Malawi

Malaria Indicator Survey

2017

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Ministry of Health
National Malaria Control Programme
Lilongwe, Malawi

The DHS Program
ICF
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The 2017 Malawi Malaria Indicator Survey (2017 MMIS) was implemented by the Malawi National Malaria Control Programme (NMCP). Financial support for the survey was provided by the United States Agency for International Development (USAID) through the President's Malaria Initiative (PMI). The government of Malawi provided financial assistance in terms of in form of personnel, office space, and logistical support. ICF provided technical assistance through The DHS Program, a USAID-funded project offering support and technical assistance in the implementation of population and health surveys in countries worldwide.

Additional information about the 2017 MMIS may be obtained from the National Malaria Control Programme, P/Bag 65, Mtunthama Drive, Lilongwe, Malawi.

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PREFACE

Malaria is a major public health problem in Malawi where an estimated 4 million cases occur each year. Children under age 5 and pregnant women are most likely to have severe illness. The Ministry of Health, in collaboration with partners, has developed the Malawi Health Sector Strategic Plan 2017-2022, which articulates the priorities for health sector development in the next 6 years and prioritizes malaria. In line with that emphasis, the National Malaria Control Program has just finished the development of the National Malaria Strategic Plan 2017–2022 with the goal of scaling up malaria interventions to reduce morbidity and mortality by 50% in 2022. Progress would continue towards attainment of the national vision of a malaria-free Malawi.

We strive for progress in achieving prompt, effective malaria treatment. We hope to improve access to early intervention and treatment by expanding village clinic services, using insecticide-treated nets, spraying inside residences, managing the environment, encouraging changes in social behaviour and communication, and preventing malaria in pregnancy. We have set for ourselves high targets for these interventions, and we are confident that we will achieve our strategic goals of halving the incidence of malaria and deaths, as well as reducing the prevalence of malaria and malaria-related anaemia.

Surveys such as the current Malaria Indicator Survey (MIS) are essential measures of progress towards these goals. Without measurement, we can only guess about progress. The 2017 Malawi Malaria Indicator Survey (MMIS) is the country's fourth nationally representative assessment of the coverage attained by key malaria interventions. Interventions are reported in combination with measures of malaria-related burden and anaemia prevalence testing among children under age 5.

Overall, there has been considerable progress in scaling up interventions and controlling malaria. We noted a decline in malaria prevalence from 33% in 2014 to 24% in 2017. Insecticide-treated net (ITN) ownership has increased from 70% in 2014 to 82% in 2017. Results of the 2017 MIS also show improvement on use of intermittent preventive treatment during pregnancy (IPTp) by pregnant women age 15-49. Coverage has increased from 64% for two or more doses in 2014 to 77% in 2017. The percentage of women who took three or more doses of SP/Fansidar for prevention of malaria in pregnancy increased from 13% in 2014 to 43% in 2017. In addition, numbers of children receiving a parasitological test and artemisinin-based combination therapy continue to increase.

These results represent the combined work of numerous partners 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 the National Malaria Control Programme for taking a leading role in this survey and 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 make Malawi free of malaria.

Dr. Dan Namarika
Secretary for Health
Ministry of Health

ACRONYMS AND ABBREVIATIONS

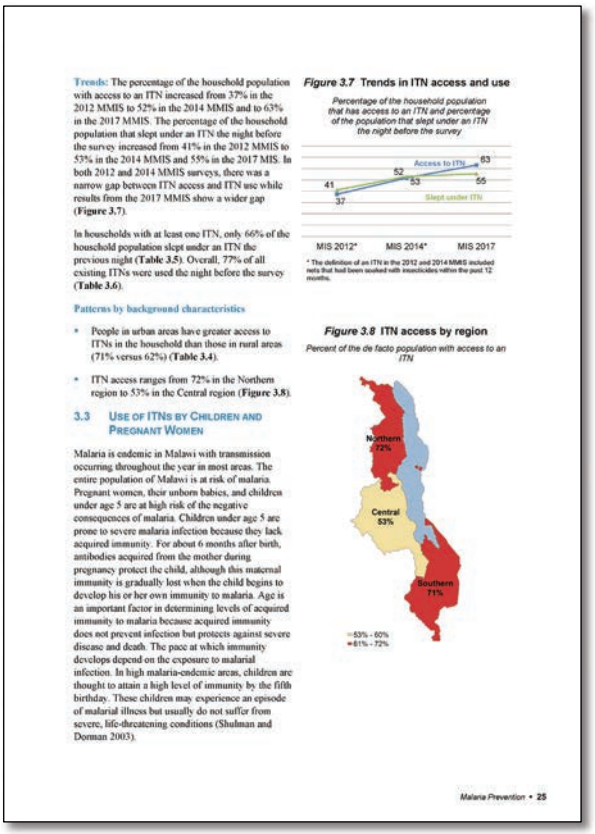
ACT	artemisinin-based combination therapy
CAPI	computer-assisted personal interviewing
CCAP	Church of Central Africa Presbyterian
CHAM	Christian Health Association of Malawi
CSPro	Census and Survey Processing System
DHS	Demographic and Health Survey
EA	enumeration area
IPTp	intermittent preventive treatment (of malaria) in pregnancy
ITN	insecticide-treated net
LA	lumefantrine-artemether
MERG	monitoring and evaluation reference group
MMIS	Malawi malaria indicator survey
MIS	malaria indicator survey
MoH	Ministry of Health
NMCP	national malaria control programme
NSO	national statistical office
PMI	US President's Malaria Initiative
RBM	Roll Back Malaria
RDT	rapid diagnostic test
SP	sulphadoxine-pyrimethamine
USAID	United States Agency for International Development
WHO	World Health Organization

READING AND UNDERSTANDING TABLES FROM THE 2017 MALAWI MALARIA INDICATOR SURVEY (MMIS)

The 2017 Malawi Malaria Indicator Survey (MMIS) report is very similar in content to the 2014 MMIS but is presented in a new format. The new style features more figures to highlight trends, subnational patterns, and background characteristics. Large colourful maps display data by regions within Malawi. The text has been simplified to highlight key points in bullets and to clearly identify indicator definitions in boxes.

Although the text and figures featured in each chapter highlight some of the most important findings, not every finding can be discussed or displayed graphically. For this reason, 2017 MMIS data users should be comfortable reading and interpreting data tables.

The following pages provide an introduction to the organization of the 2017 MMIS tables, the presentation of background characteristics, and a brief summary of sampling procedures used and understanding denominators. In addition, this section provides some exercises for users as they practice their new skills in interpreting 2017 MMIS tables.



Trends: The percentage of the household population with access to an ITN increased from 37% in the 2012 MMIS to 52% in the 2014 MMIS and to 63% in the 2017 MMIS. The percentage of the household population that slept under an ITN the night before the survey increased from 41% in the 2012 MMIS to 55% in the 2014 MMIS and 55% in the 2017 MIS. In both 2012 and 2014 MMIS surveys, there was a narrow gap between ITN access and ITN use while results from the 2017 MMIS show a wider gap (**Figure 3.7**).

In households with at least one ITN, only 66% of the household population slept under an ITN the previous night (**Table 3.5**). Overall, 77% of all existing ITNs were used the night before the survey (**Table 3.6**).

Patterns by background characteristics

- People in urban areas have greater access to ITNs in the household than those in rural areas (71% versus 62%) (**Table 3.4**).
- ITN access ranges from 72% in the Northern region to 53% in the Central region (**Figure 3.8**).

3.3 USE OF ITNS BY CHILDREN AND PREGNANT WOMEN

Malaria is endemic in Malawi with transmission occurring throughout the year in most areas. The entire population of Malawi is at risk of malaria. Pregnant women, their unborn babies, and children under age 5 are at high risk of the negative consequences of malaria. Children under age 5 are prone to severe malaria infection because they lack acquired immunity. For about 6 months after birth, antibodies acquired from the mother during pregnancy protect the child, although this maternal immunity is gradually lost when the child begins to develop his or her own immunity to malaria. Age is an important factor in determining levels of acquired immunity to malaria because acquired immunity does not prevent infection but protects against severe disease and death. The pace at which immunity develops depend on the exposure to malarial infection. In high malaria-endemic areas, children are thought to attain a high level of immunity by the fifth birthday. These children may experience an episode of malarial illness but usually do not suffer from severe, life-threatening conditions (Shulman and Dorman 2003).

Figure 3.7 **Trends in ITN access and use**

Percentage of the household population that has access to an ITN and percentage of the population that slept under an ITN the night before the survey

* The definition of an ITN in the 2012 and 2014 MMIS included nets that had been soaked with insecticides within the past 12 months.

Figure 3.8 **ITN access by region**

Percent of the de facto population with access to an ITN

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Example 1: Low Haemoglobin

A measure taken from all eligible respondents

Table 4.5 Haemoglobin <8.0 g/dl in children 1

Percentage of children age 6-59 months with haemoglobin lower than 8.0 g/dl, by background characteristics, Malawi MIS 2017

Background characteristic 3	Haemoglobin < 8.0 g/dl	Number of children 2
Age in months		
6-8	10.0	141
9-11	8.0	120
12-17	8.1	278
18-23	10.8	227
24-35	3.1	517
36-47	4.4	528
48-59	2.4	674
Sex		
Male	4.1	1,246
Female	6.1	1,238
Mother's interview status		
Interviewed	5.1	2,183
Not interviewed	4.7	302
Residence		
Urban	4.3	339
Rural	5.2	2,145
Region		
Northern	3.5	268
Central	6.1	1,065
Southern	4.5	1,152
Mother's education[1]		
No education	5.0	328
Primary	5.6	1,479
Secondary	3.9	347
More than secondary	0.0	28
Wealth quintile		
Lowest	5.0	588
Second	4.9	579
Middle	7.7	467
Fourth	4.9	443
Highest	2.6	408
Total	5.1	2,485 4

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Note: Table is based on children who stayed in the household the night before the interview. Prevalence of anaemia is based on haemoglobin levels and is adjusted for altitude using CDC formulas (CDC 1998). Haemoglobin is measured in grams per decilitre (g/dl).

[1] Excludes children whose mothers are not interviewed.

Step 1: Read the title and subtitle. They tell you the topic and the specific population group being described. In this case, the table is about anaemia in children (haemoglobin <8.0 g/dl). Haemoglobin levels were measured for all eligible children age 6-59 months whose parents or guardians gave their consent.

Step 2: Scan the column headings—highlighted in green in Example 1. They describe how the information is categorized. In this table, the first column of data shows children who have moderate-to-severe anaemia, or haemoglobin <8.0 g/dl. The second column lists the number of children age 6-59 months who were tested for low haemoglobin in the survey.

Step 3: Scan the row headings—the first vertical column highlighted in blue in Example 1. These show the different ways the data are divided into categories based on population characteristics. In this case, the table presents prevalence of low haemoglobin by age, sex, mother's interview status, urban-rural residence, region, mother's educational level, and wealth quintile.

Step 4: Look at the row at the bottom of the table highlighted in red. These percentages represent the totals of children age 6-59 months with low haemoglobin. In this case, 5.1%* of children age 6-59 months had haemoglobin <8.0 g/dl.

Step 5: To find out what percentage of children age 6-59 months in rural areas had low haemoglobin, draw two imaginary lines, as shown on the table. This shows that 5.2% of children age 6-59 months in rural areas had haemoglobin <8.0 g/dl.

Step 6: By looking at patterns by background characteristics, we can see how low haemoglobin varies across Malawi. Resources are often limited; knowing how malaria-related anaemia varies among different groups can help programme planners and policy makers determine how to most effectively use resources.

**For the purpose of this tutorial, data are presented exactly as they appear in the table including decimal places. However, the text in the remainder of this report rounds data to the nearest whole percentage point.*

Practice: Use the table in Example 1 to answer the following questions about low haemoglobin:

a) Is low haemoglobin more common among boys or girls?
b) Is there a clear pattern of low haemoglobin by age?
c) What are the lowest and highest percentages (range) of low haemoglobin by region?
d) Is there a clear pattern of low haemoglobin by mother's education level?

Answers:

a) Low haemoglobin is slightly higher among girls (6.1%) than among boys (4.1%).
b) Low haemoglobin is highest among children age 18-23 months (10.8%) and then decreases as children get older.
c) Low haemoglobin is least common in Northern Region (3.5%) and most common in Central Region (6.1%).
d) There is no clear pattern by mother's level of education; children whose mothers have primary education have the greatest levels of low haemoglobin (5.6%).

Example 2: Use of Mosquito Nets by Pregnant Women

A Question Asked of a Subgroup of Survey Respondents

Table 3.8 Use of mosquito nets by pregnant women 1

Percentage of pregnant women age 15-49 who, the night before the survey, slept under a mosquito net (treated or untreated) and under an insecticide-treated net (ITN); and among pregnant women age 15-49 in households with at least one ITN, percentage who slept under an ITN the night before the survey, according to background characteristics, Malawi MIS 2017

Background characteristic	Among pregnant women age 15-49 in all households: Percentage who slept under any mosquito net last night	Among pregnant women age 15-49 in all households: Percentage who slept under an ITN[1] last night	Among pregnant women age 15-49 in all households: Number of pregnant women	Among pregnant women age 15-49 in households with at least one ITN[1]: Percentage who slept under an ITN[1] last night	Among pregnant women age 15-49 in households with at least one ITN[1]: Number of pregnant women
Residence					
Urban	67.9	61.5	36	71.1	31
Rural	63.9	62.7	248	73.3	212
Region					
Northern	59.9	54.7	27	63.0	24
Central	59.6	57.5	129	74.5	99
Southern	70.2	69.3	128	73.7	120
Education					
No education	*	*	26	*	23
Primary	64.6	63.5	201	72.9	175
Secondary	64.5	58.4	52	74.8	41
More than secondary	*	*	5	*	5
Wealth quintile					
Lowest	(53.2)	(53.2)	67	(71.5)	50
Second	(67.2)	(67.2)	64	(73.5)	59
Middle	(74.0)	(71.2)	59	(78.4)	54
Fourth	55.8	54.7	48	(61.8)	42
Highest	73.3	66.3	46	79.1	38
Total	64.4	62.5	284	73.0	243

Note: 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 indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2012 Malawi MIS and 2014 Malawi MIS, this was known as a long-lasting insecticidal net (LLIN).

Step 1: Read the title and subtitle. In this case, the table is about two separate groups of pregnant women: all pregnant women age 15-49 in all households (a) and pregnant women age 15-49 in households with at least one insecticide-treated net (ITN) (b).

Step 2: Identify the two panels. First, identify the columns that refer to all pregnant women age 15-49 in all households (a), and then isolate the columns that refer only to pregnant women age 15-49 in households with at least one ITN (b).

Step 3: Look at the number of women included in this table. How many pregnant women age 15-49 in all households were interviewed? It's 284. Now look at the second panel. How many pregnant women age 15-49 in households with at least one ITN were interviewed? It's 243.

Step 4: Only 284 pregnant women age 15-49 in all households and 243 pregnant women in households with at least one ITN were interviewed in the 2017 MMIS. Once these pregnant women are further divided into the background characteristic categories, there may be too few cases for the percentages to be reliable.

- What percentage of pregnant women age 15-49 in all households in the lowest wealth quintile slept under an ITN the night before the survey? 53.2%. This percentage is in parentheses because there are between 25 and 49 pregnant women (unweighted) in this category. Readers should use this number with caution—it may not be reliable. (For more information on weighted and unweighted numbers, see Example 3.)

- What percentage of pregnant women age 15-49 with no education in households with at least one ITN slept under an ITN the night before the survey? There is no number in this cell—only an asterisk. This is because fewer than 25 pregnant women with no education in households with at least one ITN were interviewed in the survey. Results for this group are not reported. The subgroup is too small, and therefore the data are not reliable.

Note: When parentheses or asterisks are used in a table, the explanation will be noted under the table. If there are no parentheses or asterisks in a table, you can proceed with confidence that enough cases were included in all categories that the data are reliable.

Example 3: Understanding Sampling Weights in 2017 MMIS Tables

A sample is a group of people who have been selected for a survey. In the 2017 MMIS, the sample is designed to represent the national population age 15-49. In addition to national data, most countries want to collect and report data on smaller geographical or administrative areas. However, doing so requires a minimum sample size per area. For the 2017 MMIS, the survey sample is representative at the national and regional levels, and for urban and rural areas.

Table 2.8 Background characteristics of respondents

Percent distribution of women age 15-49, by selected background characteristics, Malawi MIS 2017

	Women		
Background characteristic	Weighted percent	Weighted number	Unweighted number
	3	2	1
Region			
Northern	12.0	465	1,315
Central	42.9	1,657	1,313
Southern	45.0	1,738	1,232
Total 15-49	100.0	3,860	3,860

To generate statistics that are representative of the country as a whole and the three regions, the number of women surveyed in each region should contribute to the size of the total (national) sample in proportion to size of the region. However, if some regions have small populations, then a sample allocated in proportion to each region's population may not include sufficient women from each region for analysis. To solve this problem, regions with small populations are oversampled. For example, let's say that you have enough money to interview 3,860 women and want to produce results that are representative of Malawi as a whole and its regions (as in Table 2.8). However, the total population of Malawi is not evenly distributed among the regions: some regions, such as Southern Region, are heavily populated while others, such as Northern Region are not. Thus, Northern Region must be oversampled.

A sampling statistician determines how many women should be interviewed in each region in order to get reliable statistics. The **blue column (1)** in the table at the right shows the actual number of women interviewed in each region. Within the regions, the number of women interviewed ranges from 1,232 in Southern Region to 1,315 in Northern Region. The number of interviews is sufficient to get reliable results in each region.

With this distribution of interviews, some regions are overrepresented and some regions are underrepresented. For example, the population in Southern Region is 45% of the population in Malawi, while Northern Region's population contributes only 12%. But as the blue column shows, the number of women interviewed in Southern Region accounts for only about 32% of the total sample of women interviewed (1,232/3,860) and the number of women interviewed in Northern Region accounts for 34% of the total sample of women interviewed (1,315/3,860). This unweighted distribution of women does not accurately represent the population.

In order to get statistics that are representative of Malawi, the distribution of the women in the sample needs to be weighted (or mathematically adjusted) such that it resembles the true distribution in the country. Women from a small region, such as Northern Region, should only contribute a small amount to the national total. Women from a large region, like Southern Region, should contribute much more. Therefore, DHS statisticians mathematically calculate a "weight" which is used to adjust the number of women from each region so that each region's contribution to the total is proportional to the actual population of the region. The numbers in the **purple column (2)** represent the "weighted" values. The weighted values can be smaller or larger than the unweighted values at regional level. The total national sample size of 3,860 women has not changed after weighting, but the distribution of the women in the regions has been changed to represent their contribution to the total population size.

How do statisticians weight each category? They take into account the probability that a woman was selected in the sample. If you were to compare the **green column (3)** to the actual population distribution

of Malawi, you would see that women in each region are contributing to the total sample with the same weight that they contribute to the population of the country. The weighted number of women in the survey now accurately represents the proportion of women who live in Northern Region and the proportion of women who live in Southern Region.

With sampling and weighting, it is possible to interview enough women to provide reliable statistics at national and regional levels. In general, only the weighted numbers are shown in each of the MMIS tables, so don’t be surprised if these numbers seem low: they may actually represent a larger number of women interviewed.

MALAWI


N
0 50 100 200
Kilometers
TANZANIA
Northern
ZAMBIA
Central
MOZAMBIQUE
Southern
ZIMBABWE

INTRODUCTION AND SURVEY METHODOLOGY 1

The 2017 Malawi Malaria Indicator Survey (MMIS) was implemented by the National Malaria Control Program (NMCP) through funding from the President's Malaria Initiative (PMI). Data collection took place from 15 April to 16 June, 2017. ICF provided technical assistance through The DHS Program, a USAID-funded project that offers support and technical assistance for the implementation of population and health surveys in countries worldwide.

1.1 SURVEY OBJECTIVES

The 2017 MMIS, a comprehensive, nationally-representative household survey, was designed in accord with the Roll Back Malaria Monitoring and Evaluation Working Group (RBM-MERG) guidelines. The primary objective of the 2017 MMIS project is to provide up-to-date estimates of basic demographic and health indicators related to malaria. Specifically, the 2017 MMIS collected information on mosquito nets, intermittent preventive treatment of malaria in pregnant women (IPTp), and care seeking behaviour and treatment of fever in children. Young children were also tested for anaemia and for malaria infection. Knowledge of malaria was assessed among interviewed women. The information collected through the 2017 MMIS is intended to assist policy makers and program managers in evaluating and designing programs and strategies for improving the health of the country's population.

1.2 SAMPLE DESIGN

The 2017 MMIS followed a two-stage sample design and allows estimates of key malaria indicators for the country as a whole, for urban and rural areas separately, and for each of the 3 administrative regions in Malawi: Northern, Central, and Southern.

The first stage of sampling involved selecting sample points (clusters) from the sampling frame. Enumeration areas (EAs) delineated for the 2008 Population and Housing Census were used as the sampling frame. A total of 150 clusters were selected, with probability proportional to size, from the EAs covered in the 2008 Population and Housing Census. Of these clusters, 60 were in urban areas and 90 in rural areas. Urban areas were oversampled within regions to produce robust estimates for each area or domain.

The second stage of sampling involved systematic selection of households. A household listing operation was undertaken in all selected EAs between February and March 2017, and households to be included in the survey were randomly selected from these lists. Twenty-five households were selected from each EA, for a total sample size of 3,750 households. Because of the approximately equal sample sizes in each region, the sample is not self-weighting at the national level. Results shown in this report have been weighted to account for the complex sample design. See Appendix A for additional details on the sampling procedures.

All women age 15-49 who were either permanent residents of the selected households or visitors who stayed in the household the night before the survey were eligible to be interviewed. With the parent's or guardian's consent, children age 6-59 months were tested for anaemia and for malaria infection.

1.3 QUESTIONNAIRES

Data was primarily collected using three types of questionnaires: the Household Questionnaire, the Woman's Questionnaire, and the Biomarker Questionnaire. Core questionnaires available from the RBM-MERG were adapted to reflect the population and health issues relevant to Malawi. The modifications

were determined at a series of meetings with various stakeholders from the National Malaria Control Programme (NMCP) and other government ministries and agencies, nongovernmental organisations, and international donors. The questionnaires in English and two local Malawian languages (Chichewa and Chitumbuka) were programmed onto tablet computers, enabling use of computer-assisted personal interviewing (CAPI) for the survey.

Additionally, a two-page Fieldworker Questionnaire was filled out by all people who implemented the 2017 MMIS in the field.

The Household Questionnaire was used to list all the usual members of and visitors to selected households. Basic information was collected on the characteristics of each person listed in the household, including his or her age, sex, and relationship to the head of the household. The data on the age and sex of household members, obtained from the Household Questionnaire, were used to identify women eligible for an individual interview and children age 6-59 months eligible for anaemia and malaria testing. Additionally, the Household Questionnaire captured information on characteristics of the household's dwelling unit, such as the source of water, type of toilet facilities, materials used for flooring, ownership of various durable goods, and ownership and use of mosquito nets.

The Woman's Questionnaire was used to collect information from all women age 15-49. These women were asked questions on the following main topics:

- Background characteristics (age, residential history, education, literacy, religion, and ethnicity)
- Reproductive history for the last 6 years
- Preventive malaria treatment for the most recent birth
- Prevalence and treatment of fever among children under age 5
- Knowledge about malaria (symptoms, causes, and how to prevent)
- Sources of media messages about malaria

The Biomarker Questionnaire was used to record the results of the anaemia and malaria testing of children 6-59 months, as well as the signatures of the fieldworker and the parent or guardian who gave consent.

Consent statements were developed for each tool (Household, Woman's, and Biomarker Questionnaires). Further consent statements were formulated for malaria testing, anaemia testing, and treatment of children with positive malaria rapid diagnostic tests (RDTs). Verbal informed consent was sought from eligible respondents before the administration of the Household Questionnaire and the Individual Questionnaire or the collection of biomarker data. For children age 6-59 months eligible for anaemia and malaria testing, consent was obtained from a parent or guardian, or other responsible adult prior to testing. The survey staff recorded their unique identification number and signed to indicate that the consent procedure was properly administered, and whether or not the respondent provided their consent.

The Fieldworker Questionnaire was self- administered by all fieldworkers who entered the field to implement the survey. The questionnaire collected information on fieldworker's basic background characteristics (residential status, age, sex, marital status, education, language spoken), past experience with large surveys such as DHS or MIS, and whether they were already employed by the NMCP.

1.4 ANAEMIA AND MALARIA TESTING

Blood samples for biomarker testing were collected by finger- or heel-prick from children age 6-59 months. Each field team included two laboratory technicians who carried out the anaemia and malaria testing and prepared the blood smears. A nurse on each field team provided malaria medications for

children who tested positive for malaria, in accordance with the approved treatment protocols. The field laboratory technicians requested informed consent for each test from the child's parent or guardian before the blood samples were collected, according to the protocols approved by the National Health Sciences Research Committee in Malawi and the institutional review board at ICF.

Anaemia testing. A single-use, retractable, spring-loaded, sterile lancet was used to make a finger- or heel-prick. A drop of blood from this site was then collected in a microcuvette. Haemoglobin analysis was carried out on site using a battery-operated, portable HemoCue® analyser, which produces a result in less than one minute. Results were given to the child's parent or guardian verbally and in writing. Parents of children with a haemoglobin level under 8 g/dl were advised to take the child to a health facility for follow-up care and were given a referral letter with the haemoglobin reading to show to staff at the health facility. Results of the anaemia test were recorded on the Biomarker Questionnaire and on a brochure left in the household that also contained information on the causes and prevention of anaemia.

Malaria testing using a rapid diagnostic test (mRDT). Using the same finger- or heel-prick that was used for anaemia testing, another drop of blood was tested immediately using the SD BIOLINE Malaria Ag P.f/Pan rapid diagnostic test (RDT). This qualitative test detects the histidine-rich protein II (HRP-II) antigen of Plasmodium falciparum and common Plasmodium lactate dehydrogenase (pLDH) of Plasmodium species in human whole blood (Standard Diagnostics, Inc.). The parasite, transmitted by a mosquito, is the major cause of malaria in Malawi. The diagnostic test includes a disposable sample applicator that comes in a standard package. A tiny volume of blood is captured on the applicator and placed in the well of the testing device. All field laboratory technicians were trained to perform the RDT in the field, in accord with manufacturer's instructions. RDT results were available in 20 minutes and recorded as either positive or negative, with faint test lines considered positive. As with anaemia testing, malaria RDT results were provided to the child's parent or guardian in oral and written form and were recorded on the Biomarker Questionnaire.

Children who tested positive for malaria were offered a full course of medicine according to standard procedures for uncomplicated malaria treatment in Malawi. To ascertain the correct dose, nurses on each field team were trained to use treatment guidance charts and to ask about any medications the child might already be taking. The nurses were also trained to identify signs and symptoms of severe malaria. The nurses provided the age-appropriate dose of artemisinin-based combination therapy (ACT) along with instructions on how to administer the medicine to the child. They also directly observed administration of the first dose.

Malaria testing using blood smears. In addition to the RDT, thick and thin blood smears were prepared in the field. Each blood smear slide was given a bar code label, with a duplicate affixed to the Biomarker Questionnaire. An additional copy of the bar code label was affixed to a blood sample transmittal form to track the blood samples from the field to the laboratory. The slides were dried in a dust-free environment and stored in slide boxes. The thick and thin blood smear slides were collected regularly from the field, along with the completed Biomarker Questionnaires, and transported to the laboratory for logging and microscopic reading. The smears were stained with Giemsa stain and examined to determine the presence of *Plasmodium* infection and parasite density. All stained slides were read by two independent microscopists. Slides with discordant microscopy results were reanalysed by a third microscopist for final validation.

The microscopic results were quality checked by internal and external quality control processes. Internal quality control consisted of an independent microscopist who read 5% of all slides in the study. External quality control was conducted through the Malawi College of Medicine Laboratory where 10% of samples were independently read.

1.5 TRAINING OF FIELD STAFF

A 3-week training for field staff took place from 27 March to 14 April, 2017, at the Riverside Hotel in Lilongwe. Overall, 60 people attended the training, including 10 field supervisors, 30 interviewers, and 20 laboratory technicians. NMCP and ICF staff members led the training and served as the supervisory team for the fieldwork practice.

During the first week of training, field supervisors and interviewers focused on how to fill out the Household and Woman's questionnaires, conduct mock interviews, and use appropriate interviewing techniques.

During the second week, two parallel training sessions were organized: one for the interviewers and team supervisors and the other for laboratory technicians. The training of interviewers and field supervisors focused on the use of the CAPI application for filling out the Household, Woman's and Biomarker questionnaires, assigning households to interviewers, and transferring data from completed questionnaires to the central data processing centre. Throughout the training, quizzes were administered to assess how well the participants absorbed the training materials, both on using the paper questionnaire and on using the CAPI application as a data collection tool.

Training of laboratory technicians focused on preparing blood samples to test for anaemia and malaria. The training involved presentations, discussion, and actual testing for anaemia and malaria. The technicians were trained to identify children eligible for testing, administer informed consent, conduct the anaemia and malaria rapid tests, make thick and thin blood smears, and administer the correct treatment protocols. They were also trained to store the blood slides, record test results on the Biomarker Questionnaire, and provide the results to the parents or guardians of the children tested. Finally, technicians were 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.

To help put the importance of the 2017 MMIS into context for the trainees, the training also included presentations given by NMCP staff on epidemiology of malaria and Malawi-specific policies and programs on malaria. All participants took part in 3-day field practice exercises in Lilongwe.

1.6 FIELDWORK

Eight teams were organised for field data collection. Each team consisted of one field supervisor, three health professionals to interview and administer treatment, two laboratory technicians to conduct biomarker testing, and one driver. The field staff also included national coordinators who collected slides from the field teams and delivered them to the National Reference Health Laboratory.

Field data collection for the 2017 MMIS started on 15 April 2017. For maximum supervision, all eight teams were visited by national monitors, at least once a week. Fieldwork was completed on 16 June 2017.

1.7 DATA PROCESSING

Data for the 2017 MMIS were collected through questionnaires programmed onto the CAPI application. The CAPI were programmed by ICF and loaded with the Household, Biomarker, and Woman's Questionnaires. Using the cloud, the field supervisors transferred data on a daily basis to a central location for data processing in Lilongwe. To facilitate communication and monitoring, each field worker was assigned a unique identification number.

ICF provided technical assistance for processing the data using the Censuses and Surveys Processing (CSPro) system for data editing, cleaning, weighting, and tabulation. In the central office, data received from the field teams' CAPI applications were registered and checked for any inconsistencies. Data editing and cleaning included an extensive range of structural and internal consistency checks. Any anomalies

were communicated to team (field) supervisors so that the data processing teams could resolve data discrepancies. The corrected results were maintained in master CSPro data files at ICF and used for analysis in producing tables for the final report.

1.8 RESPONSE RATES

Table 1.1 shows that of the 3,750 households selected for the sample, 3,735 were occupied at the time of fieldwork. Among the occupied households, 3,729 were successfully interviewed, yielding a total household response rate of 99.8%. In the interviewed households, 3,861 eligible women were identified as eligible for individual interview, and 3,860 women were successfully interviewed, yielding a response rate of 100%.

Table 1.1 Results of the household and individual interviews

Number of households, number of interviews, and response rates, according to residence (unweighted), Malawi MIS, 2017

	Residence		
Result	Urban	Rural	Total
Household interviews	1500	2250	3750
Households selected	1491	2244	3735
Households occupied	1490	2239	3729
Households interviewed			
Household response rate[1]	99.9	99.8	99.8
Interviews with women age 15-49			
Number of eligible women	1693	2168	3861
Number of eligible women interviewed	1693	2167	3860
Eligible women's response rate[2]	100.0	100.0	100.0

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

CHARACTERISTICS OF HOUSEHOLDS AND WOMEN

2

Key Findings

- ***Drinking water:*** Almost all urban households (99%) have access to an improved source of drinking water while fewer rural households (84%) have access.
- ***Sanitation:*** Only 11% of households use an improved toilet facility; 8% of households have a toilet facility that would be classified as improved if not shared with other households, 75% use an unimproved toilet facility, and 7% practice open defecation.
- ***Household wealth:*** 34% of households in the Northern region are in the highest wealth quintile, while 25% of households in the Central region are in the lowest wealth quintile.
- ***Electricity:*** 96% of households in rural areas do not have electricity.
- ***Bank account/village savings:*** 14% of households have a member with a bank account (49% in urban areas and 7% in rural areas).
- ***Literacy:*** Overall, younger women are more likely to be literate than older women. Eighty percent of women age 15-19 are literate compared with 47% of women age 45-49.

Information on the socioeconomic characteristics of the household population in the 2017 MMIS provides a context to interpret demographic and health indicators and can furnish an approximate indication of the representativeness of the survey. In addition, this information sheds light on the living conditions of the population of Malawi.

This chapter presents information on source of drinking water, sanitation, wealth, ownership of durable goods and composition of the household population. In addition, the chapter presents characteristics of the survey respondents such as age, education and literacy. Socioeconomic characteristics are useful for understanding the factors that affect use of health services and other health behaviours related to malaria control.

2.1 DRINKING WATER SOURCES AND TREATMENT

Improved sources of drinking water

Includes piped water, public taps, standpipes, tube wells, boreholes, protected dug wells, springs, and rainwater. Households using bottled water for drinking are classified as using an improved source only if their water for cooking and handwashing is from an improved source.

Sample: Households

Improved sources of water protect against outside contamination so water is more likely to be safe to drink. In Malawi, 86% of households have access to an improved source of drinking water (**Table 2.1**). Ninety-nine percent of urban households and 84% of rural households have access to improved water sources. Urban and rural households rely on different sources of drinking water. Forty-six percent of urban households have piped water in their dwelling or yard, which accounts for the largest percentage of improved water sources for urban households (**Figure 2.1**). In contrast, rural households with access to improved sources of drinking water rely mainly on tube wells or boreholes (65%). Ninety-one percent of urban and 66% of rural households have water on the premises or travel less than 30 minutes to fetch drinking water (**Table 2.1**).

Trends: The proportion of households obtaining water from improved sources increased slightly from 81% in the 2012 MMIS to 83% in the 2014 MMIS, and then to 86% in the 2017 MMIS. The increase occurred in both urban and rural households, from 93% in 2012 to 99% in 2017 in urban areas and from 79% in 2012 to 84% in 2017 in rural areas (**Figure 2.2**).

