Malawi

Malaria Indicator Survey

2014

Malawi
Malaria Indicator Survey
2014

Ministry of Health
National Malaria Control Programme
Lilongwe, Malawi

The DHS Program
ICF International
Rockville, Maryland, U.S.A.

February 2015

This report presents the findings of the 2014 Malawi Malaria Indicator Survey (2014 MMIS) conducted by the National Malaria Control Programme (NMCP) of the Ministry of Health from 2 May through 10 June 2014. The government of Malawi provided financial assistance in terms of in-kind contribution of personnel, office space, and logistical support. Principal funding partners for the MMIS are the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) and the President's Malaria Initiative (PMI). The Global Fund supported the local costs of the survey, and PMI supported the survey through ICF International, which provided technical assistance through The DHS Program. The DHS Program is a worldwide project funded by the United States Agency for International Development (USAID) and is designed to assist developing countries collect data on fertility, family planning, and maternal and child health. The opinions expressed in this report are those of the authors and do not necessarily reflect the views of USAID.

Additional information about the 2014 MMIS may be obtained from the National Malaria Control Programme, P/Bag 65, Mtunthama Drive, Lilongwe, Malawi.

Information about The DHS Program may be obtained from ICF International, 530 Gaither Road, Suite 500, Rockville, MD 20850, USA (Telephone: +1-301-407-6500; Fax: +1-301-407-6501; E-mail: info@DHSprogram.com; Internet: http://www.DHSprogram.com).

Cover photos:

©2011 Gomezani Jenda, PMI/Malawi. Used with permission.

Recommended citation:

National Malaria Control Programme (NMCP) [Malawi] and ICF International. 2014. *Malawi Malaria Indicator Survey (MIS) 2014.* Lilongwe, Malawi, and Rockville, Maryland, USA: NMCP and ICF International.

CONTENTS

TABLES AND FIGURES ..... **v**
PREFACE ..... **vii**
ACKNOWLEDGEMENTS ..... **ix**
ACRONYMS ..... **xi**
MAP OF MALAWI ..... **xii**

1 INTRODUCTION **1**
1.1 Country Profile 1
1.1.1 Geography 1
1.1.2 Economy 1
1.1.3 Health Indicators 1
1.2 Background on Malaria in Malawi 2
1.3 Objectives of the Malawi Malaria Indicator Survey 3
1.4 Methodology of the 2014 Malawi Malaria Indicator Survey 4
1.4.1 Survey Organisation 4
1.4.2 Sample Design 4
1.4.3 Questionnaires 5
1.4.4 Anaemia and Malaria Testing 5
1.4.5 Training 6
1.4.6 Fieldwork 7
1.4.7 Laboratory Testing 7
1.4.8 Data Processing 8
1.5 Response Rates 8

2 CHARACTERISTICS OF HOUSEHOLDS AND WOMEN **9**
2.1 Household Environment 9
2.1.1 Drinking Water 9
2.1.2 Household Sanitation Facilities 10
2.1.3 Housing Characteristics 11
2.1.4 Sleeping Spaces 12
2.2 Household Possessions 13
2.3 Wealth Index 13
2.4 Population by Age and Sex 14
2.5 Household Composition 16
2.6 Characteristics of Women Respondents 16
2.6.1 General Characteristics 16
2.6.2 Education Attainment of Women 17
2.6.3 Literacy of Women 18

3 MALARIA PREVENTION **21**
3.1 Vector Control 21
3.1.1 Ownership of Mosquito Nets 22
3.1.2 Indoor Residual Spraying 24
3.2 Access to Mosquito Nets 25
3.2.1 Use of Mosquito Nets by Household Population 26
3.2.2 Use of Mosquito Nets by Children under Age 5 27
3.2.3 Use of Mosquito Nets by Pregnant Women 29
3.3 Intermittent Preventive Treatment of Malaria in Pregnancy 31
3.4 Preference for Colour and Shape of Mosquito Net 33

4 MANAGEMENT OF FEVER, ANAEMIA, AND MALARIA IN CHILDREN **37**
4.1 Prevalence, Diagnosis, and Prompt Treatment of Children with Fever 37
4.2 Malaria Case Management among Children 39
4.3 Anaemia and Malaria Prevalence among Children 40
4.3.1 Anaemia Prevalence among Children 42
4.3.2 Malaria Prevalence among Children 42

5 MALARIA KNOWLEDGE 45
5.1 Knowledge of Malaria 45
5.2 Exposure to Malaria Messages 47

REFERENCES 51

APPENDIX A SAMPLE DESIGN 53
A.1 Sampling Frame and Stratification 53
A.2 Sample Allocation and Selection 53
A.2.1 Sample Allocation 53
A.2.2 Selection of Clusters 56
A.3 Selection of Households 56
A.4 Estimation Procedure 57
A.5 Sample Implementation 58

APPENDIX B ESTIMATES OF SAMPLING ERRORS 59

APPENDIX C DATA QUALITY TABLES 63

APPENDIX D SURVEY PERSONNEL 65

APPENDIX E QUESTIONNAIRES 67
Household Questionnaire 69
Biomarker Questionnaire 83
Woman's Questionnaire 91

TABLES AND FIGURES

1 INTRODUCTION 1
Table 1.1 Demographic indicators 2
Table 1.2 Results of the household and individual interviews 8

2 CHARACTERISTICS OF HOUSEHOLDS AND WOMEN 9
Table 2.1 Household drinking water 10
Table 2.2 Household sanitation facilities 11
Table 2.3 Household characteristics 12
Table 2.4 Percent distribution of households by number of sleeping spaces and number of mosquito nets 12
Table 2.5 Household possessions 13
Table 2.6 Wealth quintiles 14
Table 2.7 Household population by age, sex, and residence 15
Table 2.8 Household composition 16
Table 2.9 Background characteristics of respondents 17
Table 2.10 Educational attainment 18
Table 2.11 Literacy 19

Figure 2.1 Population pyramid 15

3 MALARIA PREVENTION 21
Table 3.1 Household possession of mosquito nets 23
Table 3.2 Indoor residual spraying against mosquitoes 24
Table 3.3 Access to an insecticide-treated net (ITN) 25
Table 3.4 Use of mosquito nets by persons in the household 27
Table 3.5 Use of mosquito nets by children 28
Table 3.6 Use of mosquito nets by pregnant women 30
Table 3.7 Prophylactic use of antimalarial drugs and use of Intermittent Preventive Treatment (IPTp) by women during pregnancy 32
Table 3.8 Preference for colour of mosquito net 34
Table 3.9 Preference for shape of mosquito net 34
Table 3.10 Preference for shape of mosquito net by reason 35

Figure 3.1 Trend in ownership of at least one ITN, 2010, 2012, and 2014 23
Figure 3.2 Percentage of the de facto population with access to an ITN in the household 26
Figure 3.3 Trend in ITN use by children under age 5, 2010, 2012, and 2014 29
Figure 3.4 Trend in use of ITN by pregnant women age 15-49, 2010, 2012, and 2014 31
Figure 3.5 Trend in percentage of pregnant women who gave birth in the two years before the survey who received two or more doses of SP, 2010, 2012, and 2014 33

4 MANAGEMENT OF FEVER, ANAEMIA, AND MALARIA IN CHILDREN 37
Table 4.1 Prevalence, diagnosis, and prompt treatment of children with fever 38
Table 4.2 Source of advice or treatment for children with fever 39
Table 4.3 Type and timing of antimalarial drugs used 40
Table 4.4 Coverage of testing for anaemia and malaria in children age 6-59 months 41
Table 4.5 Severe anaemia in children age 6-59 months 42
Table 4.6 Prevalence of malaria in children age 6-59 months 43

Figure 4.1 Prevalence of malaria among children under age 5, based on microscopy results, 2010, 2012, and 2014 44

5 MALARIA KNOWLEDGE 45
Table 5.1 Women's knowledge of malaria 46
Table 5.2 Messages about malaria 47
Table 5.3 Source of malaria messages 49

Figure 5.1 Trends in knowledge about malaria 46

APPENDIX A SAMPLE DESIGN 53
Table A.1 Sample and total population proportion by stratum, 2014 Malawi MIS 53
Table A.2 Distribution of SEAs by Urban/Rural location for districts in Northern Region, 2014 Malawi MIS 54
Table A.3 Distribution of SEAs by Urban/Rural location for districts in Central Region, 2014 Malawi MIS 54
Table A.4 Distribution of SEAs by Urban/Rural location for districts in Southern Region, 2014 Malawi MIS 54
Table A.5 Sample implementation: Women 58

Figure A.1 Location of selected SEAs in the 2014 Malawi MIS 55

APPENDIX B ESTIMATES OF SAMPLING ERRORS 59
Table B.1 List of selected variables for sampling errors, Malawi MIS 2014 60
Table B.2 Sampling errors: Total sample, Malawi MIS 2014 61
Table B.3 Sampling errors: Urban sample, Malawi MIS 2014 61
Table B.4 Sampling errors: Rural sample, Malawi MIS 2014 61
Table B.5 Sampling errors: Northern sample, Malawi MIS 2014 61
Table B.6 Sampling errors: Central sample, Malawi MIS 2014 62
Table B.7 Sampling errors: Southern sample, Malawi MIS 2014 62

APPENDIX C DATA QUALITY TABLES 63
Table C.1 Household age distribution 63
Table C.2 Age distribution of eligible and interviewed women 64
Table C.3 Completeness of reporting 64

PREFACE

Malaria continues to be a major public health problem in Malawi, with an estimated 4 million cases occurring annually. Its effects are greatest among children under age 5 and pregnant women. The Ministry of Health, in collaboration with its partners, has been implementing the National Malaria Strategic Plan 2011–2016 with the goal of scaling up malaria interventions towards attainment of the national vision of a 'Malaria-free Malawi.' Specifically, we strive for progress in achieving prompt and effective antimalarial drug treatment, use of insecticide-treated nets and indoor residual spraying, and prevention of malaria in pregnancy.

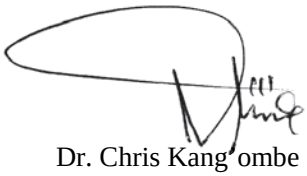
We have set for ourselves high coverage targets for these interventions. By setting high targets, we are confident of our ability to reach our strategic goals of reducing the incidence of malaria and deaths from malaria as well as reducing the prevalence of malaria parasites and malaria-related anaemia.

