNOW 8
422C	Did you purchase the LA/ COARTEM?	YES . . . . 1 NO . . . . 2 (SKIP TO 423)	YES . . . . 1 NO . . . . 2 (SKIP TO 423)	YES . . . . 1 NO . . . . 2 (SKIP TO 423)
422D	How much did you pay for the LA/COARTEM?	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998
423	CHECK 411: ARTESUNATE (F) GIVEN	CODE 'F' CIRCLED [ ] — CODE 'F' NOT CIRCLED [ ] (SKIP TO 425)	CODE 'F' CIRCLED [ ] — CODE 'F' NOT CIRCLED [ ] (SKIP TO 425)	CODE 'F' CIRCLED [ ] — CODE 'F' NOT CIRCLED [ ] (SKIP TO 425)
424	How long after the fever started did (NAME) first take ARTESUNATE?	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8
424A	For how many days did (NAME) take ARTESUNATE?	NUMBER OF DAYS . . . [ ][ ]	NUMBER OF DAYS . . . [ ][ ]	NUMBER OF DAYS . . . [ ][ ]
424B	Did you have ARTESUNATE at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE ASK :Where did you get the ARTESUNATE first?	HOME . . . . 1 GOVERNMENT HEALTH FACILITY/ WORKER . . . . . 2 PRIVATE HEALTH FACILITY/ WORKER . . . . . 3 SHOP . . . . 4 OTHER ______ 6 (SPECIFY) DON'T KNOW 8	HOME . . . . 1 GOVERNMENT HEALTH FACILITY/ WORKER . . . . . 2 PRIVATE HEALTH FACILITY/ WORKER . . . . . 3 SHOP . . . . 4 OTHER ______ 6 (SPECIFY) DON'T KNOW 8	HOME . . . . 1 GOVERNMENT HEALTH FACILITY/ WORKER . . . . . 2 PRIVATE HEALTH FACILITY/ WORKER . . . . . 3 SHOP . . . . 4 OTHER ______ 6 (SPECIFY) DON'T KNOW 8
424C	Did you purchase the ARTESUNATE?	YES . . . . 1 NO . . . . 2 (SKIP TO 425)	YES . . . . 1 NO . . . . 2 (SKIP TO 425)	YES . . . . 1 NO . . . . 2 (SKIP TO 425)

WE-15

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ____________	NEXT-TO-LAST BIRTH NAME ____________	SECOND-FROM-LAST BIRTH NAME ____________
424D	How much did you pay for the ARTESUNATE?	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998
425	CHECK 411: AA/ASAQ (COMBINED AMODIAQUINE AND ARTE-SUNATE) (G) GIVEN	CODE 'G CIRCLED [ ] CODE 'G' NOT CIRCLED [ ] (SKIP TO 427)	CODE 'G CIRCLED [ ] CODE 'G' NOT CIRCLED [ ] (SKIP TO 427)	CODE 'G CIRCLED [ ] CODE 'G' NOT CIRCLED [ ] (SKIP TO 427)
426	How long after the fever started did (NAME) first take AA/ASAQ?	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8
426A	For how many days did (NAME) take AA/ASAQ?	NUMBER OF DAYS . . . [ ][ ]	NUMBER OF DAYS . . . [ ][ ]	NUMBER OF DAYS . . . [ ][ ]
426B	Did you have AA/ASAQ at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE ASK :Where did you get the AA/ASAQ first?	HOME . . . . 1 GOVERNMENT HEALTH FACILITY/ WORKER . . . . . 2 PRIVATE HEALTH FACILITY/ WORKER . . . . . 3 SHOP . . . . 4 OTHER ____________ 6 (SPECIFY) DON'T KNOW 8	HOME . . . . 1 GOVERNMENT HEALTH FACILITY/ WORKER . . . . . 2 PRIVATE HEALTH FACILITY/ WORKER . . . . . 3 SHOP . . . . 4 OTHER ____________ 6 (SPECIFY) DON'T KNOW 8	HOME . . . . 1 GOVERNMENT HEALTH FACILITY/ WORKER . . . . . 2 PRIVATE HEALTH FACILITY/ WORKER . . . . . 3 SHOP . . . . 4 OTHER ____________ 6 (SPECIFY) DON'T KNOW 8
426C	Did you purchase the AA/ASAQ?	YES . . . . 1 NO . . . . 2 (SKIP TO 427)	YES . . . . 1 NO . . . . 2 (SKIP TO 427)	YES . . . . 1 NO . . . . 2 (SKIP TO 427)
426D	How much did you pay for the AA/ASAQ?	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998
427	CHECK 411: OTHER ANTIMALARIAL ('H') GIVEN	CODE 'H' CIRCLED [ ] CODE 'H' NOT CIRCLED [ ] (GO BACK TO 403 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 429)	CODE 'H' CIRCLED [ ] CODE 'H' NOT CIRCLED [ ] (GO BACK TO 403 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 429)	CODE 'H' CIRCLED [ ] CODE 'H' NOT CIRCLED [ ] (GO TO 403 IN NEXT-TO-LAST COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, GO TO429)