Figure 2.1 **Household drinking water by residence**

Percent distribution of households by source of drinking water

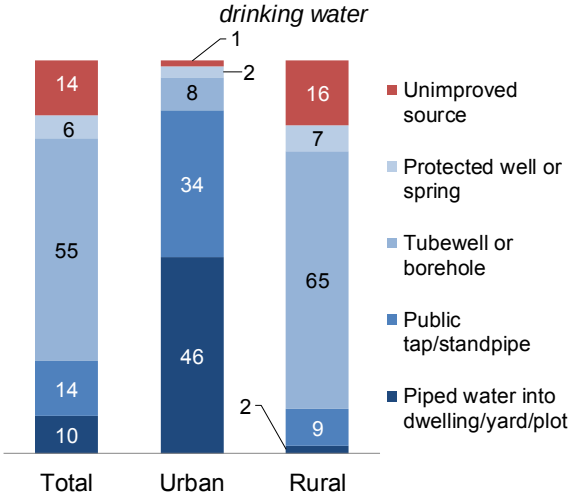
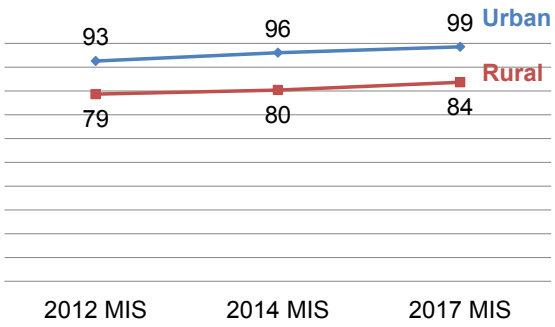


Figure 2.2 **Trends in source of drinking water by residence**

Percent obtaining drinking water from improved sources



2.2 SANITATION

Improved toilet facilities

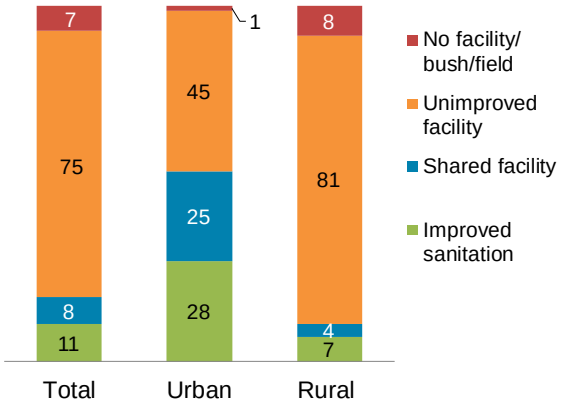
Include any non-shared toilet of the following types: flush/pour flush toilets to piped sewer systems, septic tanks, and pit latrines; ventilated improved pit (VIP) latrines; pit latrines with slabs; and composting toilets

Sample: Households

Nationally, only 11% of households use an improved sanitation facility. Ninety percent of households use unimproved sanitation, including 8% of the households that have a toilet facility that would be classified as improved if it were not shared with other households, 75% that use an unimproved toilet facility, and 7% that practice open defecation (**Figure 2.3**). Households in urban areas (28%) are more likely than rural households (7%) to use improved facilities. The most commonly used improved toilet facility is the pit latrine with a slab (7%). Only 2% of households use an improved facility that flushes to a septic tank; this proportion is higher among urban households (12%) than among rural households (less than 1%) (**Table 2.2**).

***Figure 2.3* Household toilet facilities by residence**

Percent distribution of households by type of toilet facilities



Note: Totals may not add to 100 due to rounding.

2.3 HOUSING CHARACTERISTICS

The 2017 MMIS collected data on household features such as access to electricity, flooring material, number of sleeping rooms, and types of fuel used for cooking. The responses to these questions, along with information on ownership of household durable goods, contribute to the creation of the household wealth index and provide information that may be relevant for other health indicators.

Exposure to cooking smoke, especially that produced from solid fuels such as charcoal and firewood, is potentially harmful to health. Both urban and rural households rely on solid cooking fuels, but there are differences in the type of solid fuels they use. The percentage of households using charcoal for cooking is about 10 times higher in urban households than in rural households (73% versus 7%, respectively), while rural households are more likely to use firewood than urban households (93% versus 17%, respectively). (**Table 2.3**).

Overall, 1 in 10 households (13%) in Malawi has access to electricity. Fifty-five percent of urban households but only 4% of rural households have access to electricity.

The most common flooring material in Malawi is earth or sand (68%). Cement is the second most common material (25%). By residence, the most common choice in urban areas is cement (75%), while in rural areas it is earth or sand (78%).

The number of rooms a household uses for sleeping is an indicator of socioeconomic level and crowding in the household; crowding can facilitate the spread of diseases. In Malawi, 36% of households use a single room for sleeping, while 24% use three or more rooms for sleeping. In urban areas, 31% use three or more rooms, while in rural areas 22% use three or more rooms for sleeping (**Table 2.3**).

Household Durable Goods

Data displayed in **Table 2.4** presents information on ownership of household effects, means of transport, agricultural land and animals, and bank accounts. Urban households are more likely than rural households to own a radio (62% versus 27%), television (45% versus 4%), mobile telephone (84% versus 44%), and car or truck (9% versus 1%). Urban households are also more likely than rural households to own a bank account (49% versus 7%). In contrast, rural households are more likely than urban households to own agricultural land (85% versus 25%), farm animals (51% versus 19%), a bicycle (38% vs 24%), and a torch (85% versus 72%).

2.4 HOUSEHOLD WEALTH

Wealth index

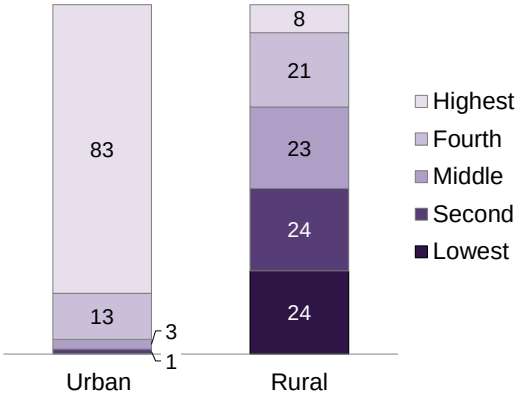
Households are given scores based on the number and kinds of consumer goods they own, ranging from a television to a bicycle or car, and housing characteristics such as source of drinking water, toilet facilities, and flooring materials. These scores are derived using principal component analysis. National wealth quintiles are compiled by assigning the household score to each usual (de jure) household member, ranking each person in the household population by their score, and then dividing the distribution into five equal categories, each with 20% of the population.

Sample: Households

There are substantial variations in the distribution of wealth quintiles at residential and regional levels. Rural residences have the highest percentage of population in the lowest quintile (24%) compared with urban ones (<1%), while 83% of the urban population is in the highest quintile compared with 8% of the rural population (**Figure 2.4**). At the regional level, the Central region has the highest percentage of population in the lowest quintile (25%), while the Northern region has the lowest percentage of the population in the lowest wealth quintile (6%). The Northern region has the highest percentage of population in the highest wealth quintile (34%) compared with Central (18%) and Southern (19%) regions (**Table 2.5**).

***Figure 2.4* Household wealth by residence**

Percent distribution of de jure population by wealth quintiles



Note: Totals may not add to 100 due to rounding.

2.5 HOUSEHOLD POPULATION AND COMPOSITION

Household

A person or group of related or unrelated persons who live together in the same dwelling unit(s), who acknowledge one adult male or female as the head of the household, who share the same housekeeping arrangements, and who are considered a single unit.

De facto population

All persons who stayed in the selected households the night before the interview (whether usual residents or visitors)

De jure population

All persons who are usual residents of the selected households, whether or not they stayed in the household the night before the interview

How data are calculated

All tables are based on the de facto population, unless specified otherwise.

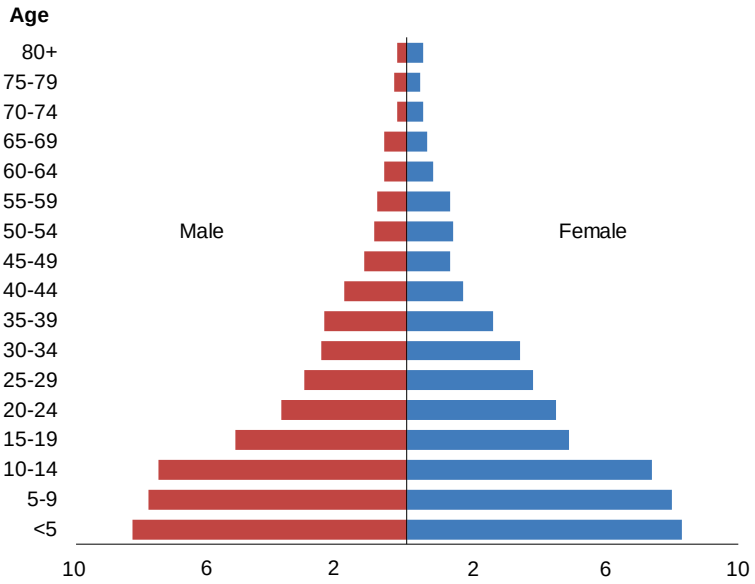
In the 2017 MMIS, 16,359 people stayed overnight in 3,729 households. The population sex ratio is 93 males per 100 females. By residence, there were 90 males per 100 females in urban areas and 94 males per 100 females in rural areas. Eighty-four percent of the population lives in rural areas (**Table 2.6**).

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 2017 MMIS by 5-year age groups, according to sex and residence.

The population pyramid in **Figure 2.5** shows the population distribution by sex and by five-year age groups. The broad base of the pyramid shows that the Malawi population is young, which is typical of developing countries with a high fertility rate and low life expectancy. Forty-seven percent of the population is under age 15, almost half of the population (49%) is between age 15 and age 64, and only 4% of the population is age 65 and above (**Table 2.6**).

Figure 2.5 **Population pyramid**

Percent distribution of the household population



On average, households in Malawi consist of 4.5 persons (**Table 2.7**). Men are predominantly the head of households in Malawi (74%). The proportion of households headed by women is slightly higher in rural areas than in urban areas (26% versus 23%).

2.6 Background Characteristics of Women Respondents

Table 2.8 shows by background characteristics the weighted and unweighted numbers and the weighted percentage distributions of women age 15-49 who were interviewed in the 2017 MMIS, by background characteristics. More than half of the respondents (60%) are between age 15 and 30, which reflects the youthful population. The majority of respondents are Christians (81%), with Catholic and CCAP forming the largest composition (33%), and 15% are Muslims.

The Chewas form the largest ethnic group (37%). Eighty percent of respondents live in rural areas. The largest percentage of respondents lives in the Southern region (45%) followed by the Central region (43%) and the Northern region (12%).

2.7 Educational Attainment of Women

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 both the use of health facilities and health management for herself and for her children.

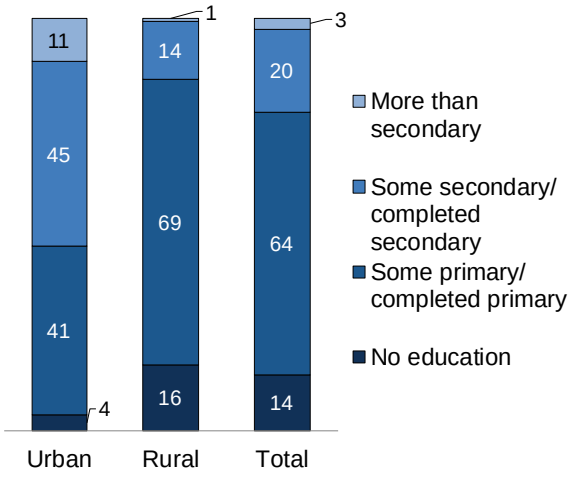
In general, 14% of women in Malawi have no education (**Figure 2.6**). Nine percent of women have completed secondary education or attended higher than secondary school. Overall, women have completed a median of 5.4 years of education (**Table 2.9**).

Patterns by background characteristics

- Sixteen percent of women in rural areas have no education compared with 4% in urban areas.
- At the regional level, the Southern region recorded the highest percentage of women with no education (16%), while the Northern region had the lowest percentage (4%) of women with no education.
- The percentage of respondents with no education decreases with increasing wealth quintile, from 24% in the lowest quintile to 3% in the highest quintile.

Figure 2.6 Education of survey respondents

Percent distribution of women age 15-49 by highest level of schooling attended or completed



2.8 LITERACY OF WOMEN

Literacy

Respondents who have attended higher than secondary school are assumed to be literate. All other respondents were given a sentence to read, and they were considered to be literate if they could read all or part of the sentence.

Sample: Women age 15-49

The results show that only 3% of women have higher than secondary education. Amongst those with secondary education or lower including those with no education, 57% can read the whole sentence, 10% can read part of the sentence and 30% cannot read at all. The results show that, overall, 70% of women age 15-49 are literate. (**Table 2.10**).

Patterns by background characteristics

- Literacy is much higher amongst the youngest women age 15-19 (80%) and decreases steadily with age to 47% amongst the oldest women (45-49) (**Table 2.10**).
- Literacy varies by place of residence as 89% of women in urban areas are literate, compared with 65% of rural women.
- Regional differences in literacy are notable; literacy is highest among women in the Northern region (85%) and lowest among women in the Central region (67%).
- By wealth, literacy ranges from 51% among women in the lowest wealth quintile to 92% among women in the highest quintile.

LIST OF TABLES

For detailed information on household population and housing characteristics, see the following tables:

- **Table 2.1 Household drinking water**
- **Table 2.2 Household sanitation facilities**
- **Table 2.3 Household characteristics**
- **Table 2.4 Household possessions**
- **Table 2.5 Wealth quintiles**
- **Table 2.6 Household population by age, sex, and residence**
- **Table 2.7 Household composition**
- **Table 2.8 Background characteristics of respondents**
- **Table 2.9 Women's educational attainment**
- **Table 2.10 Women's literacy**

Table 2.1 Household drinking water

Percent distribution of households and de jure population by source of drinking water, and by time to obtain drinking water; according to residence, Malawi MIS 2017

	Households			Population		
Characteristic	Urban	Rural	Total	Urban	Rural	Total
Source of drinking water						
Improved source	**98.6**	**83.7**	**86.2**	**98.7**	**84.4**	**86.7**
Piped into dwelling/yard plot	45.7	2.0	9.5	47.4	2.0	9.3
Piped to neighbour	8.7	0.6	2.0	8.8	0.6	1.9
Public tap/standpipe	34.2	9.3	13.6	33.5	9.1	13.0
Tube well or borehole	7.6	65.4	55.4	6.9	65.8	56.3
Protected dug well	2.2	6.2	5.5	1.9	6.7	5.9
Protected spring	0.2	0.3	0.2	0.2	0.2	0.2
Unimproved source	**1.4**	**16.3**	**13.7**	**1.3**	**15.6**	**13.3**
Unprotected dug well	1.2	10.3	8.7	1.1	9.8	8.4
Unprotected spring	0.0	1.9	1.6	0.0	1.7	1.4
Tanker truck/cart with small tank	0.1	0.1	0.1	0.1	0.1	0.1
Surface water	0.1	4.1	3.4	0.1	4.0	3.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
Time to obtain drinking water (round trip)						
Water on premises[1]	56.2	5.5	14.3	58.1	5.4	13.9
Less than 30 minutes	35.1	60.5	56.1	33.2	60.5	56.1
30 minutes or longer	8.0	30.5	26.6	8.1	30.8	27.1
Don't know/missing	0.7	3.5	3.0	0.5	3.3	2.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number	644	3,085	3,729	2,682	13,954	16,636

[1] Includes water piped to a neighbour

Table 2.2 Household sanitation facilities

Percent distribution of households and de jure population by type of toilet/latrine facilities and percent distribution of households and de jure population with a toilet/latrine facility by location of the facility, according to residence, Malawi MIS 2017

	Households			Population		
Type and location of toilet/latrine facility	Urban	Rural	Total	Urban	Rural	Total
Improved sanitation	**28.2**	**6.9**	**10.5**	**31.1**	**7.1**	**11.0**
Flush/pour flush to piped sewer system	2.6	0.0	0.5	2.8	0.0	0.5
Flush/pour flush to septic tank	11.9	0.2	2.2	12.6	0.1	2.1
Flush/pour flush to pit latrine	0.5	0.0	0.1	0.6	0.0	0.1
Ventilated improved pit (VIP) latrine	0.3	0.5	0.5	0.2	0.6	0.5
Pit latrine with slab	12.9	6.0	7.2	15.0	6.3	7.7
Composting toilet	0.0	0.1	0.1	0.0	0.1	0.1
Unimproved sanitation	**71.8**	**93.1**	**89.5**	**68.9**	**92.9**	**89.0**
Shared facility[1]	**25.4**	**3.8**	**7.6**	**24.3**	**3.5**	**6.8**
Flush/pour flush to piped sewer system	0.1	0.0	0.0	0.1	0.0	0.0
Flush/pour flush to septic tank	1.2	0.1	0.3	0.8	0.0	0.1
Flush/pour flush to pit latrine	0.1	0.0	0.0	0.1	0.0	0.0
Ventilated improved pit (VIP) latrine	0.3	0.1	0.1	0.3	0.1	0.1
Pit latrine with slab	23.6	3.5	7.0	23.0	3.2	6.4
Composting toilet	0.1	0.1	0.1	0.1	0.2	0.1
Unimproved facility	**45.1**	**81.1**	**74.9**	**43.4**	**82.5**	**76.2**
Flush/pour flush not to sewer/septic tank/pit latrine	0.1	0.0	0.0	0.0	0.0	0.0
Pit latrine without slab/open pit	45.0	80.9	74.7	43.3	82.4	76.1
Hanging toilet/hanging latrine	0.0	0.1	0.1	0.0	0.1	0.1
Other	0.0	0.1	0.1	0.0	0.0	0.0
Open defecation (No facility/bush/field)	**1.3**	**8.2**	**7.0**	**1.3**	**7.0**	**6.0**
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of households/population	644	3,085	3,729	2,682	13,954	16,636

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

Table 2.3 Household characteristics

Percent distribution of households and de jure population by housing characteristics, percentage using solid fuel for cooking, percentage using clean fuel for cooking, and percent distribution by frequency of smoking in the home, according to residence, Malawi MIS 2017

Housing characteristic	Households			Population		
	Urban	Rural	Total	Urban	Rural	Total
Electricity						
Yes	54.7	3.8	12.6	57.5	4.1	12.7
No	45.3	96.2	87.4	42.5	95.9	87.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
Flooring material						
Earth, sand	19.6	77.7	67.7	17.6	77.1	67.5
Dung	1.4	7.3	6.3	1.4	7.3	6.4
Wood/planks	0.0	0.0	0.0	0.0	0.0	0.0
Palm/bamboo	0.0	0.1	0.0	0.0	0.0	0.0
Vinyl or asphalt strips	0.1	0.0	0.0	0.1	0.0	0.0
Ceramic tiles	3.3	0.0	0.6	3.7	0.0	0.6
Cement	75.3	14.8	25.2	76.9	15.3	25.3
Carpet	0.3	0.1	0.1	0.3	0.1	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Rooms used for sleeping						
One	30.9	37.2	36.1	22.3	29.6	28.4
Two	37.9	40.9	40.4	38.3	43.0	42.2
Three or more	31.2	22.0	23.6	39.3	27.4	29.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of separate sleeping places						
None	0.2	0.1	0.1	0.1	0.1	0.1
One	23.5	28.1	27.3	12.2	17.6	16.7
Two	33.5	40.0	38.9	30.9	40.1	38.7
Three or more	42.8	31.8	33.7	56.8	42.2	44.5
Total	100.0	100.0	100.0	100.0	100.0	100.0
Cooking fuel						
Electricity	9.5	0.1	1.7	9.3	0.1	1.6
LPG/natural gas/biogas	0.2	0.0	0.0	0.2	0.0	0.0
Coal/lignite	0.0	0.1	0.1	0.0	0.1	0.0
Charcoal	72.7	7.0	18.3	72.9	6.8	17.4
Wood	17.4	92.5	79.5	17.4	92.8	80.7
Straw/shrubs/grass	0.1	0.2	0.2	0.1	0.2	0.2
Agricultural crop	0.1	0.1	0.1	0.1	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0
Percentage using solid fuel for cooking[1]	90.3	99.9	98.2	90.5	99.9	98.4
Percentage using clean fuel for cooking[2]	9.7	0.1	1.8	9.5	0.1	1.6
Number of households/population	644	3,085	3,729	2,682	13,954	16,636

LPG = Liquefied petroleum gas
[1] Includes coal/lignite, charcoal, wood, straw/shrubs/grass, and agricultural crops
[2] Includes electricity and LPG/natural gas/biogas

Table 2.4 Household possessions

Percentage of households possessing various household effects, means of transportation, agricultural land, livestock/farm animals, and a bank account, according to residence, Malawi MIS 2017

Possession	Residence		Total
	Urban	Rural	
Household effects			
Radio	61.7	27.1	33.0
Television	45.4	3.6	10.8
Mobile phone	84.0	43.6	50.6
Computer	11.8	0.5	2.4
Non-mobile telephone	4.5	0.6	1.3
Refrigerator	25.7	0.9	5.1
Koloboyi	1.9	4.8	4.3
Paraffin lamp	7.2	5.5	5.8
Bed with a mattress	74.2	19.8	29.2
Torch	72.4	84.8	82.7
Sofa set	50.8	6.2	13.9
Means of transport			
Bicycle	24.3	38.1	35.7
Animal drawn cart	0.6	2.3	2.0
Motorcycle/scooter	2.0	2.9	2.8
Car/truck	9.2	0.7	2.2
Boat with a motor	0.3	0.3	0.3
Ownership of agricultural land	24.7	84.5	74.2
Ownership of farm animals[1]	18.5	51.4	45.7
Ownership of a bank account	48.9	6.9	14.1
Number	644	3,085	3,729

[1] Cows, bulls, other cattle, horses, donkeys, goats, sheep, chickens, other poultry, pigs, and rabbits

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 MIS 2017

Residence/region	Wealth quintile					Total	Number of persons	Gini coefficient
	Lowest	Second	Middle	Fourth	Highest			
Residence								
Urban	0.0	1.4	2.8	13.2	82.6	100.0	2,682	0.20
Rural	23.8	23.6	23.3	21.3	8.0	100.0	13,954	0.40
Region								
Northern	6.0	12.0	18.0	30.5	33.5	100.0	2,032	0.40
Central	25.1	22.9	18.4	15.8	17.7	100.0	7,124	0.51
Southern	18.9	19.4	22.1	21.2	18.5	100.0	7,480	0.49
Total	20.0	20.0	20.0	20.0	20.0	100.0	16,636	0.49

Table 2.6 Household population by age, sex, and residence

Percent distribution of the de facto household population by 5-year age groups, according to sex and residence, Malawi MIS 2017

	Urban			Rural			Total		
Age	Male	Female	Total	Male	Female	Total	Male	Female	Total
<5	14.8	14.0	14.4	17.6	16.4	17.0	17.2	16.0	16.6
5-9	13.4	13.6	13.5	16.6	15.9	16.2	16.1	15.5	15.8
10-14	13.3	13.2	13.3	15.9	14.5	15.2	15.5	14.3	14.9
15-19	11.0	10.5	10.7	10.8	9.4	10.1	10.8	9.6	10.2
20-24	7.7	11.3	9.6	8.0	8.3	8.2	8.0	8.8	8.4
25-29	8.6	9.6	9.1	6.0	7.0	6.5	6.4	7.4	6.9
30-34	7.9	9.0	8.5	5.0	6.2	5.6	5.4	6.7	6.1
35-39	7.7	6.7	7.2	4.7	4.8	4.7	5.1	5.1	5.1
40-44	5.6	2.8	4.1	3.6	3.5	3.5	3.9	3.3	3.6
45-49	3.3	1.9	2.6	2.6	2.6	2.6	2.7	2.5	2.6
50-54	2.0	2.2	2.1	2.0	2.9	2.5	2.0	2.7	2.4
55-59	1.7	1.8	1.8	1.9	2.6	2.3	1.9	2.4	2.2
60-64	1.0	1.2	1.1	1.5	1.6	1.6	1.5	1.6	1.5
65-69	0.7	1.2	1.0	1.5	1.1	1.3	1.4	1.1	1.3
70-74	0.7	0.4	0.5	0.7	1.2	0.9	0.7	1.0	0.9
75-79	0.2	0.3	0.2	0.8	0.9	0.9	0.7	0.8	0.8
80 +	0.2	0.2	0.2	0.6	1.2	0.9	0.5	1.0	0.8
Don't know/missing	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Dependency age groups									
0-14	41.5	40.8	41.1	50.1	46.8	48.4	48.7	45.8	47.2
15-64	56.5	56.9	56.7	46.2	48.8	47.5	47.8	50.1	49.0
65+	1.8	2.2	2.0	3.7	4.4	4.0	3.4	4.0	3.7
Don't know/missing	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Child and adult populations									
0-17	48.2	47.0	47.5	57.6	52.8	55.1	56.1	51.8	53.9
18+	51.6	53.0	52.3	42.3	47.2	44.8	43.8	48.1	46.0
Don't know/missing	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Adolescents 10-19	24.3	23.7	24.0	26.7	23.8	25.2	26.3	23.8	25.0
Number of persons	1,257	1,393	2,650	6,642	7,067	13,709	7,899	8,460	16,359

Table 2.7 Household composition

Percent distribution of households by sex of head of household and by household size; mean size of household, and percentage of households with orphans and foster children under age 18 , according to residence, Malawi MIS 2017

	Residence		
Characteristic	Urban	Rural	Total
Household headship			
Male	77.3	73.8	74.4
Female	22.7	26.2	25.6
Total	100.0	100.0	100.0
Number of usual members			
0	0.1	0.0	0.0
1	9.2	5.7	6.3
2	11.3	10.1	10.3
3	18.2	17.7	17.8
4	20.9	19.3	19.6
5	17.3	17.5	17.5
6	10.9	14.1	13.5
7	6.1	8.2	7.8
8	3.7	3.7	3.7
9+	2.4	3.8	3.6
Total	100.0	100.0	100.0
Mean size of households	4.2	4.5	4.5
Number of households	644	3,085	3,729

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

Table 2.8 Background characteristics of respondents

Percent distribution of women age 15-49, by selected background characteristics, Malawi MIS 2017

Background characteristic	Women		
	Weighted percent	Weighted number	Unweighted number
Age			
15-19	21.8	840	828
20-24	20.5	792	775
25-29	17.2	662	667
30-34	15.3	590	624
35-39	11.6	450	479
40-44	7.9	304	282
45-49	5.8	223	205
Religion			
Catholic	17.4	673	686
CCAP	15.7	607	770
Anglican	2.3	88	88
Seventh day advent./ Baptist	5.2	202	258
Other Christian	39.9	1,541	1,510
Muslim	15.3	590	430
No religion	1.2	45	25
Other	2.9	114	93
Ethnic group			
Chewa	36.5	1,407	1,123
Tumbuka	9.5	365	846
Lomwe	17.1	659	507
Tonga	1.7	66	130
Yao	15.7	607	425
Sena	3.3	128	78
Nkhonde	1.0	37	94
Ngoni	11.3	437	422
Other	4.0	154	235
Residence			
Urban	19.7	759	1,693
Rural	80.3	3,101	2,167
Region			
Northern	12.0	465	1,315
Central	42.9	1,657	1,313
Southern	45.0	1,738	1,232
Education			
No education	13.6	526	335
Primary	63.6	2,454	2,154
Secondary	20.2	779	1,176
More than secondary	2.6	101	195
Wealth quintile			
Lowest	20.0	773	443
Second	18.9	731	471
Middle	18.5	714	506
Fourth	19.2	742	728
Highest	23.3	899	1,712
Total 15-49	100.0	3,860	3,860

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

Table 2.9 Women's 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 MIS 2017

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	5.4	56.2	10.8	19.3	6.1	2.3	100.0	6.2	1,632
15-19	3.7	62.4	10.5	19.9	2.9	0.5	100.0	6.1	840
20-24	7.1	49.5	11.1	18.6	9.4	4.2	100.0	6.4	792
25-29	10.6	52.9	10.5	12.6	10.0	3.4	100.0	5.5	662
30-34	14.2	52.7	10.2	12.0	7.9	3.0	100.0	5.1	590
35-39	20.1	51.5	11.9	8.7	5.5	2.3	100.0	4.5	450
40-44	33.9	46.0	10.8	5.0	2.7	1.6	100.0	2.8	304
45-49	41.0	44.8	5.5	2.1	3.1	3.4	100.0	1.4	223
Residence									
Urban	3.9	29.2	11.7	26.6	18.1	10.5	100.0	8.7	759
Rural	16.0	58.9	10.2	10.5	3.7	0.7	100.0	4.7	3,101
Region									
Northern	4.0	46.8	14.0	22.1	10.3	2.7	100.0	7.0	465
Central	14.3	54.8	10.2	11.7	6.0	3.0	100.0	5.0	1,657
Southern	15.6	53.1	9.9	13.3	5.9	2.2	100.0	5.1	1,738
Wealth quintile									
Lowest	23.9	61.7	7.7	4.9	1.7	0.2	100.0	3.5	773
Second	19.3	64.7	8.6	5.2	2.2	0.0	100.0	3.8	731
Middle	12.5	64.4	11.5	9.7	1.6	0.3	100.0	4.9	714
Fourth	11.5	53.5	12.5	16.5	5.2	0.8	100.0	6.0	742
Highest	2.9	26.9	11.9	29.0	19.0	10.2	100.0	9.0	899
Total	13.6	53.1	10.5	13.7	6.5	2.6	100.0	5.4	3,860

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

Table 2.10 Women's 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 MIS 2017

Background characteristic	Higher than secondary schooling	No schooling, primary or secondary school				Total	Percentage literate[1]	Number of women
		Can read a whole sentence	Can read part of a sentence	Cannot read at all	Blind/visually impaired			
Age								
15-24	2.3	64.9	11.3	21.5	0.0	100.0	78.5	1,632
15-19	0.5	68.4	10.8	20.3	0.0	100.0	79.7	840
20-24	4.2	61.1	11.8	22.8	0.1	100.0	77.2	792
25-29	3.4	56.5	6.9	33.2	0.0	100.0	66.8	662
30-34	3.0	53.6	12.1	31.3	0.0	100.0	68.7	590
35-39	2.3	53.4	8.9	35.2	0.1	100.0	64.6	450
40-44	1.6	45.3	6.9	46.3	0.0	100.0	53.7	304
45-49	3.4	35.2	7.9	53.5	0.0	100.0	46.5	223
Residence								
Urban	10.5	69.9	9.0	10.4	0.1	100.0	89.4	759
Rural	0.7	54.0	10.0	35.3	0.0	100.0	64.7	3,101
Region								
Northern	2.7	72.0	10.5	14.8	0.0	100.0	85.2	465
Central	3.0	52.2	12.2	32.6	0.1	100.0	67.4	1,657
Southern	2.2	57.8	7.4	32.5	0.0	100.0	67.5	1,738
Wealth quintile								
Lowest	0.2	41.7	9.5	48.6	0.0	100.0	51.4	773
Second	0.0	43.0	12.0	45.1	0.0	100.0	54.9	731
Middle	0.3	58.5	10.3	30.9	0.0	100.0	69.1	714
Fourth	0.8	64.3	10.6	24.3	0.0	100.0	75.7	742
Highest	10.2	74.8	7.4	7.4	0.1	100.0	92.4	899
Total	2.6	57.1	9.8	30.4	0.0	100.0	69.6	3,860

[1] Refers to women who attended schooling higher than the secondary level and women who can read a whole sentence or part of a sentence

MALARIA PREVENTION 3

Key Findings

Ownership of insecticide-treated nets (ITNs):

- Eighty-two percent of households in Malawi own at least one ITN.
- Forty-two percent of households have at least one ITN for every two people.

Sources of ITNs:

- Seventy-two percent of ITNs owned by households were obtained from mass distribution campaigns, 9% from antenatal care visits, 4% from distribution to newborns at the time of birth and 3% from shops or markets.

Access to an ITN:

- Sixty-three percent of the household population has access to an ITN. This means that 6 in 10 people could sleep under an ITN if every ITN in a household were used by up to two people.

Use of ITNs:

- Fifty-five percent of the household population, 68% of children under 5, and 63% of pregnant women slept under an ITN the night before the survey.
- In households owning at least one ITN, 66% of the household population, 79% of children under 5, and 73% of pregnant women slept under an ITN the previous night.

Intermittent Preventive Therapy (IPTp):

- Forty-one percent of women age 15-49 with a live birth in the 2 years preceding the survey received at least three doses of SP/Fansidar for prevention of malaria in pregnancy.

This chapter describes the population coverage rates of two key malaria control interventions in Malawi: use of insecticide-treated nets (ITNs) and intermittent preventive treatment in pregnancy (IPTp). Malaria control efforts focus on scaling-up these interventions.

The 2017-2022 Malawi Malaria Control Strategic Plan envisages universal coverage of the population with ITNs through routine distribution and mass campaigns to reduce the burden of malaria. ITNs are routinely given to pregnant women during their first antenatal care visit. They are also given to newborns delivered at health facilities or at their first visit to a facility or outreach clinic if they did not receive an ITN at birth.

3.1 OWNERSHIP OF INSECTICIDE-TREATED NETS

Ownership of insecticide-treated nets

Households that have at least one insecticide-treated net (ITN). An ITN is defined as a factory-treated net that does not require any further treatment.

Sample: Households

Full household ITN coverage

Percentage of households with at least one ITN for every two people.

Sample: Households

An ITN is defined as a factory-treated net that does not require any further treatment. In the 2012 and 2014 MMIS an ITN included nets that had been soaked with insecticides within the past 12 months. In the most recent questionnaire changes, The DHS Program dropped questions on retreatment of nets. This was done because bed nets that require annual retreatment and the products used for retreatment are no longer distributed and the distinction between ITNs and long-lasting insecticide-treated nets (LLIN) is no longer meaningful. For the 2017 MMIS, the current ITN was previously known as a LLIN in the 2014 and 2012 Malawi MIS surveys.