Measurement is essential for understanding progress towards these goals. Without measurement, we can only speculate on progress. The 2014 Malawi Malaria Indicator Survey is the country's third nationally representative assessment of the coverage attained by key malaria interventions. These 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 the 2010 value of 43 percent to the 2014 value of 33 percent. Net ownership has increased from 58 percent in 2010 to 70 percent in 2014. Results of the 2014 MIS also show an improvement on use of IPTp among pregnant women. Coverage has increased from 54 percent in 2012 to 63 percent in 2014. Changes in antimalarial drug policy have provided challenges to increasing effective antimalarial treatment. Nevertheless, more children than before are receiving artemisinin-based combination therapy, and we expect these numbers to continue to increase.

These results represent the combined work of numerous 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 all of those who travelled to various areas of Malawi, including the most remote parts of the country, to collect data. Most important, I thank the survey respondents for their contributions to this survey. Together, we can kick malaria out of Malawi.



Dr. Chris Kang'ombe
Secretary for Health
Ministry of Health

ACKNOWLEDGEMENTS

This report presents the results of the 2014 Malawi Malaria Indicator Survey (MMIS), the third comprehensive, nationally representative household survey designed to measure progress towards achieving the goals and targets set forth in the National Malaria Strategic Plan 2011–2016. It represents the efforts of several agencies and many individuals. The Ministry of Health (MoH), through the National Malaria Control Programme (NMCP), had the major responsibility of conducting the survey. The survey was funded by the Global Fund to Fight against HIV/AIDS, Tuberculosis and Malaria (GFATM), and the U.S. President's Malaria Initiative (PMI). Other agencies that have been instrumental in this survey include the National Statistical Office (NSO), the World Health Organization (WHO), and the University of Malawi's College of Medicine.

Within the Ministry, the following individuals provided overall survey leadership and guidance: Chris Kang'ombe, the Secretary for Health; Dr. Storn Kabuluzi, Director of Preventive Health Services; Doreen Ali, Deputy Director of Preventive Health Services (Malaria); and Dr. Ben Chilima, Deputy Director of Preventive Health Services (National Public Laboratories). The implementation of the 2014 MMIS was guided by the Steering Committee under the leadership of Prof. Malcolm Molyneux.

Misheck Luhanga was the MIS Coordinator. He was supported by NMCP staff: Austin Gumbo, John Chiphwanya, John Sande, Dubulao Moyo, Evans Kaunda, Shadreck Mulenga, and Clifton Gondwe. Staff of the National Public Health Laboratory included Yassin Madingore, Sunday Jere, James Kaphiyo, and Mathews Mhone, who participated in the field staff training and fieldwork, supervised the laboratory technicians, and read the blood specimen slides.

The NSO Commissioner, Mercy Kanyuka, and NSO staff, Isaac Chirwa, Kingsley Manda, and Sautso Wachepa, provided support for the household listing and sample selection. ICF International staff, Sri Poedjastoeti and Keith Purvis, provided assistance with survey organisation and training, logistics and procurement of supplies, data collection, processing, and analysis. Geofrey Lutwama provided support in the use of computer tablets. Wilfred Dodoli of WHO provided support for training.

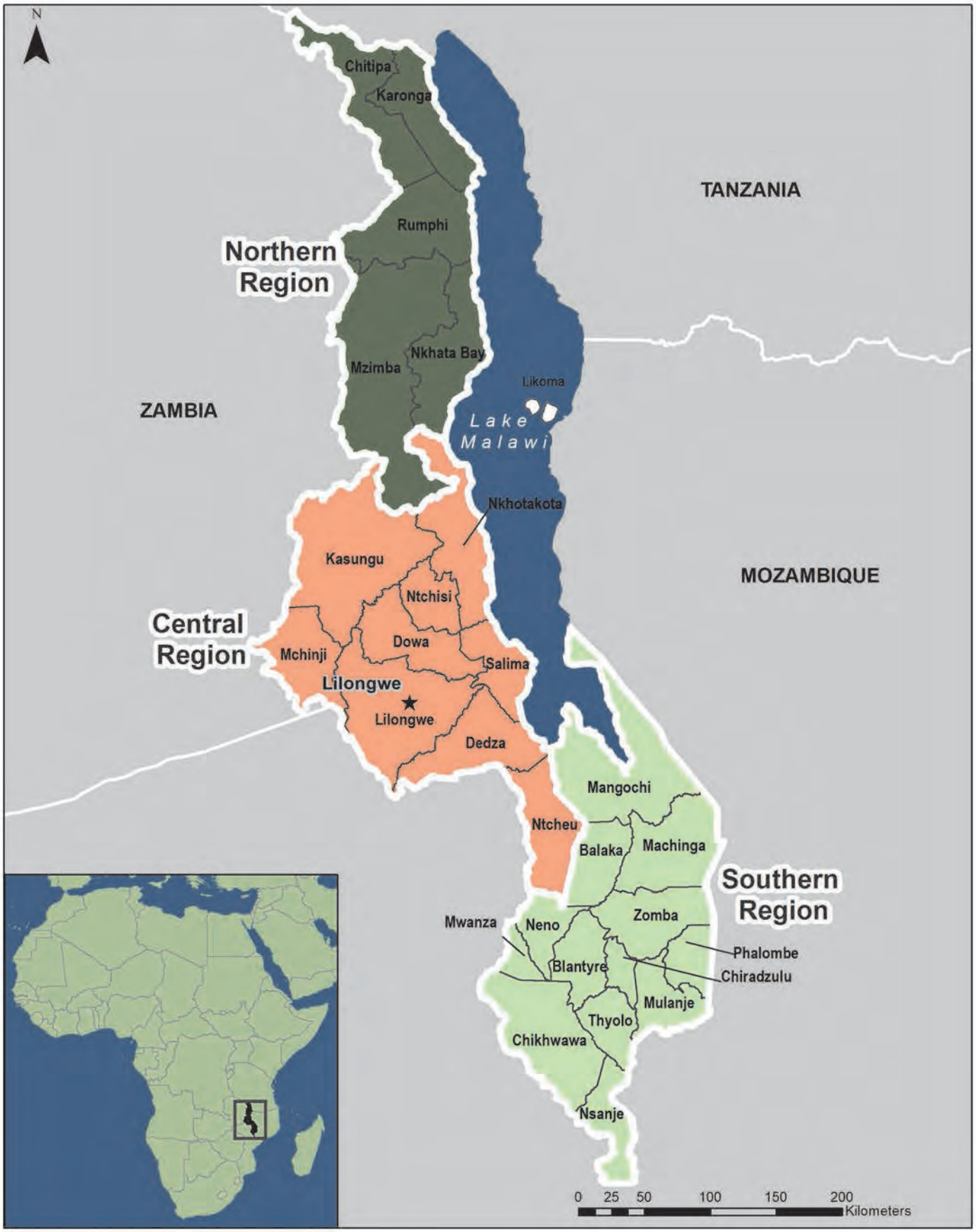
The District Health Offices worked with the survey teams and provided artemesinin-based combination therapy for the treatment of children who participated in the survey and tested positive for malaria. The Health Education Unit of the MoH supported the programme on communication and awareness about the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

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

ACRONYMS

ACT	Artemisinin-based combination therapy
ASAQ	Amodiaquine artesunate
DHO	District Health Office
DHS	Demographic and Health Surveys
EA	Enumeration area
EPI	Expanded Programme on Immunisation
IPTp	Intermittent preventive treatment (of malaria) in pregnancy
IRS	Indoor residual spraying
ITN	Insecticide-treated net
LA	Local name of artemether-lumefantrine
LLIN	Long-lasting insecticidal net
MDG	Millennium Development Goal
MERG	Monitoring and Evaluation Reference Group
MICS	Multiple Indicator Cluster Survey
MIS	Malaria Indicator Survey
MKW	Malawian Kwacha
MoH	Ministry of Health
NMCP	National Malaria Control Programme
NMSP	National Malaria Strategic Plan
NPHL	National Public Health Laboratory
NSO	National Statistical Office
PDA	Personal digital assistant
PMI	US President's Malaria Initiative
RBM	Roll Back Malaria
RDT	Rapid diagnostic test
SEA	Standard enumeration area
SP	Sulphadoxine-pyrimethamine
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WBC	White blood cell
WHO	World Health Organization

MALAWI


N
Chitipa
Karonga
TANZANIA
Rumphi
Northern Region
Nkhata Bay
Mzimba
Likoma
ZAMBIA
Lake Malawi
Nkhotakota
Kasungu
MOZAMBIQUE
Ntchisi
Central Region
Dowa
Mchinji
Salima
Lilongwe
Lilongwe
Dedza
Mangochi
Ntcheu
Balaka
Machinga
Southern Region
Zomba
Mwanza
Neno
Phalombe
Blantyre
Chiradzulu
Mulanje
Thyolo
Chikhwawa
Nsanje
0 25 50 100 150 200
Kilometers

INTRODUCTION 1

1.1 COUNTRY PROFILE

1.1.1 Geography

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

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

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

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

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

Based on the 2008 population census results, the population of Malawi in 2014 was estimated to be 15.8 million, with an intercensal population growth rate of 2.8 percent per year (Table 1.1). Population density increased from 105 persons per square kilometre in 1998 to 139 persons per square kilometre in 2008 (NSO, 2008).

1.1.2 Economy

The economy of Malawi is based primarily on agriculture, which accounts for 30 percent of the gross domestic product (GDP). The country's major exports are tobacco, tea, and sugar. They account for approximately 85 percent of Malawi's domestic exports. GDP growth was estimated to be 5 percent in 2013 and is projected to increase—driven by tobacco exports and continued growth in the key sectors of agriculture, manufacturing, and services—to 6.1 percent in 2014 and 6.2 percent in 2015 (AfDB, 2014).