WE-16

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ________	NEXT-TO-LAST BIRTH NAME ________	SECOND-FROM-LAST BIRTH NAME ________
428	How long after the fever started did (NAME) first take (OTHER ANTIMALARIAL)?	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW . . . 8
428A	For how many days did (NAME) take OTHER ANTIMALARIAL?	NUMBER OF DAYS . . . [ ][ ]	NUMBER OF DAYS . . . [ ][ ]	NUMBER OF DAYS . . . [ ][ ]
428B	Did you have OTHER ANTIMALARIAL at home or did you get it from somewhere else? IF SOMEWHERE ELSE, PROBE FOR SOURCE. IF MORE THAN ONE SOURCE ASK :Where did you get the OTHER ANTIMALARIAL first?	HOME . . . . 1 GOVERNMENT HEALTH FACILITY/ WORKER . . . . . 2 PRIVATE HEALTH FACILITY/ WORKER . . . . . 3 SHOP . . . . 4 OTHER ________ 6 (SPECIFY) DON'T KNOW 8	HOME . . . . 1 GOVERNMENT HEALTH FACILITY/ WORKER . . . . . 2 PRIVATE HEALTH FACILITY/ WORKER . . . . . 3 SHOP . . . . 4 OTHER ________ 6 (SPECIFY) DON'T KNOW 8	HOME . . . . 1 GOVERNMENT HEALTH FACILITY/ WORKER . . . . . 2 PRIVATE HEALTH FACILITY/ WORKER . . . . . 3 SHOP . . . . 4 OTHER ________ 6 (SPECIFY) DON'T KNOW 8
428C	Did you purchase the OTHER ANTIMALARIAL?	YES . . . . 1 NO . . . . 2 (SKIP TO 429)	YES . . . . 1 NO . . . . 2 (SKIP TO 429)	YES . . . . 1 NO . . . . 2 (SKIP TO 429)
428D	How much did you pay for the OTHER ANTIMALARIAL?	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998
429	Was (NAME) admitted in a hospital the last 12 months?	YES . . . . 1 NO . . . . 2 (SKIP TO 430)	YES . . . . 1 NO . . . . 2 (SKIP TO 430)	YES . . . . 1 NO . . . . 2 (SKIP TO 430)
429A	How much did you spend on admission if any?	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] DON'T KNOW 99998
430		GO BACK TO 403 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 501.	GO BACK TO 403 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 501.	GO TO 403 IN MOST RECENTCOLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, GO TO 501.