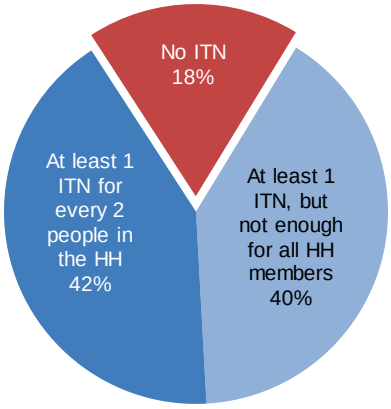
It is well understood that proper use of ITNs protects households and local communities from malaria. The distribution and use of ITNs is the central intervention for preventing malaria infection in Malawi. The 2017-2022 Malawi Malaria Control Strategic Plan prioritizes increasing household ownership of ITNs; from the 2014 baseline level of 70% of households with at least one ITN to cover 95% of households by the year 2022.

To protect people from malaria, the Malawi government, through the Malawi Ministry of Health (MoH) identified vector control and management as a critical intervention. One of the activities under this strategy is provision and promotion of the use of insecticide-treated nets (ITNs). In 2012, the National Malaria Control Programme (NMCP), in collaboration with partners, conducted the first nationwide mass distribution campaign, which was followed by three additional mass distribution campaigns between the years 2014 and 2016.

In addition to reaching all households across the country with ITN distribution, the national strategy aims to provide enough ITNs to cover all household residents. This indicator is operationalised as one ITN for every two household members.

Figure 3.1 **Household ownership of ITNs**

Percent distribution of households



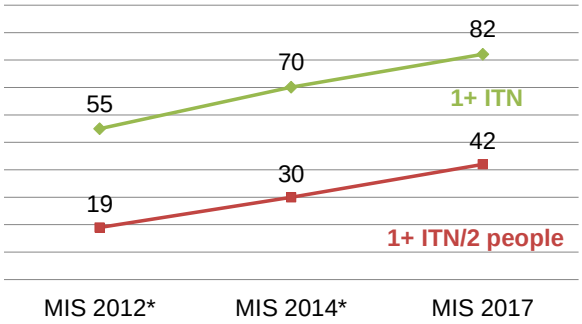
The 2017 MMIS revealed that 82% of households in Malawi own at least one ITN (**Table 3.1**). Forty-two percent of households have at least one ITN for every two people who stayed in the household the night prior to the survey. Thus to meet strategic goals, the scope of distribution needs to expand to reach the 18% of households who do not own any ITNs. In addition, the quantity of ITNs distributed needs to increase to provide sufficient ITNs for the 40% of households that own at least one ITN but have an insufficient supply for the number of household residents (**Figure 3.1**).

Trends:

- The percentage of households that own at least one ITN increased from 55% in the 2012 MMIS to 70% in the 2014 MMIS and to 82% in the 2017 MMIS (**Figure 3.2**).
- The percentage of households with at least one ITN for every two persons who stayed in the household the night before the survey increased from 19% in the 2012 MMIS to 30% in the 2014 MMIS and 42% in the 2017 MMIS.

Figure 3.2 Trends in ITN ownership

Percentage of households owning at least one insecticide-treated net (ITN) and percentage of households with at least one net for every two persons



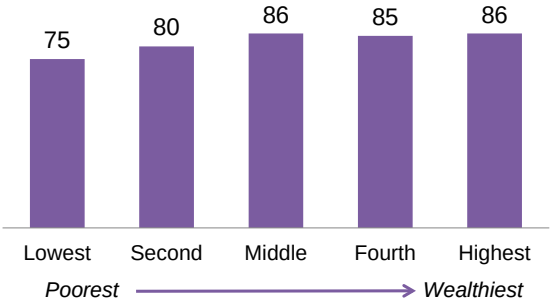
* The definition of an ITN in the 2012 and 2014 MMIS included nets that had been soaked with insecticides within the past 12 months.

Patterns by background characteristics

- The percentage of households with at least one ITN increases as household wealth increases from 75% in the lowest wealth quintile to 86% in the highest wealth quintile (**Figure 3.3**).
- The percentage of households with at least one ITN is highest in the Southern region (89%) and lowest in the Central region (74%) (**Figure 3.4**).

Figure 3.3 ITN ownership by household wealth

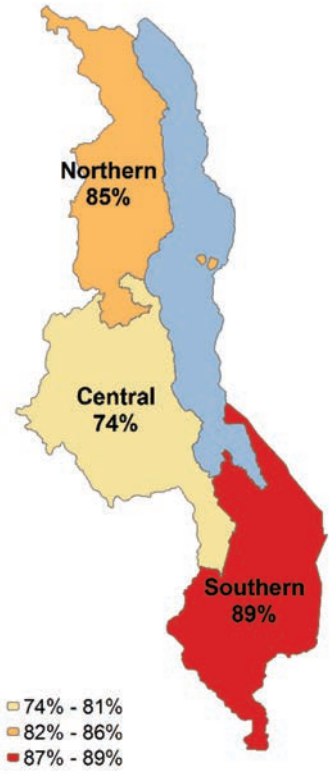
Percentage of households with at least one ITN



- Households in urban areas are more likely than households in rural areas to have at least one ITN for every two persons who stayed in the house the prior night (55% and 39%, respectively) (**Table 3.1**).

Figure 3.4 ITN ownership by region

Percentage of households with at least one ITN

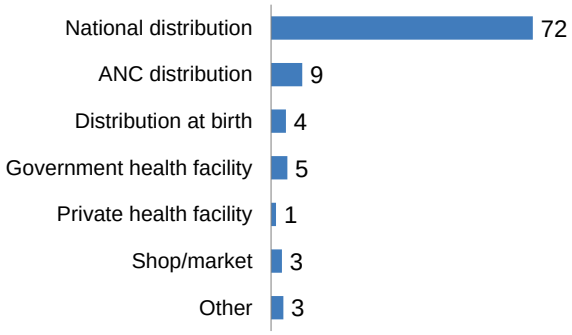


Source of Nets

The majority of ITNs (72%) were obtained from mass distribution campaigns. Another 9% of ITNs came from routine antenatal care (ANC) visits, 4% of ITNs were distributed to newborns at the time of birth, and 3% were purchased from shops or markets, and (**Figure 3.5** and **Table 3.2**).

Figure 3.5 **Source of ITNs**

Percent distribution of ITNs in interviewed households



3.2 HOUSEHOLD ACCESS AND USE OF ITNS

Access to an ITN

Percentage of the population that could sleep under an ITN if each ITN in the household were used by up to two people.

Sample: De facto household population

Use of ITNs

Percentage of population that slept under an ITN the night before the survey.

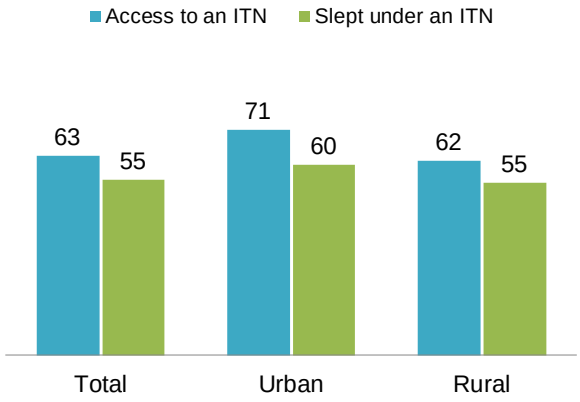
Sample: De facto household population

ITNs act as both a physical and a chemical barrier against mosquitoes. By reducing the vector population, ITNs may help to reduce malaria risk at the community level as well as to individuals who use them.

Access to an ITN is 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. Comparing ITN access and ITN use indicators can help programmes identify if there is a behavioural gap in which available ITNs are not being used. If the difference between these indicators is substantial, the programme may need to focus on behaviour change and how to identify the main drivers or barriers to ITN use to design an appropriate intervention. This analysis helps ITN programmes determine whether they need to achieve higher ITN coverage, promote ITN use, or both.

Figure 3.6 **Access to and use of ITNs**

Percentage of the household population with access to an ITN and who slept under an ITN the night before the survey



Sixty-three percent of people in Malawi have access to an ITN, whereas 55% reported having slept under an ITN the night before the survey (**Table 3.4** and **Table 3.5**). Comparing these two population-level indicators, it is evident that there exists a gap between ITN access and ITN use at the population level. The gap between access and use of ITNs is slightly higher in urban (eleven percentage points) than in rural households (seven percentage points) (**Figure 3.6**).

Trends: The percentage of the household population with access to an ITN increased from 37% in the 2012 MMIS to 52% in the 2014 MMIS and to 63% in the 2017 MMIS. The percentage of the household population that slept under an ITN the night before the survey increased from 41% in the 2012 MMIS to 53% in the 2014 MMIS and 55% in the 2017 MIS. In both 2012 and 2014 MMIS surveys, there was a narrow gap between ITN access and ITN use while results from the 2017 MMIS show a wider gap (**Figure 3.7**).

In households with at least one ITN, only 66% of the household population slept under an ITN the previous night (**Table 3.5**). Overall, 77% of all existing ITNs were used the night before the survey (**Table 3.6**).

Patterns by background characteristics

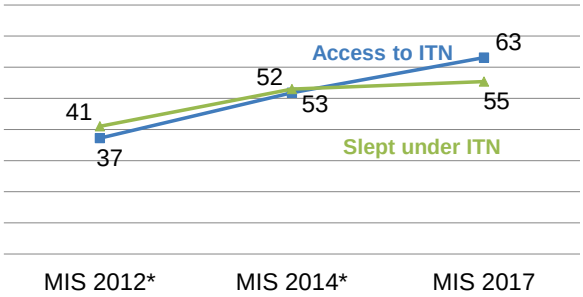
- People in urban areas have greater access to ITNs in the household than those in rural areas (71% versus 62%) (**Table 3.4**).
- ITN access ranges from 72% in the Northern region to 53% in the Central region (**Figure 3.8**).

3.3 Use of ITNs by Children and Pregnant Women

Malaria is endemic in Malawi with transmission occurring throughout the year in most areas. The entire population of Malawi is at risk of malaria. Pregnant women, their unborn babies, and children under age 5 are at high risk of the negative consequences of malaria. Children under age 5 are prone to severe malaria infection because they lack acquired immunity. For about 6 months after birth, antibodies acquired from the mother during pregnancy protect the child, although this maternal immunity is gradually lost when the child begins to develop his or her own immunity to malaria. Age is an important factor in determining levels of acquired immunity to malaria because acquired immunity does not prevent infection but protects against severe disease and death. The pace at which immunity develops depend on the exposure to malarial infection. In high malaria-endemic areas, children are thought to attain a high level of immunity by the fifth birthday. These children may experience an episode of malarial illness but usually do not suffer from severe, life-threatening conditions (Shulman and Dorman 2003).

Figure 3.7 Trends in ITN access and use

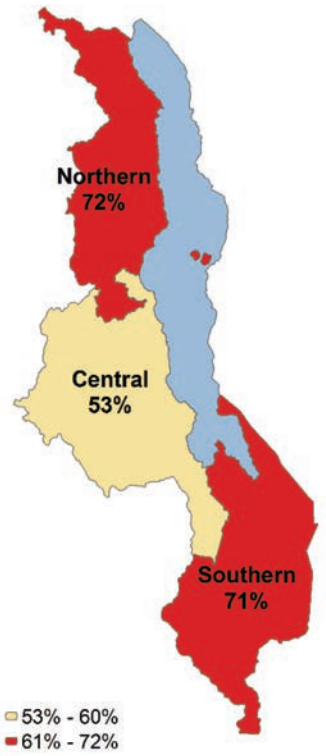
Percentage of the household population that has access to an ITN and percentage of the population that slept under an ITN the night before the survey



* The definition of an ITN in the 2012 and 2014 MMIS included nets that had been soaked with insecticides within the past 12 months.

Figure 3.8 ITN access by region

Percent of the de facto population with access to an ITN



Adults usually acquire some degree of immunity. However, since pregnancy suppresses immunity, women in their first pregnancies are at increased risk for severe malaria. Malaria in pregnancy is frequently associated with the development of anaemia, which interferes with the maternal-foetus exchange and may lead to low-birth-weight infants, placental parasitaemia, foetal death, abortion, stillbirth, and prematurity (Shulman and Dorman 2003).

The primary malaria prevention intervention in Malawi is distribution of ITNs and promotion of ITN use. The 2017-2022 Malawi Malaria Control Strategic Plan emphasizes activities that promote the use of ITNs every night to prevent malaria complications. Strategies for ITN distribution in Malawi are (1) free routine distribution to pregnant women through ANC and to newborns at the time of delivery and (2) mass campaigns every two to three years.

***Figure 3.9* ITN use**

Percentage who slept under an ITN the night before the survey

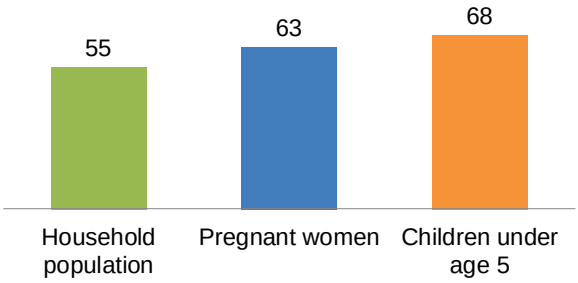


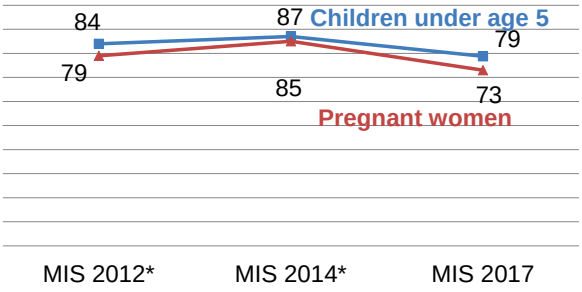
Table 3.7 and **Table 3.8** show the percentage of children under 5 and the percentage of pregnant women who slept under an ITN the night before the survey. Overall, 68% of children in Malawi under age 5 and 63% of pregnant women slept under an ITN the previous night (**Figure 3.9**).

In households with at least one ITN, 79% of children under age 5 and 73% of pregnant women slept under an ITN the night before the survey (**Table 3.7** and **Table 3.8**).

Trends: ITN use among children under age 5 in households with at least one ITN increased between 2012 and 2014 from 84% to 87%; however, it declined between 2014 and 2017, from 87% to 79%. As with children under age 5, the percentage of pregnant women in households with at least one ITN who slept under an ITN last night increased from 79% in 2012 to 85% in 2014, but declined between 2014 and 2017, from 85% in 2014 to 73% in 2017 (**Figure 3.10**).

***Figure 3.10* Trends in ITN use by children and pregnant women**

Among children under age 5 and pregnant women age 15-49 in households with at least one ITN, percentage who slept under an ITN the night before the survey



* The definition of an ITN in the 2012 and 2014 MMIS included nets that had been soaked with insecticides within the past 12 months.

Patterns by background characteristics

- Children in urban areas are more likely than children in rural areas to sleep under an ITN among households with at least one ITN (81% and 78%, respectively) (**Table 3.7**).
- The percentage of pregnant women sleeping under an ITN the night before the survey is lowest among those in the Northern region (63%) in the households with at least one ITN (**Table 3.8**).

3.4 MALARIA IN PREGNANCY

Intermittent preventive treatment (IPTp) during pregnancy (IPTp2+)

Percentage of women who took at least two doses of SP/Fansidar during their last pregnancy.

Sample: Women age 15-49 with a live birth in the 2 years before the survey

Intermittent preventive treatment (IPTp) during pregnancy (IPTp3+)

Percentage of women who took at least three doses of SP/Fansidar during their last pregnancy.

Sample: Women age 15-49 with a live birth in the 2 years before the survey

Malaria infection during pregnancy is a major public health problem in Malawi, with substantial risks for the mother, her foetus, and the neonate. Intermittent preventive treatment of malaria in pregnancy (IPTp) is a full therapeutic course of antimalarial medicine given to pregnant women at routine antenatal care visits to prevent malaria. IPTp helps prevent maternal malaria episodes, maternal and foetal anaemia, placental parasitaemia, low birth weight, and neonatal mortality.

The World Health Organization (WHO) recommends a three-pronged approach for reducing the negative health effects associated with malaria in pregnancy: prompt diagnosis and treatment of confirmed infection, use ITNs, and IPTp (WHO 2004).

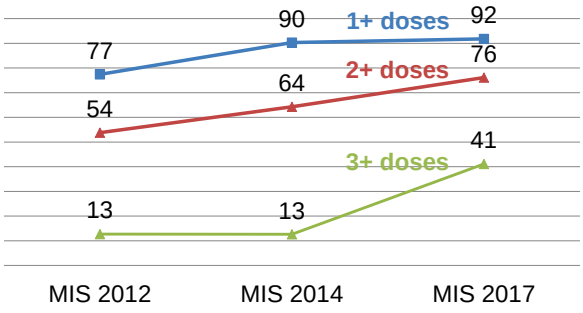
Sulfadoxine-pyrimethamine (SP), also known as Fansidar, is the recommended drug for IPTp in Malawi. For over 10 years, the Malawi Ministry of Health (MoH) has been implementing IPTp, defined as provision of at least two doses of sulfadoxine-pyrimethamine (SP)/Fansidar to protect the mother and her child from malaria during routine antenatal care visits in the second and third trimesters of pregnancy (IPTp2+). In 2016 the National Malaria Control Programme adopted the 2012 WHO recommendation to administer one dose of SP/Fansidar at each antenatal care (ANC) visit after the first trimester, with at least 1 month between doses (WHO 2012a; WHO 2012b). The household survey indicator used to measure coverage of this intervention is the percentage of women with a live birth in the 2 years preceding the survey who received three or more doses of SP/Fansidar to prevent malaria during her most recent pregnancy (IPTp3+).

Ninety-two percent of women with a live birth in the 2 years preceding the survey received one or more doses of SP/Fansidar to prevent malaria. Seventy-six percent of the women received two or more doses of SP/Fansidar, and 41% of the women received three or more doses of SP/Fansidar. (**Table 3.9**).

Trends: The percentage of women receiving IPTp1+ increased from 77% in the 2012 MMIS to 90% in the 2014 MMIS and to 92% in the current survey. The percentage of women receiving two or more doses of SP/Fansidar for IPTp increased from 54% in the 2012 MMIS to 76% in the 2017 MMIS. There was no change in IPTp3+ between the 2012 and 2014 MMIS, but an increase from 13% in 2012 to 41% in 2017 was observed (**Figure 3.11**).

Figure 3.11 **Trends in IPTp use by pregnant women**

Percentage of women with a live birth in the 2 years before the survey who received at least 1, 2, or 3 doses of SP/Fansidar



Patterns by background characteristics

- The use of IPTp1+ (93% and 92%) and IPTp2+ (77% and 76%) is similar for women in the urban and rural areas, while the use of IPTp3+ is higher among women in the rural areas (42%) than among women in the urban areas (38%) **(Table 3.9)**.
- IPTp3+ coverage ranges from 38% in the Southern region to 51% in the Northern region.

3.5 MOSQUITO NET PREFERENCE

Preferences for various social marketing goods significantly affect the consistent use of products. In consideration of this influence, the 2017 MMIS observed actual colour of respondents' mosquito nets as well as assessed respondents' preferences for colour. Additionally, the survey also observed the shape of mosquito nets and assessed respondents' preferred shape. In recent years, nets obtained through the public sector (mass distribution campaigns and/or routine distribution) have been green, while nets obtained through the private sector (shops or markets) are predominantly blue or white.

In assessing the colour of the nets, 88% of the observed nets were green, 7% light blue, 4% dark blue, and 1% white (**Table 3.10**). However, when the respondents were asked about colour preference, 61% preferred the blue colour, and 29% preferred the green (**Table 3.11**).

In assessing the shape of the nets, 94% of the observed nets were rectangular and 6% were conical (**Table 3.12**). However, 76% of respondents prefer conical, 21% prefer rectangular, and 2% did not have a clear preference (**Table 3.13**).

Among households that preferred conical nets, 84% said that they are easier to hang, and 21% said that they fit better around sleeping spaces. Similarly, among households that preferred rectangular nets, 53% said that these nets are easier to hang, and 36% said that they are a better fit around sleeping spaces (**Table 3.14**).

Trends: Preferences in colour have changed from 38% green and 56% blue in the 2012 MMIS to 29% green and 61% blue in the 2017 MMIS (**Figure 3.12**).

Additionally, preferences in shape have changed from 55% conical and 44% rectangular in the 2012 MMIS to 76% conical and 21% rectangular in the 2017 MMIS (**Figure 3.13**).

Figure 3.12 **Trends in colour preference**

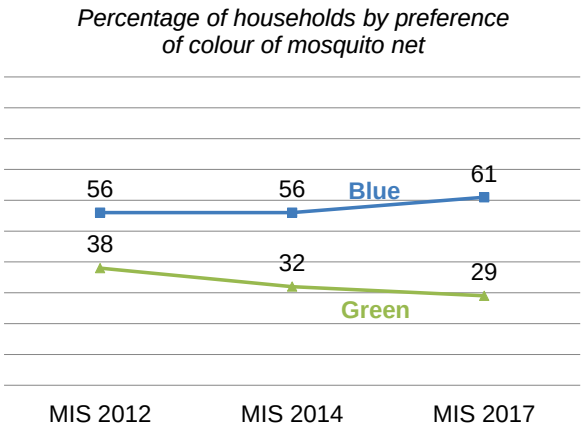
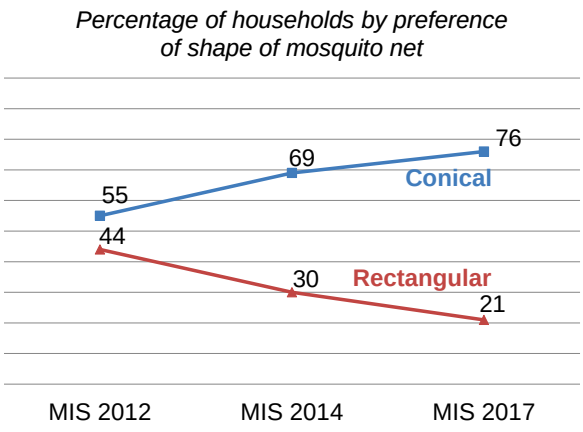


Figure 3.13 **Trends in preferred net**



LIST OF TABLES

For detailed information on malaria, see the following tables:

Table 3.1 Household possession of mosquito nets

Percentage of households with at least one mosquito net (treated or untreated) and insecticide-treated net (ITN); average number of nets and ITNs per household; and percentage of households with at least one net and ITN per two persons who stayed in the household last night, according to background characteristics, Malawi MIS 2017

Background characteristic	Percentage of households with at least one mosquito net		Average number of nets per household		Number of households	Percentage of households with at least one net for every two persons who stayed in the household last night		Number of households with at least one person who stayed in the household last night
	Any mosquito net	Insecticide-treated mosquito net (ITN)[1]	Any mosquito net	Insecticide-treated mosquito net (ITN)[1]		Any mosquito net	Insecticide-treated mosquito net (ITN)[1]	
Residence								
Urban	87.4	82.8	2.1	1.9	644	60.2	54.5	641
Rural	82.9	81.9	1.6	1.6	3,085	40.6	39.1	3,080
Region								
Northern	88.6	85.4	2.2	2.0	438	57.7	53.1	435
Central	75.0	73.8	1.4	1.4	1,572	31.4	29.9	1,569
Southern	90.4	88.8	1.9	1.8	1,719	52.0	49.7	1,717
Wealth quintile								
Lowest	75.2	74.6	1.2	1.2	816	32.3	31.9	815
Second	81.4	80.2	1.4	1.4	747	33.9	32.2	746
Middle	86.3	85.9	1.7	1.7	696	40.5	39.7	694
Fourth	86.6	84.9	1.9	1.9	721	49.9	48.0	720
Highest	89.9	85.9	2.3	2.1	749	64.1	57.9	747
Total	83.7	82.1	1.7	1.7	3,729	44.0	41.7	3,721

[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2012 Malawi MIS and 2014 Malawi MIS, this was known as a long-lasting insecticidal net (LLIN).

Table 3.2 Source of mosquito nets

Percent distribution of mosquito nets by source of net, according to background characteristics, Malawi MIS 2017

Background characteristic	Mass distribution campaign	ANC visit	Immunisation visit	At birth	Government hospital	Government health centre	Government health post	Private health facility	Pharmacy	Shop/ market	Workplace	Relative/ friends	Other	Don't know/ missing	Total	Number of mosquito nets
Type of net																
ITN[1]	72.4	8.7	0.3	4.2	0.5	1.5	2.5	1.3	0.0	3.4	0.2	2.1	2.6	0.3	100.0	6,178
Other[2]	23.8	5.8	0.1	1.6	1.0	1.0	1.1	5.5	0.2	46.0	2.8	3.6	6.6	0.8	100.0	235
Residence																
Urban	66.7	5.7	0.2	3.0	0.4	0.8	0.8	0.2	0.1	15.5	1.0	3.2	1.9	0.6	100.0	1,335
Rural	71.6	9.3	0.3	4.4	0.5	1.7	2.9	1.7	0.0	2.1	0.2	1.9	3.0	0.3	100.0	5,077
Region																
Northern	80.2	5.7	0.0	2.8	0.9	0.9	1.9	0.4	0.2	4.3	0.3	1.5	0.6	0.3	100.0	957
Central	62.1	9.7	0.2	5.6	0.7	2.6	4.1	2.4	0.0	6.0	0.4	3.0	3.1	0.1	100.0	2,185
Southern	73.4	8.6	0.4	3.5	0.3	1.0	1.6	1.0	0.0	4.4	0.3	1.7	3.2	0.5	100.0	3,271
Wealth quintile																
Lowest	67.4	12.6	0.4	6.6	0.6	2.0	3.7	1.1	0.0	0.4	0.0	2.0	3.3	0.0	100.0	986
Second	68.3	13.1	0.4	5.9	0.4	2.2	1.9	2.7	0.0	1.5	0.0	2.0	1.4	0.3	100.0	1,079
Middle	73.8	8.0	0.5	4.2	0.5	1.2	1.8	1.7	0.0	2.1	0.2	2.2	3.4	0.2	100.0	1,199
Fourth	72.7	7.8	0.0	2.8	0.8	0.8	4.3	1.2	0.0	2.6	0.3	2.2	3.9	0.6	100.0	1,405
Highest	70.0	4.5	0.3	2.5	0.3	1.6	1.2	0.7	0.1	13.5	0.9	2.2	1.9	0.4	100.0	1,743
Total	70.6	8.6	0.3	4.1	0.5	1.5	2.5	1.4	0.0	4.9	0.3	2.1	2.8	0.3	100.0	6,413

ANC = Antenatal care
[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2012 Malawi MIS and 2014 Malawi MIS, this was known as a long-lasting insecticidal net (LLIN).
[2] Any net that is not an ITN

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 MIS 2017

	Number of persons who stayed in the household the night before the survey								
Number of ITNs[1]	1	2	3	4	5	6	7	8+	Total
Number of ITNs[1]									
0	33.0	23.8	18.3	14.6	17.2	13.1	14.8	16.7	16.3
1	57.1	44.6	43.6	31.3	23.7	18.0	17.8	15.7	26.2
2	7.9	24.0	27.0	34.7	34.3	30.0	29.5	18.5	29.0
3	1.9	5.4	9.4	14.8	17.7	25.0	21.1	29.6	18.7
4	0.1	0.8	1.3	4.1	4.9	10.4	10.2	9.5	6.3
5	0.0	0.0	0.2	0.4	1.9	1.4	4.6	5.9	2.1
6	0.0	1.4	0.0	0.0	0.4	1.3	0.9	2.2	0.8
7	0.0	0.0	0.2	0.2	0.0	0.8	1.1	1.9	0.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	240	808	2,088	2,841	3,244	2,936	1,921	2,280	16,359
Percent with access to an ITN[1,2]	67.0	76.2	67.2	69.8	61.7	64.9	56.8	50.8	63.1

[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2012 Malawi MIS and 2014 Malawi MIS, this was known as a long-lasting insecticidal net (LLIN).
[2] Percentage of the de facto household population that could sleep under an ITN if each ITN in the household were used by up to two people

Table 3.4 Access to an insecticide-treated net (ITN) by background characteristics

Percentage of the de facto population with access to an ITN in the household, by background characteristics, Malawi MIS 2017

Background characteristic	Percentage of the de facto population with access to an ITN[1,2]
Residence	
Urban	71.2
Rural	61.5
Region	
Northern	71.9
Central	52.8
Southern	70.6
Wealth quintile	
Lowest	53.3
Second	56.6
Middle	62.8
Fourth	67.6
Highest	75.2
Total	63.1

[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2012 Malawi MIS and 2014 Malawi MIS, this was known as a long-lasting insecticidal net (LLIN).
[2] Percentage of the de facto household population that could sleep under an ITN if each ITN in the household were used by up to two people

Table 3.5 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) and under an insecticide-treated net (ITN); and among the de facto household population in households with at least one ITN, percentage who slept under an ITN the night before the survey, according to background characteristics, Malawi MIS 2017

	Household population			Household population in households with at least one ITN[1]	
Background characteristic	Percentage who slept under any mosquito net last night	Percentage who slept under an ITN[1] last night	Number of persons	Percentage who slept under an ITN[1] last night	Number of persons
Age					
<5	69.2	67.5	2,724	78.8	2,335
5-14	49.3	48.0	5,004	57.5	4,176
15-34	55.5	53.6	5,156	64.4	4,291
35-49	64.2	61.3	1,861	72.5	1,573
50+	58.6	57.1	1,602	70.4	1,299
Sex					
Male	55.2	53.5	7,899	64.2	6,578
Female	59.0	57.3	8,460	68.2	7,108
Residence					
Urban	65.7	60.2	2,650	70.5	2,264
Rural	55.5	54.5	13,709	65.4	11,422
Region					
Northern	60.6	57.2	2,015	66.3	1,738
Central	46.3	45.4	7,032	59.9	5,334
Southern	66.7	64.6	7,312	71.4	6,614
Wealth quintile					
Lowest	47.8	47.6	3,274	61.9	2,519
Second	54.7	53.8	3,273	65.8	2,678
Middle	57.7	56.7	3,227	66.6	2,747
Fourth	57.5	55.6	3,286	64.3	2,841
Highest	68.2	63.3	3,298	72.0	2,901
Total	57.2	55.4	16,359	66.3	13,685

Note: Total includes 12 weighted cases with missing information on age.
[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2012 Malawi MIS and 2014 Malawi MIS, this was known as a long-lasting insecticidal net (LLIN).

Table 3.6 Use of existing ITNs

Percentage of insecticide-treated nets (ITNs) that were used by anyone the night before the survey, according to background characteristics, Malawi MIS 2017

Background characteristic	Percentage of existing ITNs[1] used last night	Number of ITNs[1]
Residence		
Urban	77.3	1,219
Rural	76.6	4,959
Region		
Northern	74.9	895
Central	75.6	2,127
Southern	78.1	3,155
Wealth quintile		
Lowest	77.0	976
Second	76.6	1,055
Middle	79.9	1,177
Fourth	73.4	1,361
Highest	77.3	1,608
Total	76.8	6,178

[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2012 Malawi MIS and 2014 Malawi MIS, this was known as a long-lasting insecticidal net (LLIN).

Table 3.7 Use of mosquito nets by children

Percentage of children under age 5 who, the night before the survey, slept under a mosquito net (treated or untreated) and under an insecticide-treated net (ITN); and among children under age 5 in households with at least one ITN, percentage who slept under an ITN the night before the survey, according to background characteristics, Malawi MIS 2017

	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 mosquito net last night	Percentage who slept under an ITN[1] last night	Number of children	Percentage who slept under an ITN[1] last night	Number of children
Age in months					
<12	80.8	78.6	490	87.6	439
12-23	65.4	63.7	513	75.3	434
24-35	76.6	75.0	518	85.7	454
36-47	65.6	64.2	530	76.4	445
48-59	61.0	59.3	674	70.9	563
Sex					
Male	70.2	68.2	1,366	79.2	1,176
Female	68.2	66.8	1,358	78.3	1,159
Residence					
Urban	76.4	71.2	382	80.6	337
Rural	68.1	66.9	2,342	78.4	1,998
Region					
Northern	72.6	69.1	306	76.9	275
Central	63.4	62.3	1,153	78.7	913
Southern	73.7	71.9	1,264	79.2	1,147
Wealth quintile					
Lowest	62.3	61.9	640	77.0	514
Second	66.1	64.6	631	77.3	528
Middle	72.7	71.5	516	80.4	459
Fourth	70.6	69.0	483	78.6	424
Highest	78.0	73.4	454	81.2	410
Total	69.2	67.5	2,724	78.8	2,335

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. In the 2012 Malawi MIS and 2014 Malawi MIS, this was known as a long-lasting insecticidal net (LLIN).

Table 3.8 Use of mosquito nets by pregnant women

Percentage of pregnant women age 15-49 who, the night before the survey, slept under a mosquito net (treated or untreated) and under an insecticide-treated net (ITN); and among pregnant women age 15-49 in households with at least one ITN, percentage who slept under an ITN the night before the survey, according to background characteristics, Malawi MIS 2017

	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 mosquito net last night	Percentage who slept under an ITN[1] last night	Number of pregnant women	Percentage who slept under an ITN[1] last night	Number of pregnant women
Residence					
Urban	67.9	61.5	36	71.1	31
Rural	63.9	62.7	248	73.3	212
Region					
Northern	59.9	54.7	27	63.0	24
Central	59.6	57.5	129	74.5	99
Southern	70.2	69.3	128	73.7	120
Education					
No education	*	*	26	*	23
Primary	64.6	63.5	201	72.9	175
Secondary	64.5	58.4	52	74.8	41
More than secondary	*	*	5	*	5
Wealth quintile					
Lowest	(53.2)	(53.2)	67	(71.5)	50
Second	(67.2)	(67.2)	64	(73.5)	59
Middle	(74.0)	(71.2)	59	(78.4)	54
Fourth	55.8	54.7	48	(61.8)	42
Highest	73.3	66.3	46	79.1	38
Total	64.4	62.5	284	73.0	243

Note: 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 indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment. In the 2012 Malawi MIS and 2014 Malawi MIS, this was known as a long-lasting insecticidal net (LLIN).