1.1.3 Health Indicators

Life expectancy at birth in Malawi is estimated at 51.3 years for women and 48.3 years for men. (NSO, 2008). Data from the 2004 MDHS and 2010 MDHS show that the under-5 mortality rate has decreased from 133 deaths per 1,000 live births in 2000-2004 to 112 deaths per 1,000 live births in 2005-2010 (NSO and ORC Macro, 2005; NSO and ICF Macro, 2011). The Malawi MDG Endline Survey

(MES) carried out in 2013-14 by the National Statistical Office found the under-5 mortality rate to be 85 deaths per 1,000 live births (NSO, 2014). The maternal mortality ratio has also declined from 984 deaths per 100,000 live births in 1998-2004 (NSO and ORC Macro, 2005) to 675 deaths per 100,000 live births in 2004-2010 (NSO and ICF Macro, 2011) and to 574 deaths per 100,000 live births in 2008-2014 (NSO, 2014). The adult HIV/AIDS prevalence in 2010 was estimated at 10.6 percent (12.9 percent for women, 8.1 percent for men) (NSO and ICF Macro, 2011).

Although malnutrition among children persists, stunting has declined from 53 percent in 2004 to 47 percent in 2010 (NSO and ICF Macro, 2011) and to 42 percent in 2013-14 (NSO, 2014). At the same time, anaemia prevalence among children has declined from 73 percent to 63 percent. The percentage of nonpregnant, nonbreastfeeding women with anaemia has decreased from 46 percent in 2004 to 29 percent in 2010. Among pregnant women, the percentage with anaemia decreased from 47 percent to 38 percent (NSO and ICF Macro, 2011).

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

Table 1.1 Demographic indicators

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

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

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

1.2 BACKGROUND ON MALARIA IN MALAWI

Malaria is endemic throughout Malawi and continues to be a major public health problem. Malaria is the leading cause of morbidity and mortality in children under age 5 and among pregnant women. It is estimated that Malawi experiences about 4 million episodes of malaria annually (HMIS, 2013). Transmission is mainly determined by climatic factors: temperature, humidity, and rainfall. The extent and distribution of these factors influence malaria prevalence. Transmission is highest in areas of high temperature and frequent rainfall from October through April.

Efforts to control malaria are currently being scaled up through coordination of Roll Back Malaria (RBM) partners. Malaria is one of the main public health priorities within the Essential Health Package (EHP). The Ministry of Health (MoH), in collaboration with its development partners, has developed the National Malaria Strategic Plan 2011-2016 (NMSP 2011-2016) (MoH, nd). The vision of the National Malaria Control Programme (NMCP) is for all people in Malawi to be free from the burden of malaria. The programme's mission is to reduce the burden of malaria to a level of no public health significance in Malawi. This can be achieved through improved diagnosis; appropriate treatment, integrated vector management; supply chain management; behaviour change, communication, and advocacy; and a robust monitoring and surveillance system.

The National Malaria Control Policy recognises the use of long-lasting insecticide-treated nets (LLINs) as an important intervention for the control of malaria in Malawi. This is described in the NMSP 2011-2016 which states that the main objective of the plan is to minimise the exposure of individuals to malaria vectors through integrated vector management. The Plan includes scaling up the procurement and

distribution of LLINs, targeting one LLIN for every two people in a household, increasing awareness on appropriate use of nets, developing and distributing information and educational campaign materials, and expanding indoor residual spraying (IRS).

In 2007, the NMCP decided to switch the recommended treatment regimen of uncomplicated malaria from sulfadoxine-pyrimethamine (SP) to artemisinin-based combination therapy (ACT). The first line drug is artemether-lumefantrine (locally known as LA) and the second line drug is amodiaquine artesunate (ASAQ). Parenteral artesunate is currently being introduced and will replace quinine as the recommended medication for the treatment of severe malaria. In 2011, the NMCP revised its policy to require confirmation of clinical diagnosis of malaria at all levels of health care, using malaria rapid diagnostic tests (RDTs) and light microscopy.

1.3 Objectives of the Malawi Malaria Indicator Survey

Effective monitoring and evaluation is needed in order to assess national scale-up efforts under implementation and to measure progress toward selected targets and goals. Evidence of progress in rolling out malaria interventions to affected communities in Malawi has come from several data sources, including the 2004 and 2010 Malawi Demographic and Health Surveys (MDHS), the 2006 Multiple Indicator Cluster Survey (MICS) and the 2013-2014 Malawi MDG Endline Survey, smaller-scale household surveys such as the 2001, 2004, and 2008 RBM surveys funded by the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), and the 2010 and 2012 Malaria Indicator Surveys (MIS).

The RBM Monitoring and Evaluation Reference Group (MERG)—a global technical advisory group providing monitoring and evaluation guidance for malaria control programmes—recommends that the MIS be conducted every two years within six weeks of the end of the rainy season in countries with endemic malaria transmission patterns, especially those in sub-Saharan Africa. For this reason, the NMCP conducted the third nationwide MIS in Malawi in 2014. The 2014 MIS used a standard set of instruments and protocol developed by RBM-MERG. These tools are largely based on the collective experience gained from the DHS and MIS surveys and are presented as a package of materials to promote standardised survey management and data collection methodology. The package also includes standardised measurement of malaria parasite and anaemia prevalence among target populations to derive the malaria-related burden at the community level.

The key objectives of the 2014 MIS were to:

- Measure the level of ownership and use of mosquito nets
- Assess coverage of intermittent preventive treatment for pregnant women
- Identify treatment practises, including the use of specific antimalarial medications to treat malaria among children under 5
- Measure the prevalence of malaria and anaemia among children age 6-59 months
- Assess knowledge, attitudes, and practises of malaria in the adult population
- Measure trends in key malaria indicators since the 2012 MIS

The 2014 MIS was designed to produce most of the key malaria indicators for the country as a whole, for urban and rural areas separately, and for each of the three regions in Malawi: Northern, Central, and Southern.

1.4 METHODOLOGY OF THE 2014 MALAWI MALARIA INDICATOR SURVEY

The 2014 MIS was carried out from 2 May to 10 June 2014, covering a nationally-representative sample of 3,500 households. All women age 15-49 years in the selected households were eligible for individual interviews and were asked questions about malaria prevention during pregnancy and treatment of childhood fever. In addition, the survey included testing for anaemia and malaria among children age 6-59 months using a finger prick blood sample. The results of anaemia and malaria rapid diagnostic testing were available immediately and were provided to the children's parents or guardians. Thick blood smears were collected in the field and carried to the Public Health Laboratory at the Community Health Sciences Unit in Lilongwe where they were tested for the presence of malaria parasites.

1.4.1 Survey Organisation

The 2014 Malawi MIS was implemented by the NMCP under the MoH. The NMCP was responsible for general administrative management of the survey, including overseeing the day-to-day operations; establishing and hosting meetings of the Steering Committee; designing the survey instruments and supporting documentation; and developing the survey protocol and ensuring its approval by the Malawi National Health Sciences Research Committee prior to the data collection. In addition, the NMCP was responsible for administering all the funds for the local costs of the survey and for keeping adequate accounts and providing office space for survey operations and data processing. The NMCP recruited and monitored field personnel through the District Health Offices (DHOs) and provided artemether-lumefantrine (LA) for treating children who tested positive for malaria in the field.

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

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

Financial support for the survey was provided by the Global Fund and U.S. President's Malaria Initiative (PMI).

1.4.2 Sample Design

The 2014 MIS sample was designed to produce most of the key indicators for the country as a whole, for urban and rural areas separately, and for each of the three regions.

The survey utilised a two-stage sample design (see Appendix A for details). The first stage involved selecting 140 clusters with probability proportional to size from the list of approximately 12,474 EAs covered in the 2008 National Population and Housing Census. The EA size was the number of residential households in the EA recorded in the census. Among the 140 clusters selected, 50 were in urban areas and 90 were in rural areas. Urban areas were over-sampled within regions in order to produce robust estimates for that domain. Therefore, the MIS sample was not proportional to the population for urban-rural residence and required a final weighting adjustment to provide valid estimates for every domain of the survey. In the second stage, in each of the selected EAs, 25 households were selected, using systematic sampling, from a list of households in the EA.

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

1.4.3 Questionnaires

Three questionnaires were used in the 2014 Malawi MIS: a Household Questionnaire, a Biomarker Questionnaire, and a Woman's Questionnaire. The Household and Woman's questionnaires were based on the model MIS questionnaires developed by the RBM and DHS programmes, as well as the 2010 and 2012 MIS. The model questionnaires were modified to reflect relevant issues of malaria in Malawi in consultation with the Steering Committee, the NMCP, and staff from ICF International. The questionnaires were translated into the two main local languages of Malawi—Chichewa and Tumbuka.

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

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

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

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

No formal field pre-test was done for the survey questionnaires because most of the 2014 MIS questions were included in previous surveys in Malawi and the field staff were experienced in anaemia and malaria testing in the field and in the use of PDAs for data collection.

1.4.4 Anaemia and Malaria Testing

The 2014 MIS incorporated three biomarkers. Finger prick blood samples were collected from children age 6-59 months to perform on-the-spot testing for anaemia and malaria, and thick blood smears were prepared—to be read in the laboratory—to determine the presence of malaria parasitemia. Each data collection team included two laboratory technicians who were responsible for the malaria and anaemia testing and preparing blood smear slides. Each field team also included two community health nurses who served as interviewers. In addition to conducting field interviews, they were responsible for dispensing malaria medications according to the appropriate treatment guidelines. Verbal informed consent for testing

of children was obtained from their parents or guardians at the end of the household interview. The protocol for the blood specimen collection and analysis was approved by ICF International's Institutional Review Board as well as by the National Health Sciences Research Committee in Malawi.

Anaemia testing. Because of the strong correlation between malaria infection and anaemia, the MIS included anaemia testing for children age 6-59 months. After obtaining informed consent from the child's parent or guardian, blood samples were collected using a single-use, spring-loaded, sterile lancet to make a finger prick. Laboratory technicians then used a microcuvette to collect a drop of blood from the finger prick. Haemoglobin analysis was carried out on site using a battery-operated portable HemoCue analyser, which produces results in less than one minute. Results were given to the child's parent or guardian verbally and in written form. Children who had a haemoglobin level under 8 g/dl (severe anaemia) were recommended to be taken to a health facility for follow-up care. They were given a referral letter with the haemoglobin reading to show staff at the health facility. Results of the anaemia test were recorded on the Biomarker Questionnaire as well as in an anaemia brochure that included information about the causes and prevention of anaemia and was given to the child's parent/guardian by the community health nurses.