WE-17

SECTION 5. KNOWLEDGE OF MALARIA

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
501	Have you ever heard of an illness called malaria?	YES . . . . . 1 NO 2	→ 523
502	What signs or symptoms would lead you to think that a person has malaria? Anything else? RECORD ALL MENTIONED.	FEVER . . . . . A FEELING COLD . . . . . B HEADACHE . . . . . C NAUSEA/VOMITING . . . . . D DIARRHEA . . . . . E DIZZINESS . . . . . F LOSS OF APPETITE . . . . . G BODY ACHE OR JOINT PAIN . . . . . H PALE EYES . . . . . I SALTY-TASTING PALMS . . . . . J FEELING WEAK . . . . . K REFUSE TO EAT OR DRINK . . . . . L OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
503	What do you think is the cause of malaria? Anything else? RECORD ALL MENTIONED.	MOSQUITO BITES . . . . . A EATING IMMATURE SUGARCANE . . . B EATING COLD SIMA . . . . . C EATING DIRTY FOOD . . . . . D DRINKING DIRTY WATER . . . . . E GETTING SOAKED IN RAIN . . . . . F COLD OR CHANGING WEATHER . . . G WITCHCRAFT . . . . . H OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
504	How can someone protect themselves against malaria? Anything else? RECORD ALL MENTIONED.	SLEEP UNDER A MOSQUITO NET . . . A SLEEP UNDER AN INSECTICIDE-TREATED MOSQUITO NET . . . . . B USE MOSQUITO REPELLANT . . . . . C AVOID MOSQUITO BITES . . . . . D TAKE PREVENTIVE MEDICATION . . . E SPRAY HOUSE WITH INSECTICIDE F USE MOSQUITO COILS . . . . . G CUT GRASS AROUND THE HOUSE H FILL IN PUDDLES (STAGNANT WATER) . . . . . I KEEP HOUSE AND SURROUNDINGS CLEAN . . . . . J BURN LEAVES . . . . . K AVOID DRINKING DIRTY WATER . . . L AVOID EATING BAD FOOD . . . . . M PUT SCREENS ON WINDOWS . . . . . N AVOID GETTING SOAKED IN RAIN . . . O OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
505	What are the danger signs of malaria? Anything else? RECORD ALL MENTIONED.	SEIZURE/CONVULSIONS . . . . . A FAINTING . . . . . B ANY FEVER . . . . . C HIGH FEVER . . . . . D STIFF NECK . . . . . E FEELING WEAK . . . . . F NOT ACTIVE . . . . . G CHILLS/SHIVERING . . . . . H UNABLE TO EAT . . . . . I VOMITING . . . . . J CRYING ALL THE TIME . . . . . K RESTLESS . . . . . L DIARRHEA . . . . . M OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
506	In your opinion, which people are most affected by malaria in your community? Anybody else? RECORD ALL MENTIONED.	CHILDREN . . . . . A ADULTS . . . . . B PREGNANT WOMEN . . . . . C OLDER ADULTS . . . . . D EVERYONE . . . . . E OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
507	In the last six months, have you listened or saw messages or information about malaria?	YES . . . . . 1 NO 2	→ 511
508	Where did you hear or see these messages or information? Anywhere else? RECORD ALL MENTIONED.	GOVT. CLINIC/HOSPITAL . . . . . A COMMUNITY HEALTH WORKER . . . B FRIENDS/FAMILY . . . . . C WORKPLACE . . . . . D DRAMA GROUPS . . . . . E PEER EDUCATORS . . . . . F POSTER/BILLBOARDS . . . . . G TELEVISION . . . . . H RADIO . . . . . I NEWSPAPER . . . . . J OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
509	How many months ago was the last time you heard or saw the message?	MONTHS AGO . . . . . ☐	
510	What type of messages about malaria did you hear or saw? Anything else? RECORD ALL MENTIONED.	MALARIA IS DANGEROUS . . . . . A MALARIA CAN KILL . . . . . B MOSQUITO SPREAD MALARIA . . . C SLEEPING UNDER A MOSQUITO NET IS IMPORTANT . . . . . D WHO SHOULD SLEEP UNDER A MOSQUITO NET . . . . . E F SEEK TREATMENT FOR FEVER . . . G SEEK TREATMENT FOR FEVER PROMPTLY (WITHIN 24 HOURS) . H I IMPORTANCE OF HOUSE SPRAYING . . . . . J NOT PLASTERING WALLS AFTER SPRAYING . . . . . K ENVIRONMENTAL SANITATION ACTIVITIES . . . . . L OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
511	Has anyone ever provided you with information on malaria at your home?	YES . . . . . 1 NO 2	→ 515
512	Who gave you the information at your home? Anybody else? RECORD ALL MENTIONED.	HEALTH CARE WORKER . . . . . A COMMUNITY HEALTH WORKER . . . B FRIENDS/FAMILY . . . . . C EMPLOYER . . . . . D PEER EDUCATORS . . . . . E OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
513	How long ago did someone visit your house to provide you with information about malaria?	MONTHS AGO . . . . . ☐☐	
514	What type of messages about malaria did you hear or saw? Anything else? RECORD ALL MENTIONED.	MALARIA IS DANGEROUS . . . . . A MALARIA CAN KILL . . . . . B MOSQUITO SPREAD MALARIA . . . C SLEEPING UNDER A MOSQUITO NET IS IMPORTANT . . . . . D WHO SHOULD SLEEP UNDER A MOSQUITO NET . . . . . E SEEK TREATMENT FOR FEVER . . . F SEEK TREATMENT FOR FEVER PROMPTLY (WITHIN 24 HOURS) . . . G IMPORTANCE OF HOUSE SPRAYING . . . . . I NOT PLASTERING WALLS AFTER SPRAYING . . . . . J ENVIRONMENTAL SANITATION ACTIVITIES . . . . . K OTHER _____ L (SPECIFY) DON'T KNOW . . . . . M OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
515	CHECK HOUSEHOLD QUESTIONNAIRE 121: HAS MOSQUITO NET ☐ ↓ HAS NO MOSQUITO NET ☐ → 523		
516	Has the community health worker in your village ever helped hang a mosquito net in this house?	YES . . . . . 1 NO 2	
517	Has any mosquito net in this house been used for any reason other than sleeping?	YES . . . . . 1 NO 2	→ 519
518	What was it used for? Anything else? RECORD ALL MENTIONED.	FISHING . . . . . A COVER/PROTECTION . . . . . B WINDOW SCREEN . . . . . C CLOTHING/WEDDING VEIL . . . . . D OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
519	How often do your children sleep under a mosquito net?	ALWAYS . . . . . 1 SOMETIMES . . . . . 2 NEVER 3	→ 523
523	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 SUPERVISOR: _____ DATE: _____

EDITOR'S OBSERVATIONS

NAME OF EDITOR: _____ DATE: _____

W-22

23 Jan 2012

2012 MALAWI MALARIA INDICATOR SURVEY
BIOMARKER QUESTIONNAIRE

IDENTIFICATION	
PLACE NAME _____	
DISTRICT _____	
CLUSTER NUMBER	
HOUSEHOLD NUMBER	
NAME OF HOUSEHOLD HEAD _____	
HEALTH TECHNICIAN _____	