Table 3.9 Use of intermittent preventive treatment (IPTp) by women during pregnancy

Percentage of women age 15-49 with a live birth in the 2 years preceding the survey who, during the pregnancy that resulted in the last live birth, received one or more doses of SP/Fansidar, received two or more doses of SP/Fansidar, and received three or more doses of SP/Fansidar, according to background characteristics, Malawi MIS 2017

Background characteristic	Percentage who received one or more doses of SP/Fansidar	Percentage who received two or more doses of SP/Fansidar	Percentage who received three or more doses of SP/Fansidar	Number of women with a live birth in the 2 years preceding the survey
Residence				
Urban	93.0	77.1	37.7	156
Rural	91.6	75.9	41.7	876
Region				
Northern	96.5	86.9	51.4	119
Central	92.1	77.9	41.9	419
Southern	90.4	72.0	37.9	494
Education				
No education	90.7	72.1	38.8	156
Primary	91.8	76.2	41.6	693
Secondary	92.1	78.1	40.4	170
More than secondary	(100.0)	(90.1)	(51.4)	13
Wealth quintile				
Lowest	92.5	73.9	37.8	263
Second	91.5	75.0	45.1	216
Middle	92.8	81.4	49.2	195
Fourth	90.1	72.8	34.1	185
Highest	91.8	78.3	39.5	172
Total	91.8	76.1	41.1	1,032

Note: Table is based on women who stayed in the household the night before the interview. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

Table 3.10 Observed colour of mosquito nets

Percent distribution of households by observed colour of mosquito net, according to background characteristics, Malawi MIS 2017

Background characteristic	Observed colour of mosquito net						Total	Number of mosquito nets
	Green	Dark blue	Light blue	Red	White	Other		
Residence								
Urban	82.1	7.0	7.2	0.1	2.9	0.6	100.0	1,335
Rural	89.9	2.8	7.0	0.0	0.3	0.0	100.0	5,077
Region								
Northern	94.0	3.7	1.6	0.1	0.6	0.0	100.0	957
Central	83.6	5.1	10.0	0.1	0.9	0.3	100.0	2,185
Southern	89.7	2.7	6.7	0.0	0.9	0.1	100.0	3,271
Wealth quintile								
Lowest	92.7	2.0	5.0	0.2	0.2	0.0	100.0	986
Second	92.2	1.0	6.8	0.0	0.0	0.0	100.0	1,079
Middle	89.6	3.7	6.4	0.0	0.4	0.0	100.0	1,199
Fourth	90.1	2.8	6.6	0.0	0.5	0.0	100.0	1,405
Highest	80.9	6.9	9.1	0.1	2.5	0.5	100.0	1,743
Total	88.2	3.7	7.0	0.1	0.9	0.1	100.0	6,413

Table 3.11 Preferred colour of mosquito nets

Percent distribution of households by preferred colour of mosquito net, according to background characteristic, Malawi MIS 2017

Background characteristic	Preferred colour of mosquito net								Number of mosquito nets
	Blue	Green	Red	White	Black	Other	Don't know/ no preference	Total	
Residence									
Urban	69.7	19.9	0.1	8.0	0.0	0.2	2.1	100.0	1,335
Rural	58.3	31.7	0.6	3.8	0.5	0.1	5.0	100.0	5,077
Region									
Northern	58.2	30.3	1.0	5.4	0.5	0.7	4.0	100.0	957
Central	61.7	28.3	0.7	3.5	0.3	0.1	5.4	100.0	2,185
Southern	60.7	29.5	0.2	5.3	0.4	0.0	3.8	100.0	3,271
Wealth quintile									
Lowest	56.8	31.6	1.5	4.0	1.2	0.0	4.8	100.0	986
Second	58.2	34.7	0.3	1.8	0.5	0.1	4.3	100.0	1,079
Middle	59.1	31.5	0.2	2.2	0.3	0.0	6.7	100.0	1,199
Fourth	58.5	30.2	0.6	6.2	0.2	0.2	4.2	100.0	1,405
Highest	67.3	22.0	0.1	7.5	0.0	0.2	2.8	100.0	1,743
Total	60.7	29.2	0.5	4.7	0.4	0.1	4.4	100.0	6,413

Table 3.12 Observed shape of mosquito nets

Percent distribution of households by observed shape of mosquito net, according to background characteristics, Malawi MIS 2017

Background characteristic	Observed shape of mosquito net			Total	Number of mosquito nets
	Conical	Rectangular	Other		
Residence					
Urban	17.8	82.1	0.1	100.0	1,335
Rural	3.1	96.8	0.1	100.0	5,077
Region					
Northern	5.9	94.0	0.1	100.0	957
Central	7.0	92.8	0.1	100.0	2,185
Southern	5.6	94.2	0.1	100.0	3,271
Wealth quintile					
Lowest	0.6	99.3	0.0	100.0	986
Second	1.9	97.9	0.2	100.0	1,079
Middle	2.5	97.5	0.0	100.0	1,199
Fourth	3.6	96.1	0.3	100.0	1,405
Highest	16.5	83.5	0.1	100.0	1,743
Total	6.1	93.7	0.1	100.0	6,413

Table 3.13 Preferred shape of mosquito nets

Percent distribution of households by preferred shape of mosquito net, by background characteristic, Malawi MIS 2017

Background characteristic	Preferred shape of mosquito net			Total	Number of mosquito nets
	Conical	Rectangular	Don't know/no preference		
Residence					
Urban	90.4	8.8	0.8	100.0	1,335
Rural	72.5	24.7	2.8	100.0	5,077
Region					
Northern	74.6	24.5	1.0	100.0	957
Central	72.3	23.7	4.0	100.0	2,185
Southern	79.3	18.9	1.8	100.0	3,271
Wealth quintile					
Lowest	65.9	30.9	3.2	100.0	986
Second	70.4	26.2	3.5	100.0	1,079
Middle	68.8	27.5	3.7	100.0	1,199
Fourth	77.9	20.8	1.4	100.0	1,405
Highest	89.3	9.3	1.3	100.0	1,743
Total	76.2	21.4	2.4	100.0	6,413

Table 3.14 Reasons for preferring a specific shape of mosquito net

Among households that preferred canonical mosquito nets, percentage that reported specific reasons for preferring the canonical shape; and among households that preferred rectangular mosquito nets, percentage that reported specific reasons for preferring the rectangular shape, according to background characteristics, Malawi MIS 2017

	Among households that preferred canonical mosquito nets, percentage that reported that it is because										Among households that preferred rectangular mosquito nets, percentage that reported that it is because									
Background characteristic	they are easier to hang	they are easier to store when not hung	they are easier to travel with outside the house-hold	they are better fit around sleeping place	they are taller	more people can sleep under net (wider)	they look nicer	they are stronger	there are other reasons	Number of house-holds that preferred mosquito nets in canonical shape	they are easier to hang	they are easier to store when not hung	they easier to travel with outside the house-hold	they are better fit around sleeping place	they are taller	more people can sleep under net (wider)	they look nicer	they are stronger	there are other reasons	Number of house-holds that preferred mosquito nets in rectan-gular shape
Residence																				
Urban	93.2	4.1	1.0	17.8	11.7	6.5	20.0	12.3	2.2	1,207	48.8	2.8	7.1	33.9	4.5	37.2	14.8	7.2	2.3	117
Rural	81.3	1.7	1.1	22.5	9.7	7.4	15.4	10.2	3.7	3,679	53.2	1.2	0.7	36.3	1.0	30.4	7.3	5.3	4.3	1,255
Region																				
Northern	95.1	4.3	3.0	41.5	11.9	11.4	22.0	4.2	1.4	714	72.5	3.4	1.4	51.3	0.8	39.2	5.2	3.9	0.4	234
Central	87.1	1.9	0.3	16.1	8.2	7.5	14.1	17.3	2.0	1,579	41.9	1.5	0.6	41.1	1.3	30.1	10.2	8.2	4.0	518
Southern	79.4	2.0	1.0	19.0	10.9	5.9	16.4	8.5	4.7	2,592	54.5	0.5	1.8	26.1	1.5	28.7	7.0	3.8	5.5	619
Wealth quintile																				
Lowest	79.1	0.9	0.6	14.2	7.4	5.8	13.3	13.9	2.0	650	45.8	0.2	1.4	37.5	0.2	33.3	3.8	3.5	6.2	305
Second	77.4	2.7	1.7	19.8	8.4	4.6	16.8	8.9	2.4	760	61.5	1.3	0.0	25.4	0.0	30.9	10.8	8.7	6.6	282
Middle	80.6	1.6	1.4	18.8	8.0	7.4	10.5	10.1	3.3	824	51.0	2.7	0.4	38.9	0.1	28.3	5.8	6.6	2.6	330
Fourth	84.0	1.5	0.6	28.2	13.2	8.7	16.9	10.5	4.2	1,094	55.3	0.9	1.2	34.0	4.5	31.7	9.3	3.4	1.6	292
Highest	91.7	3.6	1.2	21.6	11.3	8.0	20.6	10.9	3.8	1,557	50.5	2.0	5.1	49.9	2.5	31.3	12.4	5.2	3.3	163
Total	84.2	2.3	1.1	21.4	10.2	7.2	16.5	10.7	3.4	4,885	52.8	1.4	1.3	36.1	1.3	31.0	7.9	5.5	4.1	1,372

MALARIA IN CHILDREN 4

Key Findings

- ***Fever prevalence:*** Forty percent of children under age 5 had a fever in the 2 weeks prior to the survey.
- ***Care-seeking for fever:*** Advice or treatment was sought for 54% of children under age 5 with fever in the 2 weeks before the survey.
- ***Source of advice or treatment:*** Among children under age 5 with fever for whom advice or treatment was sought, 69% were from the public health sector, 21% were from the private health sector, 12% were from other private sector sources, and 2% from other sources.
- ***Testing:*** Thirty-eight percent of children under age 5 with a fever had blood taken from a finger or heel for testing.
- ***Type of antimalarial drug used:*** Ninety-six percent of children under age 5 with fever who took an antimalarial drug in the 2 weeks before the survey were given an Artemisinin-based combination therapy (ACT), the recommended first-line malaria treatment in Malawi.
- ***Severe anaemia:*** Five percent of children age 6-59 months were severely anaemic (haemoglobin level less than 8 g/dl).
- ***Malaria:*** Analysis of blood smears by microscopy revealed that 24% of children age 6-59 months had malaria parasites.

This chapter presents data useful for assessing how well fever management strategies are implemented. Specific topics include care seeking for febrile children, diagnostic testing of children with fever, and therapeutic use of antimalarial drugs. Prevalence of anaemia and malaria among children age 6-59 months is also assessed.

4.1 CARE SEEKING FOR FEVER IN CHILDREN

Care seeking for children under age 5 with fever

Percentage of children under age 5 with a fever in the 2 weeks before the survey for whom advice or treatment was sought from the public health sector, CHAM/mission, private medical sector, shop, market, and itinerant drug seller.

Sample: Children under age 5 with a fever in the 2 weeks before the survey

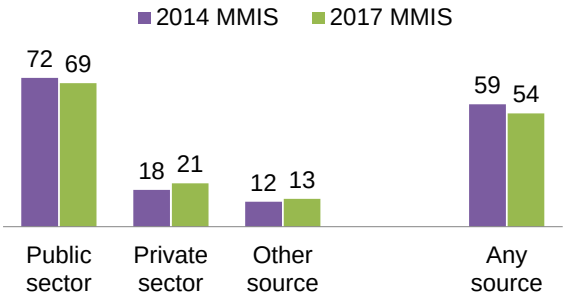
One of the key case management objectives of the National Malaria Control Programme (NMCP) is to ensure that all suspected malaria cases have access to confirmatory diagnosis and receive effective treatment. Fever is a key symptom of malaria and other acute infections in children. These fevers require prompt and effective treatment to prevent morbidity and mortality. Forty percent of children under age 5 had fever in the 2 weeks preceding the survey. Advice or treatment was sought for 54% of the children

with fever in the 2 weeks preceding the survey, and timely care seeking (the same or next day following fever onset) occurred for 31% of the febrile children (**Table 4.1**).

Among the children with recent fever for whom care was sought, most received advice or treatment from the public health sector (69%), including 41% who sought care from a government health centre, and 17% from a government hospital. Only 21% sought advice from a private health sector, and the remaining 13% sought advice or treatment from other private sector or other sources (**Table 4.2**).

***Figure 4.1* Trends in care seeking for fever in children by source of care**

Among children under age 5 with fever for whom advice or treatment was sought, percentage for whom advice or treatment was sought from specific sources



Trends: Among those with fever, advice or treatment seeking was slightly less likely in the 2017 MMIS than in the 2014 MMIS (54% compared to 59%). While the percentage of children with fever in the 2 weeks before the survey for whom advice or treatment was sought from the public sector decreased between 2014 and 2017 (from 72% to 69%), the percentage of those for whom advice or treatment was sought in the private sector increased from 18% to 21% within the same period (**Figure 4.1**).

Patterns by background characteristics

- The percentage of children under age 5 with fever decreases with increasing wealth quintile, dropping from 47% among children in the lowest wealth quintile to 31% among children in the highest wealth quintile.
- The percentage of children under age 5 with fever ranges from 30% in urban areas to 42% in rural areas.
- Advice or treatment for children with fever was sought for 58% of children age <12 months compared with 49% of children age 48-59 months.
- The percentage of children with fever for whom advice or treatment was sought ranges from 46% in the Southern region to 63% in the Northern region.

4.2 Diagnostic Testing of Children with Fever

Diagnosis of malaria in children under 5 with fever

Percentage of children under 5 with a fever in the 2 weeks before the survey who had blood taken from a finger or heel for testing. This is a proxy measure of diagnostic testing for malaria.

Sample: Children under 5 with a fever in the 2 weeks before the survey

The Malawi National Malaria Control Programme policy recommends prompt parasitological confirmation before treatment commences. Malaria rapid diagnostic tests (RDTs) are performed for all patients suspected of uncomplicated malaria. Adherence to this policy cannot be directly measured through household surveys; however, the 2017 MMIS asked interviewed women with children under 5 who had a fever in the 2 weeks before the survey if the child had blood taken from a finger or heel for testing during the illness. This information is used as a proxy measure for adherence to the NMCP treatment guidelines of conducting diagnostic testing for all suspected malaria cases.

In the MMIS 2017, 38% of children under age 5 with a fever in the 2 weeks before the survey had blood taken from a finger or heel, presumably for malaria testing (**Table 4.1**).

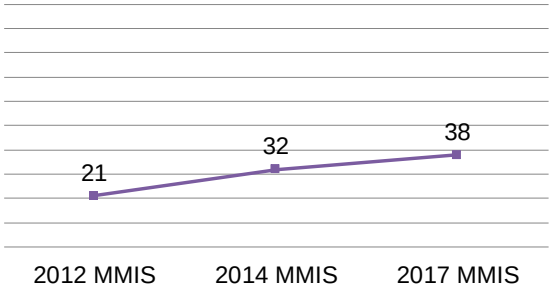
Trends: The percentage of children under age 5 with fever who had blood taken from the finger or heel for testing increased from 21% in 2012 to 38% in 2017 (**Figure 4.2**).

Patterns by background characteristics

- Forty-one percent of children less than age 12-23 months had blood taken from a finger or heel for testing, compared with 36% of children age 48-59 months.
- Thirty-two percent of children under age 5 with recent fever in the Southern region had blood taken from a finger or heel for testing, compared with 50% from the Northern region (**Table 4.1**).

Figure 4.2 **Trends in diagnostic testing of children with fever**

Percent of children under age 5 with fever in the 2 weeks preceding the survey who had blood taken from a finger or heel for testing



4.3 USE OF RECOMMENDED ANTIMALARIALS

Artemisinin-based combination therapy (ACT) for children under 5 with fever

Among children under age 5 with a fever in the 2 weeks before the survey who took any antimalarial drugs, the percentage who took an artemisinin-based combination therapy (ACT)

Sample: Children under 5 with a fever in the two weeks before the survey

Artemisinin-based combination therapy (ACT) is the recommended first-line antimalarial drug for the treatment of uncomplicated malaria in Malawi. This policy was first recommended in 2006 and then implemented in 2007 (MoH 2013).

According to the treatment data in **Table 4.3**, 96% of children under age 5 with recent fever who received an antimalarial took an ACT.

4.4 PREVALENCE OF LOW HAEMOGLOBIN IN CHILDREN

Prevalence of low haemoglobin in children

Percentage of children age 6-59 months who had a haemoglobin measurement of less than 8 grams per decilitre (g/dl) of blood. The cut-off of 8 g/dl is often used to classify malaria-related anaemia.

Sample: Children age 6-59 months

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 B12, or other nutrients. Other causes of anaemia include intestinal worms, haemoglobinopathy, and sickle cell disease. Although anaemia is not specific to malaria, trends in anaemia prevalence can reflect malaria morbidity, and they respond to changes in the coverage of malaria interventions (Korenromp 2004). Malaria interventions have been associated with a 60% reduction in the risk of anaemia when using a diagnostic cut-off of 8g/dl (RBM 2003).

Among eligible children age 6-59 months from interviewed households, almost all (99.7%) were tested for anaemia after consent from their parent or responsible adult (**Table 4.4**).

Table 4.5 shows 5% of children age 6-59 months are classified as having severe anaemia, defined as a haemoglobin concentration of less than 8 g/dl.

Patterns by background characteristics

- The prevalence of severe anaemia (haemoglobin <8g/dl) in children age 6-59 months is slightly higher in females as compared with males (6% versus 4%, respectively) (**Table 4.5**).
- Severe anaemia ranges from 4% in the Northern region to 6% in the Central region.

4.5 Prevalence of Malaria in Children

Malaria prevalence in children

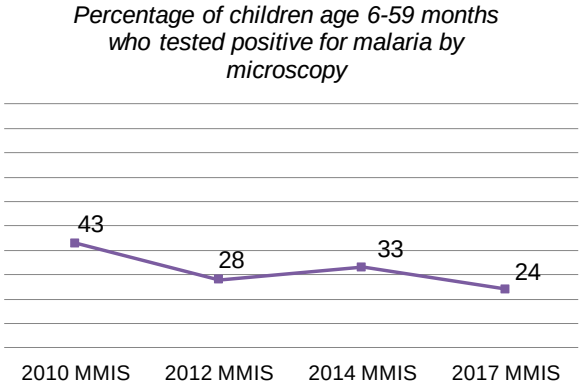
Percentage of children age 6-59 months classified as infected with malaria, according to microscopy results

Sample: Children age 6-59 months

As is the case in many other countries in sub-Saharan Africa, malaria is the leading cause of death in Malawi among children under age 5. Malaria transmission is high throughout the year, contributing to development of partial immunity within the first 2 years of life. However, many people, 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 and other associated morbidity among the infected individuals.

In the 2017 MMIS, 24% of children age 6-59 months were positive for malaria parasites according to microscopy results (**Table 4.6**). Among children who tested positive, 95% had a *P. falciparum* infection (**Table 4.7**). Rapid diagnostic tests (RDTs) were done in conjunction with microscopy to facilitate the treatment of infected children during the survey fieldwork. Results from these RDTs are also presented in **Table 4.6** for reference. Thirty-six percent of children age 6-59 months tested positive for malaria antigens with RDTs.

Figure 4.3 **Trends in malaria prevalence among children**



The differences in malaria prevalence observed between the RDT and microscopy results are expected. Microscopic detection of malaria parasites depends on the visualization of stained parasites under 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. Therefore, direct comparisons of malaria results from microscopy with those from RDTs should be avoided. The SD BIOLINE Malaria Ag P.f/Pan (HRP-II)™ rapid diagnostic test RDT, like many other commercially available RDTs, detects the *P. falciparum*-specific, histidine-rich protein-2 (HRP-2) rather than the parasite itself. The HRP-2 remains in the blood for up to a month after parasite clearance with antimalarials (Moody 2002). In areas highly endemic for *P. falciparum*, its persistence often leads to higher malaria prevalence estimates detected with RDTs compared with those measured by microscopy.

Results presented in this section are based on the microscopy analysis of blood samples.

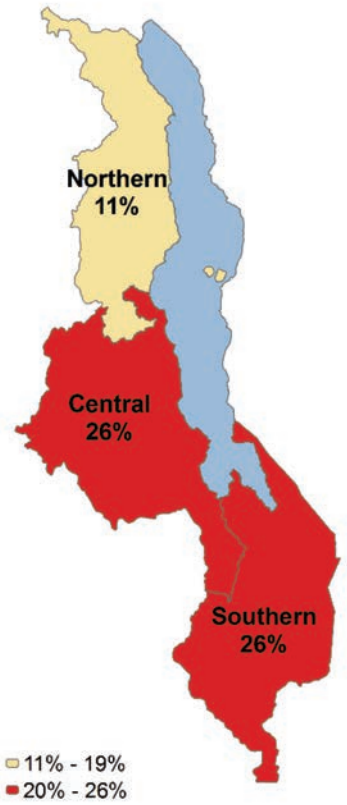
Trends: National malaria prevalence in children under age 5 has decreased by 19 percentage points from 43% in 2010 to 24% in 2017. (**Figure 4.3**)

Patterns by background characteristics

- Malaria prevalence by microscopy ranges from 7% in children age 9-11 months to 32% in children age 48-59 months (**Table 4.6**).
- Malaria prevalence by microscopy is higher among children whose mothers have no formal education (34%) than among those whose mothers have a secondary (9%) or higher (5%) education.
- Malaria prevalence by microscopy is about seven times higher in rural areas (28%) than in urban areas (4%).
- By region, malaria prevalence by microscopy is lowest in the Northern region (11%) as compared with the Central and Southern regions (26% each). (**Figure 4.4**)
- The prevalence of malaria in children age 6-59 months by microscopy increases with decreasing wealth quintile, from 8% among those in the highest wealth quintile to 34% amongst those in the second wealth quintile.

Figure 4.4 Prevalence of malaria in children by region

Percentage of children age 6-59 months who tested positive for malaria by microscopy



List of Tables

For detailed information on malaria, see the following tables:

- **Table 4.1 Prevalence, diagnosis, and prompt treatment of children with fever**
- **Table 4.2 Source of advice or treatment for children with fever**
- **Table 4.3 Types of antimalarial drugs used**
- **Table 4.4 Coverage of testing for haemoglobin and malaria in children**
- **Table 4.5 Haemoglobin <8.0g/dl in children**
- **Table 4.6 Prevalence of malaria in children**
- **Table 4.7 Malaria species from microscopy**

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

Percentage of children under age 5 with fever in the 2 weeks preceding the survey; and among children under age 5 with fever, percentage for whom advice or treatment was sought, percentage for whom advice or treatment was sought the same or next day following the onset of fever, and percentage who had blood taken from a finger or heel for testing, according to background characteristics, by background characteristics, Malawi MIS 2017

	Children under age 5		Children under age 5 with fever			
Background characteristic	Percentage with fever in the 2 weeks preceding the survey	Number of children	Percentage for whom advice or treatment was sought[1]	Percentage for whom advice or treatment was sought the same or next day[1]	Percentage who had blood taken from a finger or heel for testing	Number of children
Age in months						
<12	33.9	507	58.0	30.0	35.1	172
12-23	46.0	509	57.6	28.9	41.0	234
24-35	44.6	490	58.7	43.0	38.0	219
36-47	40.0	510	49.1	30.4	37.1	204
48-59	36.7	582	48.5	20.0	35.8	214
Sex						
Male	40.1	1,318	58.3	30.4	39.4	528
Female	40.2	1,280	50.3	30.6	35.6	514
Residence						
Urban	29.5	365	58.4	30.2	40.6	108
Rural	41.9	2,234	53.9	30.5	37.2	935
Region						
Northern	22.8	288	62.8	38.8	50.4	65
Central	43.9	1,110	61.6	31.4	41.6	488
Southern	40.8	1,201	46.0	28.5	31.8	490
Mother's education						
No education	41.7	380	50.4	21.6	35.5	158
Primary	42.0	1,765	54.2	30.7	37.8	741
Secondary	33.2	419	59.5	39.6	38.6	139
More than secondary	11.0	35	*	*	*	4
Wealth quintile						
Lowest	47.0	621	58.8	33.0	38.8	292
Second	41.8	618	46.9	25.5	33.5	258
Middle	40.4	482	57.2	33.7	38.2	195
Fourth	36.9	450	52.6	28.5	33.8	166
Highest	30.8	429	57.0	32.5	46.4	132
Total	40.1	2,598	54.4	30.5	37.6	1,043

Note: An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.
[1] Includes advice or treatment from the following sources: public sector, Christian Health Association of Malawi (CHAM)/mission, private medical sector, shop, market, and itinerant drug seller. Excludes advice or treatment from a traditional practitioner.

Table 4.2 Source of advice or treatment for children with fever

Percentage of children under age 5 with fever in the 2 weeks preceding the survey for whom advice or treatment was sought from specific sources; and among children under age 5 with fever in the 2 weeks preceding the survey for whom advice or treatment was sought, the percentage for whom advice or treatment was sought from specific sources, Malawi MIS 2017

	Percentage for whom advice or treatment was sought from each source:	
Source	Among children with fever	Among children with fever for whom advice or treatment was sought
Public health sector	37.4	68.8
Government hospital	9.1	16.8
Government health centre	22.0	40.5
Government health post	2.5	4.7
Mobile clinic	1.1	2.0
HSA	2.9	5.2
Private health sector	11.3	20.8
Private hospital/clinic	5.1	9.3
Pharmacy	2.4	4.4
Private doctor	0.1	0.1
Mobile clinic	0.2	0.4
Other private medical sector	0.2	0.3
CHAM/Mission hospital	1.7	3.2
CHAM/Mission health centre	2.0	3.7
Other private sector	6.3	11.5
Shop	5.8	10.7
Market	0.2	0.4
Itinerant drug seller	0.2	0.4
Other	1.0	1.9
Number of children	1,043	567

HSA = Health service assistant
CHAM = Christian Health Association of Malawi

Table 4.3 Type of antimalarial drugs used

Among children under age 5 with fever in the 2 weeks preceding the survey who took any antimalarial medication, percentage who took specific antimalarial drugs, according to background characteristics, Malawi MIS 2017

Background characteristic	Percentage of children who took:							Number of children with fever who took anti-malarial drug
	Any ACT	LA	AA/ASAQ (combined amodiaquine and artesunate)	SP/Fansidar	Quinine	Artesunate	Other anti-malarial	
Age in months								
< 6	*	*	*	*	*	*	*	6
6-11	*	*	*	*	*	*	*	19
12-23	(97.5)	(97.5)	(0.0)	(0.0)	(1.7)	(0.0)	(0.8)	75
24-35	97.2	94.7	2.4	2.1	6.7	2.9	0.0	81
36-47	(94.5)	(94.5)	(0.0)	(2.7)	(3.6)	(0.0)	(0.0)	63
48-59	(94.4)	(94.4)	(1.0)	(0.0)	(5.6)	(0.0)	(0.0)	63
Sex								
Male	96.8	95.5	1.3	2.2	4.2	0.0	0.4	158
Female	95.9	95.9	0.4	0.0	5.6	1.6	0.0	149
Residence								
Urban	*	*	*	*	*	*	*	9
Rural	96.7	96.0	0.7	1.2	4.5	0.6	0.0	298
Region								
Northern	(96.9)	(96.9)	(0.0)	(0.0)	(6.1)	(0.0)	(0.0)	17
Central	95.1	95.1	0.0	1.0	4.5	1.0	0.0	171
Southern	98.0	96.4	2.2	1.4	5.3	0.5	0.5	119
Mother's education								
No education	(96.8)	(96.8)	(0.0)	(0.0)	(6.9)	(0.0)	(0.0)	54
Primary	96.4	95.5	1.1	1.5	4.2	0.8	0.3	229
Secondary	*	*	*	*	*	*	*	23
More than secondary	*	*	*	*	*	*	*	1
Wealth quintile								
Lowest	94.9	94.9	0.0	3.4	4.0	1.7	0.0	101
Second	(94.9)	(94.9)	(0.0)	(0.0)	(7.7)	(0.0)	(0.9)	72
Middle	(100.0)	(97.2)	(2.8)	(0.0)	(0.0)	(0.0)	(0.0)	71
Fourth	(100.0)	(100.0)	(1.3)	(0.0)	(4.2)	(0.0)	(0.0)	47
Highest	*	*	*	*	*	*	*	17
Total	96.4	95.7	0.8	1.1	4.9	0.8	0.2	307

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

Table 4.4 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, according to background characteristics (unweighted), Malawi MIS 2017

Background characteristic	Percentage tested for: Anaemia	Malaria with RDT	Malaria by microscopy	Number of children
Age in months				
6-8	99.3	99.3	99.3	138
9-11	100.0	100.0	100.0	111
12-17	99.2	98.8	99.2	249
18-23	100.0	100.0	100.0	217
24-35	99.6	99.2	99.6	483
36-47	99.4	99.4	99.4	492
48-59	100.0	99.7	100.0	614
Sex				
Male	99.6	99.6	99.6	1,148
Female	99.7	99.3	99.7	1,156
Mother's interview status				
Interviewed	99.7	99.6	99.7	2,007
Not interviewed	99.3	98.3	99.3	297
Residence				
Urban	99.4	98.7	99.4	773
Rural	99.8	99.8	99.8	1,531
Region				
Northern	99.9	99.9	99.9	721
Central	99.9	99.3	99.9	816
Southern	99.2	99.2	99.2	767
Mother's education[1]				
No education	99.5	99.5	99.5	206
Primary	99.8	99.7	99.8	1,250
Secondary	99.6	99.4	99.6	493
More than secondary	100.0	100.0	100.0	58
Wealth quintile				
Lowest	100.0	100.0	100.0	351
Second	99.7	99.7	99.7	380
Middle	99.4	99.4	99.4	348
Fourth	100.0	99.8	100.0	457
Highest	99.3	98.8	99.3	768
Total	99.7	99.4	99.7	2,304

RDT = Rapid Diagnostic Test (SD Bioline Malaria Pf/Pan Ag)
[1] Excludes children whose mothers are not interviewed.

Table 4.5 Haemoglobin <8.0 g/dl in children

Percentage of children age 6-59 months with haemoglobin lower than 8.0 g/dl, by background characteristics, Malawi MIS 2017

Background characteristic	Haemoglobin < 8.0 g/dl	Number of children
Age in months		
6-8	10.0	141
9-11	8.0	120
12-17	8.1	278
18-23	10.8	227
24-35	3.1	517
36-47	4.4	528
48-59	2.4	674
Sex		
Male	4.1	1,246
Female	6.1	1,238
Mother's interview status		
Interviewed	5.1	2,183
Not interviewed	4.7	302
Residence		
Urban	4.3	339
Rural	5.2	2,145
Region		
Northern	3.5	268
Central	6.1	1,065
Southern	4.5	1,152
Mother's education[1]		
No education	5.0	328
Primary	5.6	1,479
Secondary	3.9	347
More than secondary	0.0	28
Wealth quintile		
Lowest	5.0	588
Second	4.9	579
Middle	7.7	467
Fourth	4.9	443
Highest	2.6	408
Total	5.1	2,485

Note: Table is based on children who stayed in the household the night before the interview. Prevalence of anaemia is based on haemoglobin levels and is adjusted for altitude using CDC formulas (CDC 1998). Haemoglobin is measured in grams per decilitre (g/dl).
[1] Excludes children whose mothers are not interviewed.

Table 4.6 Prevalence of malaria in children

Percentage of children age 6-59 months classified in two tests as having malaria, according to background characteristics, Malawi MIS 2017

Background characteristic	Malaria prevalence according to RDT		Malaria prevalence according to microscopy	
	RDT positive	Number of children	Microscopy positive	Number of children
Age in months				
6-8	15.5	141	7.6	141
9-11	16.1	120	7.3	120
12-17	25.5	277	14.8	278
18-23	36.9	227	26.1	227
24-35	33.8	516	22.5	517
36-47	44.2	528	29.4	528
48-59	43.0	673	31.5	674
Sex				
Male	36.3	1,246	24.3	1,246
Female	35.6	1,236	24.3	1,238
Mother's interview status				
Interviewed	35.1	2,181	23.2	2,183
Not interviewed	41.8	301	31.6	302
Residence				
Urban	6.0	337	4.0	339
Rural	40.6	2,145	27.5	2,145
Region				
Northern	19.4	268	11.2	268
Central	39.7	1,062	26.0	1,065
Southern	36.4	1,152	25.7	1,152
Mother's education[1]				
No education	46.4	328	34.2	328
Primary	37.3	1,479	24.6	1,479
Secondary	17.5	346	8.7	347
More than secondary	4.8	28	4.8	28
Wealth quintile				
Lowest	48.7	588	32.6	588
Second	45.6	579	34.0	579
Middle	36.9	467	23.7	467
Fourth	28.2	443	16.6	443
Highest	11.1	406	7.5	408
Total	36.0	2,482	24.3	2,485

RDT = Rapid Diagnostic Test (SD Bioline Malaria Ag-Pf/Pan)
[1] Excludes children whose mothers are not interviewed.

Table 4.7 Malaria species from microscopy

Among children age 6-59 months who were positive for malaria parasites by the microscopy, percentage with specific species of plasmodium, Malawi MIS 2017

Background characteristic	*Plasmodium falciparum*	*Plasmodium malariae*	*Plasmodium. ovale*	Mixed infections	Number of children with malaria parasites
Sex					
Male	94.8	7.9	0.2	2.9	303
Female	95.8	8.1	0.7	4.6	300
Residence					
Urban	(98.9)	(0.0)	(1.1)	(0.0)	14
Rural	95.2	8.2	0.4	3.8	589
Region					
Northern	92.3	7.6	2.1	2.0	30
Central	95.7	8.1	0.8	4.6	277
Southern	95.2	7.9	0.0	3.2	296
Total	95.3	8.0	0.5	3.8	603

Note: Figures in parentheses are based on 25-49 unweighted cases.

MALARIA KNOWLEDGE AND MESSAGING 5

Key Findings

- ***Women's knowledge of malaria prevention method:*** 87% of women age 15-49 reported that sleeping under a mosquito net can protect against malaria.
- ***Exposure to malaria messages:*** 3 in 10 women age 15-49 have seen or heard a malaria message in the past 6 months. Among those women, 71% saw or heard the message at a government clinic or hospital.
- ***Mosquito net misuse****:* Seven percent of women age 15-49 reported nets being used for reasons other than sleeping

This chapter assesses the extent to which women age 15-49 are exposed to malaria messages and the channels through which they receive such messages. The chapter also provides data on women's basic knowledge of the causes, symptoms, and prevention of malaria. Net misuse is perceived to be a significant barrier to malaria prevention in Malawi and the 2017 MMIS asked direct questions on this topic. Information on the percentage of women who reported nets being used for purposes other than sleeping is included at the end of this chapter.