Rapid malaria testing. Another major objective of the 2014 Malawi MIS was to provide information about the extent of malaria infection among children age 6-59 months. Using the same finger prick used for anaemia testing, a drop of blood was tested immediately using the SD Bioline rapid diagnostic test (RDT), which tests for *Plasmodium falciparum*. The test includes a loop applicator that comes in a sterile packet. A tiny volume of blood is captured on the applicator and placed in the well of the device. Results were available in 15 minutes. The results were provided to the child's parent/guardian both orally and written on a form, and were recorded in the Biomarker Questionnaire.

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

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

1.4.5 Training

The NMCP in collaboration with the DHOs identified 22 interviewers 22 laboratory technicians and 11 field team supervisors. In addition, 7 national supervisors from the NMCP, the Public Health Laboratory, and other stakeholders were identified for overall supervision.

The participants attended a three-week interviewer and supervisor training which took place 14-28 April 2014 at Riverside Hotel in Lilongwe. All the field staff participated in a one-week joint training session, focusing on how to fill out the Household and Woman's Questionnaires, mock interviews, and interviewing techniques, as well as on how to locate selected households. Two quizzes were administered to assess how well the participants absorbed the training materials.

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

The training of laboratory technicians was facilitated by an ICFI consultant. It focused on preparation of blood samples and testing for anaemia using the HemoCue equipment and malaria testing using SD Bioline RDT. The training involved presentations, discussions, and actual testing for anaemia and malaria. The technicians were trained in identifying children eligible for testing, administering informed consent, conducting the anaemia and malaria rapid testing, and making a proper thick blood smear. They were also trained in storing the blood slides, recording test results on the Biomarker Questionnaire, and providing the results to the parent/guardians of the children tested. The laboratory technicians also received training 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. They were given specific instructions on how to calculate the correct dose of antimalarial medications for children who tested positive for malaria, using the portable scales to determine the child's weight. The laboratory technicians received a lecture on the epidemiology of malaria in Malawi and the correct treatment protocols.

At the completion of classroom practise and instructions, the laboratory technicians visited the under-5 children's clinic at Kawale Health Centre and Area 18 Health Centre hospitals, where they performed anaemia and malaria testing and collected thick blood smears from children between the ages of 6 and 71 months.

All participants took part in a field practise exercise in households located close to the training site before being dispatched to their respective area of assignment.

1.4.6 Fieldwork

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

The NMCP arranged for printing the questionnaires, manuals, consent forms, and other field forms. It was also in charge of fieldwork logistics such as backpacks, identification cards, umbrellas, and other field supplies.

Field data collection for the 2014 Malawi MIS began on 2 May 2014. To allow for maximum supervision, all 11 teams were visited by the national supervisors at least once in the first two weeks. Fieldwork was completed by 10 June 2014.

1.4.7 Laboratory Testing

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

For the malaria parasitemia, all microscopic slides were stained with Giemsa and read by laboratory technicians at the PHL. Asexual stage parasites were counted against at least 200 white blood cells (WBC), and parasite densities were calculated assuming 8,000 WBC/dl of blood. When there were less than 10 parasites per 100 fields, the slides were read up to a threshold of 500+ WBCs. Blood smears were considered negative if no parasites were found after counting 200 fields. For quality control, all slides were read by a second laboratory technician, and a third reviewer settled any discrepant readings. In

addition, 10 percent of the slides were re-read independently at Kamuzu Central Hospital laboratory to ascertain the quality of microscopy reading at the PHL.

1.4.8 Data Processing

Data for the 2014 Malawi MIS were collected through questionnaires programmed onto computer tablets. ICFI data processing specialists loaded the Household, Biomarker, and Woman's Questionnaires in English and the two main local languages, Chichewa and Tumbuka, in the computer tablets and installed data entry and processing programmes. The tablets were Bluetooth-enabled to facilitate electronic transfer of files, e.g., data from the Household Questionnaires transferred among survey team members and transfer of completed questionnaires to the team supervisor's tablet. The field supervisors transferred data on a daily basis to the central data processing unit using the Internet. To facilitate communication and monitoring, each field worker was assigned a unique identification number.

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

1.5 RESPONSE RATES

Table 1.2 shows that, of the 3,501 households selected for the sample, 3,415 were occupied at the time of fieldwork. Eighty-six dwellings were abandoned and, therefore, were not included in the response rate. Among the occupied households, 3,405 were successfully interviewed, yielding a total household response rate above 99 percent. In the interviewed households, 2,927 eligible women were identified as eligible for the individual interview and 2,897 were successfully interviewed, yielding a response rate of 99 percent.

Table 1.2 Results of the household and individual interviews

Number of households, number of interviews, and response rates, according to residence (unweighted), Malawi, 2014

	Residence		
Result	Urban	Rural	Total
Household interviews			
Households selected	1,250	2,251	3,501
Households occupied	1,217	2,198	3,415
Households interviewed	1,211	2,194	3,405
Household response rate[1]	99.5	99.8	99.7
Interviews with women age 15-49			
Number of eligible women	1,121	1,806	2,927
Number of eligible women interviewed	1,104	1,793	2,897
Eligible women response rate[2]	98.5	99.3	99.0

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

CHARACTERISTICS OF HOUSEHOLDS AND WOMEN

2

Key Findings

- More than eight in ten households and 83 percent of the population have access to improved sources of water.
- Twelve percent of households have electricity.
- One in five households owns a bank account (52 percent in urban areas and 14 percent in rural areas).
- Seventy-two percent of women age 15-49 in Malawi are literate.

This chapter provides a descriptive summary of basic demographic and socioeconomic characteristics of the households and women interviewed in the 2014 Malaria Indicator Survey (MIS). For purposes of the survey, a household was defined as a person or group of persons, related or not related, who live together and eat from the same pot. The Household Questionnaire (see Appendix E) included a schedule with the age, sex, and relationship to the head of household for all usual residents and visitors who spent the night preceding the interview. This method of data collection allows the analysis of the results for either the de jure or de facto populations. The Household Questionnaire also obtained information on housing facilities, (e.g., source of water supply, sanitation facilities) and household possessions. Combined with other indicators, these items are used to create an index of relative wealth, which is described later in this chapter. This chapter also provides a profile of the women who were interviewed in the MIS. Information is presented on basic characteristics, including age at the time of the survey, religion, residence, education, literacy, and household wealth quintile.

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

2.1 HOUSEHOLD ENVIRONMENT

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

2.1.1 Drinking Water

One of the Millennium Development Goals (MDGs) that Malawi and other countries have adopted is to increase the percentage of the population with sustainable access to an improved water source in both urban and rural areas (United Nations General Assembly, 2001). Improved water sources refer to a household connection (piped), public standpipe, tubewell or borehole, protected dug well, and protected spring or rainwater collection system. However, water that must be fetched from an improved source that is not immediately accessible to the household may be contaminated during transport or storage. Long distances to an improved source of water and a disproportionate burden on female members of the household to collect water may limit the quantity and quality of suitable drinking water available to a household. Home water treatment can improve the quality of household drinking water.

Table 2.1 includes a number of indicators that are useful in monitoring household access to improved drinking water. The table shows that 83 percent of both the households and the population have

access to improved sources of water. In urban areas, 96 percent of households have access to improved sources of water compared with 80 percent of households in rural areas. Piped water (to the dwelling or to a public tap) is the main source of drinking water for households in urban areas (84 percent), whereas in rural areas the main source of drinking water is a tube well or borehole (65 percent). Overall, 56 percent of households draw water from a borehole. The most commonly used non-improved source of water is an unprotected dug well (12 percent). Twenty-four percent of households have a source of drinking water on the premises. The availability of a source of drinking water on the premises is higher among households in urban areas (58 percent) than in rural areas (17 percent). Twenty-nine percent of households take 30 minutes or longer to travel round trip to obtain water; 32 percent of these households are in the rural areas and 14 percent are in the urban areas.

Table 2.1 Household drinking water

Percent distribution of households and de jure population by source of drinking water, and time to obtain drinking water, according to residence, Malawi 2014

	Households			Population		
Characteristic	Urban	Rural	Total	Urban	Rural	Total
Source of drinking water						
Improved source	96.1	80.4	83.1	95.9	80.6	83.2
Piped into dwelling	13.1	1.7	3.6	13.9	1.5	3.7
Piped to yard/plot	35.3	5.4	10.6	34.5	4.9	9.9
Public tap/standpipe	35.6	6.1	11.2	35.8	5.9	11.0
Tube well or borehole	9.9	65.4	55.8	9.9	66.4	56.8
Protected well	2.0	1.8	1.8	1.6	1.9	1.9
Bottled water	0.1	0.0	0.0	0.1	0.0	0.0
Non-improved source	3.9	19.6	16.9	4.1	19.4	16.8
Unprotected well	2.1	14.0	12.0	2.5	13.7	11.8
Unprotected spring	0.2	0.9	0.7	0.2	0.8	0.7
Surface water	1.7	4.7	4.1	1.4	4.8	4.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
Percentage using any improved source of drinking water	96.1	80.4	83.1	95.9	80.6	83.2
Time to obtain drinking water (round trip)						
Water on premises	57.5	16.5	23.6	57.7	16.5	23.5
Less than 30 minutes	25.2	48.4	44.4	25.8	48.4	44.6
30 minutes or longer	13.8	31.6	28.5	13.2	32.0	28.8
Don't know/missing	3.5	3.5	3.5	3.2	3.1	3.1
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number	591	2,814	3,405	2,390	11,629	14,019

2.1.2 Household Sanitation Facilities

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

Table 2.2 shows that only 11 percent of households in Malawi use an improved toilet/latrine facility and 89 percent use a non-improved facility, including 7 percent who use a shared facility. Four percent use a facility that would be considered improved if it were not shared by two or more households. Households in urban areas are notably more likely than those in rural areas to use improved, non-shared facilities (27 percent compared with 7 percent). The most commonly used improved, non-shared toilet facility is the pit latrine with slab (7 percent of all households). Only 3 percent of households use a facility that flushes to a piped sewer system and is not shared. This proportion is much higher among urban households (13 percent) than among rural households (one percent).