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 0-5

201	CHECK COLUMN 9 IN HOUSEHOLD SCHEDULE. RECORD THE LINE NUMBER AND NAME FOR ALL ELIGIBLE CHILDREN 0-5 YEARS IN QUESTION 202. IF MORE THAN SIX CHILDREN, USE ADDITIONAL QUESTIONNAIRE(S).			
		CHILD 1	CHILD 2	CHILD 3
202	LINE NUMBER FROM COLUMN 9 NAME FROM COLUMN 2	LINE NUMBER . . . . . ☐☐ NAME _____	LINE NUMBER . . . . . ☐☐ NAME _____	LINE NUMBER . . . . . ☐☐ NAME _____
203	IF MOTHER INTERVIEWED, COPY MONTH AND YEAR OF BIRTH FROM BIRTH HISTORY AND ASK DAY; IF MOTHER NOT INTERVIEWED, ASK: What is (NAME)'s birth date?	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR ☐☐☐☐	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR ☐☐☐☐	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR ☐☐☐☐
204	CHECK 203: CHILD BORN IN JANUARY 2006 OR LATER?	YES . . . . . 1 NO . . . . . 2 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW)	YES . . . . . 1 NO . . . . . 2 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW)	YES . . . . . 1 NO . . . . . 2 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW)
205	CHECK 203: WAS CHILD BORN IN MONTH OF INTERVIEW OR FIVE PREVIOUS MONTHS?	YES . . . . . 1 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW) NO 2	YES . . . . . 1 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW) NO 2	YES . . . . . 1 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW) NO 2
206	LINE NUMBER OF PARENT/ OTHER ADULT RESPONSIBLE FOR THE CHILD (FROM COLUMN 1 OF HOUSEHOLD SCHEDULE). RECORD '00' IF NOT LISTED.	LINE NUMBER . . . . . ☐☐	LINE NUMBER . . . . . ☐☐	LINE NUMBER . . . . . ☐☐
207	ASK CONSENT FOR ANEMIA TEST FROM PARENT/OTHER ADULT IDENTIFIED IN 206 AS RESPONSIBLE FOR CHILD.	As part of this survey, we are asking children all over the country to take an **anemia** test. Anemia is a serious health problem that usually results from poor nutrition, infection, or chronic disease. This survey will assist the government to develop programs to prevent and treat anemia. We ask that all children born in 2006 or later take part in anemia testing in this survey and give a few drops of blood from a finger or heel. The equipment used to take the blood is clean and completely safe. It has never been used before and will be thrown away after each test. The blood will be tested for anemia immediately, and the result will be told to you right away. The result will be kept strictly confidential and will not be shared with anyone other than members of our survey team. Do you have any questions? You can say yes to the test, or you can say no. It is up to you to decide. Will you allow (NAME OF CHILD) to participate in the anemia test?		

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 0-5

208	CIRCLE THE APPROPRIATE CODE AND SIGN YOUR NAME.	GRANTED .... 1 ______ (SIGN) REFUSED .... 2 NOT PRESENT .... 5 OTHER 6	GRANTED .... 1 ______ (SIGN) REFUSED .... 2 NOT PRESENT .... 5 OTHER 6	GRANTED .... 1 ______ (SIGN) REFUSED .... 2 NOT PRESENT .... 5 OTHER 6
209	ASK CONSENT FOR MALARIA TEST FROM PARENT/OTHER ADULT IDENTIFIED IN 206 AS RESPONSIBLE FOR CHILD.	As part of this survey, we are asking that children all over the country take a test to see if they have **malaria**. Malaria is a serious illness caused by a parasite transmitted by a mosquito bite. This survey will help the government to develop programs to prevent malaria. We ask that all children born in 2006 or later take part in malaria testing in this survey and give a few drops of blood from a finger or heel. The equipment used to take the blood is clean and completely safe. It has never been used before and will be thrown away after each test. (We will use blood from the same finger prick made for the anemia test). One blood drop will be tested for malaria immediately, and the result will be told to you right away. A few blood drops will be collected on a slide and taken to a laboratory for testing. You will not be told the results of the laboratory testing. All results will be kept strictly confidential and will not be shared with anyone other than members of our survey team. Do you have any questions? You can say yes to the test, or you can say no. It is up to you to decide. Will you allow (NAME OF CHILD) to participate in the malaria testing?		
210	CIRCLE THE APPROPRIATE CODE AND SIGN YOUR NAME.	GRANTED .... 1 ______ (SIGN) REFUSED .... 2 NOT PRESENT .... 5 OTHER 6	GRANTED .... 1 ______ (SIGN) REFUSED .... 2 NOT PRESENT .... 5 OTHER 6	GRANTED .... 1 ______ (SIGN) REFUSED .... 2 NOT PRESENT .... 5 OTHER 6
211	PREPARE EQUIPMENT AND SUPPLIES ONLY FOR THE TEST(S) FOR WHICH CONSENT HAS BEEN OBTAINED AND PROCEED WITH THE TEST(S).			
212	BAR CODE LABEL	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT 99994 REFUSED ..... 99995 OTHER .... 99996 PUT THE 2ND BAR CODE LABEL ON THE SLIDE AND THE 3RD ON THE TRANSMITTAL FORM.	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT 99994 REFUSED ..... 99995 OTHER .... 99996 PUT THE 2ND BAR CODE LABEL ON THE SLIDE AND THE 3RD ON THE TRANSMITTAL FORM.	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT 99994 REFUSED ..... 99995 OTHER .... 99996 PUT THE 2ND BAR CODE LABEL ON THE SLIDE AND THE 3RD ON THE TRANSMITTAL FORM.
213	RECORD HEMOGLOBIN LEVEL HERE AND IN THE ANEMIA AND MALARIA BROCHURE.	G/DL [ ][ ].[ ] NOT PRESENT ..... 994 REFUSED .... 995 OTHER 996	G/DL [ ][ ].[ ] NOT PRESENT ..... 994 REFUSED .... 995 OTHER 996	G/DL [ ][ ].[ ] NOT PRESENT ..... 994 REFUSED .... 995 OTHER 996
214	RECORD RESULT CODE OF THE MALARIA RDT	TESTED .... 1 NOT PRESENT ..... 2 REFUSED .... 3 OTHER .... 6 (SKIP TO 216)	TESTED .... 1 NOT PRESENT ..... 2 REFUSED .... 3 OTHER .... 6 (SKIP TO 216)	TESTED .... 1 NOT PRESENT ..... 2 REFUSED .... 3 OTHER .... 6 (SKIP TO 216)
215	RECORD THE RESULT OF THE MALARIA RDT HERE AND IN THE ANEMIA AND MALARIA BROCHURE.	POSITIVE .... 1 (SKIP TO 218) NEGATIVE .... 2 OTHER 6	POSITIVE .... 1 (SKIP TO 218) NEGATIVE .... 2 OTHER 6	POSITIVE .... 1 (SKIP TO 218) NEGATIVE .... 2 OTHER 6
216	CHECK 213: HEMOGLOBIN RESULT	< 8.0 G/DL, SEVERE ANEMIA [ ] OTHER [ ] SKIP TO 229	< 8.0 G/DL, SEVERE ANEMIA [ ] OTHER [ ] SKIP TO 229	< 8.0 G/DL, SEVERE ANEMIA [ ] OTHER [ ] SKIP TO 229
217	**SEVERE ANEMIA REFERRAL** STATEMENT	The anemia test shows that (NAME OF CHILD) has severe anemia. Your child is very ill and must be taken to a health facility immediately. SKIP TO 229		