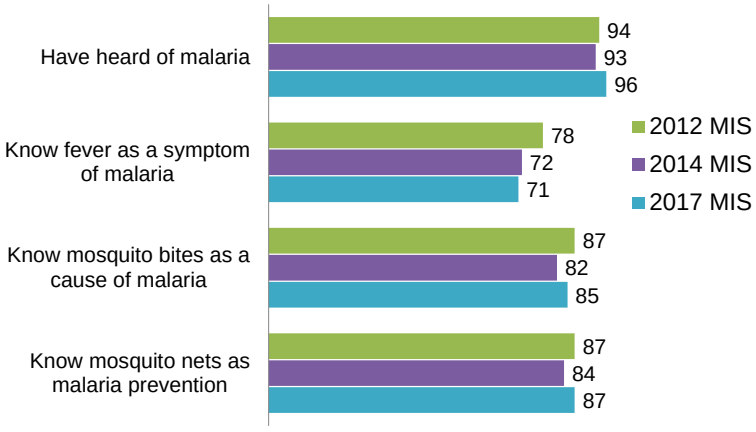
5.1 WOMEN'S KNOWLEDGE OF CAUSES, SYMPTOMS, AND PREVENTION

Perceptions, beliefs, and attitudes about the causes of malaria, how to identify symptoms, and ways to prevent the illness are often overlooked in malaria control efforts. Yet such understanding is necessary to identify and target vulnerable populations and ensure the success of malaria control.

The majority of women age 15-49 in Malawi have heard of malaria (96%), recognize fever as a symptom (71%), report mosquito bites as a cause (85%), and say mosquito nets are a prevention method (87%) (**Table 5.1**).

Figure 5.1 **Trends in malaria knowledge**

Percentage of women age 15-49 who have heard of malaria and know malaria symptoms, causes, and prevention methods



Trends: In general, women's knowledge about malaria, including causes, symptoms, and prevention, has not changed over the last 5 years. (**Figure 5.1**)

Patterns by background characteristics

- The percentage of women who report mosquito nets as a malaria prevention method ranges from 79% in the lowest wealth quintile to 97% in the highest wealth quintile **(Table 5.1)**.
- Urban women (99%) are more likely to have heard of malaria than rural women (95%).

5.2 EXPOSURE TO MALARIA MESSAGES

Exposure to communication messages

Percentage of women age 15-49 who recall seeing or hearing a message about malaria through various sources in the past 6 months

Sample: Women age 15-49 who have seen or heard messages or information about malaria in the past 6 months

The effectiveness of social and behavioural change communications is notoriously difficult to measure. Because of this, the success of these initiatives is often measured by the percentage of the target population who recall hearing or seeing messages. Exposure is the critical first step in increasing knowledge of malaria prevention methods, as well as attitudes and practices about malaria. The target population's ability to recall messages about malaria is an indicator of how widely communications have penetrated the target audience.

Overall, almost one-third of women age 15-49 in Malawi (31%) heard or saw a message on malaria in the 6 months prior to the survey (**Table 5.2**). The most common place to be exposed to these messages was at government clinics/hospitals; 7 in 10 women who saw or heard a message on malaria in the 6 months prior to the survey did so at a government clinic or hospital (71%). Radio is the second most common form of media for exposure to malaria messages (38%), while TV and newspapers/magazines account for just 15% and 8%, respectively (**Table 5.3**).

Over half of women age 15-49 who were exposed to malaria messages heard/saw messages related to "malaria is dangerous" and/or "sleeping under a mosquito net is important" (52% and 51%) (**Table 5.4**).

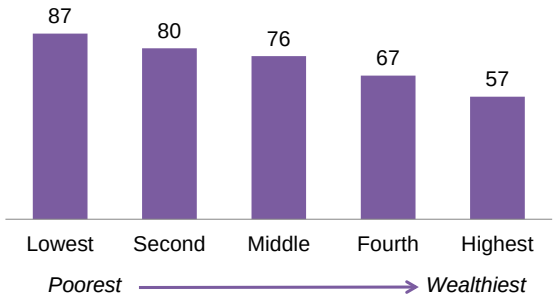
Trends: The percentage of women age 15-49 who have seen or heard malaria messages in the past 6 months increased from 22% in the 2014 MMIS to 31% in the 2017 MMIS. However, the average number of months ago that the messages were seen or heard also increased from 1 months to 1.5 months.

Patterns by background characteristics

- Exposure to malaria messages at government clinics/hospitals decreases as wealth quintile increases; from 87% in the lowest quintile to 57% in the highest quintile (**Figure 5.2**).
- Women living in urban areas (21%) were more likely to have heard or seen information about seeking treatment for fever than rural women (11%) (**Table 5.4**).
- Among women who saw or heard a message on malaria in the past 6 months, women from the Northern region (67%) were more likely than women in the Central (43%) and Southern (56%) regions to have heard or seen a message that "sleeping under a mosquito net is important" (**Table 5.4**).

Figure 5.2 **Exposure to messages on malaria at government clinics/hospitals**

Percentage of women age 15-49 who heard or saw a message on malaria at government clinics/hospitals by wealth quintile



5.3 Mosquito Net Misuse

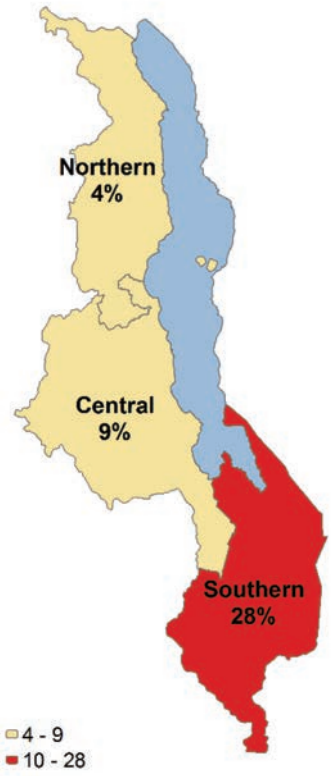
Use of an insecticide-treated net (ITN) is the primary strategy for vector control implemented by the NMCP in Malawi, and net misuse is considered a threat to Malawi's Malaria Strategic Plan. However, only 7% of women 15-49 reported using nets for reasons other than sleeping. Among women who reported mosquito nets in the house being used for reasons other than sleeping, four in ten women reported using nets for cover or protection (42%) (**Table 5.5**). Examples of using a net for cover or protection include use as fencing for vegetable gardens and/or chicken coops. Two in ten women reported their nets were also used for fishing (20%).

Patterns by background characteristics

- Women in rural areas (25%) were more likely to report nets being used as window screens than women in urban areas (14%).
- A higher percentage of women in the Southern region reported using a mosquito net for fishing than women in the Northern region (28% and 4%, respectively) (**Figure 5.3**)

Figure 5.3 Map of women age 15-49 who reported using nets for fishing by region

Among women who reported mosquito nets in the house being used for reasons other than sleeping, the percentage of women age 15-49 who reported mosquito nets being used for fishing by region



List of Tables

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- **Table 5.1 Women's knowledge of malaria causes and symptoms**
- **Table 5.2 Messages about malaria**
- **Table 5.3 Exposure to messages on malaria by source**
- **Table 5.4 Exposure to specific messages and information on malaria**
- **Table 5.5 Use of mosquito nets for reasons other than sleeping**

Table 5.1 Women's knowledge of malaria causes, symptoms and prevention

Percentage of women age 15-49 who reported having heard of malaria, percentage who can recognize fever as a sign or symptom of malaria, percentage who reported mosquito bites as a cause of malaria, and percentage who reported that sleeping under a mosquito net can protect against malaria, according to background characteristics, Malawi MIS 2017

Background characteristic	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 malaria prevention method	Number of women
Age					
15-19	94.2	58.1	82.0	83.7	840
20-24	96.0	73.9	85.0	86.1	792
25-29	97.2	76.7	83.8	87.1	662
30-34	96.8	77.5	88.8	91.0	590
35-39	96.9	77.1	87.9	91.8	450
40-44	95.3	67.2	86.4	89.8	304
45-49	95.2	67.7	74.1	81.7	223
Residence					
Urban	98.5	77.7	95.0	96.6	759
Rural	95.3	69.3	82.0	84.9	3,101
Region					
Northern	93.8	72.5	87.7	86.8	465
Central	97.2	74.6	84.8	86.9	1,657
Southern	95.3	67.1	83.5	87.5	1,738
Education					
No education	92.2	60.3	68.2	77.2	526
Primary	95.6	71.0	83.6	85.6	2,454
Secondary	99.0	76.2	96.5	97.3	779
More than secondary	100.0	86.7	99.4	99.6	101
Wealth quintile					
Lowest	93.9	67.6	76.9	78.7	773
Second	95.7	73.5	80.2	83.6	731
Middle	94.7	67.2	84.0	86.3	714
Fourth	95.8	67.1	83.9	88.3	742
Highest	99.1	78.0	95.7	97.2	899
Total	95.9	71.0	84.5	87.2	3,860

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 6 months, and among women who have heard or seen malaria messages in the last 6 months, percentage who have seen or heard malaria messages within the past 1 month, and average number of months ago the malaria message was seen or heard, according to background characteristics, Malawi MIS 2017

Background characteristic	Percentage who have seen or heard malaria messages in the past 6 months	Number of women	Among women who have seen or heard malaria messages in the past 6 months		
			Percentage who have seen or heard malaria messages in the past 1 month	Average months ago the messages were seen or heard	Number of women
Age					
15-19	24.5	840	58.0	1.8	206
20-24	31.4	792	68.1	1.4	249
25-29	37.4	662	71.1	1.6	248
30-34	29.3	590	69.8	1.0	172
35-39	37.1	450	65.8	1.3	167
40-44	25.0	304	54.8	1.4	76
45-49	27.7	223	70.3	1.7	62
Residence					
Urban	37.0	759	68.3	1.5	281
Rural	29.0	3,101	65.5	1.5	899
Region					
Northern	32.7	465	62.5	1.8	152
Central	37.2	1,657	65.7	1.4	617
Southern	23.6	1,738	68.1	1.4	411
Education					
No education	16.8	526	65.4	1.8	89
Primary	28.4	2,454	64.9	1.5	697
Secondary	41.9	779	67.8	1.5	326
More than secondary	67.4	101	72.0	0.9	68
Wealth quintile					
Lowest	23.0	773	59.2	1.8	177
Second	27.4	731	71.1	1.0	200
Middle	31.0	714	66.7	1.6	221
Fourth	30.8	742	59.8	1.7	229
Highest	39.2	899	70.5	1.4	352
Total	30.6	3,860	66.1	1.5	1,180

Table 5.3 Exposure to messages on malaria by source

Among women age 15-49 who saw or heard a message on malaria in past 6 months, percentage who saw or heard messages through various sources, according to background characteristics, Malawi MIS 2017

Background characteristic	Government clinic/ hospital	Community health worker	Friends/ family	Work-place	Drama groups	Peer educators	Poster/ billboard	TV	Radio	Newspaper/ magazine	Other	Number of women
Age												
15-19	63.4	27.9	22.4	0.5	20.3	24.2	19.6	16.1	37.2	8.9	8.6	206
20-24	75.9	32.7	20.8	3.7	11.5	9.0	20.7	12.7	38.9	6.4	3.8	249
25-29	74.3	35.0	12.3	7.4	8.3	9.1	14.3	12.9	40.7	8.7	5.2	248
30-34	68.3	27.7	13.2	1.7	9.0	9.6	12.6	18.7	37.7	8.0	2.5	172
35-39	71.0	37.3	19.7	4.8	11.7	9.3	16.2	18.9	35.3	6.2	6.7	167
40-44	67.0	28.7	12.5	3.4	16.3	4.8	14.4	8.6	44.3	8.8	3.3	76
45-49	74.1	29.2	11.6	4.0	6.9	5.7	14.3	9.8	31.9	6.9	1.8	62
Residence												
Urban	54.5	14.1	13.3	7.1	13.5	9.3	25.7	41.3	64.9	15.2	6.0	281
Rural	76.0	37.4	18.2	2.7	11.6	12.0	13.7	6.3	29.9	5.4	4.7	899
Region												
Northern	69.7	37.4	20.0	7.8	15.9	14.3	20.8	20.7	44.1	13.3	7.2	152
Central	74.8	35.6	21.9	2.7	12.6	13.6	12.9	12.5	33.3	5.5	3.8	617
Southern	65.5	24.0	8.6	3.9	10.0	7.0	20.5	15.7	43.6	9.0	6.1	411
Education												
No education	82.2	29.5	13.0	0.0	5.1	4.6	8.0	10.1	17.5	0.0	0.0	89
Primary	77.0	36.9	17.3	1.6	11.6	10.9	12.8	7.4	29.9	5.4	4.5	697
Secondary	60.7	25.9	18.6	6.0	14.9	13.9	24.4	23.4	56.1	10.4	8.4	326
More than secondary	42.4	11.3	11.1	20.5	13.0	12.4	29.2	52.7	66.1	28.2	1.0	68
Wealth quintile												
Lowest	86.6	27.2	12.3	1.1	8.3	10.8	10.5	8.2	21.4	3.0	2.2	177
Second	79.8	45.4	20.0	1.1	8.6	6.8	8.9	4.3	16.7	2.9	4.9	200
Middle	76.1	43.5	18.1	0.4	9.8	11.6	14.1	4.2	28.9	4.9	5.9	221
Fourth	67.0	34.9	16.3	2.4	15.2	16.6	16.9	5.4	41.3	6.7	4.1	229
Highest	57.2	17.1	17.4	9.8	15.4	10.7	25.4	36.3	63.0	15.2	6.6	352
Total	70.9	31.8	17.0	3.8	12.1	11.4	16.6	14.7	38.3	7.7	5.0	1,180

Table 5.4 Exposure to specific messages and information on malaria

Among women age 15-49 who saw or heard a message on malaria in the past 6 months, the percentage of women who heard or saw a specific message or information on malaria, according to background characteristics, Malawi MIS 2017

	Percentage of women who heard or saw the information										
Background characteristic	Malaria is dangerous	Malaria can kill	Mosquitos spread malaria	Sleeping under a mosquito net is important	Seek treatment for fever	Seek treatment for fever promptly (within 24 hours)	Import-ance of house spraying	Not plastering walls after spraying	Environ-mental sanitation activities	Any of the previous 9 specific messages	Number of women
Age											
15-19	52.7	32.2	19.1	48.8	8.1	11.3	1.0	0.0	29.4	98.4	206
20-24	43.0	29.7	18.2	56.6	10.7	10.7	0.5	0.0	19.3	97.9	249
25-29	50.4	29.6	16.1	49.2	13.9	13.8	0.8	0.0	24.3	97.4	248
30-34	57.6	33.5	14.5	51.0	13.8	18.6	0.1	0.0	23.3	99.6	172
35-39	48.9	34.6	16.4	52.0	17.0	12.1	1.4	1.2	28.0	96.8	167
40-44	69.0	42.7	14.0	38.6	18.0	22.4	0.0	0.0	10.9	100.0	76
45-49	54.9	32.1	19.8	49.3	15.8	26.7	1.0	0.0	17.2	99.0	62
Residence											
Urban	54.0	35.8	18.4	51.3	20.7	16.0	0.8	0.0	21.7	98.9	281
Rural	50.8	31.2	16.5	50.5	10.6	13.9	0.7	0.2	23.8	97.9	899
Region											
Northern	44.2	30.8	20.0	67.3	15.3	20.3	1.0	0.0	35.7	98.2	152
Central	52.8	36.0	17.9	43.0	11.5	13.8	0.8	0.3	20.8	99.1	617
Southern	52.3	27.3	14.4	56.1	14.3	13.1	0.5	0.0	22.4	96.8	411
Education											
No education	38.9	26.9	9.5	43.5	7.2	13.4	0.0	0.0	18.6	97.5	89
Primary	52.0	32.2	17.6	48.3	12.0	14.4	0.8	0.3	21.8	97.5	697
Secondary	53.6	32.3	17.2	56.3	14.9	14.4	0.8	0.0	29.4	99.4	326
More than secondary	52.7	40.6	18.3	57.3	21.3	16.3	0.2	0.0	15.4	100.0	68
Wealth quintile											
Lowest	44.6	26.6	13.6	52.3	7.3	10.7	1.0	0.0	18.6	96.5	177
Second	48.6	33.1	13.5	45.4	7.9	12.5	1.0	1.0	18.8	97.7	200
Middle	51.6	39.0	21.3	49.2	11.8	15.4	0.9	0.0	19.3	98.9	221
Fourth	51.4	28.3	15.8	51.8	13.6	15.3	0.0	0.0	35.4	97.8	229
Highest	56.7	33.2	18.5	53.0	19.0	16.1	0.8	0.0	22.7	99.1	352
Total	51.5	32.3	16.9	50.7	13.0	14.4	0.7	0.2	23.3	98.2	1,180

Table 5.5 Use of mosquito nets for reasons other than sleeping

Percentage of women age 15-49 who reported mosquito nets in the house being used for reasons other than sleeping, and what they were used for, by background characteristics, Malawi MIS 2017

Background characteristic	Percentage who reported mosquito nets in the house being used for reasons other than sleeping	Number of women	Among those who reported mosquito nets in the house being used for reasons other than sleeping						
			Fishing	Cover/ protection	Window screen	Clothing/ wedding veil	Other	Don't know	Number of women who reported use of mosquito nets other than sleeping
Age									
15-19	6.1	840	(40.2)	(46.8)	(17.2)	(3.4)	(39.0)	(0.0)	51
20-24	6.7	792	(10.5)	(48.4)	(11.8)	(3.4)	(35.3)	(0.0)	53
25-29	6.3	662	(19.9)	(37.2)	(23.0)	(0.0)	(30.3)	(4.1)	42
30-34	8.2	590	(13.2)	(46.5)	(28.1)	(3.6)	(18.1)	(0.0)	48
35-39	5.9	450	(15.2)	(30.5)	(43.9)	(0.0)	(24.1)	(8.1)	27
40-44	10.6	304	(12.5)	(40.9)	(27.9)	(0.0)	(24.3)	(0.0)	32
45-49	8.9	223	*	*	*	*	*	*	20
Residence									
Urban	5.5	759	25.0	63.1	14.0	0.0	21.6	0.0	42
Rural	7.5	3,101	18.6	38.4	25.4	3.2	30.8	1.7	232
Region									
Northern	7.0	465	3.5	29.5	60.3	0.0	18.7	0.0	33
Central	4.7	1,657	8.7	40.6	16.6	2.2	42.8	2.2	78
Southern	9.4	1,738	27.9	45.5	19.7	3.4	25.1	1.3	163
Education									
No education	7.6	526	*	*	*	*	*	*	40
Primary	6.7	2,454	19.3	46.2	21.0	1.1	32.0	1.3	165
Secondary	8.1	779	22.2	35.3	28.0	5.5	27.6	2.7	63
More than secondary	5.2	101	*	*	*	*	*	*	5
Wealth quintile									
Lowest	6.2	773	(10.0)	(48.9)	(14.2)	(0.0)	(46.4)	(0.0)	48
Second	6.8	731	(19.3)	(45.9)	(19.3)	(0.0)	(36.1)	(3.4)	50
Middle	8.5	714	(22.0)	(24.0)	(34.0)	(2.8)	(21.7)	(0.0)	61
Fourth	9.1	742	21.0	42.3	29.5	8.3	20.5	3.2	67
Highest	5.3	899	24.3	54.8	16.1	0.0	27.5	0.0	47
Total	7.1	3,860	19.6	42.2	23.6	2.7	29.4	1.4	273

Note: Figures in parentheses are based on 25-49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25.

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SAMPLE DESIGN

APPENDIX A

A.1 INTRODUCTION

The 2017 Malawi Malaria Indicator Survey (MMIS) is a country-wide survey with a nationally representative sample of approximately 3,750 households. The survey provides information on key malaria control indictors, such as the proportion of households having at least one insecticide-treated net (ITN). Among children, it looks at the proportion under age 5 who slept under a bed net the previous night and whether the net was an ITN. In addition, the survey assessed the prevalence of malaria among children age 6-59 months. Among pregnant women, the survey tallied the proportion of pregnant women who slept under a bed net the previous night and who received intermittent preventive treatment (IPTp) for malaria during their last pregnancy.

In Malawi, there are three regions divided into 28 districts. In addition to reporting estimates for the country as a whole and for urban and rural areas separately, the survey reports estimates for each of the three geographical regions. The 28 districts are distributed over the three regions as follows:

- 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, Phalombe, Thyolo, and Zomba

A.2 SAMPLE FRAME

The sampling frame used for the 2017 MMIS is the frame of the Malawi Population and Housing Census (MPHC) conducted in Malawi in 2008, provided by the Malawi National Statistical Office (NSO). The census frame is a complete list of all census enumeration areas (EA) created for the 2008 MPHC. An EA is a geographic area covering on average 235 households. The sampling frame contains information about the EA location, type of residence (urban or rural), and the estimated number of residential households. A sketch map that delineates the EA geographic boundaries is available for each EA.

Table A.1 indicates the percentage distribution of households by region and by type of residence. The region size varies from 11.7 percent (Northern, the smallest) to 47.0 percent (Southern, the largest). In Malawi, 15.2 percent of the households are in urban areas. The percentage of urban areas is similar across the three regions.

Table A.1 Distribution of residential households

Number distribution of residential households in the sampling frame by region and according to residence; percent distribution of households by region, and percentage of households that are in urban areas, Malawi MIS 2017

Region	Number of households in the frame			Percentage of households in the frame	Percentage of households that are in urban
	Urban	Rural	Total		
Northern	48,981	296,771	345,752	11.7	14.2
Central	191,179	1,031,186	1,222,365	41.3	15.6
Southern	209,657	1,178,705	1,388,362	47.0	15.1
Malawi	449,817	2,506,662	2,956,479	100.0	15.2

Source: The 2008 MPHC provided by the NSO

Table A.2 indicates the distribution of EAs and their average size in number of households by region and by type of residence. There are a total 12,569 EAs, excluding the institutional EAs; among them 1,411 are in urban areas, and 11,158 are in rural areas. The average EA size is 235 households; the urban EAs are large,

with an average of 319 households per EA. The rural EAs are smaller, with and an average of 225 households per EA. The EA size is adequate for a primary sampling unit (PSU), with a sample take of 25 households per EA.

Table A.2 Enumeration areas and households

Distribution of the enumeration areas (EA) in the sampling frame and average number of residential households per EA by region, according to residence, Malawi MIS 2017

	Number of enumeration areas in frame			Average number of residential households in enumeration area		
Region	Urban	Rural	Total	Urban	Rural	Total
Northern	196	1,794	1,990	250	165	174
Central	587	4,234	4,821	326	244	254
Southern	628	5,130	5,758	334	230	241
Malawi	1,411	11,158	12,569	319	225	235

Source: The 2008 MPHC provided by the NSO

A.3 SAMPLE DESIGN AND IMPLEMENTATION

The sample for the 2017 MMIS is a stratified sample selected in two stages. In the first stage, 150 EAs were selected from the sampling frame; they had a stratified probability proportional to size (PPS). The EA size is the number of residential households residing in the EA as recorded in the census. Stratification was achieved by separating every region into urban and rural areas. Therefore, the 2017 MMIS contains 6 sampling strata, including six urban strata and six rural strata. Samples were selected independently in every stratum, with a predetermined number of EAs to be selected, as shown in **Table A.3**.

A household listing operation was carried out in all of the selected EAs before the main survey. The household listing operation consisted of visiting each of the 150 selected EAs, drawing a location map and a detailed sketch map, and recording on the household listing forms all residential households found in the EA with the address and the name of the head of the household. The resulting list of households served as the sampling frame for the selection of households in the second stage.

At the second stage, for each selected EA, a fixed number of 25 households was selected from the list created during the household listing. Only the pre-selected households were interviewed. To prevent bias, no replacements and no changes of the pre-selected households were allowed in the implementing stages. All women age 15-49 in the selected households were eligible for an interview.

Table A.3 below shows the sample allocation of enumeration areas (clusters) by region and by urban-rural residence. Because of the desire to produce results by region, as well as budgetary and implementing constraints, the sample allocation is an equal size allocation at the regional level, with 50 clusters in each region. The 50 clusters in each region were then allocated to urban/rural areas. Among the 150 clusters selected, 60 clusters are in urban areas and 90 clusters are in rural areas. **Table A.3** below shows the number of households selected by region and by type of residence. The total number of households selected in the 2017 MMIS is 3,750, with 1,500 in urban areas and 2,250 in rural areas.

Table A.3 Sample allocation of clusters and households

Sample allocation of clusters and selected households by region, according to residence, Malawi MIS 2017

	Number of clusters allocated			Number of households allocated		
Region	Urban	Rural	Total	Urban	Rural	Total
Northern	20	30	50	500	750	1,250
Central	20	30	50	500	750	1,250
Southern	20	30	50	500	750	1,250
Malawi	60	90	150	1,500	2,250	3,750

Table A.4 below shows the expected number of women age 15-49 in the sampled households and the expected number of completed interviews with women by region and type of residence. The total expected

number of interviewed women in the 2017 MMIS is 3,117, with 1,326 in urban areas and 1,791 in rural areas. **Table A.5** shows the expected number of children age 6-59 months tested for malaria. These calculations were based on the results obtained from the 2014 MMIS, using the following assumptions: (1) the household completion rate is 96.9% in urban areas and 97.5% in rural areas; (2) the response rate for women is 98.5% in urban areas and 99.3% in rural areas; (3) in urban and rural areas, there is less than one woman per household; and (4) in urban and rural areas there is less than one child age 6-59 months tested for malaria.

Table A.4 Sample allocations of completed interviews with women

Sample allocation of expected number of women age 15-49 in interviewed households and sample allocation of expected number of women age 15-49 with completed interviews by region, according to residence, Malawi MIS 2017

	Expected number of women 15-49 in interviewed households			Expected number of women 15-49 with completed interviews		
Region	Urban	Rural	Total	Urban	Rural	Total
Northern	449	601	1,050	442	597	1,039
Central	449	601	1,050	442	597	1,039
Southern	449	601	1,050	442	597	1,039
Malawi	1,347	1,803	3,150	1,326	1,791	3,117

Table A.5 Sample allocations of completed rapid diagnostic tests for malaria in children

Sample allocation of expected number of children age 6-59 months tested with rapid diagnostic test (RDT) for malaria by region, according to residence, Malawi MIS 2017

	Expected number of children 6-59 months tested for malaria (RDT)		
Region	Urban	Rural	Total
Northern	225	452	677
Central	225	452	677
Southern	225	452	677
Malawi	675	1,356	2,031

A.4 SAMPLE PROBABILITIES AND SAMPLING WEIGHTS

Because of the nonproportional allocation of the sample to the different reporting domains, sampling weights will be required for any analysis using the 2017 MMIS data to ensure the actual representativity of the sample. Because the 2017 MMIS sample is a two-stage stratified cluster sample, sampling weights were calculated based on sampling probabilities, which were calculated separately for each sampling stage and for each cluster. We use the following notations:

P_{1hi}: first stage's sampling probability of the i^{th} cluster in stratum h
P_{2hi}: second-stage's sampling probability within the i^{th} cluster (households)
P_{hi}: overall sampling probability of any households of the i^{th} cluster in stratum h

Let a_h be the number of clusters selected in stratum h, M_{hi} the number of households according to the sampling frame in the i^{th} cluster, and $\sum M_{hi}$ the total number of households in the stratum h. The probability of selecting the i^{th} cluster in stratum h is calculated as follows:

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

Let b_{hi} be the proportion of households in the selected cluster compared to the total number of households in EA *i* in stratum *h* if the EA is segmented; otherwise $b_{hi} = 1$. Then the probability of selecting cluster *i* in the sample is:

$$P_{1hi} = \frac{a_h M_{hi}}{\sum M_{hi}} \times b_{hi}$$

Let L_{hi} be the number of households listed in the household listing operation in cluster *i* in stratum *h*, and let g_{hi} be the number of households selected in the cluster. The second stage's selection probability for each household in the cluster is calculated as follows:

$$P_{2hi} = \frac{g_{hi}}{L_{hi}}$$

The overall selection probability of each household in cluster *i* of stratum *h* is therefore the product of the two stages of selection probabilities:

$$P_{hi} = P_{1hi} \times P_{2hi}$$

The sampling weight for each household in cluster *i* of stratum *h* is the inverse of its overall selection probability:

$$W_{hi} = 1 / P_{hi}$$

A spreadsheet containing all sampling parameters and selection probabilities was constructed to facilitate the calculation of sampling weights. Household sampling weights and individual sampling weights were obtained by adjusting the previous calculated weight to compensate household nonresponse and individual nonresponse, respectively. These weights were further normalized at the national level to produce unweighted cases equal to weighted cases for both households and individuals at the national level. The normalized weights are valid for estimation of proportions and means at any aggregation levels, but not valid for estimation of totals.

A.5 SURVEY IMPLEMENTATION

An examination of response rates for the 2017 MMIS indicates that the survey was successfully implemented. **Table A.6** present interview completion rates for household and individual women in the 2017 MMIS by urban and rural areas, and region. The rates of completed household and women interviews are generally higher than expected.

Table A.6 Sample implementation: Women

Percent distribution of households and eligible women age 15-49 by results of the household and individual interviews, and household, eligible women and overall women response rates, according to residence and region (unweighted), Malawi MIS 2017

	Residence		Region			
Result	Urban	Rural	North	Central	South	Total
Selected households						
Completed (C)	99.3	99.5	99.4	99.4	99.5	99.4
Household present but no competent respondent at home (HP)	0.0	0.0	0.0	0.1	0.0	0.0
Refused (R)	0.1	0.0	0.0	0.0	0.1	0.0
Dwelling not found (DNF)	0.0	0.2	0.3	0.0	0.0	0.1
Household absent (HA)	0.1	0.0	0.0	0.1	0.0	0.0
Dwelling vacant/address not a dwelling (DV)	0.5	0.2	0.2	0.4	0.3	0.3
Dwelling destroyed (DD)	0.1	0.0	0.1	0.0	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of sampled households	1,500	2,250	1,250	1,250	1,250	3,750
Household response rate (HRR)[1]	99.9	99.8	99.7	99.9	99.9	99.8
Eligible women						
Completed (EWC)	100.0	100.0	100.0	100.0	99.9	100.0
Incapacitated (EWI)	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 women	1,693	2,168	1,315	1,313	1,233	3,861
Eligible women response rate (EWRR)[2]	100.0	100.0	100.0	100.0	99.9	100.0
Overall women response rate (ORR)[3]	99.9	99.7	99.7	99.9	99.8	99.8

[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:

$$OWRR = HRR * EWRR/100$$

ESTIMATE OF SAMPLING ERRORS APPENDIX B

The estimates from a sample survey are affected by two types of errors: non-sampling errors and sampling errors. Non-sampling 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 2017 Malawi Malaria Indicator Survey (MMIS) to minimize this type of error, non-sampling 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 2017 MMIS 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 between 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 2017 MMIS 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 SAS, using programs developed by ICF Macro. These programs use the Taylor linearization method of variance estimation for survey estimates that are means, proportions or ratios.

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 which 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 2017 MMIS 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 each of the country regions. 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 un-weighted (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 DEFT is considered undefined when the standard error considering a simple random sample is zero (when the estimate is close to 0 or 1).

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 0.401, and its standard error is 0.014. Therefore, to obtain the 95 percent confidence limits, one adds and subtracts twice the standard error to the sample estimate, i.e., $0.401 \pm 2 \times 0.014$. There is a high probability (95 percent) that the true proportion of children have fever in last two weeks is between 0.373 and 0.428.

For the total sample, the value of the DEFT, averaged over all variables, is 1.56. This means that, due to multi-stage clustering of the sample, the average standard error is increased by a factor of 1.56 over that in an equivalent simple random sample.