Table 2.2 Household sanitation facilities

Percent distribution of households and de jure population by type of toilet/latrine facilities, according to residence, Malawi 2014

	Households			Population		
Type of toilet/latrine facility	Urban	Rural	Total	Urban	Rural	Total
Improved, not shared facility	26.9	7.4	10.8	29.1	6.3	10.2
Flush/pour flush to piped sewer system	13.3	1.4	3.4	13.8	1.3	3.4
Ventilated improved pit (VIP) latrine	0.3	0.1	0.1	0.3	0.1	0.1
Pit latrine with slab	13.4	5.9	7.2	15.0	4.9	6.6
Composting toilet	0.0	0.0	0.0	0.0	0.0	0.0
Shared facility[1]	24.8	3.6	7.3	23.0	3.5	6.8
Flush/pour flush to piped sewer system	0.4	0.0	0.1	0.3	0.0	0.1
Ventilated improved pit (VIP) latrine	0.6	0.1	0.2	0.5	0.1	0.1
Pit latrine with slab	23.7	3.5	7.0	22.1	3.4	6.6
Composting toilet	0.1	0.0	0.0	0.1	0.0	0.0
Non-improved facility	48.2	89.0	81.9	47.8	90.2	83.0
Pit latrine without slab/open pit	45.3	74.7	69.6	45.1	77.0	71.6
Hanging toilet/hanging latrine	0.0	0.0	0.0	0.0	0.0	0.0
No facility/bush/field	2.9	14.2	12.2	2.7	13.0	11.3
Other	0.0	0.1	0.1	0.0	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number	591	2,814	3,405	2,390	11,629	14,019

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

2.1.3 Housing Characteristics

Table 2.3 presents information on electricity, flooring material, rooms, rooms used for sleeping, sleeping spaces, and the proportion of households using various types of fuel for cooking. These characteristics reflect the household's socioeconomic situation. They also may influence environmental conditions that have a direct bearing on household members' health and welfare.

The results indicate that only 12 percent of households have electricity. The proportion of households with electricity is much higher in urban areas (46 percent) than those in rural areas (5 percent). Earth or sand is the most common flooring material, used by 65 percent of all households. As expected, rural households are substantially more likely to have floors made of earth or sand (75 percent) than urban households (22 percent). Overall, 31 percent of the households have floors made of cement. Use of cement floors is more common among households in urban areas than in rural areas (76 percent compared with 21 percent).

The number of rooms a household uses for sleeping is not only an indicator of socioeconomic level, but can also be used to assess crowding which can facilitate the spread of disease. In the 2014 MIS, household respondents were asked how many separate rooms there were in the house, how many were used for sleeping, regardless of whether they were bedrooms, and how many sleeping spaces were available in the house. Overall, 8 percent of households reported having one room, 29 percent have two rooms, and 63 percent have three or more rooms. There are no urban-rural differences. Four in ten households have only one room for sleeping, 38 percent have two rooms, while 22 percent have three or more rooms for sleeping. There are small urban-rural differences in the number of rooms used for sleeping.

When asked about sleeping spaces, households are almost equally split between having one or two spaces, while 27 percent have three or more sleeping spaces in the household. Households with one sleeping space are more common in rural areas than in urban areas (36 and 25 percent, respectively), while households with three or more sleeping spaces are more common in urban areas than rural areas (35 and 25 percent, respectively).

Table 2.3 also shows that wood is the fuel most commonly used for cooking, reported by 80 percent of households. Use of wood is four times more common in rural areas (92 percent) than in urban areas (23 percent). Sixteen percent of all households interviewed use charcoal for cooking; 65 percent in urban areas compared with 6 percent in rural areas. Ninety-seven percent of all households use solid fuel for cooking, 89 percent in urban areas and 99 percent in rural areas.

2.1.4 Sleeping Spaces

Table 2.4 presents the distribution of households by the reported number of sleeping spaces and the number of mosquito nets available in the household. Overall, 29 percent of households have no mosquito net, 34 percent have one net, 24 percent have two nets, and 13 percent have three or more nets. In the majority of households the number of mosquito nets is fewer than the number of sleeping spaces. For instance, 29 percent of households with two sleeping spaces have no nets and 29 percent have one net. Four in five households with five sleeping places have fewer than five nets.

Table 2.3 Household characteristics

Percent distribution of households by housing characteristics and percentage using solid fuel for cooking, according to residence, Malawi 2014

Housing characteristic	Residence		Total
	Urban	Rural	
Electricity			
Yes	46.1	4.7	11.9
No	53.9	95.3	88.1
Total	100.0	100.0	100.0
Flooring material			
Earth, sand	21.7	74.6	65.4
Dung	0.5	3.5	3.0
Wood planks	0.0	0.1	0.1
Broken bricks	0.1	0.5	0.4
Parquet, polished wood	0.4	0.0	0.1
Vinyl, asphalt strips	0.2	0.2	0.2
Ceramic tiles	0.9	0.0	0.2
Cement	76.0	21.1	30.6
Carpet	0.3	0.0	0.1
Total	100.0	100.0	100.0
Rooms			
One	7.7	8.1	8.1
Two	26.6	29.3	28.8
Three or more	65.7	62.6	63.1
Total	100.0	100.0	100.0
Rooms used for sleeping			
One	36.2	40.8	40.0
Two	37.3	38.2	38.0
Three or more	26.5	21.0	21.9
Total	100.0	100.0	100.0
Sleeping spaces			
None	5.9	1.4	2.2
One	25.3	35.6	33.8
Two	33.8	37.9	37.2
Three or more	35.0	25.1	26.9
Total	100.0	100.0	100.0
Cooking fuel			
Electricity	11.1	1.0	2.8
Charcoal	65.3	6.1	16.4
Wood	23.4	92.2	80.2
Other[1]	0.2	0.7	0.7
No food cooked in household	0.0	0.1	0.1
Total	100.0	100.0	100.0
Percentage using solid fuel for cooking[2]	88.9	98.8	97.1
Number	591	2,814	3,405

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

Table 2.4 Percent distribution of households by number of sleeping spaces and number of mosquito nets

Percent distribution of households by number of sleeping spaces and number of mosquito nets, Malawi 2014

Number of sleeping spaces	Number of mosquito nets							Total	Number of households
	0	1	2	3	4	5	6+		
0	20.4	33.3	26.4	16.6	3.3	0.0	0.0	100.0	73
1	36.7	49.6	12.3	1.1	0.2	0.1	0.0	100.0	1,151
2	29.4	29.2	34.4	5.7	0.6	0.7	0.0	100.0	1,266
3	21.5	21.6	25.2	25.6	5.0	0.8	0.2	100.0	702
4	9.2	19.9	24.1	23.7	14.0	1.3	7.8	100.0	148
5	10.0	9.1	21.7	27.6	12.1	13.5	6.0	100.0	44
6+	(7.9)	(22.2)	(41.5)	(8.6)	(1.7)	(7.3)	(10.8)	100.0	20
Total	28.8	33.9	24.3	9.5	2.2	0.7	0.5	100.0	3,405

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

2.2 HOUSEHOLD POSSESSIONS

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

Table 2.5 Household possessions

Percentage of households possessing various household effects, means of transportation, agricultural land and livestock/farm animals by residence, Malawi 2014

Possession	Residence		Total
	Urban	Rural	
Household effects			
Radio	70.8	48.3	52.2
Television	44.6	7.6	14.0
Mobile telephone	78.7	42.5	48.8
Non-mobile telephone	5.3	0.6	1.4
Refrigerator	23.8	1.3	5.2
Means of transport			
Bicycle	24.7	42.9	39.7
Animal drawn cart	0.6	2.8	2.4
Motorcycle/scooter	1.3	2.5	2.3
Car/truck	6.3	1.0	1.9
Ownership of agricultural land	24.6	84.7	74.2
Ownership of farm animals[1]	21.6	62.4	55.4
Ownership of bank account	51.8	13.8	20.4
Number	591	2,814	3,405

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

Table 2.5 shows, by place of residence, the percentage of households possessing or owning specific household effects, means of transport, agricultural land, livestock/farm animals, and a bank account. Overall, 52 percent of households own a radio. Households in urban areas are more likely than those in rural areas to own a radio (71 percent compared with 48 percent). Fourteen percent of the households own a television; 45 percent in urban areas and 8 percent in rural areas. A mobile telephone is owned by 49 percent of households (79 percent in urban areas and 43 percent in rural areas). Finally, 5 percent of the households have a refrigerator; 24 percent in urban areas compared with only 1 percent in rural areas.

Table 2.5 also shows the proportion of households owning various means of transport. Forty percent of the households own a bicycle (25 percent in urban areas and 43 percent in rural areas). Only 2 percent of households own a motorcycle or scooter, and 2 percent own a car or truck. Ownership of a car or truck is higher among urban than rural households (6 percent versus 1 percent).

Three in four households (74 percent) own agricultural land, 85 percent in rural areas and 25 percent in urban areas. Fifty-five percent of households own farm animals, 62 percent in rural areas compared with 22 percent in urban areas. One in five households owns a bank account (52 percent in urban areas and 14 percent in rural areas).

2.3 WEALTH INDEX

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

Table 2.6 shows the distribution of the de jure household population into five wealth quintiles based on the wealth index by residence. These distributions indicate the degree to which wealth is evenly (or unevenly) distributed by geographic area. The table shows that urban respondents are much more likely to fall in the higher wealth quintiles. Seventy-seven percent of the population in urban areas is in the

highest quintile. The rural population is almost evenly distributed in the first four quintiles, with only 8 percent in the highest quintile. Variations were observed regionally, with the Central region having the highest percentage of the population in the lowest quintile (26 percent) compared with the Northern and Southern regions (19 and 15 percent, respectively).