BE-2

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 0-5

218	Does (NAME) suffer from the any of following illnesses or symptoms: Extreme weakness (Prostration)? Heart problems? Loss of consciousness? Rapid or difficult breathing? Seizures? Abnormal bleeding? Jaundice (Yellow Skin)? Dark urine (brown)?	EXTREME WEAKNESS .... A HEART PROBLEMS B LOSS OF CONSCIOUSNESS C RAPID BREATHING ..... D (SKIP TO 222) SEIZURES .... E BLEEDING .... F JAUNDICE .... G DARK URINE .... H NO SYMPTOMS ..... Y	EXTREME WEAKNESS .... A HEART PROBLEMS B LOSS OF CONSCIOUSNESS C RAPID BREATHING ..... D SEIZURES .... E BLEEDING .... F JAUNDICE .... G DARK URINE .... H NO SYMPTOMS ..... Y	EXTREME WEAKNESS .... A HEART PROBLEMS B LOSS OF CONSCIOUSNESS C RAPID BREATHING ..... D SEIZURES .... E BLEEDING .... F JAUNDICE .... G DARK URINE .... H NO SYMPTOMS ..... Y
220	CHECK 213: HEMOGLOBIN RESULT	< 8.0 G/DL, SEVERE ANEMIA ☐ (SKIP TO 222) OTHER ☐	< 8.0 G/DL, SEVERE ANEMIA ☐ (SKIP TO 222) OTHER ☐	< 8.0 G/DL, SEVERE ANEMIA ☐ (SKIP TO 222) OTHER ☐
221	In the past two weeks has (NAME) taken or is taking [FIRST LINE MEDICATION] given by a doctor or health center to treat the malaria? VERIFY BY ASKING TO SEE TREATMENT	YES .... 1 (SKIP TO 223) NO .... 2 (SKIP TO 224)	YES .... 1 (SKIP TO 223) NO .... 2 (SKIP TO 224)	YES .... 1 (SKIP TO 223) NO .... 2 (SKIP TO 224)
222	**SEVERE MALARIA REFERRAL** STATEMENT	The malaria test shows that (NAME OF CHILD) has malaria. Your child also has symptoms of severe malaria. The malaria treatment I have will not help your child, and I cannot give you the medication. Your child is very ill and must be taken to a health facility right away. SKIP TO 229		
223	**ALREADY TAKING [FIRST LINE MEDICATION] REFERRAL** STATEMENT	You have told me that (NAME OF CHILD) has already received medication for malaria. Therefore, I cannot give you additional medication. However, the test shows that he/she is positive for malaria. If your child has a fever for two days after the last dose of medication, you should take the child to the nearest health facility for further examination. SKIP TO 229		
224	READ INFORMATION FOR MALARIA TREATMENT AND CONSENT STATEMENT TO PARENT OR OTHER ADULT RESPONSIBLE FOR THE CHILD	The malaria test shows that your child has malaria. We can give you free medicine. The medicine is called LA. LA is very effective and in a few days it should get rid of the fever and other symptoms. You do not have to give the child the medicine. This is up to you. Please tell me whether you accept the medicine or not.		
225	CIRCLE THE APPROPRIATE CODE AND SIGN YOUR NAME.	ACCEPTED MEDICINE 1 __________ (SIGN) REFUSED .... 2 OTHER .... 6 (SKIP TO 228)	ACCEPTED MEDICINE 1 __________ (SIGN) REFUSED .... 2 OTHER .... 6 (SKIP TO 228)	ACCEPTED MEDICINE 1 __________ (SIGN) REFUSED .... 2 OTHER .... 6 (SKIP TO 228)
227	TREATMENT FOR CHILDREN WITH POSITIVE MALARIA TESTS	[INSERT DOSAGE INSTRUCTIONS] ALSO TELL THE PARENT/ADULT RESPONSIBLE FOR THE CHILD **(10)**: If [NAME] has a high fever, fast or difficult breathing, is not able to drink or breastfeed, gets sicker or does not get better in two days, you should take him/her to a health professional for treatment right away.		
228	RECORD THE RESULT CODE OF **MALARIA TREATMENT OR REFERRAL**	MEDICATION GIVEN 1 MEDS REFUSED ... 2 SEVERE MALARIA REFERRAL .... 3 ALREADY TAKING MEDS REFERRAL .... 4 OTHER 6	MEDICATION GIVEN 1 MEDS REFUSED ... 2 SEVERE MALARIA REFERRAL .... 3 ALREADY TAKING MEDS REFERRAL .... 4 OTHER 6	MEDICATION GIVEN 1 MEDS REFUSED ... 2 SEVERE MALARIA REFERRAL .... 3 ALREADY TAKING MEDS REFERRAL .... 4 OTHER 6
229	GO BACK TO 203 IN NEXT COLUMN OF THIS QUESTIONNAIRE OR IN THE FIRST COLUMN OF THE NEXT PAGE; IF NO MORE CHILDREN, END INTERVIEW.			