Table B.1 List of indicators for sampling errors, Malawi MIS 2017

Variable	Type of Estimate	Base Population
HOUSEHOLDS		
Ownership of at least one ITN	Proportion	All households interviewed
Ownership of at least one ITN for two persons	Proportion	All households interviewed and have at least one ITN
CHILDREN		
Slept under an ITN last night	Proportion	All children under age 5
Slept under an ITN last night in household with at least one ITN	Proportion	All children under age 5 in households having at least one ITN
Had a fever in last 2 weeks	Proportion	All children under age 5
For whom advice or treatment was sought	Proportion	Children under age 5 had fever in last 2 weeks
Had received ACT treatment for fever	Proportion	Children under age 5 had fever in last 2 weeks who received any antimalarial drugs
Prevalence of anaemia (haemoglobin level <8.0g/dl)	Proportion	Children age 6-59 months who were tested
Prevalence of malaria (RDT)	Proportion	Children age 6-59 months who were tested
Prevalence of malaria (microscopy)	Proportion	Children age 6-59 months who were tested
ALL WOMEN 15-49		
Urban residence	Proportion	All women age 15-49
Literacy	Proportion	All women age 15-49
No education	Proportion	All women age 15-49
At least some secondary education	Proportion	All women age 15-49
PREGNANT WOMEN		
Slept under an ITN last night	Proportion	Pregnant women age 15-49
Slept under an ITN last night in household with at least one ITN	Proportion	Pregnant women 15-49 in households having at least one ITN
Received two or more doses of SP/Fansidar during the pregnancy of the most recent live birth	Proportion	Women age 15-49 with a live birth in the 2 years
Received three or more doses of SP/Fansidar during the pregnancy of the most recent live birth	Proportion	Women age 15-49 with a live birth in the 2 years

Table B.2 Sampling errors: Total sample, Malawi MIS 2017

Variable	Value (R)	Standard error (SE)	Number of cases		Design effect (DEFT)	Relative Error (SE/R)	Confidence limits	
			Un-weighted (N)	Weighted (WN)			Lower (R-2SE)	Upper (R+2SE)
Urban residence	0.197	0.005	3,860	3,860	0.830	0.027	0.186	0.207
Literacy	0.696	0.019	3,860	3,860	2.552	0.027	0.658	0.734
No education	0.136	0.011	3,860	3,860	2.017	0.082	0.114	0.159
At least some secondary education	0.228	0.012	3,860	3,860	1.761	0.052	0.204	0.252
Ownership of at least one ITN	0.821	0.011	3,729	3,729	1.685	0.013	0.800	0.842
Ownership of at least one ITN for two persons	0.417	0.014	3,719	3,721	1.695	0.033	0.390	0.445
Child slept under an ITN last night	0.675	0.012	2,555	2,724	1.201	0.018	0.651	0.700
Child slept under an ITN last night in household with at least one ITN	0.788	0.011	2,222	2,335	1.153	0.014	0.766	0.809
Pregnant women slept under an ITN last night	0.625	0.034	254	284	1.173	0.054	0.557	0.693
Pregnant women slept under an ITN last night in household with at least one ITN	0.730	0.037	220	243	1.306	0.051	0.655	0.805
Woman received two or more doses of SP/Fansidar during the pregnancy of the most recent live birth	0.761	0.017	938	1,032	1.290	0.023	0.727	0.795
Woman received three or more doses of SP/Fansidar during the pregnancy of the most recent live birth	0.411	0.019	938	1,032	1.268	0.047	0.372	0.450
Child has fever in last 2 weeks	0.401	0.014	2,314	2,598	1.398	0.034	0.374	0.429
Child for whom advice or treatment was sought	0.544	0.026	794	1,043	1.590	0.047	0.492	0.595
Child took ACT	0.964	0.014	196	307	1.279	0.014	0.936	0.991
Child has anaemia (Haemoglobin level < 8.0 g/dl)	0.051	0.006	2,296	2,485	1.469	0.127	0.038	0.064
Child has malaria (child has RDT)	0.360	0.024	2,291	2,482	2.266	0.065	0.312	0.407
Child has malaria (based on microscopy test)	0.243	0.019	2,296	2,485	2.083	0.079	0.204	0.281

Table B.3 Sampling errors: Urban sample, Malawi MIS 2017

Variable	Value (R)	Standard error (SE)	Number of cases		Design effect (DEFT)	Relative Error (SE/R)	Confidence limits	
			Un-weighted (N)	Weighted (WN)			Lower (R-2SE)	Upper (R+2SE)
Urban residence	1.000	0.000	1,693	759	na	na	1.000	1.000
Literacy	0.894	0.013	1,693	759	1.727	0.014	0.869	0.920
No education	0.039	0.007	1,693	759	1.449	0.175	0.025	0.052
At least some secondary education	0.552	0.029	1,693	759	2.395	0.053	0.494	0.610
Ownership of at least one ITN	0.828	0.015	1,490	644	1.566	0.019	0.797	0.859
Ownership of at least one ITN for two persons	0.545	0.019	1,485	641	1.497	0.036	0.506	0.584
Child slept under an ITN last night	0.712	0.022	867	382	1.284	0.030	0.668	0.755
Child slept under an ITN last night in household with at least one ITN	0.806	0.019	773	337	1.220	0.023	0.769	0.843
Pregnant women slept under an ITN last night	0.615	0.060	86	36	1.126	0.098	0.494	0.736
Pregnant women slept under an ITN last night in household with at least one ITN	0.711	0.054	77	31	1.009	0.076	0.603	0.819
Woman received two or more doses of SP/Fansidar during the pregnancy of the most recent live birth	0.771	0.024	337	156	1.084	0.032	0.723	0.820
Woman received three or more doses of SP/Fansidar during the pregnancy of the most recent live birth	0.377	0.033	337	156	1.263	0.087	0.312	0.443
Child has fever in last 2 weeks	0.295	0.021	790	365	1.289	0.071	0.253	0.337
Child for whom advice or treatment was sought	0.584	0.036	227	108	1.120	0.062	0.511	0.656
Child took ACT	0.868	0.083	19	9	1.091	0.096	0.702	1.035
Child has anaemia (Haemoglobin level < 8.0 g/dl)	0.043	0.011	768	339	1.422	0.254	0.021	0.065
Child has malaria (child has RDT)	0.060	0.015	763	337	1.639	0.249	0.030	0.090
Child has malaria (based on microscopy test)	0.040	0.009	768	339	1.138	0.214	0.023	0.057

Table B.4 Sampling errors: Rural sample, Malawi MIS 2017

Variable	Value (R)	Standard error (SE)	Number of cases		Design effect (DEFT)	Relative Error (SE/R)	Confidence limits	
			Un-weighted (N)	Weighted (WN)			Lower (R-2SE)	Upper (R+2SE)
Urban residence	0.000	0.000	2,167	3,101	na	na	0.000	0.000
Literacy	0.647	0.023	2,167	3,101	2.257	0.036	0.601	0.693
No education	0.160	0.014	2,167	3,101	1.738	0.086	0.133	0.188
At least some secondary education	0.149	0.012	2,167	3,101	1.583	0.081	0.125	0.173
Ownership of at least one ITN	0.819	0.012	2,239	3,085	1.524	0.015	0.794	0.844
Ownership of at least one ITN for two persons	0.391	0.016	2,234	3,080	1.558	0.041	0.359	0.423
Child slept under an ITN last night	0.669	0.014	1,688	2,342	1.063	0.021	0.642	0.697
Child slept under an ITN last night in household with at least one ITN	0.784	0.012	1,449	1,998	1.019	0.016	0.760	0.809
Pregnant women slept under an ITN last night	0.627	0.038	168	248	1.042	0.060	0.551	0.702
Pregnant women slept under an ITN last night in household with at least one ITN	0.733	0.042	143	212	1.173	0.057	0.649	0.817
Woman received two or more doses of SP/Fansidar during the pregnancy of the most recent live birth	0.759	0.020	601	876	1.139	0.026	0.720	0.799
Woman received three or more doses of SP/Fansidar during the pregnancy of the most recent live birth	0.417	0.022	601	876	1.106	0.053	0.373	0.461
Child has fever in last 2 weeks	0.419	0.016	1,524	2,234	1.231	0.037	0.387	0.450
Child for whom advice or treatment was sought	0.539	0.028	567	935	1.382	0.053	0.482	0.596
Child took ACT	0.967	0.014	177	298	1.106	0.014	0.939	0.994
Child has anaemia (Haemoglobin level < 8.0 g/dl)	0.052	0.007	1,528	2,145	1.305	0.139	0.038	0.067
Child has malaria (child has RDT)	0.406	0.027	1,528	2,145	2.012	0.066	0.353	0.460
Child has malaria (based on microscopy test)	0.275	0.022	1,528	2,145	1.819	0.080	0.231	0.319

Table B.5 Sampling errors: North sample, Malawi MIS 2017

Variable	Value (R)	Standard error (SE)	Number of cases		Design effect (DEFT)	Relative Error (SE/R)	Confidence limits	
			Un-weighted (N)	Weighted (WN)			Lower (R-2SE)	Upper (R+2SE)
Urban residence	0.203	0.012	1,315	465	1.103	0.060	0.178	0.227
Literacy	0.852	0.017	1,315	465	1.720	0.020	0.818	0.886
No education	0.040	0.007	1,315	465	1.291	0.174	0.026	0.054
At least some secondary education	0.351	0.025	1,315	465	1.918	0.072	0.301	0.402
Ownership of at least one ITN	0.854	0.015	1,242	438	1.539	0.018	0.823	0.885
Ownership of at least one ITN for two persons	0.531	0.024	1,238	435	1.667	0.045	0.484	0.579
Child slept under an ITN last night	0.691	0.027	821	306	1.565	0.039	0.638	0.745
Child slept under an ITN last night in household with at least one ITN	0.769	0.024	741	275	1.482	0.031	0.722	0.817
Pregnant women slept under an ITN last night	0.547	0.077	78	27	1.339	0.142	0.392	0.702
Pregnant women slept under an ITN last night in household with at least one ITN	0.630	0.091	70	24	1.493	0.145	0.448	0.812
Woman received two or more doses of SP/Fansidar during the pregnancy of the most recent live birth	0.869	0.018	303	119	0.980	0.021	0.833	0.905
Woman received three or more doses of SP/Fansidar during the pregnancy of the most recent live birth	0.514	0.032	303	119	1.164	0.062	0.450	0.577
Child has fever in last 2 weeks	0.228	0.019	735	288	1.244	0.083	0.190	0.265
Child for whom advice or treatment was sought	0.628	0.062	171	65	1.682	0.099	0.504	0.753
Child took ACT	0.969	0.032	36	17	1.273	0.033	0.906	1.032
Child has anaemia (Haemoglobin level < 8.0 g/dl)	0.035	0.008	720	268	1.151	0.217	0.020	0.050
Child has malaria (child has RDT)	0.194	0.031	720	268	2.028	0.161	0.132	0.257
Child has malaria (based on microscopy test)	0.112	0.021	720	268	1.749	0.183	0.071	0.153

Table B.6 Sampling errors: Central sample, Malawi MIS 2017

Variable	Value (R)	Standard error (SE)	Number of cases		Design effect (DEFT)	Relative Error (SE/R)	Confidence limits	
			Un-weighted (N)	Weighted (WN)			Lower (R-2SE)	Upper (R+2SE)
Urban residence	0.205	0.008	1,313	1,657	0.757	0.041	0.188	0.222
Literacy	0.674	0.029	1,313	1,657	2.236	0.043	0.616	0.732
No education	0.143	0.014	1,313	1,657	1.491	0.101	0.114	0.172
At least some secondary education	0.208	0.015	1,313	1,657	1.342	0.072	0.178	0.238
Ownership of at least one ITN	0.738	0.020	1,243	1,572	1.569	0.027	0.699	0.777
Ownership of at least one ITN for two persons	0.299	0.021	1,240	1,569	1.633	0.071	0.256	0.341
Child slept under an ITN last night	0.623	0.019	896	1,153	1.050	0.031	0.585	0.661
Child slept under an ITN last night in household with at least one ITN	0.787	0.017	721	913	1.038	0.022	0.753	0.822
Pregnant women slept under an ITN last night	0.575	0.044	94	129	0.905	0.077	0.486	0.663
Pregnant women slept under an ITN last night in household with at least one ITN	0.745	0.053	74	99	1.080	0.071	0.639	0.852
Woman received two or more doses of SP/Fansidar during the pregnancy of the most recent live birth	0.779	0.027	326	419	1.206	0.035	0.724	0.834
Woman received three or more doses of SP/Fansidar during the pregnancy of the most recent live birth	0.419	0.033	326	419	1.209	0.078	0.354	0.485
Child has fever in last 2 weeks	0.439	0.025	825	1,110	1.478	0.057	0.389	0.490
Child for whom advice or treatment was sought	0.616	0.038	332	488	1.468	0.062	0.540	0.692
Child took ACT	0.951	0.022	97	171	1.174	0.023	0.908	0.995
Child has anaemia (Haemoglobin level < 8.0 g/dl)	0.061	0.011	815	1,065	1.367	0.183	0.039	0.084
Child has malaria (child has RDT)	0.397	0.035	810	1,062	1.948	0.089	0.326	0.467
Child has malaria (based on microscopy test)	0.260	0.031	815	1,065	1.920	0.120	0.198	0.322

Table B.7 Sampling errors: South sample, Malawi MIS 2017

Variable	Value (R)	Standard error (SE)	Number of cases		Design effect (DEFT)	Relative Error (SE/R)	Confidence limits	
			Un-weighted (N)	Weighted (WN)			Lower (R-2SE)	Upper (R+2SE)
Urban residence	0.187	0.008	1,232	1,738	0.722	0.043	0.171	0.203
Literacy	0.675	0.031	1,232	1,738	2.338	0.046	0.612	0.737
No education	0.156	0.020	1,232	1,738	1.972	0.131	0.115	0.197
At least some secondary education	0.214	0.021	1,232	1,738	1.793	0.098	0.172	0.256
Ownership of at least one ITN	0.888	0.014	1,244	1,719	1.510	0.015	0.861	0.915
Ownership of at least one ITN for two persons	0.497	0.022	1,241	1,717	1.519	0.043	0.454	0.540
Child slept under an ITN last night	0.719	0.018	838	1,264	1.056	0.025	0.683	0.755
Child slept under an ITN last night in household with at least one ITN	0.792	0.016	760	1,147	1.019	0.020	0.760	0.824
Pregnant women slept under an ITN last night	0.693	0.056	82	128	1.157	0.080	0.582	0.804
Pregnant women slept under an ITN last night in household with at least one ITN	0.737	0.059	76	120	1.242	0.080	0.620	0.855
Woman received two or more doses of SP/Fansidar during the pregnancy of the most recent live birth	0.720	0.026	309	494	1.069	0.036	0.669	0.771
Woman received three or more doses of SP/Fansidar during the pregnancy of the most recent live birth	0.379	0.028	309	494	1.087	0.074	0.322	0.435
Child has fever in last 2 weeks	0.408	0.018	754	1,201	1.060	0.044	0.372	0.444
Child for whom advice or treatment was sought	0.460	0.037	291	490	1.293	0.080	0.386	0.533
Child took ACT	0.980	0.016	63	119	1.033	0.016	0.949	1.012
Child has anaemia (Haemoglobin level < 8.0 g/dl)	0.045	0.009	761	1,152	1.243	0.199	0.027	0.063
Child has malaria (child has RDT)	0.364	0.038	761	1,152	2.111	0.104	0.288	0.440
Child has malaria (based on microscopy test)	0.257	0.029	761	1,152	1.796	0.114	0.198	0.316

DATA QUALITY TABLES

APPENDIX C

Table C.1 Household age distribution

Single-year age distribution of the de facto household population by sex (weighted), Malawi MIS 2017

	Female		Male			Female		Male	
Age	Number	Percent	Number	Percent	Age	Number	Percent	Number	Percent
0	251	3.0	237	3.0	36	91	1.1	92	1.2
1	267	3.2	241	3.1	37	86	1.0	76	1.0
2	241	2.8	279	3.5	38	91	1.1	83	1.0
3	254	3.0	267	3.4	39	73	0.9	64	0.8
4	344	4.1	331	4.2	40	77	0.9	86	1.1
5	218	2.6	188	2.4	41	62	0.7	68	0.9
6	278	3.3	301	3.8	42	58	0.7	59	0.8
7	273	3.2	321	4.1	43	39	0.5	53	0.7
8	248	2.9	224	2.8	44	47	0.6	44	0.6
9	292	3.5	236	3.0	45	49	0.6	57	0.7
10	245	2.9	264	3.3	46	39	0.5	39	0.5
11	255	3.0	246	3.1	47	40	0.5	47	0.6
12	279	3.3	307	3.9	48	44	0.5	40	0.5
13	246	2.9	232	2.9	49	38	0.5	33	0.4
14	181	2.1	175	2.2	50	47	0.6	25	0.3
15	181	2.1	186	2.4	51	48	0.6	20	0.3
16	178	2.1	176	2.2	52	56	0.7	38	0.5
17	153	1.8	222	2.8	53	42	0.5	45	0.6
18	149	1.8	148	1.9	54	39	0.5	32	0.4
19	148	1.8	123	1.6	55	32	0.4	34	0.4
20	132	1.6	136	1.7	56	50	0.6	31	0.4
21	144	1.7	134	1.7	57	50	0.6	19	0.2
22	193	2.3	132	1.7	58	44	0.5	40	0.5
23	131	1.5	97	1.2	59	30	0.4	27	0.3
24	144	1.7	130	1.7	60	46	0.5	33	0.4
25	167	2.0	124	1.6	61	23	0.3	14	0.2
26	111	1.3	86	1.1	62	19	0.2	9	0.1
27	118	1.4	107	1.4	63	21	0.3	28	0.4
28	119	1.4	109	1.4	64	23	0.3	32	0.4
29	113	1.3	79	1.0	65	13	0.2	24	0.3
30	115	1.4	88	1.1	66	23	0.3	17	0.2
31	118	1.4	85	1.1	67	28	0.3	40	0.5
32	119	1.4	81	1.0	68	17	0.2	13	0.2
33	95	1.1	88	1.1	69	15	0.2	16	0.2
34	117	1.4	87	1.1	70+	245	2.9	155	2.0
35	93	1.1	91	1.2	Don't know/ missing	4	0.1	8	0.1
					Total	8,460	100.0	7,899	100.0

Note: The de facto population includes all residents and non-residents 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, number and percent distribution of interviewed women age 15-49, and percentage of eligible women who were interviewed (weighted), by 5-year age groups, Malawi MIS 2017

	Household population of	Interviewed women age 15-49		Percentage of eligible women interviewed
Age group	women age 10-54	Number	Percentage	
10-14	1,206	na	na	na
15-19	809	809	22.0	100.0
20-24	744	744	20.3	100.0
25-29	628	628	17.1	100.0
30-34	564	564	15.4	100.0
35-39	433	432	11.8	99.6
40-44	283	283	7.7	100.0
45-49	211	211	5.7	100.0
50-54	232	na	na	na
15-49	3,672	3,670	100.0	99.9

Note: The de facto population includes all residents and non-residents who stayed in the household the night before the interview. Weights for both the 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 2017

Subject	Reference group	Percentage with information missing	Number of cases
Birth date	Birth in the 5 years preceding the survey		
Date only		1.55	2,873
Month only		0.83	2,873
Month and Year		0.00	2,873
Respondent's education	All women age 15-49	0.00	3,860
Anaemia	Living children age 6-59 months from the Biomarker questionnaire	0.91	2,508

Table C.4 Births by calendar years

Number of births, percentage with complete birth date, sex ratio at birth, and calendar year ratio by calendar year, according to living (L), dead (D), and total (T) children (weighted), Malawi MIS 2017

	Number of births			Percentage with complete birth date[1]			Sex ratio at birth[2]			Calendar year ratio[3]		
Calendar year	L	D	T	L	D	T	L	D	T	L	D	T
2017	179	4	183	100.0	100.0	100.0	94.4	122.6	94.9	na	na	na
2016	517	34	551	99.7	89.3	99.1	86.9	190.8	91.1	na	na	na
2015	516	18	534	100.0	100.0	100.0	104.3	121.1	104.8	102.2	76.6	101.0
2014	493	13	506	99.1	100.0	99.1	117.2	173.4	118.3	99.0	86.9	98.7
2013	480	12	491	98.0	100.0	98.0	118.9	1,782.8	123.6	88.0	99.6	88.2
2012	597	11	608	99.2	100.0	99.2	92.5	81.4	92.3	na	na	na
2013-2017	2,185	81	2,266	99.3	95.5	99.1	104.7	198.5	107.0	na	na	na
All	2,782	91	2,873	99.3	96.0	99.2	101.9	177.8	103.7	na	na	na

na = Not applicable
[1] Both year and month of birth given.
[2] (Bm/Bf)x100, where Bm and Bf are the numbers of male and female births, respectively.
[3] [2Bx/(Bx-1+Bx+1)]x100, where Bx is the number of births in calendar year x

PERSONS INVOLVED IN THE 2017 MALAWI MALARIA INDICATOR SURVEY

APPENDIX D

Survey Management Team

Dr Michael Kayange	Programme Manager
Dr B Chilima	Director - Laboratory
Gracious Hamuza	Project Manager
Austine Gumbo	Project Manager
Innocent Zungu	Assistant Director - Laboratory
Elizabeth Mkandawire	Logistics
Norman Lakalaka	Logistics
Kingsley C Manda	Mapping/Listing Trainer
Osman Luwembe	Driver
Kondwani Zimba	Driver
Loyd Mselera	Driver
Noel Dick	Programme Assistant
Milliam Miluka	Programme Assistant
Esnart Katuya	Programme Secretary
Diverson Banda	Logistics
Mathew Mhone (1971 - 2017)	Lab Supervisor
James Kaphiyo	Lab Supervisor

Listing Team

Elias Sambani	Leader
Oscar Nsutu	Leader
Harry Milala	Leader
George Golosi	Leader
Josephy Mphepo	Leader
John Salapa	Lister
Hastings Ngómbe	Lister
Chief Mahame	Lister
Charity Hamuza	Lister
Donald Sabola	Lister
Christina Kamanga	Lister
Kennie Mkandawire	Lister
Dyson Mapesi	Lister
Dyson Nkhata	Lister
George Mlenga	Lister
Esimie Dandaula	Mapper
Brian Malunga	Mapper
Richard Mbwana	Mapper
Tobias Maonga	Mapper
Noel Dick	Mapper
Christopher Ndawala	Mapper
Humphreys Tungánde	Mapper
Maria Chakanza	Mapper
Aisa Chimeza	Mapper

Umali Saidi	Mapper
James Pindani	Driver
Rodrick Bwanali	Driver
Cathbert Zapita	Driver
Mabvuto Moloko	Driver
Mayamiko Dzimphwanyani	Driver

Microscopist

Thomas Mughogho
Dorothy Moyo
Arthur Tembo
Gift Kasiyafumbi
Wesley Mwafulirwa
Geofrey Lutwama
Chifundo Banda
Moses Singini
Abel Phiri
Alick Banda
Tenson Makumb

Payment Team

Stuart Miller	Calcon Malawi
Paul Nank	Calcon Malawi

Fieldwork Team 1

Symon Nyondo	Team Supervisor
Alberta Kayange	Interviewer 1
Alice Msukwa	Interviewer 2
Sarah Msowoya	Interviewer 3
Wambwene Mwangomba	Biomarker 1
Grant Gondwe	Biomarker 2
Mabvuto Moloko	Driver

Fieldwork Team 2

Carolyn Chipeta	Supervisor
Agnes Banda Mapala	Interviewer 1
Sarah Nyirongo	Interviewer 2
Lizie Mzumala	Interviewer 3
Kandakuone Makamo	Biomarker 1
Patrick Kalengo	Biomarker 2
Prince Mghandira	Driver

Fieldwork Team 3

Sophie Gumbo	Team Supervisor
Ella Kamanga	Interviewer 1
Henly Kachisa	Interviewer 2
Rita Mukamusoni	Interviewer 3
Jeremia Nyondo	Biomarker 1
Grey Chizenga	Biomarker 2
Peter Mbewe	Driver

Fieldwork Team 4

Beatrice Kamanga	Team Supervisor
Regina Juwa	Interviewer 1
Beatrice Kamwendo	Interviewer 2
Chrissy Maulidi	Interviewer 3
Patrick Mbulaje	Biomarker 1
Yusufu Kanamazina	Biomarker 2
James Moyo	Driver

Fieldwork Team 5

Tiwonge Lungu	Supervisor
Kupatsa Chigona	Interviewer 1
Mirriam Maseko	Interviewer 2
Chrissy Sitima	Interviewer 3
Margaret Gremu	Biomarker 1
Chiyembekezo Kachala	Biomarker 2
Rhodrick Bwanali	Driver

Fieldwork Team 6

Doris Namanja	Supervisor
Annie Chaura Zoya	Interviewer 1
Grenna Jumbe	Interviewer 2
Naomi Khulungira	Interviewer 3
Reginald Mandula	Biomarker 1
Isaac Ajassie	Biomarker 2
Eston Manda	Driver

Fieldwork Team 7

Thereza Ziba	Supervisor
Thokozani Ngomba	Interviewer 1
Edgar Muonja	Interviewer 3
Deliah Gomiwa	Interviewer 3
Masauko Chiwaya	Biomarker 1
Joseph Kachikoti	Biomarker 2
Obedie Zondwayo	Driver

Fieldwork Team 8

Tionge Mafuleka	Team Supervisor
Gloria Thole	Interviewer 1
Liness Nkhoma	Interviewer 2
Esther Nagoli	Interviewer 3
Steven Mlonga	Biomarker 1
Judith Tasosa	Biomarker 2
James Pindani	Driver

Report Writing Team

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Austin Gumbo	NMCP
Gracious Hamuza	NMCP
Norman Lakalaka	NMCP
Agnes Banda Mapala	NMCP
Akuzike Tauzi Banda	NMCP
James Kaphiyo	Public Lab
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Collins Kwizombe	PMI
Ashley Malpass	PMI
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ICF

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Christian Reed
Jehan Ahmed
Mianmian Yu
Sam Lubwama
Geofrey Lutwama
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Mahmoud Elkasabi
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Nancy Johnson

QUESTIONNAIRES

APPENDIX E

FORMATTING DATE: 13 April 2017
ENGLISH LANGUAGE: 13 April 2017

2017 MALAWI MALARIA INDICATOR SURVEY
HOUSEHOLD QUESTIONNAIRE

MINISTRY OF HEALTH NATIONAL MALARIA CONTROL PROGRAM

IDENTIFICATION

PLACE NAME _____

NAME OF HOUSEHOLD HEAD _____

CLUSTER NUMBER . . . . . | | | | |

HOUSEHOLD NUMBER . . . . . | | | | |

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE				DAY
				MONTH
				YEAR 2017
INTERVIEWER'S NAME				INT. NO.
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** 01 | LANGUAGE OF INTERVIEW** | | NATIVE LANGUAGE OF RESPONDENT** | | TRANSLATOR USED (YES = 1, NO = 2) |

LANGUAGE OF QUESTIONNAIRE** ENGLISH

**LANGUAGE CODES:
01 ENGLISH
02 CHICHEWA
03 TUMBUKA
06 OTHER _____ (SPECIFY)

SUPERVISOR

NAME _____ NUMBER | | | | |

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INTRODUCTION AND CONSENT

Hello. My name is _____. I am working with the Ministry of Health. We are conducting a survey about malaria 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

100	RECORD THE TIME.	HOURS	
		MINUTES	

HOUSEHOLD SCHEDULE

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		DATE OF BIRTH	AGE	ELIGIBILITY	
1	**2**	**3**	**4**	**5**	**6**	**7A**	**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 5-9 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?	What is (NAME)'s date of birth? On what day, month, and year was (NAME) born? IF DON'T KNOW DAY, RECORD '98'. IF DON'T KNOW MONTH, RECORD '98'. IF DON'T KNOW YEAR, RECORD '9998.'	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	DAY MONTH YEAR	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

2A)	Just to make sure that I have a complete listing: are there any other people 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 SCHEDULE

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		DATE OF BIRTH	AGE	ELIGIBILITY	
1	**2**	**3**	**4**	**5**	**6**	**7A**	**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 5-9 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?	What is (NAME)'s date of birth? On what day, month, and year was (NAME) born? IF DON'T KNOW DAY, RECORD '98'. IF DON'T KNOW MONTH, RECORD '98'. IF DON'T KNOW YEAR, RECORD '9998.'	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	DAY MONTH YEAR	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 ☐

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 PIPED TO NEIGHBOR . . . . . 13 PUBLIC TAP/STANDPIPE . . . . . 14 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 SACHET WATER . . . . . 92 OTHER _____ 96 (SPECIFY)	→ 105 → 103 → 103
102	What is the main source of water used by your household for other purposes such as cooking and handwashing?	**PIPED WATER** PIPED INTO DWELLING . . . . . 11 PIPED TO YARD/PLOT . . . . . 12 PIPED TO NEIGHBOR . . . . . 13 PUBLIC TAP/STANDPIPE . . . . . 14 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 OTHER _____ 96 (SPECIFY)	→ 105
103	Where is that water source located?	IN OWN DWELLING . . . . . 1 IN OWN YARD/PLOT . . . . . 2 ELSEWHERE 3	→ 105
104	How long does it take to go there, get water, and come back?	MINUTES . . . . . ☐☐☐ DON'T KNOW 998	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
105	What kind of toilet facility do members of your household usually use? IF NOT POSSIBLE TO DETERMINE, ASK PERMISSION TO OBSERVE THE FACILITY.	**FLUSH OR POUR FLUSH TOILET** FLUSH TO PIPED SEWER SYSTEM . . . . . 11 FLUSH TO SEPTIC TANK . . . . . 12 FLUSH TO PIT LATRINE . . . . . 13 FLUSH TO SOMEWHERE ELSE . . . . . 14 FLUSH, DON'T KNOW WHERE . . . . . 15 **PIT LATRINE** VENTILATED IMPROVED PIT LATRINE . . . . . 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)	→ 108
106	Do you share this toilet facility with other households?	YES . . . . . 1 NO 2	→ 108
107	Including your own household, how many households use this toilet facility?	NO. OF HOUSEHOLDS IF LESS THAN 10 . . . . . 0 [ ] 10 OR MORE HOUSEHOLDS . . . . . 95 DON'T KNOW 98	
108	What type of fuel does your household mainly use for cooking?	ELECTRICITY . . . . . 01 LPG . . . . . 02 NATURAL GAS . . . . . 03 BIOGAS . . . . . 04 KEROSENE . . . . . 05 COAL, LIGNITE . . . . . 06 CHARCOAL . . . . . 07 WOOD . . . . . 08 STRAW/SHRUBS/GRASS . . . . . 09 AGRICULTURAL CROP RESIDUE . . . . . 10 ANIMAL DUNG . . . . . 11 NO FOOD COOKED IN HOUSEHOLD . . . . . 95 OTHER _____ 96 (SPECIFY)	
109	How many rooms in this household are used for sleeping?	ROOMS . . . . . [ ][ ]	
109A	How many separate rooms are in this household?	ROOMS . . . . . [ ][ ]	
109B	How many separate sleeping spaces are there in your household?	SPACES . . . . . [ ][ ]	
110	Does this household own any livestock, herds, other farm animals, or poultry?	YES . . . . . 1 NO 2	→ 112
111	How many of the following animals does this household own? IF NONE, RECORD '00'. IF 95 OR MORE, RECORD '95'. IF UNKNOWN, RECORD '98'. a) Milk cows or bulls? b) Other cattle? c) Horses, donkeys, or mules? d) Goats? e) Sheep? f) Chickens or other poultry? g) Pigs? h) Rabbits?	a) COWS/BULLS . . . . . [ ][ ] b) OTHER CATTLE . . . . . [ ][ ] c) HORSES/DONKEYS/MULES . . . . . [ ][ ] d) GOATS . . . . . [ ][ ] e) SHEEP . . . . . [ ][ ] f) CHICKENS/POULTRY . . . . . [ ][ ] g) PIGS . . . . . [ ][ ] h) RABBITS . . . . . [ ][ ]	

HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
112	Does any member of your household own any agricultural land?	YES . . . . . 1 NO 2	→ 114
113	How many hectares of agricultural land do members of this household own? 1 ACRE = 0.4 HECTARE 1 FOOTBALL PITCH = 2.5 ACRE IF 95 OR MORE HECTARES, CIRCLE '950' IF 95 OR MORE FOOT. PITCH, CIRCLE '950' IF 95 OR MORE ACRES, RECORD IN HECTARES	HECTARES . . . . . 1 ☐☐.☐ FOOTBALL PITCH . . . . . 2 ☐☐.☐ ACRES . . . . . 3 ☐☐.☐ 95 OR MORE HECTARES/FOOT. PITCH . . 950 DON'T KNOW 998	

114	Does your household have:	YES	NO
	a) Electricity?	a) ELECTRICITY 1	2
	b) A radio?	b) RADIO 1	2
	c) A television?	c) TELEVISION 1	2
	d) A non-mobile telephone?	d) NON-MOBILE TELEPHONE . . 1	2
	e) A computer/Tablet computer?	e) COMPUTER/TABLET 1	2
	f) A refrigerator?	f) REFRIGERATOR 1	2
	g) A Koloboyi?	g) KOLOBOYI 1	2
	h) A paraffin lamp?	h) PARAFFIN LAMP 1	2
	i) A bed with a mattress?	i) BED WITH MATTRESS 1	2
	j) A torch?	j) TORCH 1	2
	k) A sofa set?	k) SOFA SET 1	2

115	Does any member of this household own:	YES	NO
	a) A wrist watch?	a) WRIST WATCH 1	2
	b) A mobile phone?	b) MOBILE PHONE 1	2
	c) A bicycle?	c) BICYCLE 1	2
	d) A motorcycle or motor scooter?	d) MOTORCYCLE/SCOOTER 1	2
	e) An animal-drawn cart?	e) ANIMAL-DRAWN CART 1	2
	f) A car or truck?	f) CAR/TRUCK 1	2
	g) A boat with motor	g) BOAT WITH MOTOR 1	2

116	Does any member of this household have a bank account?	YES . . . . . 1 NO 2	
119	Does your household have any mosquito nets?	YES . . . . . 1 NO 2	→ 131
120	How many mosquito nets does your household have? IF 7 OR MORE NETS, RECORD '7'.	NUMBER OF NETS . . . . . ☐	

		NET #1	NET #2	NET #3
121	ASK THE RESPONDENT TO SHOW YOU ALL THE NETS IN THE HOUSEHOLD. IF MORE THAN 3 NETS, USE ADDITIONAL QUESTIONNAIRE(S).	OBSERVED HANGING . . 1 OBSERVED NOT HANGING/ PACKAGED . . . . . 2 NOT OBSERVED 3	OBSERVED HANGING . . 1 OBSERVED NOT HANGING/ PACKAGED . . . . . 2 NOT OBSERVED 3	OBSERVED HANGING . . 1 OBSERVED NOT HANGING/ PACKAGED . . . . . 2 NOT OBSERVED 3
121A	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
121B	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
121C	OBSERVE OR ASK THE SHAPE OF THE MOSQUITO NET	CONICAL . . . . 1 RECTANGULAR . . . . 2 (SKIP TO 122) OTHER 6	CONICAL . . . . 1 RECTANGULAR . . . . 2 (SKIP TO 122) OTHER 6	CONICAL . . . . 1 RECTANGULAR . . . . 2 (SKIP TO 122) OTHER 6
121D	Was this net altered to become a conical net?	YES . . . . 1 NO . . . . 2 (SKIP TO 122) NOT SURE 8	YES . . . . 1 NO . . . . 2 (SKIP TO 122) NOT SURE 8	YES . . . . 1 NO . . . . 2 (SKIP TO 122) NOT SURE 8
121E	How many nets were used to make the mosquito net conical?	ONE NET . . . . 1 TWO NETS . . . . 2 THREE OR MORE NET . . 3	ONE NET . . . . 1 TWO NETS . . . . 2 THREE OR MORE NET . . 3	ONE NET . . . . 1 TWO NETS . . . . 2 THREE OR MORE NET . . 3
122	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
123	OBSERVE OR ASK BRAND/TYPE OF MOSQUITO NET. IF BRAND IS UNKNOWN AND YOU CANNOT OBSERVE THE NET, SHOW PICTURES OF TYPICAL NET TYPES/BRANDS TO RESPONDENT.	**LONG-LASTING INSECTICIDE-TREATED NET (LLIN)** DAWAPLUS . . . . 11 DURANET . . . . 12 INTERCEPTOR . . . . . 13 LIFENET . . . . 14 MAGNET . . . . 15 OLYSET . . . . 16 OLYSET PLUS . . . . . 17 PERMANET 2.0 . . . . . 18 PERMANET 3.0 . . . . . 19 ROYAL SENTRY . . . . . 20 YORKOOL . . . . 21 OTHER/DON'T KNOW BRAND . . . . 26 OTHER TYPE . . . . 96 DON'T KNOW TYPE . . 98	**LONG-LASTING INSECTICIDE-TREATED NET (LLIN)** DAWAPLUS . . . . 11 DURANET . . . . 12 INTERCEPTOR . . . . . 13 LIFENET . . . . 14 MAGNET . . . . 15 OLYSET . . . . 16 OLYSET PLUS . . . . . 17 PERMANET 2.0 . . . . . 18 PERMANET 3.0 . . . . . 19 ROYAL SENTRY . . . . . 20 YORKOOL . . . . 21 OTHER/DON'T KNOW BRAND . . . . 26 OTHER TYPE . . . . 96 DON'T KNOW TYPE . . 98	**LONG-LASTING INSECTICIDE-TREATED NET (LLIN)** DAWAPLUS . . . . 11 DURANET . . . . 12 INTERCEPTOR . . . . . 13 LIFENET . . . . 14 MAGNET . . . . 15 OLYSET . . . . 16 OLYSET PLUS . . . . . 17 PERMANET 2.0 . . . . . 18 PERMANET 3.0 . . . . . 19 ROYAL SENTRY . . . . . 20 YORKOOL . . . . 21 OTHER/DON'T KNOW BRAND . . . . 26 OTHER TYPE . . . . 96 DON'T KNOW TYPE . . 98

		NET #1	NET #2	NET #3
126	Did you get the net through the 2015-2016 mass distribution campaign, during an antenatal care visit, at birth, or first immunization visit?	YES, 2015-2016 MASS CAMPAIGN . . . . 1 YES, ANC . . . . 2 YES, AT BIRTH . . . . 3 YES, IMMUNIZATION VISIT . . . . 4 (SKIP TO 128) NO 5	YES, 2015-2016 MASS CAMPAIGN . . . . 1 YES, ANC . . . . 2 YES, AT BIRTH . . . . 3 YES, IMMUNIZATION VISIT . . . . 4 (SKIP TO 128) NO 5	YES, 2015-2016 MASS CAMPAIGN . . . . 1 YES, ANC . . . . 2 YES, AT BIRTH . . . . 3 YES, IMMUNIZATION VISIT . . . . 4 (SKIP TO 128) NO 5
127	Where did you get the net?	GOVERNMENT HOSPITAL 01 GOVERNMENT HEALTH CENTER . . . . 02 GOVERNMENT HEALTH POST/OUTREACH . . 03 CHAM/MISSION . . . . 04 PRIVATE HEALTH FACILITY . . . . 05 PHARMACY . . . . 06 SHOP/MARKET . . . . 07 WORKPLACE . . . . 08 OTHER ______ (SPECIFY) 96 DON'T KNOW 98	GOVERNMENT HOSPITAL 01 GOVERNMENT HEALTH CENTER . . . . 02 GOVERNMENT HEALTH POST/OUTREACH . . 03 CHAM/MISSION . . . . 04 PRIVATE HEALTH FACILITY . . . . 05 PHARMACY . . . . 06 SHOP/MARKET . . . . 07 WORKPLACE . . . . 08 OTHER ______ (SPECIFY) 96 DON'T KNOW 98	GOVERNMENT HOSPITAL 01 GOVERNMENT HEALTH CENTER . . . . 02 GOVERNMENT HEALTH POST/OUTREACH . . 03 CHAM/MISSION . . . . 04 PRIVATE HEALTH FACILITY . . . . 05 PHARMACY . . . . 06 SHOP/MARKET . . . . 07 WORKPLACE . . . . 08 OTHER ______ (SPECIFY) 96 DON'T KNOW 98
128	Did anyone sleep under this mosquito net last night?	YES . . . . 1 NO . . . . 2 (SKIP TO 130) NOT SURE 8	YES . . . . 1 NO . . . . 2 (SKIP TO 130) NOT SURE 8	YES . . . . 1 NO . . . . 2 (SKIP TO 130) NOT SURE 8
129	Who slept under this mosquito net last night? RECORD THE PERSON'S NAME AND LINE NUMBER FROM 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		GO BACK TO 121 FOR NEXT NET; OR, IF NO MORE NETS, GO TO 131.	GO BACK TO 121 FOR NEXT NET; OR, IF NO MORE NETS, GO TO 131.	GO TO 121 IN FIRST COLUMN OF A NEW QUESTIONNAIRE; OR, IF NO MORE NETS, GO TO 131.