Table 2.6 Wealth quintiles

Percent distribution of the de jure population by wealth quintiles, and the Gini Coefficient, according to residence and region, Malawi 2014

Residence/ region	Wealth quintile					Total	Number of persons	Gini coefficient
	Lowest	Second	Middle	Fourth	Highest			
Residence								
Urban	3.0	2.6	4.3	13.1	76.9	100.0	2,390	0.213
Rural	23.4	23.7	23.2	21.4	8.3	100.0	11,629	0.455
Region								
Northern	18.6	18.4	23.5	27.8	11.7	100.0	2,623	0.369
Central	25.5	20.0	16.9	15.1	22.5	100.0	5,502	0.535
Southern	15.4	20.9	21.2	21.1	21.4	100.0	5,895	0.438
Total	19.9	20.1	20.0	20.0	20.0	100.0	14,019	0.434

Also included in Table 2.6 is the Gini coefficient, which indicates the level of concentration of wealth, 0 being an equal distribution and 1 a totally unequal distribution. If every person in the country owned the same amount of wealth, the Gini coefficient would be 0. If one person in the country owned all of the wealth, then the Gini coefficient would be 1. In Malawi, the Gini coefficient is 0.43, which means that the wealth is unevenly distributed across the population. The Gini coefficient in the 2012 Malawi MIS was 0.40, indicating that wealth is becoming slightly more concentrated, and disparities between the richest and poorest are increasing.

2.4 POPULATION BY AGE AND SEX

Age and sex are important demographic variables and are the primary basis of demographic classification. The distribution of the de facto household population in the 2014 MIS is shown in Table 2.7 by five-year age groups, according to sex and residence.

A total of 13,979 people were enumerated in the survey and they were almost equally divided by sex; the overall sex ratio is 96 males per 100 females. The ratio in urban areas is 101 males per 100 females, and in rural areas it is 95 males per 100 females.

The population age structure shows a substantially larger proportion of persons in the younger age groups than in the older age groups for both sexes (Figure 2.1). This reflects the relatively youthful age structure of the population of Malawi and indicates a population with high fertility. Forty-nine percent of the population is below age 15, 46 percent is age 15 to 64, and 3 percent is age 65 or older.

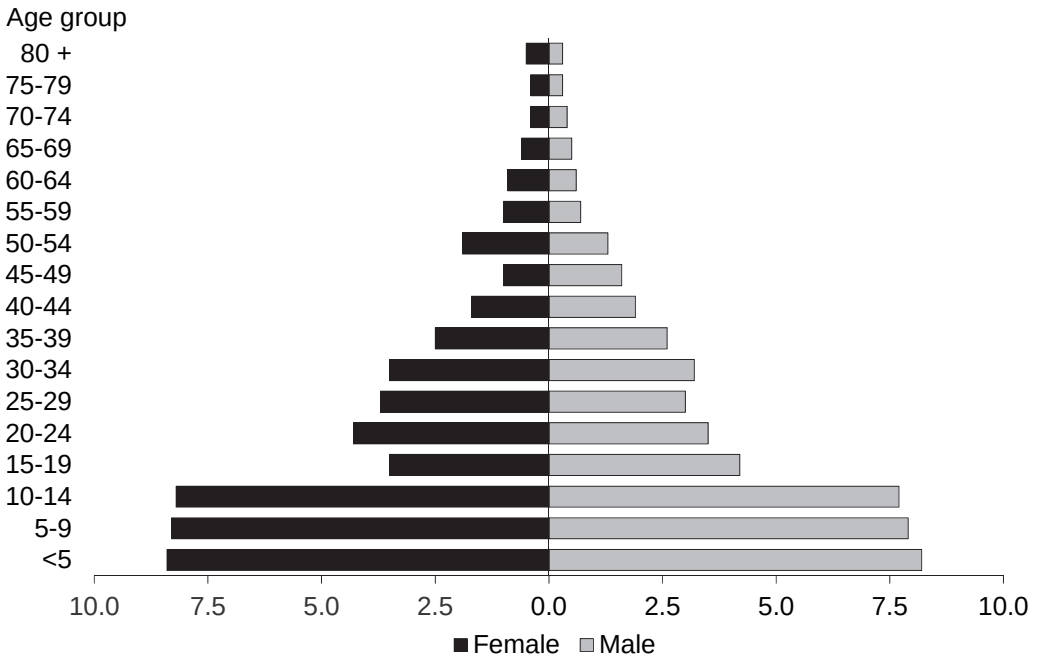
Table 2.7 Household population by age, sex, and residence

Percent distribution of the de facto household population by five-year age groups, according to sex and residence, Malawi 2014

	Urban			Rural			Total		
Age	Male	Female	Total	Male	Female	Total	Male	Female	Total
<5	12.7	15.2	14.0	17.6	16.6	17.1	16.8	16.4	16.6
5-9	13.2	14.9	14.0	16.7	16.6	16.7	16.1	16.3	16.2
10-14	13.0	15.0	14.0	16.2	16.2	16.2	15.7	16.0	15.9
15-19	10.2	7.9	9.0	8.2	6.7	7.4	8.5	6.9	7.7
20-24	10.7	12.7	11.7	6.4	7.6	7.0	7.2	8.5	7.8
25-29	10.3	10.1	10.2	5.2	6.8	6.0	6.1	7.3	6.7
30-34	8.4	8.1	8.2	6.0	6.7	6.4	6.4	6.9	6.7
35-39	6.5	4.1	5.3	5.1	5.2	5.1	5.3	5.0	5.2
40-44	4.9	2.7	3.8	3.5	3.4	3.4	3.8	3.3	3.5
45-49	2.1	1.8	2.0	3.4	1.9	2.7	3.2	1.9	2.5
50-54	1.5	2.7	2.1	2.8	3.9	3.3	2.6	3.7	3.1
55-59	1.6	1.7	1.6	1.5	1.9	1.7	1.5	1.9	1.7
60-64	1.0	0.8	0.9	1.3	2.0	1.7	1.3	1.8	1.5
65-69	0.7	0.7	0.7	1.1	1.4	1.2	1.0	1.2	1.1
70-74	0.6	0.7	0.7	0.9	0.8	0.8	0.9	0.8	0.8
75-79	0.2	0.2	0.2	0.8	0.9	0.8	0.7	0.8	0.7
80 +	0.3	0.4	0.3	0.7	1.0	0.9	0.7	0.9	0.8
Don't know/ missing	2.1	0.3	1.2	2.4	0.4	1.4	2.3	0.4	1.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	1,189	1,173	2,363	5,665	5,951	11,617	6,855	7,125	13,979

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

Figure 2.1 **Population pyramid**



MMIS 2014

2.5 HOUSEHOLD COMPOSITION

Table 2.8 presents information on the household composition, including sex of the head of household and the household size. These characteristics are important because they are associated with the welfare of the household. Female-headed households are, for example, typically poorer than male-headed households. Economic resources are often more limited in larger households. Moreover, where the size of the household is large, crowding also can lead to health problems.

The table shows that households in Malawi are predominantly male-headed (78 percent). The proportion of households headed by women is higher in rural areas than in urban areas (23 percent and 18 percent, respectively). Overall, the mean size of households in Malawi is 4.1, 4.0 in urban and 4.1 in rural areas.

Table 2.8 Household composition

Percent distribution of households by sex of head of household and by household size and mean size of household, according to residence, Malawi 2014

Characteristic	Residence		Total
	Urban	Rural	
Household headship			
Male	82.5	76.6	77.6
Female	17.5	23.4	22.4
Total	100.0	100.0	100.0
Number of usual members			
1	8.4	9.2	9.0
2	11.2	13.3	12.9
3	20.6	18.3	18.7
4	24.3	18.1	19.2
5	16.1	17.4	17.2
6	10.0	11.9	11.5
7	4.4	7.0	6.5
8	2.5	3.0	2.9
9+	2.4	2.0	2.0
Total	100.0	100.0	100.0
Mean size of households	4.0	4.1	4.1
Number of households	591	2,814	3,405

2.6 CHARACTERISTICS OF WOMEN RESPONDENTS

2.6.1 General Characteristics

Table 2.9 presents the distribution of women age 15-49 by selected background characteristics. More than half of women are under age 30, reflecting the comparatively young age structure of the population. The majority of women age 15-49 live in rural areas (80 percent). By region, the smallest percentage of women live in the Northern Region (19 percent) compared with 41 percent each in the Central and Southern regions.

Nine in ten Malawian women belong to various denominations of Christianity, 9 percent are Muslim, and 1 percent report other or no religion. The largest ethnic group is Chewa (35 percent), followed by Lomwe (19 percent) and Tumbuka (12 percent).

Fourteen percent of women age 15-49 have never been to school. Sixty-three percent have primary school education, and 21 percent of women have secondary school education. Only 2 percent of women have education beyond secondary school. Roughly one-fifth of respondents fall into each wealth quintile, with slightly more women in the highest quintile (23 percent).

Table 2.9 Background characteristics of respondents

Percent distribution of women age 15-49 by selected background characteristics, Malawi 2014

Background characteristic	Weighted percent	Number of women: Weighted number	Number of women: Unweighted number
Age			
15-19	17.5	507	542
20-24	21.5	623	653
25-29	17.9	518	522
30-34	17.2	498	495
35-39	12.9	374	341
40-44	8.2	239	213
45-49	4.8	139	131
Religion			
Catholic	22.7	657	601
CCAP	15.1	437	514
Anglican	1.7	49	83
Seventh-Day Adventist/ Baptist	9.3	269	240
Other Christianity	40.9	1,184	1,141
Muslim	9.4	273	289
No religion	0.9	26	27
Other	0.1	2	2
Ethnic group			
Chewa	34.6	1,002	856
Tumbuka	11.7	340	539
Lomwe	19.3	558	461
Tonga	2.9	83	109
Yao	10.1	292	301
Sena	3.0	88	81
Nkhonde	1.3	39	57
Ngoni	9.4	272	301
Other	7.7	224	192
Residence			
Urban	19.6	568	1,104
Rural	80.4	2,329	1,793
Region			
Northern	18.7	543	869
Central	40.8	1,182	1,036
Southern	40.5	1,172	992
Education			
No education	14.4	417	293
Primary	62.6	1,815	1,763
Secondary	20.5	594	742
More than secondary	2.4	70	99
Wealth quintile			
Lowest	18.9	549	434
Second	18.8	545	456
Middle	19.7	570	503
Fourth	19.6	568	591
Highest	23.0	665	913
Total 15-49	100.0	2,897	2,897

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

2.6.2 Education Attainment of Women

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

Table 2.10 shows the percent distribution of women age 15-49 by highest level of schooling attended or completed, and median years completed, according to background characteristics. Young women have higher levels of education than older women. For example, only 7 percent of women age 15-24 have no education compared with 27 percent of women age 45-49. Similarly, 19 percent of women age 15-24 have some secondary education compared with 3 percent of women age 45-49.