BE-3

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 0-5

201	CHECK COLUMN 9 IN HOUSEHOLD SCHEDULE. RECORD THE LINE NUMBER AND NAME FOR ALL ELIGIBLE CHILDREN 0-5 YEARS IN QUESTION 202. IF MORE THAN SIX CHILDREN, USE ADDITIONAL QUESTIONNAIRE(S).			
		CHILD 4	CHILD 5	CHILD 6
202	LINE NUMBER FROM COLUMN 9 NAME FROM COLUMN 2	LINE NUMBER . . . . . ☐☐ NAME _____	LINE NUMBER . . . . . ☐☐ NAME _____	LINE NUMBER . . . . . ☐☐ NAME _____
203	IF MOTHER INTERVIEWED, COPY MONTH AND YEAR OF BIRTH FROM BIRTH HISTORY AND ASK DAY; IF MOTHER NOT INTERVIEWED, ASK: What is (NAME)'s birth date?	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR ☐☐☐☐	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR ☐☐☐☐	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR ☐☐☐☐
204	CHECK 203: CHILD BORN IN JANUARY 2006 OR LATER?	YES . . . . . 1 NO . . . . . 2 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW)	YES . . . . . 1 NO . . . . . 2 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW)	YES . . . . . 1 NO . . . . . 2 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW)
205	CHECK 203: WAS CHILD BORN IN MONTH OF INTERVIEW OR FIVE PREVIOUS MONTHS?	YES . . . . . 1 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW) NO 2	YES . . . . . 1 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW) NO 2	YES . . . . . 1 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW) NO 2
206	LINE NUMBER OF PARENT/ OTHER ADULT RESPONSIBLE FOR THE CHILD (FROM COLUMN 1 OF HOUSEHOLD SCHEDULE). RECORD '00' IF NOT LISTED.	LINE NUMBER . . . . . ☐☐	LINE NUMBER . . . . . ☐☐	LINE NUMBER . . . . . ☐☐
207	ASK CONSENT FOR ANEMIA TEST FROM PARENT/OTHER ADULT IDENTIFIED IN 206 AS RESPONSIBLE FOR CHILD.	As part of this survey, we are asking children all over the country to take an **anemia** test. Anemia is a serious health problem that usually results from poor nutrition, infection, or chronic disease. This survey will assist the government to develop programs to prevent and treat anemia. We ask that all children born in 2006 or later take part in anemia testing in this survey and give a few drops of blood from a finger or heel. The equipment used to take the blood is clean and completely safe. It has never been used before and will be thrown away after each test. The blood will be tested for anemia immediately, and the result will be told to you right away. The result will be kept strictly confidential and will not be shared with anyone other than members of our survey team. Do you have any questions? You can say yes to the test, or you can say no. It is up to you to decide. Will you allow (NAME OF CHILD) to participate in the anemia test?		
208	CIRCLE THE APPROPRIATE CODE AND SIGN YOUR NAME.	GRANTED . . . . . 1 _____ (SIGN) REFUSED . . . . . 2 NOT PRESENT . . . . . 5 OTHER 6	GRANTED . . . . . 1 _____ (SIGN) REFUSED . . . . . 2 NOT PRESENT . . . . . 5 OTHER 6	GRANTED . . . . . 1 _____ (SIGN) REFUSED . . . . . 2 NOT PRESENT . . . . . 5 OTHER 6
209	ASK CONSENT FOR MALARIA TEST FROM PARENT/OTHER ADULT IDENTIFIED IN 206 AS RESPONSIBLE FOR CHILD.	As part of this survey, we are asking that children all over the country take a test to see if they have **malaria**. Malaria is a serious illness caused by a parasite transmitted by a mosquito bite. This survey will help the government to develop programs to prevent malaria. We ask that all children born in 2006 or later take part in malaria testing in this survey and give a few drops of blood from a finger or heel. The equipment used to take the blood is clean and completely safe. It has never been used before and will be thrown away after each test. (We will use blood from the same finger prick made for the anemia test). One blood drop will be tested for malaria immediately, and the result will be told to you right away. A few blood drops will be collected on a slide and taken to a laboratory for testing. You will not be told the results of the laboratory testing. All results will be kept strictly confidential and will not be shared with anyone other than members of our survey team. Do you have any questions? You can say yes to the test, or you can say no. It is up to you to decide. Will you allow (NAME OF CHILD) to participate in the malaria testing?		