ADDITIONAL HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
131	OBSERVE MAIN MATERIAL OF THE FLOOR OF THE DWELLING. RECORD OBSERVATION.	**NATURAL FLOOR** EARTH/SAND . . . . . 11 DUNG . . . . . 12 **RUDIMENTARY FLOOR** WOOD PLANKS . . . . . 21 PALM/BAMBOO . . . . . 22 **FINISHED FLOOR** PARQUET OR POLISHED WOOD . . . . . 31 VINYL OR ASPHALT STRIPS . . . . . 32 CERAMIC TILES . . . . . 33 CEMENT . . . . . 34 CARPET . . . . . 35 OTHER _____ 96 (SPECIFY)	
132	OBSERVE MAIN MATERIAL OF THE ROOF OF THE DWELLING. RECORD OBSERVATION.	**NATURAL ROOFING** NO ROOF . . . . . 11 THATCH/PALM LEAF . . . . . 12 SOD . . . . . 13 **RUDIMENTARY ROOFING** RUSTIC MAT . . . . . 21 PALM/BAMBOO . . . . . 22 WOOD PLANKS . . . . . 23 CARDBOARD . . . . . 24 **FINISHED ROOFING** METAL . . . . . 31 WOOD . . . . . 32 CALAMINE/CEMENT FIBER . . . . . 33 CERAMIC TILES . . . . . 34 CEMENT . . . . . 35 ROOFING SHINGLES . . . . . 36 OTHER _____ 96 (SPECIFY)	
133	OBSERVE MAIN MATERIAL OF THE EXTERIOR WALLS OF THE DWELLING. RECORD OBSERVATION.	**NATURAL WALLS** NO WALLS . . . . . 11 CANE/PALM/TRUNKS . . . . . 12 DIRT . . . . . 13 **RUDIMENTARY WALLS** BAMBOO WITH MUD . . . . . 21 STONE WITH MUD . . . . . 22 UNCOVERED ADOBE . . . . . 23 PLYWOOD . . . . . 24 CARDBOARD . . . . . 25 REUSED WOOD . . . . . 26 **FINISHED WALLS** CEMENT . . . . . 31 STONE WITH LIME/CEMENT . . . . . 32 BRICKS . . . . . 33 CEMENT BLOCKS . . . . . 34 COVERED ADOBE . . . . . 35 WOOD PLANKS/SHINGLES . . . . . 36 OTHER _____ 96 (SPECIFY)	

ADDITIONAL MOSQUITO NETS RELATED QUESTIONS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
134	Has anyone in your household ever sold or given away a mosquito net?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
135	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) DON'T KNOW / NO PREFERENCE 8	
136	If you have a choice, what shape of mosquito net do you prefer?	CONICAL . . . . . 1 RECTANGULAR . . . . . 2 DON'T KNOW / NO PREFERENCE 8	→ 138 → 139
137	What are the reasons why you prefer a conical-shaped net over a rectangular-shaped net?	EASIER TO HANG . . . . . A EASIER TO STORE WHEN NOT HUNG . . . . . B EASIER TO TRAVEL WITH OUTSIDE THE HOUSEHOLD . . . . . C BETTER FIT AROUND SLEEPING PLACE . . . . . D TALLER . . . . . E MORE PEOPLE CAN SLEEP UNDER NET (WIDER F LOOKS NICER . . . . . G STRONGER . . . . . H OTHER _____ X (SPECIFY)	→ 139
138	What are the reasons why you prefer a rectangular-shaped net over a conical-shaped net?	EASIER TO HANG . . . . . A EASIER TO STORE WHEN NOT HUNG . . . . . B EASIER TO TRAVEL WITH OUTSIDE THE HOUSEHOLD . . . . . C BETTER FIT AROUND SLEEPING PLACE . . . . . D TALLER . . . . . E MORE PEOPLE CAN SLEEP UNDER NET (WIDER F LOOKS NICER . . . . . G STRONGER . . . . . H OTHER _____ X (SPECIFY)	
139	RECORD THE TIME.	HOURS . . . . . [ ][ ] MINUTES . . . . . [ ][ ]	

INTERVIEWER'S OBSERVATIONS

TO BE FILLED IN AFTER COMPLETING INTERVIEW

COMMENTS ABOUT INTERVIEW:

COMMENTS ON SPECIFIC QUESTIONS:

ANY OTHER COMMENTS:

SUPERVISOR'S OBSERVATIONS

EDITOR'S OBSERVATIONS

FORMATTING DATE: 13 April 2017
ENGLISH LANGUAGE: 13 April 2017

2017 MALAWI MALARIA INDICATOR SURVEY
BIOMARKER QUESTIONNAIRE

MINISTRY OF HEALTH NATIONAL MALARIA CONTROL PROGRAM

IDENTIFICATION

PLACE NAME _____

NAME OF HOUSEHOLD HEAD _____

CLUSTER NUMBER . . . . . [ ][ ][ ][ ]

HOUSEHOLD NUMBER . . . . . [ ][ ][ ][ ]

FIELDWORKER VISITS

	1	2	3	FINAL VISIT
DATE				DAY [ ][ ]
FIELDWORKER'S NAME				MONTH [ ][ ]
				YEAR 2017
NEXT VISIT: DATE				TOTAL NUMBER OF VISITS [ ]
TIME				

NOTES:

TOTAL ELIGIBLE CHILDREN [ ][ ]

LANGUAGE OF QUESTIONNAIRE** 01 | LANGUAGE OF INTERVIEW** [ ][ ] | NATIVE LANGUAGE OF RESPONDENT** [ ][ ] | TRANSLATOR (YES = 1, NO = 2) [ ]

LANGUAGE OF QUESTIONNAIRE** ENGLISH

**LANGUAGE CODES:
01 ENGLISH
02 CHICHEWA
03 TUMBUKA
04 OTHER _____ (SPECIFY)

SUPERVISOR

_____ NAME [ ][ ][ ][ ] NUMBER

101	CHECK COLUMN 9 IN HOUSEHOLD QUESTIONNAIRE. RECORD THE LINE NUMBER AND NAME FOR ALL ELIGIBLE CHILDREN 0-5 YEARS IN QUESTION 102; IF MORE THAN SIX CHILDREN, USE ADDITIONAL QUESTIONNAIRE(S).			
		CHILD 1	CHILD 2	CHILD 3
102	CHECK HOUSEHOLD QUESTIONNAIRE: LINE NUMBER FROM COLUMN 9.	LINE NUMBER . . . . . ☐☐ NAME _____	LINE NUMBER . . . . . ☐☐ NAME _____	LINE NUMBER . . . . . ☐☐ NAME _____
103	IF MOTHER INTERVIEWED: COPY CHILD'S DATE OF BIRTH (DAY, MONTH, AND YEAR) FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: What is (NAME)'s date of birth?	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR . . . ☐☐☐☐	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR . . . ☐☐☐☐	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR . . . ☐☐☐☐
104	CHECK 103: CHILD BORN IN 2012-2017?	YES . . . . . 1 NO . . . . . 2 → (SKIP TO 130)	YES . . . . . 1 NO . . . . . 2 → (SKIP TO 130)	YES . . . . . 1 NO . . . . . 2 → (SKIP TO 130)
105	CHECK 103: CHILD AGE 0-5 MONTHS, I.E., WAS CHILD BORN IN MONTH OF INTERVIEW OR 5 PREVIOUS MONTHS?	0-5 MONTHS . . . . . 1 → (SKIP TO 130) OLDER 2	0-5 MONTHS . . . . . 1 → (SKIP TO 130) OLDER 2	0-5 MONTHS . . . . . 1 → (SKIP TO 130) OLDER 2
106	NAME OF PARENT/OTHER ADULT RESPONSIBLE FOR THE CHILD.	NAME _____	NAME _____	NAME _____
107	ASK CONSENT FOR ANEMIA TEST FROM PARENT/OTHER ADULT.	As part of this survey, we are asking children in Malawi that are between 6 months to 5 years old from the selected households 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 2012 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 or no. It is up to you to decide. Will you allow (NAME OF CHILD) to participate in the anemia test?		
108	CIRCLE THE CODE AND SIGN YOUR NAME.	GRANTED . . . . . 1 _____ (SIGN) REFUSED . . . . . 2 NOT PRESENT/OTHER . 3	GRANTED . . . . . 1 _____ (SIGN) REFUSED . . . . . 2 NOT PRESENT/OTHER . 3	GRANTED . . . . . 1 _____ (SIGN) REFUSED . . . . . 2 NOT PRESENT/OTHER . 3

		CHILD 1	CHILD 2	CHILD 3
	CHECK HOUSEHOLD QUESTIONNAIRE: LINE NUMBER FROM COLUMN 9.	LINE NUMBER . . . . . . ☐☐ NAME ________	LINE NUMBER . . . . . . ☐☐ NAME ________	LINE NUMBER . . . . . . ☐☐ NAME ________

109	ASK CONSENT FOR MALARIA TEST FROM PARENT/OTHER ADULT.	As part of this survey, we are asking children all over the country to 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 assist the government to develop programs to prevent malaria. We ask that all children born in 2012 or later take part in malaria testing in this survey and give a few drops of blood from a finger or heel. 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 slide(s) 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 or no. It is up to you to decide. Will you allow (NAME OF CHILD) to participate in the malaria test?		
110	CIRCLE THE CODE, SIGN YOUR NAME, AND ENTER YOUR FIELDWORKER NUMBER.	GRANTED . . . . 1 REFUSED . . . . 2 ________ (SIGN AND ENTER YOUR FIELDWORKER NUMBER) ☐☐☐☐ NOT PRESENT/OTHER . 3	GRANTED . . . . 1 REFUSED . . . . 2 ________ (SIGN AND ENTER YOUR FIELDWORKER NUMBER) ☐☐☐☐ NOT PRESENT/OTHER . 3	GRANTED . . . . 1 REFUSED . . . . 2 ________ (SIGN AND ENTER YOUR FIELDWORKER NUMBER) ☐☐☐☐ NOT PRESENT/OTHER . 3
111	PREPARE EQUIPMENT AND SUPPLIES ONLY FOR THE TEST(S) FOR WHICH CONSENT HAS BEEN OBTAINED AND PROCEED WITH THE TEST(S).			
112	PLACE BAR CODE LABEL FOR MALARIA LAB TEST.	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT . . . 99994 REFUSED . . . . 99995 OTHER . . . . 99996 PUT THE 2ND BAR CODE ON THE RDT, THE 3RD ON THE THICK SMEAR SLIDE, THE 4TH ON THE THIN SMEAR SLIDE AND THE 5TH ON THE	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT . . . 99994 REFUSED . . . . 99995 OTHER . . . . 99996 PUT THE 2ND BAR CODE ON THE RDT, THE 3RD ON THE THICK SMEAR SLIDE, THE 4TH ON THE THIN SMEAR SLIDE AND THE 5TH ON THE	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT . . . 99994 REFUSED . . . . 99995 OTHER . . . . 99996 PUT THE 2ND BAR CODE ON THE RDT, THE 3RD ON THE THICK SMEAR SLIDE, THE 4TH ON THE THIN SMEAR SLIDE AND THE 5TH ON THE
113	RECORD HEMOGLOBIN LEVEL HERE AND IN THE ANEMIA AND MALARIA PAMPHLET.	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
114	CIRCLE THE CODE FOR THE MALARIA RDT.	TESTED . . . . 1 NOT PRESENT . . . . . . 2 REFUSED . . . . 3 OTHER . . . . 6 (SKIP TO 116)	TESTED . . . . 1 NOT PRESENT . . . . . . 2 REFUSED . . . . 3 OTHER . . . . 6 (SKIP TO 116)	TESTED . . . . 1 NOT PRESENT . . . . . . 2 REFUSED . . . . 3 OTHER . . . . 6 (SKIP TO 116)
115	RECORD THE RESULT OF THE MALARIA RDT HERE AND IN THE ANEMIA AND MALARIA PAMPHLET.	POSITIVE, Pf .... 1 POSITIVE, PAN .... 2 POSITIVE, Pf and PAN . 3 (SKIP TO 118) NEGATIVE . . . . 4 OTHER 6	POSITIVE, Pf .... 1 POSITIVE, PAN .... 2 POSITIVE, Pf and PAN . 3 (SKIP TO 118) NEGATIVE . . . . 4 OTHER 6	POSITIVE, Pf .... 1 POSITIVE, PAN .... 2 POSITIVE, Pf and PAN . 3 (SKIP TO 118) NEGATIVE . . . . 4 OTHER 6

		CHILD 1	CHILD 2	CHILD 3
	CHECK HOUSEHOLD QUESTIONNAIRE: LINE NUMBER FROM COLUMN 9.	LINE NUMBER . . . . . . ☐☐ NAME ________	LINE NUMBER . . . . . . ☐☐ NAME ________	LINE NUMBER . . . . . . ☐☐ NAME ________

116	CHECK 113: HEMOGLOBIN RESULT	BELOW 8.0 G/DL, SEVERE ANEMIA . . . 1 8.0 G/DL OR ABOVE . . . 2 NOT PRESENT . . . . . . 3 REFUSED . . . . 4 OTHER . . . . 6 (SKIP TO 130)	BELOW 8.0 G/DL, SEVERE ANEMIA . . . 1 8.0 G/DL OR ABOVE . . . 2 NOT PRESENT . . . . . . 3 REFUSED . . . . 4 OTHER . . . . 6 (SKIP TO 130)	BELOW 8.0 G/DL, SEVERE ANEMIA . . . 1 8.0 G/DL OR ABOVE . . . 2 NOT PRESENT . . . . . . 3 REFUSED . . . . 4 OTHER . . . . 6 (SKIP TO 130)
117	**SEVERE ANEMIA REFERRAL** RECORD THE RESULT OF THE ANEMIA TEST ON THE REFERRAL FORM.	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 130)		
118	Does (NAME) suffer from any of the following illnesses or symptoms: a) Extreme weakness? b) Heart problems? c) Loss of consciousness? d) Rapid or difficult breathing? e) Seizures? f) Abnormal bleeding? g) Jaundice or yellow skin? h) Dark urine?	YES NO a) EXTREME WEAKNESS 1 2 b) HEART PROBLEMS 1 2 c) LOSS OF CONSCIOUS. 1 2 d) RAPID BREATHING 1 2 e) SEIZURES 1 2 f) BLEEDING 1 2 g) JAUNDICE 1 2 h) DARK URINE 1 2	YES NO a) EXTREME WEAKNESS 1 2 b) HEART PROBLEMS 1 2 c) LOSS OF CONSCIOUS. 1 2 d) RAPID BREATHING 1 2 e) SEIZURES 1 2 f) BLEEDING 1 2 g) JAUNDICE 1 2 h) DARK URINE 1 2	YES NO a) EXTREME WEAKNESS 1 2 b) HEART PROBLEMS 1 2 c) LOSS OF CONSCIOUS. 1 2 d) RAPID BREATHING 1 2 e) SEIZURES 1 2 f) BLEEDING 1 2 g) JAUNDICE 1 2 h) DARK URINE 1 2
119	CHECK 118: ANY 'YES' CIRCLED?	NO ☐ YES ☐ (SKIP TO 122)	NO ☐ YES ☐ (SKIP TO 122)	NO ☐ YES ☐ (SKIP TO 122)
120	CHECK 113: HEMOGLOBIN RESULT	BELOW 8.0 G/DL, SEVERE ANEMIA . . . 1 (SKIP TO 122) 8.0 G/DL OR ABOVE . . . 2 NOT PRESENT . . . . . . 3 REFUSED . . . . 4 OTHER 6	BELOW 8.0 G/DL, SEVERE ANEMIA . . . 1 (SKIP TO 122) 8.0 G/DL OR ABOVE . . . 2 NOT PRESENT . . . . . . 3 REFUSED . . . . 4 OTHER 6	BELOW 8.0 G/DL, SEVERE ANEMIA . . . 1 (SKIP TO 122) 8.0 G/DL OR ABOVE . . . 2 NOT PRESENT . . . . . . 3 REFUSED . . . . 4 OTHER 6
121	In the past two weeks has (NAME) taken or is taking LA given by a doctor or health center to treat the malaria? VERIFY BY ASKING TO SEE TREATMENT	YES . . . . 1 (SKIP TO 123) NO . . . . 2 (SKIP TO 124)	YES . . . . 1 (SKIP TO 123) NO . . . . 2 (SKIP TO 124)	YES . . . . 1 (SKIP TO 123) NO . . . . 2 (SKIP TO 124)

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 0-5

		CHILD 1	CHILD 2	CHILD 3
	CHECK HOUSEHOLD QUESTIONNAIRE: LINE NUMBER FROM COLUMN 9.	LINE NUMBER . . . . . ☐☐ NAME _____	LINE NUMBER . . . . . ☐☐ NAME _____	LINE NUMBER . . . . . ☐☐ NAME _____

122	**SEVERE MALARIA REFERRAL** RECORD THE RESULT OF THE MALARIA RDT ON THE REFERRAL FORM.	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 taked to a health facility right away. (SKIP TO 128)		
123	ALREADY TAKING LA REFERRAL STATEMENT	You have told me that (NAME OF CHILD) had already received LA for malaria. Therefore, I cannot give you additional LA. However, the test shows that he/she has malaria. If your child has a fever for two days after the last dose of LA, you should take the child to the nearest health facility for further examination. (SKIP TO 130)		
124	READ INFORMATION FOR MALARIA TREATMENT AND CONSENT STATEMENT TO PARENT/OTHER	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.		
125	CIRCLE THE APPROPRIATE CODE AND SIGN YOUR NAME.	ACCEPTED MEDICINE . 1 _____ (SIGN) REFUSED . . . . . 2 OTHER 6	ACCEPTED MEDICINE . 1 _____ (SIGN) REFUSED . . . . . 2 OTHER 6	ACCEPTED MEDICINE . 1 _____ (SIGN) REFUSED . . . . . 2 OTHER 6
126	CHECK 125: MEDICATION ACCEPTED	ACCEPTED MEDICINE . 1 REFUSED . . . . . 2 OTHER . . . . . 6 (SKIP TO 130)	ACCEPTED MEDICINE . 1 REFUSED . . . . . 2 OTHER . . . . . 6 (SKIP TO 130)	ACCEPTED MEDICINE . 1 REFUSED . . . . . 2 OTHER . . . . . 6 (SKIP TO 130)
127	READ INFORMATION FOR MALARIA TREATMENT AND CONSENT STATEMENT TO PARENT/OTHER ADULT.	TREATMENT WITH ARTEMETHER-LUMEFANTRINE-(A-20mg tablets/L-120mg) Weight (in kg) – Approximate age — Dosage ≥5kg to 14kg (under 3 years) — 1 tablet AL in AM-1 tablet AL in PM daily for 3 days >14kg - <24kg (age 3-5 years) — 2 tablets AL in AM-2 tablets AL in PM daily for 3 days Give the child one tablet each day for three consucutive days. Take the medicine with fatty food or drinks like milk or breast milk. For smaller children, put the tablet in a little water, mix water and tablet well, and give to the child. If your child vomits within an hour of taking the medicine, repeat the dose and get additional tablets. ALSO TELL THE PARENT / OTHER ADULT: If (NAME OF CHILD) has any of the following symptoms, you should take him/her to a health professional for further assessment and treatment right away: -- A high temperature or fever -- Fast or difficulty breathing -- Not able to drink or breastfeed -- Gets sicker or does not get better in two days (SKIP TO 130)		
128	CHECK 113: HEMOGLOBIN RESULT	BELOW 8.0 G/DL, SEVERE ANEMIA 1 8.0 G/DL OR ABOVE 2 NOT PRESENT 3 REFUSED 4 OTHER 6 (SKIP TO 130)	BELOW 8.0 G/DL, SEVERE ANEMIA 1 8.0 G/DL OR ABOVE 2 NOT PRESENT 3 REFUSED 4 OTHER 6 (SKIP TO 130)	BELOW 8.0 G/DL, SEVERE ANEMIA 1 8.0 G/DL OR ABOVE 2 NOT PRESENT 3 REFUSED 4 OTHER 6 (SKIP TO 130)
129	**SEVERE ANEMIA REFERRAL** RECORD THE RESULT OF THE ANEMIA TEST ON THE REFERRAL FORM.	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.		
130	GO BACK TO 103 IN NEXT COLUMN OF THIS QUESTIONNAIRE OR IN THE FIRST COLUMN OF THE NEXT PAGE; IF NO MORE CHILDREN, END INTERVIEW.			

101	CHECK COLUMN 9 IN HOUSEHOLD QUESTIONNAIRE. RECORD THE LINE NUMBER AND NAME FOR ALL ELIGIBLE CHILDREN 0-5 YEARS IN QUESTION 102; IF MORE THAN SIX CHILDREN, USE ADDITIONAL QUESTIONNAIRE(S).			
		CHILD 4	CHILD 5	CHILD 6
102	CHECK HOUSEHOLD QUESTIONNAIRE: LINE NUMBER FROM COLUMN 9.	LINE NUMBER . . . . . ☐☐ NAME _____	LINE NUMBER . . . . . ☐☐ NAME _____	LINE NUMBER . . . . . ☐☐ NAME _____
103	IF MOTHER INTERVIEWED: COPY CHILD'S DATE OF BIRTH (DAY, MONTH, AND YEAR) FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: What is (NAME)'s date of birth?	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR . . . ☐☐☐☐	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR . . . ☐☐☐☐	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR . . . ☐☐☐☐
104	CHECK 103: CHILD BORN IN 2012-2017?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 130)	YES . . . . . 1 NO . . . . . 2 (SKIP TO 130)	YES . . . . . 1 NO . . . . . 2 (SKIP TO 130)
105	CHECK 103: CHILD AGE 0-5 MONTHS, I.E., WAS CHILD BORN IN MONTH OF INTERVIEW OR 5 PREVIOUS MONTHS?	0-5 MONTHS . . . . . 1 (SKIP TO 130) OLDER 2	0-5 MONTHS . . . . . 1 (SKIP TO 130) OLDER 2	0-5 MONTHS . . . . . 1 (SKIP TO 130) OLDER 2
106	NAME OF PARENT/OTHER ADULT RESPONSIBLE FOR THE CHILD.	NAME _____	NAME _____	NAME _____
107	ASK CONSENT FOR ANEMIA TEST FROM PARENT/OTHER ADULT.	As part of this survey, we are asking children in Malawi that are between 6 months to 5 years old from the selected households 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 2012 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 or no. It is up to you to decide.		
108	CIRCLE THE CODE AND SIGN YOUR NAME.	GRANTED . . . . . 1 _____ (SIGN) REFUSED . . . . . 2 NOT PRESENT/OTHER . 3	GRANTED . . . . . 1 _____ (SIGN) REFUSED . . . . . 2 NOT PRESENT/OTHER . 3	GRANTED . . . . . 1 _____ (SIGN) REFUSED . . . . . 2 NOT PRESENT/OTHER . 3

		CHILD 4	CHILD 5	CHILD 6
	CHECK HOUSEHOLD QUESTIONNAIRE: LINE NUMBER FROM COLUMN 9.	LINE NUMBER . . . . . . [ ][ ] NAME ________	LINE NUMBER . . . . . . [ ][ ] NAME ________	LINE NUMBER . . . . . . [ ][ ] NAME ________

109	ASK CONSENT FOR MALARIA TEST FROM PARENT/OTHER ADULT.	As part of this survey, we are asking children all over the country to 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 assist the government to develop programs to prevent malaria. We ask that all children born in 2012 or later take part in malaria testing in this survey and give a few drops of blood from a finger or heel. 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 slide(s) 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 or no. It is up to you to decide. Will you allow (NAME OF CHILD) to participate in the malaria test?		
110	CIRCLE THE CODE, SIGN YOUR NAME, AND ENTER YOUR FIELDWORKER NUMBER.	GRANTED . . . . 1 REFUSED . . . . 2 ________ (SIGN AND ENTER YOUR FIELDWORKER NUMBER) [ ][ ][ ][ ] NOT PRESENT/OTHER . 3	GRANTED . . . . 1 REFUSED . . . . 2 ________ (SIGN AND ENTER YOUR FIELDWORKER NUMBER) [ ][ ][ ][ ] NOT PRESENT/OTHER . 3	GRANTED . . . . 1 REFUSED . . . . 2 ________ (SIGN AND ENTER YOUR FIELDWORKER NUMBER) [ ][ ][ ][ ] NOT PRESENT/OTHER . 3
111	PREPARE EQUIPMENT AND SUPPLIES ONLY FOR THE TEST(S) FOR WHICH CONSENT HAS BEEN OBTAINED AND PROCEED WITH THE TEST(S).			
112	PLACE BAR CODE LABEL FOR MALARIA LAB TEST.	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT . . . 99994 REFUSED . . . . 99995 OTHER . . . . 99996 PUT THE 2ND BAR CODE ON THE RDT, THE 3RD ON THE THICK SMEAR SLIDE, THE 4TH ON THE THIN SMEAR SLIDE AND THE 5TH ON THE	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT . . . 99994 REFUSED . . . . 99995 OTHER . . . . 99996 PUT THE 2ND BAR CODE ON THE RDT, THE 3RD ON THE THICK SMEAR SLIDE, THE 4TH ON THE THIN SMEAR SLIDE AND THE 5TH ON THE	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT . . . 99994 REFUSED . . . . 99995 OTHER . . . . 99996 PUT THE 2ND BAR CODE ON THE RDT, THE 3RD ON THE THICK SMEAR SLIDE, THE 4TH ON THE THIN SMEAR SLIDE AND THE 5TH ON THE
113	RECORD HEMOGLOBIN LEVEL HERE AND IN THE ANEMIA AND MALARIA PAMPHLET.	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
114	CIRCLE THE CODE FOR THE MALARIA RDT.	TESTED . . . . 1 NOT PRESENT . . . . . . 2 REFUSED . . . . 3 OTHER . . . . 6 (SKIP TO 116)	TESTED . . . . 1 NOT PRESENT . . . . . . 2 REFUSED . . . . 3 OTHER . . . . 6 (SKIP TO 116)	TESTED . . . . 1 NOT PRESENT . . . . . . 2 REFUSED . . . . 3 OTHER . . . . 6 (SKIP TO 116)
115	RECORD THE RESULT OF THE MALARIA RDT HERE AND IN THE ANEMIA AND MALARIA PAMPHLET.	POSITIVE, Pf .... 1 POSITIVE, PAN .... 2 POSITIVE, Pf and PAN . 3 (SKIP TO 118) NEGATIVE . . . . 4 OTHER 6	POSITIVE, Pf .... 1 POSITIVE, PAN .... 2 POSITIVE, Pf and PAN . 3 (SKIP TO 118) NEGATIVE . . . . 4 OTHER 6	POSITIVE, Pf .... 1 POSITIVE, PAN .... 2 POSITIVE, Pf and PAN . 3 (SKIP TO 118) NEGATIVE . . . . 4 OTHER 6

		CHILD 4	CHILD 5	CHILD 6
	CHECK HOUSEHOLD QUESTIONNAIRE: LINE NUMBER FROM COLUMN 9.	LINE NUMBER . . . . . . [ ][ ] NAME ________	LINE NUMBER . . . . . . [ ][ ] NAME ________	LINE NUMBER . . . . . . [ ][ ] NAME ________
116	CHECK 113: HEMOGLOBIN RESULT	BELOW 8.0 G/DL, SEVERE ANEMIA . . . 1 8.0 G/DL OR ABOVE . . . 2 NOT PRESENT . . . . . . 3 REFUSED . . . . 4 OTHER . . . . 6 (SKIP TO 130)	BELOW 8.0 G/DL, SEVERE ANEMIA . . . 1 8.0 G/DL OR ABOVE . . . 2 NOT PRESENT . . . . . . 3 REFUSED . . . . 4 OTHER . . . . 6 (SKIP TO 130)	BELOW 8.0 G/DL, SEVERE ANEMIA . . . 1 8.0 G/DL OR ABOVE . . . 2 NOT PRESENT . . . . . . 3 REFUSED . . . . 4 OTHER . . . . 6 (SKIP TO 130)
117	**SEVERE ANEMIA REFERRAL** RECORD THE RESULT OF THE ANEMIA TEST ON THE REFERRAL FORM.	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 130)		
118	Does (NAME) suffer from any of the following illnesses or symptoms: a) Extreme weakness? b) Heart problems? c) Loss of consciousness? d) Rapid or difficult breathing? e) Seizures? f) Abnormal bleeding? g) Jaundice or yellow skin? h) Dark urine?	YES NO a) EXTREME WEAKNESS 1 2 b) HEART PROBLEMS 1 2 c) LOSS OF CONSCIOUS. 1 2 d) RAPID BREATHING 1 2 e) SEIZURES 1 2 f) BLEEDING 1 2 g) JAUNDICE 1 2 h) DARK URINE 1 2	YES NO a) EXTREME WEAKNESS 1 2 b) HEART PROBLEMS 1 2 c) LOSS OF CONSCIOUS. 1 2 d) RAPID BREATHING 1 2 e) SEIZURES 1 2 f) BLEEDING 1 2 g) JAUNDICE 1 2 h) DARK URINE 1 2	YES NO a) EXTREME WEAKNESS 1 2 b) HEART PROBLEMS 1 2 c) LOSS OF CONSCIOUS. 1 2 d) RAPID BREATHING 1 2 e) SEIZURES 1 2 f) BLEEDING 1 2 g) JAUNDICE 1 2 h) DARK URINE 1 2
119	CHECK 118: ANY 'YES' CIRCLED?	NO [ ] YES [ ] (SKIP TO 122)	NO [ ] YES [ ] (SKIP TO 122)	NO [ ] YES [ ] (SKIP TO 122)
120	CHECK 113: HEMOGLOBIN RESULT	BELOW 8.0 G/DL, SEVERE ANEMIA . . . 1 (SKIP TO 122) 8.0 G/DL OR ABOVE . . . 2 NOT PRESENT . . . . . . 3 REFUSED . . . . 4 OTHER 6	BELOW 8.0 G/DL, SEVERE ANEMIA . . . 1 (SKIP TO 122) 8.0 G/DL OR ABOVE . . . 2 NOT PRESENT . . . . . . 3 REFUSED . . . . 4 OTHER 6	BELOW 8.0 G/DL, SEVERE ANEMIA . . . 1 (SKIP TO 122) 8.0 G/DL OR ABOVE . . . 2 NOT PRESENT . . . . . . 3 REFUSED . . . . 4 OTHER 6
121	In the past two weeks has (NAME) taken or is taking LA given by a doctor or health center to treat the malaria? VERIFY BY ASKING TO SEE TREATMENT	YES . . . . 1 (SKIP TO 123) NO . . . . 2 (SKIP TO 124)	YES . . . . 1 (SKIP TO 123) NO . . . . 2 (SKIP TO 124)	YES . . . . 1 (SKIP TO 123) NO . . . . 2 (SKIP TO 124)

		CHILD 4	CHILD 5	CHILD 6
	CHECK HOUSEHOLD QUESTIONNAIRE: LINE NUMBER FROM COLUMN 9.	LINE NUMBER . . . . . ☐☐ NAME _____	LINE NUMBER . . . . . ☐☐ NAME _____	LINE NUMBER . . . . . ☐☐ NAME _____

122	**SEVERE MALARIA REFERRAL** RECORD THE RESULT OF THE MALARIA RDT ON THE REFERRAL FORM.	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 taked to a health facility right away. (SKIP TO 128)		
123	ALREADY TAKING LA REFERRAL STATEMENT	You have told me that (NAME OF CHILD) had already received LA for malaria. Therefore, I cannot give you additional LA. However, the test shows that he/she has malaria. If your child has a fever for two days after the last dose of LA, you should take the child to the nearest health facility for further examination. (SKIP TO 130)		
124	READ INFORMATION FOR MALARIA TREATMENT AND CONSENT STATEMENT TO PARENT/OTHER	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.		
125	CIRCLE THE APPROPRIATE CODE AND SIGN YOUR NAME.	ACCEPTED MEDICINE . 1 _____ (SIGN) REFUSED . . . . . 2 OTHER 6	ACCEPTED MEDICINE . 1 _____ (SIGN) REFUSED . . . . . 2 OTHER 6	ACCEPTED MEDICINE . 1 _____ (SIGN) REFUSED . . . . . 2 OTHER 6
126	CHECK 125: MEDICATION ACCEPTED	ACCEPTED MEDICINE . 1 REFUSED . . . . . 2 OTHER . . . . . 6 (SKIP TO 130)	ACCEPTED MEDICINE . 1 REFUSED . . . . . 2 OTHER . . . . . 6 (SKIP TO 130)	ACCEPTED MEDICINE . 1 REFUSED . . . . . 2 OTHER . . . . . 6 (SKIP TO 130)
127	READ INFORMATION FOR MALARIA TREATMENT AND CONSENT STATEMENT TO PARENT/OTHER ADULT.	TREATMENT WITH ARTEMETHER-LUMEFANTRINE-(A-20mg tablets/L-120mg) Weight (in kg) – Approximate age — Dosage ≥5kg to 14kg (under 3 years) — 1 tablet AL in AM-1 tablet AL in PM daily for 3 days >14kg - <24kg (age 3-5 years) — 2 tablets AL in AM-2 tablets AL in PM daily for 3 days Give the child one tablet each day for three consucutive days. Take the medicine with fatty food or drinks like milk or breast milk. For smaller children, put the tablet in a little water, mix water and tablet well, and give to the child. If your child vomits within an hour of taking the medicine, repeat the dose and get additional tablets. ALSO TELL THE PARENT / OTHER ADULT: If (NAME OF CHILD) has any of the following symptoms, you should take him/her to a health professional for further assessment and treatment right away: -- A high temperature or fever -- Fast or difficulty breathing -- Not able to drink or breastfeed -- Gets sicker or does not get better in two days (SKIP TO 130)		
128	CHECK 113: HEMOGLOBIN RESULT	BELOW 8.0 G/DL, SEVERE ANEMIA 1 8.0 G/DL OR ABOVE 2 NOT PRESENT 3 REFUSED 4 OTHER 6 (SKIP TO 130)	BELOW 8.0 G/DL, SEVERE ANEMIA 1 8.0 G/DL OR ABOVE 2 NOT PRESENT 3 REFUSED 4 OTHER 6 (SKIP TO 130)	BELOW 8.0 G/DL, SEVERE ANEMIA 1 8.0 G/DL OR ABOVE 2 NOT PRESENT 3 REFUSED 4 OTHER 6 (SKIP TO 130)
129	**SEVERE ANEMIA REFERRAL** RECORD THE RESULT OF THE ANEMIA TEST ON THE REFERRAL FORM.	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.		
130	GO BACK TO 103 IN NEXT COLUMN OF THIS QUESTIONNAIRE OR IN THE FIRST COLUMN OF THE NEXT PAGE; IF NO MORE CHILDREN, END INTERVIEW.			