The Northern Region has the lowest proportion of women with no education (6 percent) compared with 16 percent in the Central Region and 17 percent in the Southern Region.

Table 2.10 also shows the correlation between education and economic status. The poorer a woman is, the less likely she is to have an education. Twenty-two percent of women in the lowest wealth quintile have no education compared with 5 percent in the highest wealth quintile.

Overall, the median number of years of education among women age 15-49 is 5.6 years. Education decreases steadily with age. The median number of years of education for urban women is higher (8.9 years) than the median for rural women (4.9 years). Education also varies across regions, ranging from 6.9 years in the Northern Region to 5.1 and 5.2 years in the Central and Southern regions, respectively. Education increases notably with household wealth status, from 3.5 years in the lowest wealth quintile to 9.4 years in the highest wealth quintile.

Table 2.10 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 2014

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	6.9	51.6	13.4	19.3	7.3	1.5	100.0	6.4	1,130
15-19	4.2	55.8	13.5	22.8	3.3	0.5	100.0	6.4	507
20-24	9.0	48.3	13.4	16.5	10.6	2.2	100.0	6.4	623
25-29	10.3	42.5	14.6	18.9	10.1	3.6	100.0	6.8	518
30-34	15.4	54.4	10.6	8.6	7.5	3.5	100.0	5.2	498
35-39	25.7	56.9	5.8	4.9	3.5	3.2	100.0	3.0	374
40-44	31.4	51.5	7.0	7.6	1.4	1.1	100.0	2.8	239
45-49	27.7	51.1	11.5	2.8	4.5	2.5	100.0	2.7	139
Residence									
Urban	4.7	30.0	9.3	25.9	20.6	9.4	100.0	8.9	568
Rural	16.8	56.2	12.1	10.8	3.3	0.7	100.0	4.9	2,329
Region									
Northern	6.1	45.8	20.6	17.3	7.7	2.5	100.0	6.9	543
Central	15.9	50.9	10.1	12.7	7.0	3.3	100.0	5.1	1,182
Southern	16.7	53.8	8.7	13.2	6.0	1.5	100.0	5.2	1,172
Wealth quintile									
Lowest	21.6	66.2	8.2	3.4	0.6	0.0	100.0	3.5	549
Second	21.6	63.0	11.1	3.1	1.2	0.0	100.0	4.0	545
Middle	15.3	57.1	16.6	9.8	1.2	0.0	100.0	5.1	570
Fourth	11.0	50.0	14.5	17.8	5.4	1.2	100.0	6.1	568
Highest	4.7	24.7	7.7	31.0	22.2	9.6	100.0	9.4	665
Total	14.4	51.1	11.5	13.8	6.7	2.4	100.0	5.6	2,897

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

2.6.3 Literacy of Women

Knowing the level and distribution of literacy among the population is an important factor in design and delivery of health messages and interventions. In this part of the survey, female respondents who had only primary education were shown a card with a short sentence in Chichewa and Tumbuka and asked to read the complete sentence or part of it to assess their literacy. A woman is considered literate if she can read all or part of the sentence on the card shown to her by the interviewer, or if she has secondary or higher education. Table 2.11 shows the distribution of female respondents by the level of schooling attended and literacy, and the percentage literate according to background characteristics.

Overall, 72 percent of women age 15-49 are literate. Younger women are more often literate than older women; 82 percent of women age 15-24 are literate compared with 52 percent of women age 45-49. Urban-rural differences exist: 90 percent of urban women are literate compared with 68 percent of rural women. The proportion of women who are literate varies from 84 percent in the Northern Region to 69 percent and 70 percent, respectively, in the Central and Southern regions.

Table 2.11 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 2014

Background characteristic	Secondary school or higher	No schooling or primary school: Can read a whole sentence	No schooling or primary school: Can read part of a sentence	No schooling or primary school: Cannot read at all	Total	Percentage literate[1]	Number of women
Age							
15-24	28.1	42.4	11.3	18.2	100.0	81.8	1,130
15-19	26.5	47.0	10.0	16.4	100.0	83.6	507
20-24	29.3	38.7	12.4	19.6	100.0	80.4	623
25-29	32.6	39.0	6.4	22.0	100.0	78.0	518
30-34	19.6	38.9	13.3	28.2	100.0	71.8	498
35-39	11.6	30.3	9.6	48.5	100.0	51.5	374
40-44	10.1	36.4	14.0	39.3	100.0	60.5	239
45-49	9.7	34.2	8.4	47.6	100.0	52.4	139
Residence							
Urban	55.9	26.7	6.9	10.4	100.0	89.6	568
Rural	14.9	41.7	11.5	31.9	100.0	68.1	2,329
Region							
Northern	27.5	43.6	12.5	16.3	100.0	83.6	543
Central	23.1	38.2	8.1	30.7	100.0	69.3	1,182
Southern	20.8	37.1	12.3	29.9	100.0	70.1	1,172
Wealth quintile							
Lowest	4.0	42.3	12.8	40.8	100.0	59.2	549
Second	4.3	40.4	14.1	41.1	100.0	58.9	545
Middle	11.0	47.7	10.5	30.7	100.0	69.3	570
Fourth	24.5	41.6	11.3	22.6	100.0	77.4	568
Highest	62.8	24.3	5.4	7.5	100.0	92.5	665
Total	23.0	38.8	10.6	27.7	100.0	72.3	2,897

Note: Total may not sum to 100 percent due to rounding.
[1] Refers to women who attended secondary school or higher and women who can read a whole sentence or part of a sentence

MALARIA PREVENTION 3

Key Findings

- Seven in ten households in Malawi (70 percent) own at least one insecticide-treated net (ITN), and almost one in three households (30 percent) have at least one ITN for every two people who stayed in the house the night before the survey.
- More than half of the population in Malawi (52 percent) has access to an ITN. This means that 52 percent of Malawians could sleep under a mosquito net if every net in a household were used by up to two people.
- Seventy-two percent of the population, 67 percent of children, and 62 percent of pregnant women slept under an ITN the night before the survey.
- Sixty-three percent of pregnant women received intermittent preventive treatment (IPTp) for malaria, that is, at least two doses of SP/Fansidar with at least one dose received during an antenatal care visit for the most recent pregnancy.

This chapter describes the population coverage rates of the primary malaria control interventions. In Malawi, malaria control efforts have focused on scaling up interventions that include ownership and use of long-lasting insecticide-treated nets (LLINs), providing prompt effective treatment with artemether-lumefantrine (known in Malawi as LA) within 24 hours of onset of symptoms, and intermittent preventive treatment (IPTp) for pregnant women. Cross-cutting interventions such as behaviour change communication have also been critical as well for increasing knowledge of prevention and for treatment-seeking behaviour.

3.1 VECTOR CONTROL

Vector control measures, including ownership and use of ITNs and indoor residual spraying (IRS), are key interventions in malaria control. Under the current National Malaria Strategic Plan, Malawi's vector control objective is to have at least 85 percent of people living in malaria risk areas use appropriate malaria prevention interventions by 2016 (NMCP, nd).

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

The treatment of nets has been made possible by the availability of synthetic pyrethroids, the only insecticides currently used for treatment of nets. This class of insecticides was developed to mimic the insecticidal compounds of the natural pyrethrum. Currently, ITNs are regarded as a key malaria control tool, and can reduce malaria transmission when used by all or most members of the community. ITNs have been shown to reduce malaria transmission by as much as 90 percent under trial conditions (Lengeler, 2004). ITNs also reduce malaria morbidity and mortality. Long-lasting insecticidal nets (LLINs) are a

subset of ITNs. An LLIN is a factory-treated mosquito net made with netting material that has insecticide incorporated within or bound around the fibres. The net must retain its effective biological activity without re-treatment for repeated washes, for three to five years of use under field conditions (WHO/Global Malaria Program, 2007).

3.1.1 Ownership of Mosquito Nets

The ownership and use of both treated and untreated mosquito nets is the primary prevention strategy for reducing malaria transmission in Malawi. The LLINs policy includes free distribution of LLINs for pregnant women at their first visit to an antenatal care (ANC) clinic and for new born babies in health facilities at delivery or at their first clinic visit under the Expanded Program on Immunisation (EPI) if an LLIN was not received at birth. In the past five years, over 6 million ITNs have been distributed countrywide in Malawi through routine channels. Malawi distributed an additional 5.6 million ITNs during a mass LLIN distribution campaign in 2012.

To assess household net ownership, all households in the 2014 MIS were asked if they owned mosquito nets and, if so, how many. To determine the type of net in the household, interviewers were instructed to observe the nets or to ask the respondent the type of net he or she owns. Table 3.1 provides information on the percentage of households that own at least one mosquito net (any net, an ITN, or an LLIN), the average number of nets per household, and the percentage of households with at least one net for every two people who slept in the household the previous night, according to background characteristics.

Table 3.1 shows that 71 percent of all households own at least one mosquito net (any type), 70 percent of households own at least one ITN, and 70 percent own at least one LLIN. This shows that almost all nets in Malawi are LLINs. On average, a Malawian household owns 1.2 ITNs or LLINs, compared with an average of 1.3 of any type of net.

As seen in Table 3.1, ITN ownership is higher in urban households than in rural households; 75 percent of households in urban areas have at least one ITN compared with 69 percent of households in rural areas. By region, ownership of ITNs is slightly higher in the Northern Region than in the other regions: 78 percent compared with 70 percent in the Central Region and 68 percent in the Southern Region. Wealthier households are more likely to own mosquito nets than households in lower wealth quintiles; 78 percent of households in the highest wealth quintile own an ITN compared with 61 percent of households in the lowest wealth quintile.

Although mosquito net ownership is an important indication of the success of a vector control programme, it is also important to determine if a household has a sufficient number of nets for those sleeping in the dwelling. Table 3.1 also shows the percentage of households with at least one mosquito net for every two persons who stayed in the household the night before the interview.