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 0-5

210	CIRCLE THE APPROPRIATE CODE AND SIGN YOUR NAME.	GRANTED .... 1 (SIGN) REFUSED .... 2 NOT PRESENT .... 5 OTHER 6	GRANTED .... 1 (SIGN) REFUSED .... 2 NOT PRESENT .... 5 OTHER 6	GRANTED .... 1 (SIGN) REFUSED .... 2 NOT PRESENT .... 5 OTHER 6
211	PREPARE EQUIPMENT AND SUPPLIES ONLY FOR THE TEST(S) FOR WHICH CONSENT HAS BEEN OBTAINED AND PROCEED WITH THE TEST(S).			
212	BAR CODE LABEL	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT 99994 REFUSED ...... 99995 OTHER .... 99996 PUT THE 2ND BAR CODE LABEL ON THE SLIDE AND THE 3RD ON THE TRANSMITTAL FORM.	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT 99994 REFUSED ...... 99995 OTHER .... 99996 PUT THE 2ND BAR CODE LABEL ON THE SLIDE AND THE 3RD ON THE TRANSMITTAL FORM.	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT 99994 REFUSED ...... 99995 OTHER .... 99996 PUT THE 2ND BAR CODE LABEL ON THE SLIDE AND THE 3RD ON THE TRANSMITTAL FORM.
213	RECORD HEMOGLOBIN LEVEL HERE AND IN THE ANEMIA AND MALARIA BROCHURE.	G/DL [ ][ ].[ ] NOT PRESENT ..... 994 REFUSED .... 995 OTHER 996	G/DL [ ][ ].[ ] NOT PRESENT ..... 994 REFUSED .... 995 OTHER 996	G/DL [ ][ ].[ ] NOT PRESENT ..... 994 REFUSED .... 995 OTHER 996
214	RECORD RESULT CODE OF THE MALARIA RDT	TESTED .... 1 NOT PRESENT ...... 2 REFUSED .... 3 OTHER .... 6 (SKIP TO 216)	TESTED .... 1 NOT PRESENT ...... 2 REFUSED .... 3 OTHER .... 6 (SKIP TO 216)	TESTED .... 1 NOT PRESENT ...... 2 REFUSED .... 3 OTHER .... 6 (SKIP TO 216)
215	RECORD THE RESULT OF THE MALARIA RDT HERE AND IN THE ANEMIA AND MALARIA BROCHURE.	POSITIVE .... 1 (SKIP TO 218) NEGATIVE .... 2 OTHER 6	POSITIVE .... 1 (SKIP TO 218) NEGATIVE .... 2 OTHER 6	POSITIVE .... 1 (SKIP TO 218) NEGATIVE .... 2 OTHER 6
216	CHECK 213: HEMOGLOBIN RESULT	< 8.0 G/DL, SEVERE ANEMIA [ ] OTHER [ ] SKIP TO 229	< 8.0 G/DL, SEVERE ANEMIA [ ] OTHER [ ] SKIP TO 229	< 8.0 G/DL, SEVERE ANEMIA [ ] OTHER [ ] SKIP TO 229
217	**SEVERE ANEMIA REFERRAL** STATEMENT	The anemia test shows that (NAME OF CHILD) has severe anemia. Your child is very ill and must be taken to a health facility immediately. SKIP TO 229		
218	Does (NAME) suffer from the any of following illnesses or symptoms: Extreme weakness (Prostration)? Heart problems? Loss of consciousness? Rapid or difficult breathing? Seizures? Abnormal bleeding? Jaundice (Yellow Skin)? Dark urine (brown)?	EXTREME WEAKNESS .... A HEART PROBLEMS B LOSS OF CONSCIOUSNESS C RAPID BREATHING ...... D SEIZURES .... E BLEEDING .... F JAUNDICE .... G DARK URINE .... H (SKIP TO 222) NO SYMPTOMS ...... Y	EXTREME WEAKNESS .... A HEART PROBLEMS B LOSS OF CONSCIOUSNESS C RAPID BREATHING ...... D SEIZURES .... E BLEEDING .... F JAUNDICE .... G DARK URINE .... H (SKIP TO 222) NO SYMPTOMS ...... Y	EXTREME WEAKNESS .... A HEART PROBLEMS B LOSS OF CONSCIOUSNESS C RAPID BREATHING ...... D SEIZURES .... E BLEEDING .... F JAUNDICE .... G DARK URINE .... H (SKIP TO 222) NO SYMPTOMS ...... Y