FIELDWORKER'S OBSERVATIONS

TO BE FILLED IN AFTER COMPLETING BIOMARKERS

SUPERVISOR'S OBSERVATIONS

EDITOR'S OBSERVATIONS

FORMATTING DATE: 13 April 2017
ENGLISH LANGUAGE: 13 April 2017

2017 MALAWI MALARIA INDICATOR SURVEY
WOMAN'S QUESTIONNAIRE

MINISTRY OF HEALTH — NATIONAL MALARIA CONTROL PROGRAM

IDENTIFICATION

PLACE NAME _____

NAME OF HOUSEHOLD HEAD _____

CLUSTER NUMBER . . . . . [ ][ ][ ][ ]

HOUSEHOLD NUMBER . . . . . [ ][ ][ ][ ]

NAME AND LINE NUMBER OF WOMAN _____ [ ][ ]

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE	_____	_____	_____	DAY [ ][ ]
				MONTH [ ][ ]
				YEAR 2017
INTERVIEWER'S NAME	_____	_____	_____	INT. NO. [ ][ ][ ][ ]
RESULT*	_____	_____	_____	RESULT* [ ]
NEXT VISIT: DATE	_____	_____		TOTAL NUMBER OF VISITS [ ]
TIME	_____	_____		

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

LANGUAGE OF QUESTIONNAIRE** 01 — LANGUAGE OF INTERVIEW** [ ][ ] — NATIVE LANGUAGE OF RESPONDENT** [ ][ ] — TRANSLATOR USED (YES = 1, NO = 2) [ ]

LANGUAGE OF QUESTIONNAIRE** ENGLISH

**LANGUAGE CODES:
01 ENGLISH; 02 CHICHEWA; 03 TUMBUKA; 06 OTHER _____ (SPECIFY)

SUPERVISOR

_____ NAME — [ ][ ][ ][ ] NUMBER

INTRODUCTION AND CONSENT

Hello. My name is _____. I am working with the Malaria Control Program. We are conducting a survey about malaria 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 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 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

SECTION 1. RESPONDENT'S BACKGROUND

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
101	RECORD THE TIME.	HOURS . . . . . [ ][ ] 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	

SECTION 1. RESPONDENT'S BACKGROUND

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
106	What is the highest [GRADE/FORM/YEAR] you completed at that level? IF COMPLETED LESS THAN ONE YEAR AT THAT LEVEL, RECORD '00'.	[GRADE/FORM/YEAR] . . . . . ☐☐	
107	CHECK 105: PRIMARY OR SECONDARY ☐↓ HIGHER ☐ → 109		
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 PART OF THE 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	a) How many sons live with you? b) And how many daughters live with you? IF NONE, RECORD '00'.	a) SONS AT HOME . . . . . [ ][ ] b) 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	a) How many sons are alive but do not live with you? b) And how many daughters are alive but do not live with you? IF NONE, RECORD '00'.	a) SONS ELSEWHERE . . . . . [ ][ ] b) 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, who made any movement, sound, or effort to breathe, or who showed any other signs of life even if for a very short time?	YES . . . . . 1 NO 2	→ 208
207	a) How many boys have died? b) And how many girls have died? IF NONE, RECORD '00'.	a) BOYS DEAD . . . . . [ ][ ] b) GIRLS DEAD . . . . . [ ][ ]	
208	SUM ANSWERS TO 203, 205, AND 207, AND ENTER TOTAL. IF NONE, RECORD '00'.	TOTAL BIRTHS . . . . . [ ][ ]	
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 OR MORE BIRTHS ☐ NO BIRTHS ☐		→ 225
211	Now I'd like to ask you about your more recent births. How many births have you had in 2012-2017? RECORD NUMBER OF LIVE BIRTHS IN 2012-2017	TOTAL IN 2012-2017 . . . . . [ ][ ] NONE 00	→ 225

212 Now I would like to record the names of all your births in 2012-2017, whether still alive or not, starting with the most recent one you had.
RECORD IN 213 THE NAMES OF ALL THE BIRTHS BORN IN 2012-2017. RECORD TWINS AND TRIPLETS ON SEPARATE ROWS. IF THERE ARE MORE THAN 5 BIRTHS, USE AN ADDITIONAL QUESTIONNAIRE STARTING WITH THE SECOND ROW.

213 What name was given to your (most recent/ previous) baby? RECORD NAME. BIRTH HISTORY NUMBER.	214 Is (NAME) a boy or a girl?	215 Were any of these births twins?	216 On what day, month, and year was (NAME) born?	217 Is (NAME) still alive?	218 IF ALIVE: How old was (NAME) at (NAME)'s last birthday? RECORD AGE IN COMP-LETED YEARS.	219 IF ALIVE: Is (NAME) living with you?	220 IF ALIVE: RECORD HOUSEHOLD LINE NUMBER OF CHILD. RECORD '00' IF CHILD NOT LISTED IN HOUSEHOLD.	221 Were there any other live births between (NAME) and (NAME OF PREVIOUS BIRTH), including any children who died after birth?
01	BOY 1 GIRL 2	SING 1 MULT 2	DAY ☐☐ 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	DAY ☐☐ MONTH ☐☐ ☐☐☐☐ YEAR	YES 1 NO 2 → (SKIP TO 221)	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	DAY ☐☐ MONTH ☐☐ ☐☐☐☐ YEAR	YES 1 NO 2 → (SKIP TO 221)	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	DAY ☐☐ MONTH ☐☐ ☐☐☐☐ YEAR	YES 1 NO 2 → (SKIP TO 221)	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	DAY ☐☐ MONTH ☐☐ ☐☐☐☐ YEAR	YES 1 NO 2 → (SKIP TO 221)	AGE IN YEARS ☐☐	YES 1 NO 2	HOUSEHOLD LINE NUMBER ☐☐	YES 1 (ADD BIRTH) ↵ NO . . . . 2 (NEXT BIRTH) ↵

SECTION 2. REPRODUCTION

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
222	Have you had any live births since the birth of (NAME OF MOST RECENT BIRTH)?"	YES . . . . . 1 (RECORD BIRTH(S) IN TABLE) NO 2	
223	COMPARE 211 WITH NUMBER OF BIRTHS IN BIRTH HISTORY NUMBERS ARE SAME ☐ NUMBERS ARE DIFFERENT ☐ (PROBE AND RECONCILE)		
224	CHECK 216: ENTER THE NUMBER OF BIRTHS IN 2012-2017	NUMBER OF BIRTHS . . . . . ☐☐ NONE 0	
225	Are you pregnant now?	YES . . . . . 1 NO . . . . . 2 UNSURE 8	→ 227
226	How many months pregnant are you? RECORD NUMBER OF COMPLETED MONTHS.	MONTHS . . . . . ☐☐	
227	CHECK 224: ONE OR MORE BIRTHS IN 2012-2017 ☐ (GO TO 301) NO BIRTHS IN 2012-2017 ☐ Q. 224 IS BLANK ☐		→ 501 → 501

SECTION 3. PREGNANCY AND INTERMITTENT PREVENTIVE TREATMENT

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
301	RECORD THE NAME AND SURVIVAL STATUS OF THE MOST RECENT BIRTH FROM 213 AND 217,	MOST RECENT BIRTH NAME _____ LIVING ☐ DEAD ☐	
302	Now I would like to ask you some questions about your last pregnancy that resulted in a live birth. When you got 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/OFFICER/MEDICAL ASSISTANT . . A NURSE/MIDWIFE . . . . . B PATIENT ATTENDANT . . . . . C HSA . . . . . D **OTHER PERSON** TRADITIONAL BIRTH ATTENDANT . . . . . E OTHER _____ X (SPECIFY)	
304	During this pregnancy, did you take SP/Fansidar or Novidar SP to keep you from getting malaria?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 306D
305	How many times did you take SP/Fansidar or Novidar SP during this pregnancy?	TIMES . . . . . ☐☐	
306	Did you get the SP/Fansidar or Novidar SP during any antenatal care visit, during another visit to a health facility or from another source? IF MORE THAN ONE SOURCE, RECORD THE HIGHEST SOURCE ON THE LIST.	ANTENATAL VISIT . . . . . 1 ANOTHER FACILITY VISIT . . . . . 2 OTHER SOURCE 6	→ 306D
306A	How many times did you take SP/Fansidar or Novidar SP during an antenatal care visit?	TIMES . . . . . ☐☐	
306B	Did you take the SP/Fansidar or Novidar SP under direct observation by the health personnel each time?	YES . . . . . 1 NO 2	→ 306D
306C	How many times did you take the SP/Fansidar or Novidar SP under direct observation by the health personnel?	TIMES . . . . . ☐☐	

SECTION 3. PREGNANCY AND INTERMITTENT PREVENTIVE TREATMENT

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
306D	Did you take CPT (cotrimoxazole preventive therapy) during the last pregnancy?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 306F
306E	How long did you take cotrimoxazole during the last pregnancy? IF LESS THAN 1 WEEK, RECORDS DAYS; IF LESS THAN 1 MONTH, RECORD DAYS.	DAYS . . . . . 1 WEEKS . . . . . 2 MONTHS . . . . . 3 DON'T KNOW 998	
306F	CHECK 302: ANC RECEIVED	ANC RECEIVED NO ANC → (SKIP TO 307)	
306G	Do you have an ANC card for the time you were pregnant with (NAME)?	YES, SEEN . . . . . 1 YES, NOT SEEN . . . . . 2 → (SKIP TO 307) NO CARD 3	
306H	CHECK ANC CARD AND RECORD NUMER OF SP/FANSIDAR GIVEN	DOSES . . . . . NONE 0	
307	CHECK 216 AND 217: ONE OR MORE LIVING CHILDREN BORN IN 2012-2017 → (GO TO 401) NO LIVING CHILDREN BORN IN 2012-2017 → 501		

SECTION 4. FEVER IN CHILDREN

401	CHECK 213: RECORD THE BIRTH HISTORY NUMBER IN 402 AND THE NAME AND SURVIVAL STATUS IN 403 FOR EACH BIRTH IN 2012-2017. ASK THE QUESTIONS ABOUT ALL OF THESE BIRTHS. BEGIN WITH THE MOST RECENT BIRTH. IF THERE ARE MORE THAN 2 BIRTHS, USE ADDITIONAL QUESTIONNAIRE(S). Now I would like to ask some questions about the health of your children born since January 2012. (We will talk about each separately.)		
402	BIRTH HISTORY NUMBER FROM 213 IN BIRTH HISTORY.	MOST RECENT BIRTH BIRTH HISTORY NUMBER	NEXT MOST RECENT BIRTH BIRTH HISTORY NUMBER . . . . .
403	FROM 213 AND 217:	NAME _____ LIVING / DEAD → (SKIP TO 426)	NAME _____ LIVING / DEAD → (SKIP TO 426)
404	Has (NAME) been ill with a fever at any time in the last 2 weeks?	YES . . . . . 1 NO . . . . . 2 → (SKIP TO 426) DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 → (SKIP TO 426) DON'T KNOW 8
404A	How many days ago did the fever start? IF LESS THAN ONE DAY, RECORD '00'.	DAYS	DAYS . . . . .
405	At any time during the illness, did (NAME) have blood taken from (NAME)'s finger or heel for testing?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8
406	Did you seek advice or treatment for the illness from any source?	YES . . . . . 1 NO . . . . . 2 → (SKIP TO 411)	YES . . . . . 1 NO . . . . . 2 → (SKIP TO 411)

SECTION 4. FEVER IN CHILDREN

NO.	QUESTIONS AND FILTERS	MOST RECENT BIRTH NAME _____	NEXT MOST RECENT BIRTH NAME _____
407	Where did you seek advice or treatment? Anywhere else? PROBE TO IDENTIFY THE TYPE OF SOURCE. IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE(S). _____ (NAME OF PLACE(S))	**PUBLIC SECTOR** GOVERNMENT HOSPITAL . . A GOVERNMENT HEALTH CENTER . . . . . B GOVERNMENT HEALTH POST/OUTREACH . . . . . C MOBILE CLINIC . . . . . D HSA . . . . . E OTHER PUBLIC SECTOR _____ F (SPECIFY) **CHAM/MISSION** HOSPITAL . . . . . G HEALTH CENTER . . . . . H **PRIVATE MEDICAL SECTOR** PRIVATE HOSPITAL/ CLINIC . . . . . I PHARMACY . . . . . J PRIVATE DOCTOR . . . . . K MOBILE CLINIC . . . . . L HSA . . . . . M OTHER PRIVATE MEDICAL SECTOR _____ N (SPECIFY) **BLM** . . . . . O **MACRO** . . . . . P **YOUTH DROP IN CENTRE** . . Q **OTHER SOURCE** SHOP . . . . . R TRADITIONAL PRACTITIONER . . . . . S MARKET . . . . . T ITINERANT DRUG SELLER . . . . . U OTHER _____ X (SPECIFY)	**PUBLIC SECTOR** GOVERNMENT HOSPITAL . . A GOVERNMENT HEALTH CENTER . . . . . B GOVERNMENT HEALTH POST/OUTREACH . . . . . C MOBILE CLINIC . . . . . D HSA . . . . . E OTHER PUBLIC SECTOR _____ F (SPECIFY) **CHAM/MISSION** HOSPITAL . . . . . G HEALTH CENTER . . . . . H **PRIVATE MEDICAL SECTOR** PRIVATE HOSPITAL/ CLINIC . . . . . I PHARMACY . . . . . J PRIVATE DOCTOR . . . . . K MOBILE CLINIC . . . . . L HSA . . . . . M OTHER PRIVATE MEDICAL SECTOR _____ N (SPECIFY) **BLM** . . . . . O **MACRO** . . . . . P **YOUTH DROP IN CENTRE** . . Q **OTHER SOURCE** SHOP . . . . . R TRADITIONAL PRACTITIONER . . . . . S MARKET . . . . . T ITINERANT DRUG SELLER . . . . . U OTHER _____ X (SPECIFY)
407A	How much did you spend on the treatment including consultation and fees, if any?	COST IN KWACHA [ ][ ][ ][ ][ ] FREE ..... 99995 DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] FREE ..... 99995 DON'T KNOW 99998
407B	How much did you spend on the drugs?	COST IN KWACHA [ ][ ][ ][ ][ ] FREE ..... 99995 DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] FREE ..... 99995 DON'T KNOW 99998
408	CHECK 407:	TWO OR MORE CODES CIRCLED ↓ ONLY ONE CODE CIRCLED → (SKIP TO 410)	TWO OR MORE CODES CIRCLED ↓ ONLY ONE CODE CIRCLED → (SKIP TO 410)

SECTION 4. FEVER IN CHILDREN

NO.	QUESTIONS AND FILTERS	MOST RECENT BIRTH NAME _____	NEXT MOST RECENT BIRTH NAME _____
409	Where did you first seek advice or treatment? USE LETTER CODE FROM 407	FIRST PLACE . . . . . [ ]	FIRST PLACE . . . . . [ ]
409A	How far is your house from the (FIRST PLACE IN 409)?	LESS THAN 15KM . . . . . 1 15KM OR MORE 2	LESS THAN 15KM . . . . . 1 15KM OR MORE 2
409B	How much did you spend on transport to and from the (FIRST PLACE IN 409)?	COST IN KWACHA [ ][ ][ ][ ][ ] FREE ..... 99995 DON'T KNOW 99998	COST IN KWACHA [ ][ ][ ][ ][ ] FREE ..... 99995 DON'T KNOW 99998
409C	Did you take any days off work to care for your child's illness?	YES . . . . . 1 NO . . . . . 2 → (SKIP TO 410)	YES . . . . . 1 NO . . . . . 2 → (SKIP TO 410)
409D	How many days did you take take off work to care for your child's illness?	DAYS . . . . . [ ][ ]	DAYS . . . . . [ ][ ]
410	How many days after the illness began did you first seek advice or treatment for (NAME)? IF THE SAME DAY RECORD '00'.	DAYS . . . . . [ ][ ]	DAYS . . . . . [ ][ ]
411	At any time during the illness, did (NAME) take any drugs for the illness?	YES . . . . . 1 NO . . . . . 2 → (SKIP TO 426) DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 → (SKIP TO 426) DON'T KNOW 8
412	What drugs did (NAME) take? Any other drugs? RECORD ALL MENTIONED.	**ANTIMALARIAL DRUGS** LA . . . . . A ASAQ (COMBINED AMODIAQUINE AND ARTESUNATE) . . . . . B SP/FANSIDAR/ NOVIDAR SP . . . . . C QUININE TABLETS . . . . . D INJECTION/IV . . . . . E ARTESUNATE RECTAL . . . . . F INJECTION/IV . . . . . G OTHER ANTIMALARIAL _____ H (SPECIFY) **ANTIBIOTIC DRUGS** PILL/SYRUP . . . . . I INJECTION/IV . . . . . J **OTHER DRUGS** ASPIRIN/CAFENOL . . . . . K ACETAMINOPHEN/ PANADOL/ PARACETAMOL . . . . . L IBUPROFEN . . . . . M OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	**ANTIMALARIAL DRUGS** LA . . . . . A AA/ASAQ (COMBINED AMODIAQUINE AND ARTESUNATE) . . . . . B SP/FANSIDAR/ NOVIDAR SP . . . . . C QUININE TABLETS . . . . . D INJECTION/IV . . . . . E ARTESUNATE RECTAL . . . . . F INJECTION/IV . . . . . G OTHER ANTIMALARIAL _____ H (SPECIFY) **ANTIBIOTIC DRUGS** PILL/SYRUP . . . . . I INJECTION/IV . . . . . J **OTHER DRUGS** ASPIRIN/CAFENOL . . . . . K ACETAMINOPHEN/ PANADOL/ PARACETAMOL . . . . . L IBUPROFEN . . . . . M OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z

SECTION 4. FEVER IN CHILDREN

NO.	QUESTIONS AND FILTERS	MOST RECENT BIRTH NAME _____	NEXT MOST RECENT BIRTH NAME _____
413	CHECK 412: ANY CODE A-H CIRCLED?	YES → NO → (SKIP TO 426)	YES → NO → (SKIP TO 426)
414	CHECK 412: LA ('A') GIVEN	CODE 'A' CIRCLED → CODE 'A' NOT CIRCLED → (SKIP TO 416)	CODE 'A' CIRCLED → CODE 'A' NOT CIRCLED → (SKIP TO 416)
415	How long after the fever started did (NAME) first take LA?	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
415A	For how many days did (NAME) take LA?	DAYS	DAYS . . . . .
415B	Did you have LA 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 first?	HOME . . . . . 01 GOVERNMENT HEALTH FACILITY/WORKER . . . . . 02 CHAM/MISSION FACILITY/WORKER . . . . . 03 PRIVATE HEALTH FACILITY/WORKER . . . . . 04 BLM HEALTH FACILITY/WORKEF 05 MACRO HEALTH FACILITY/ WORKER . . . . . 06 YOUTH DROP IN CENTRE . . . . . 07 SHOP . . . . . 08 OTHER _____ 96 (SPECIFY)	HOME . . . . . 01 GOVERNMENT HEALTH FACILITY/WORKER . . . . . 02 CHAM/MISSION FACILITY/WORKER . . . . . 03 PRIVATE HEALTH FACILITY/WORKER . . . . . 04 BLM HEALTH FACILITY/WORKEF 05 MACRO HEALTH FACILITY/ WORKER . . . . . 06 YOUTH DROP IN CENTRE . . . . . 07 SHOP . . . . . 08 OTHER _____ 96 (SPECIFY)
415C	Did you purchase the LA?	YES . . . . . 1 NO . . . . . 2 → (SKIP TO 416)	YES . . . . . 1 NO . . . . . 2 → (SKIP TO 416)
415D	How much did you pay for the LA?	COST IN KWACHA DON'T KNOW 99998	COST IN KWACHA DON'T KNOW 99998
416	CHECK 412: ASAQ (COMBINED AMODIAQUINE AND ARTESUNATE) ('B') GIVEN	CODE 'B' CIRCLED → CODE 'B' NOT CIRCLED → (SKIP TO 418)	CODE 'B' CIRCLED → CODE 'B' NOT CIRCLED → (SKIP TO 418)
417	How long after the fever started did (NAME) first take 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

SECTION 4. FEVER IN CHILDREN

NO.	QUESTIONS AND FILTERS	MOST RECENT BIRTH NAME_____	NEXT MOST RECENT BIRTH NAME_____
418	CHECK 412: SP/FANSIDAR/NOVIDAR SP ('C') GIVEN	CODE 'C' CIRCLED → CODE 'C' NOT CIRCLED (SKIP TO 420)	CODE 'C' CIRCLED → CODE 'C' NOT CIRCLED (SKIP TO 420)
419	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
420	CHECK 412: QUININE ('D' OR 'E') GIVEN	CODE 'D' OR 'E' CIRCLED → CODE 'D' OR 'E' NOT CIRCLED (SKIP TO 422)	CODE 'D' OR 'E' CIRCLED → CODE 'D' OR 'E' NOT CIRCLED (SKIP TO 422)
421	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
422	CHECK 412: ARTESUNATE ('F' OR 'G') GIVEN	CODE 'F' OR 'G' CIRCLED → CODE 'F' OR 'G' NOT CIRCLED (SKIP TO 424)	CODE 'F' OR 'G' CIRCLED → CODE 'F' OR 'G' NOT CIRCLED (SKIP TO 424)
423	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
424	CHECK 412: OTHER ANTIMALARIAL ('H') GIVEN	CODE 'H' CIRCLED → CODE 'H' NOT CIRCLED (SKIP TO 426)	CODE 'H' CIRCLED → CODE 'H' NOT CIRCLED (SKIP TO 426)
425	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
426		GO BACK TO 403 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 501.	GO TO 403 IN FIRST COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, GO TO 501.

SECTION 5. KNOWLEDGE OF MALARIA

501	Have you ever heard of an illness called malaria?	YES . . . . . 1 NO 2	→ 516
502	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	
503	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	
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 REPELLENT . . . . . C TAKE PREVENTATIVE MEDICATION . . . . . D SPRAY THE HOUSE/ROOMS WITH INSECTICIDE E CLEAR WEEDS AROUND THE HOUSE . . . . . F USE MOSQUITO COILS . . . . . G CUT GRASS AROUND THE HOUSE . . . . . H FILL IN STAGNANT WATERS (PUDDLES) . . . . . I KEEP SURROUNDING 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	
505	What are the danger signs of malaria? Anything else? RECORD ALL MENTIONED.	SEAZURE/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 the past six months, have you listened or seen any messages or information about malaria?	YES . . . . . 1 NO 2	→ 510
507	Where did you hear or see these messages of information? a) At a Government clinic/hospital? b) From a community health worker? c) From a friend/relative? d) At workplace? e) In drama groups? f) From peer educators? g) On a poster or billboard? h) On the television? i) On the radio? j) In a newspaper? k) Anywhere else?	YES NO a) GOVT.CLINIC/HOSPITAL . . . . . 1 2 b) COMMUNITY HEALTH WORKER . . . . . 1 2 c) FRIENDS/FAMILY . . . . . 1 2 d) WORKPLACE . . . . . 1 2 e) DRAMA GROUPS . . . . . 1 2 f) PEER EDUCATORS . . . . . 1 2 g) POSTER/BILLBOARD . . . . . 1 2 h) TELEVISION . . . . . 1 2 i) RADIO . . . . . 1 2 j) NEWSPAPER . . . . . 1 2 k) ANYWHERE ELSE 1 2	
508	How many months ago was the last time you heard or saw the messages?	MONTHS AGO	
509	What type of messages about malaria did you hear or see? 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 . . . . . H NOT PLASTERING WALLS AFTER SPRAYING . . I ENVIRONMENTAL SANITATION ACTIVTIES . . . . . J OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
510	Has anyone ever provided you with information on malaria at your home?	YES . . . . . 1 NO 2	→ 514
511	Who gave you the information at your home? Anyone 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	
512	How long ago did someone visit your house to provide you information about malaria?	MONTHS AGO	
513	What type of messages about malaria did you hear or see? 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 . . . . . H NOT PLASTERING WALLS AFTER SPRAYING . . I ENVIRONMENTAL SANITATION ACTIVTIES . . . . . J OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	

514	Has any mosquito net in this house been used for any reason other than sleeping?	YES . . . . . 1 NO 2	→ 516
515	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	
516	RECORD THE TIME.	HOURS . . . . . [ ][ ] MINUTES . . . . . [ ][ ]	

INTERVIEWER'S OBSERVATIONS

TO BE FILLED IN AFTER COMPLETING INTERVIEW

COMMENTS ABOUT INTERVIEW:

COMMENTS ON SPECIFIC QUESTIONS:

ANY OTHER COMMENTS:

SUPERVISOR'S OBSERVATIONS

EDITOR'S OBSERVATIONS

2017 MALAWI MALARIA INDICATOR SURVEY
FIELDWORKER QUESTIONNAIRE

MINISTRY OF HEALTH
NATIONAL MALARIA CONTROL PROGRAM

LANGUAGE OF QUESTIONNAIRE ENGLISH

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
100	What is your name?	NAME _____	
101	RECORD FIELDWORKER NUMBER	NUMBER . . . . . [ ][ ][ ][ ]	

INSTRUCTIONS

Information on all 2017 Malawi MIS field workers is collected as part of the MMIS survey. Please fill out the questions below. The information you provide will be part of the survey data file; however, your name will be removed and will not be part of the data file. Thank you for providing the information needed.

102	In what REGION do you live?	NORTHERN . . . . . 01 CENTRAL . . . . . 02 SOUTHERN 03	
103	Do you live in a city, town, or rural area?	CITY . . . . . 1 TOWN . . . . . 2 RURAL 3	
104	How old are you? RECORD AGE IN COMPLETED YEARS.	AGE . . . . . [ ][ ]	
105	Are you male or female?	MALE . . . . . 1 FEMALE 2	
106	What is your current marital status?	CURRENTLY MARRIED . . . . . 1 LIVING WITH A MAN/WOMAN . . . . . 2 WIDOWED . . . . . 3 DIVORCED . . . . . 4 SEPARATED . . . . . 5 NEVER MARRIED OR LIVED WITH A MAN/WOMAN 6	
107	How many living children do you have? INCLUDE ONLY CHILDREN WHO ARE YOUR BIOLOGICAL CHILDREN.	LIVING CHILDREN . . . . . [ ][ ]	
108	Have you ever had a child who died?	YES . . . . . 1 NO 2	
109	What is the highest level of school you attended: primary, secondary, or higher?	PRIMARY . . . . . 1 SECONDARY . . . . . 2 HIGHER 3	
110	What is the highest [GRADE/FORM/YEAR] you completed at that level? IF COMPLETED LESS THAN ONE YEAR AT THAT LEVEL, RECORD '00'.	[GRADE/FORM/YEAR] . . . . . [ ][ ]	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
111	What is your religion?	CATHOLIC . . . . . 01 CCAP . . . . . 02 ANGLICAN . . . . . 03 SEVENTH DAY ADVENT./BAPTIST . . . . . 04 OTHER CHRISTIAN . . . . . 05 MUSLIM . . . . . 06 NO RELIGION . . . . . 95 OTHER _____ 96 (SPECIFY)	
112	What is your ethnicity?	CHEWA . . . . . 01 TUMBUKA . . . . . 02 LOMWE . . . . . 03 TONGA . . . . . 04 YAO . . . . . 05 SENA . . . . . 06 NKHONDE . . . . . 07 NGONI . . . . . 08 OTHER _____ (SPECIFY) 96	
113	What languages can you speak? RECORD ALL LANGUAGES YOU CAN SPEAK.	CHEWA . . . . . A TUMBUKA . . . . . B ENGLISH . . . . . C OTHER _____ X (SPECIFY)	
114	What is your mother tongue/native language (language spoken at home growing up)?	CHEWA . . . . . 01 TUMBUKA . . . . . 02 OTHER _____ 96 (SPECIFY)	
115	Have you ever worked on an MIS or a DHS survey prior to this one?	YES, MIS . . . . . 1 YES, DHS . . . . . 2 YES, MIS AND DHS . . . . . 3 NO, NEITHER MIS NOR DHS 4	
116	Have you ever worked on any other survey prior to this one (not an MIS and not a DHS)?	YES . . . . . 1 NO 2	
117	Were you already working for the NATIONAL MALARIA CONTROL PROGRAM (NMCP) or other DIRECTORATE OF MINISTRY OF HEALTH (MOH) at the time you were employed to work on this MIS?	YES, NMCP . . . . . 1 YES, OTHER MOH . . . . . 2 NO 3	→ 119
118	Are you a permanent or temporary employee of NMCP or other MOH DIRECTORATE?	PERMANENT . . . . . 1 TEMPORARY 2	
119	If you have comments, please write them here.		

ADDITIONAL DHS PROGRAM RESOURCES

The DHS Program Website – Download free DHS reports, standard documentation, key indicator data, and training tools, and view announcements.	DHSprogram.com	
STATcompiler – Build custom tables, graphs, and maps with data from 90 countries and thousands of indicators.	Statcompiler.com	
DHS Program Mobile App – Access key DHS indicators for 90 countries on your mobile device (Apple, Android, or Windows).	Search DHS Program in your iTunes or Google Play store	
DHS Program User Forum – Post questions about DHS data, and search our archive of FAQs.	userforum.DHSprogram.com	
Tutorial Videos – Watch interviews with experts and learn DHS basics, such as sampling and weighting, downloading datasets, and how to read DHS tables.	www.youtube.com/DHSProgram	
Datasets – Download DHS datasets for analysis.	DHSprogram.com/Data	
Spatial Data Repository – Download geographically-linked health and demographic data for mapping in a geographic information system (GIS).	spatialdata.DHSprogram.com	

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