BE-5

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 0-5

220	CHECK 213: HEMOGLOBIN RESULT	< 8.0 G/DL, SEVERE ANEMIA (SKIP TO 222) / OTHER	< 8.0 G/DL, SEVERE ANEMIA (SKIP TO 222) / OTHER	< 8.0 G/DL, SEVERE ANEMIA (SKIP TO 222) / OTHER
221	In the past two weeks has (NAME) taken or is taking [FIRST LINE MEDICATION] given by a doctor or health center to treat the malaria? VERIFY BY ASKING TO SEE TREATMENT	YES . . . . 1 (SKIP TO 223) NO . . . . 2 (SKIP TO 224)	YES . . . . 1 (SKIP TO 223) NO . . . . 2 (SKIP TO 224)	YES . . . . 1 (SKIP TO 223) NO . . . . 2 (SKIP TO 224)
222	**SEVERE MALARIA REFERRAL** STATEMENT	The malaria test shows that (NAME OF CHILD) has malaria. Your child also has symptoms of severe malaria. The malaria treatment I have will not help your child, and I cannot give you the medication. Your child is very ill and must be taken to a health facility right away. SKIP TO 229		
223	**ALREADY TAKING [FIRST LINE MEDICATION] REFERRAL** STATEMENT	You have told me that (NAME OF CHILD) has already received medication for malaria. Therefore, I cannot give you additional medication. However, the test shows that he/she is positive for malaria. If your child has a fever for two days after the last dose of medication, you should take the child to the nearest health facility for further examination. SKIP TO 229		
224	READ INFORMATION FOR MALARIA TREATMENT AND CONSENT STATEMENT TO PARENT OR OTHER ADULT RESPONSIBLE FOR THE CHILD	The malaria test shows that your child has malaria. We can give you free medicine. The medicine is called LA. LA is very effective and in a few days it should get rid of the fever and other symptoms. You do not have to give the child the medicine. This is up to you. Please tell me whether you accept the medicine or not.		
225	CIRCLE THE APPROPRIATE CODE AND SIGN YOUR NAME.	ACCEPTED MEDICINE 1 __________ (SIGN) REFUSED . . . . 2 OTHER . . . . 6 (SKIP TO 228)	ACCEPTED MEDICINE 1 __________ (SIGN) REFUSED . . . . 2 OTHER . . . . 6 (SKIP TO 228)	ACCEPTED MEDICINE 1 __________ (SIGN) REFUSED . . . . 2 OTHER . . . . 6 (SKIP TO 228)
227	TREATMENT FOR CHILDREN WITH POSITIVE MALARIA TESTS	[INSERT DOSAGE INSTRUCTIONS] ALSO TELL THE PARENT/ADULT RESPONSIBLE FOR THE CHILD: If [NAME] has a high fever, fast or difficult breathing, is not able to drink or breastfeed, gets sicker or does not get better in two days, you should take him/her to a health professional for treatment right away.		
228	RECORD THE RESULT CODE OF **MALARIA TREATMENT OR REFERRAL**	MEDICATION GIVEN 1 MEDS REFUSED . . . 2 SEVERE MALARIA REFERRAL . . . . 3 ALREADY TAKING MEDS REFERRAL . . . . 4 OTHER 6	MEDICATION GIVEN 1 MEDS REFUSED . . . 2 SEVERE MALARIA REFERRAL . . . . 3 ALREADY TAKING MEDS REFERRAL . . . . 4 OTHER 6	MEDICATION GIVEN 1 MEDS REFUSED . . . 2 SEVERE MALARIA REFERRAL . . . . 3 ALREADY TAKING MEDS REFERRAL . . . . 4 OTHER 6
229	GO BACK TO 203 IN NEXT COLUMN OF THIS QUESTIONNAIRE OR IN THE FIRST COLUMN OF THE NEXT PAGE; IF NO MORE CHILDREN, END INTERVIEW.			

BE-6

TREATMENT FOR CHILDREN WITH POSITIVE MALARIA TESTS

The malaria test shows that your child has malaria. We can give you free medicine. The medicine is called Arthemether-Lumefantrine or LA. LA is very effective and in a few days it should get rid of the fever and other symptoms.

You do not have to give the child the medicine. This is up to you. Please tell me whether you accept the medicine or not.

Dosage schedule for Artemether-Lumefantrine-(A-20mg tablets/L-120mg)

Body weight in kg (age in years)	Number of AL tablets at approximate timing of dosing					
	DAY 1		DAY 2		DAY 3	
	Start	After 8	AM	PM	AM	PM
Less than 5 kg	0	0	0	0	0	0
5-14 kg (under 3)	1	1	1	1	1	1
15-24 kg (3 to under 5)	2	2	2	2	2	2

ALSO TELL THE PARENT/ADULT RESPONSIBLE FOR THE CHILD:
If (NAME) has a fever for [TWO DAYS] after completing the last dose of LA, you should take him/her to a health professional for treatment right away.