Overall, 30 percent of households in Malawi have reached universal ITN coverage; that is, about one third of the households have at least one ITN for every two persons who slept in the household the night before the survey. Universal ITN coverage is higher among urban households than among rural households (40 percent and 28 percent, respectively). Twenty-five percent of households in the Southern region have at least one ITN for every two persons, compared with 40 percent of households in the Northern Region and 32 percent of households in the Central Region. As expected, the highest proportion of households to have reached universal ITN coverage is among those in the highest wealth quintile: 44 percent compared with 22 percent among households in the lowest wealth quintile.

Table 3.1 Household possession of mosquito nets

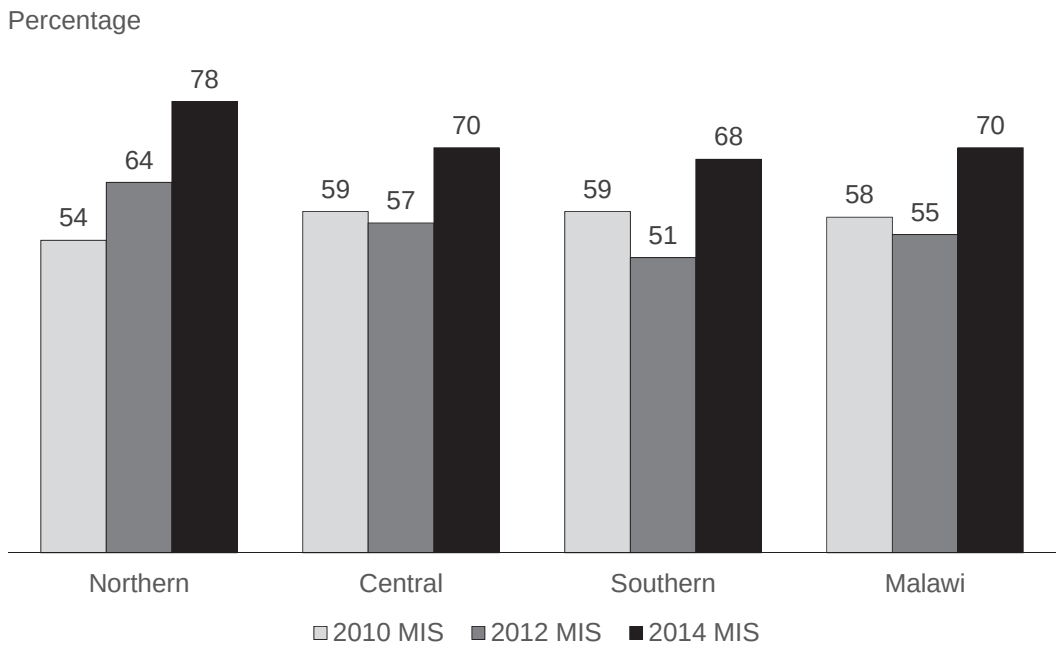
Percentage of households with at least one mosquito net (treated or untreated), insecticide-treated net (ITN), and long-lasting insecticidal net (LLIN); average number of nets, ITNs, and LLINs per household; and percentage of households with at least one net, ITN, and LLIN per two persons who stayed in the household last night, by background characteristics, Malawi 2014

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[1]			Number of households with at least one person who stayed in the household last night
	Any mosquito net	Insecticide-treated mosquito net (ITN)[2]	Long-lasting insecticidal net (LLIN)	Any mosquito net	Insecticide-treated mosquito net (ITN)[2]	Long-lasting insecticidal net (LLIN)		Any mosquito net	Insecticide-treated mosquito net (ITN)[2]	Long-lasting insecticidal net (LLIN)	
Residence											
Urban	78.9	75.4	74.7	1.6	1.4	1.4	591	45.6	39.8	39.1	590
Rural	69.6	69.1	69.1	1.2	1.2	1.2	2,814	29.1	28.3	28.1	2,814
Region											
Northern	78.8	77.9	77.8	1.6	1.5	1.5	600	41.6	40.1	39.4	600
Central	71.1	69.7	69.5	1.3	1.3	1.2	1,317	34.5	32.0	31.7	1,316
Southern	68.3	67.6	67.6	1.1	1.1	1.1	1,488	25.7	24.8	24.8	1,488
Wealth quintile											
Lowest	61.1	60.7	60.7	0.9	0.9	0.9	691	22.3	21.8	21.5	691
Second	66.1	66.0	66.0	1.0	1.0	1.0	692	25.9	25.3	25.3	692
Middle	69.5	69.2	69.1	1.1	1.1	1.1	660	25.8	25.5	25.5	660
Fourth	78.9	77.6	77.6	1.5	1.5	1.5	659	36.6	34.5	34.5	659
Highest	80.6	77.8	77.3	1.7	1.6	1.6	704	48.7	44.0	43.1	703
Total	71.2	70.2	70.1	1.3	1.2	1.2	3,405	31.9	30.3	30.0	3,404

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

Figure 3.1 shows household ownership of at least one ITN, as measured by Malawi's three Malaria Indicator Surveys. At the national level, ownership of ITNs increased from 58 percent in 2010 to 70 percent in 2014. The Northern Region showed the largest increase, from 54 percent in 2010 to 78 percent in 2014.

Figure 3.1 **Trend in ownership of at least one ITN, 2010, 2012, and 2014**



3.1.2 Indoor Residual Spraying

Indoor residual spraying (IRS) is another component of efforts to control malaria transmission. IRS is the spraying of the interior walls and ceilings of a dwelling with long-lasting insecticide. It reduces

the transmission of malaria by killing adult female mosquitoes when they rest on the walls of the dwelling after feeding. To obtain information on the prevalence of indoor residual spraying, all households interviewed in the 2014 MMIS were asked whether the interior walls of their dwelling had been sprayed to protect against mosquitoes during the 12-month period before the survey, and, if so, who had sprayed the dwelling.

Overall, 9 percent of households in Malawi were treated with IRS in the past 12 months (see Table 3.2). Rural households were five times more likely than urban households to have had IRS (10 percent compared with 2 percent). Households in the Northern Region were more likely to have been sprayed than households in the other regions (12 percent compared with 9 percent in the Southern Region and 7 percent in the Central Region). Households in the lowest and second wealth quintiles were the most likely to have been sprayed. Among households with IRS in the past 12 months, 2 percent had their walls painted or plastered after being sprayed.

Table 3.2 Indoor residual spraying against mosquitoes

Percentage of households in which someone has come into the dwelling to spray the interior walls against mosquitoes (IRS) in the past 12 months, the percentage of households with at least one ITN and/or IRS in the past 12 months, and the percentage of households with at least one ITN for every two persons and/or IRS in the past 12 months, by background characteristics, Malawi 2014

Background characteristic	Percentage of households with IRS[1] in the past 12 months	Percentage of households with at least one ITN[2] and/or IRS in the past 12 months	Percentage of households with at least one ITN[2] for every two persons and/or IRS in the past 12 months	Number of households	Among households with IRS[1] in the past 12 months, percentage with walls painted or plastered after IRS	Number of households with IRS[1] in the past 12 months
Residence						
Urban	2.2	75.9	41.1	591	19.5	13
Rural	9.8	72.6	35.6	2,814	1.6	276
Region						
Northern	11.7	79.1	45.3	600	1.6	70
Central	6.8	72.5	36.9	1,317	2.8	89
Southern	8.8	71.4	32.8	1,488	2.5	131
Wealth quintile						
Lowest	11.8	67.4	31.9	691	2.8	82
Second	10.0	68.6	32.1	692	4.1	69
Middle	8.7	72.0	30.8	660	0.0	57
Fourth	8.7	80.1	41.5	659	0.1	57
Highest	3.4	78.1	46.4	704	7.4	24
Total	8.5	73.2	36.6	3,405	2.4	289

[1] Indoor residual spraying (IRS) is limited to spraying conducted by a government, private or non-governmental organisation.
[2] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment (LLIN) or a net that has been soaked with insecticide within the past 12 months.

Table 3.2 also shows which households were covered by vector control. By combining IRS with use of an ITN, it is possible to look at a combined indicator of malaria protection at the household level. Overall, 73 percent of households were protected from malaria either by owning an ITN or having been sprayed in the past 12 months. There was a small urban-rural difference in the percentage of protected households (76 percent in urban and 73 percent in rural areas). Households in the Northern Region were the most likely to have at least one ITN and/or IRS in the past 12 months (79 percent) compared with households in the Central and Southern Regions (73 and 71 percent, respectively). The proportion of households covered by this vector control intervention increased with wealth quintile.

The next column in Table 3.2 shows the percentage of households with at least one ITN for every two persons and/or IRS in the past 12 months. Overall, 37 percent of households had at least one ITN for every two persons and/or were sprayed in the past 12 months. The variations across residence and wealth quintiles are similar to those for households that are protected from malaria either by owning an ITN or having been sprayed in the past 12 months.

In 62 percent of households, the spraying was done by a government worker. In the remaining households, the spraying was done by a private company (16 percent) or a non-governmental organisation (15 percent). There was no clear pattern with regard to the organisation that did the spraying, by residence or wealth status. However, it appeared that the government programme was more active in the Central Region while private companies covered the other regions; NGOs did not operate in urban areas. While not linear, there is a relationship between household wealth status (quintile) and spraying by a government worker or programme. Households in the lowest wealth quintile are most likely to be sprayed by a government worker—80 percent in the lowest quintile compared with 69 percent in the middle quintile, and 53 percent in the highest quintile (data not shown).

3.2 ACCESS TO MOSQUITO NETS

The 2014 MMIS presents data on access to an ITN, measured by the proportion of the population that could sleep under an ITN if each ITN in the household were used by up to two people. Coupled with mosquito net usage, ITN access can provide useful information on the magnitude of the behavioural gap in ITN ownership and use, or, in other words, the population with access to an ITN but not using it. If the difference between these indicators is substantial, the programme may need to focus on behaviour change and how to identify the main drivers/barriers to ITN use, in order to design an appropriate intervention. This analysis helps ITN programmes determine whether they need to achieve higher ITN coverage, promote ITN use, or both. Table 3.3 shows the 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.

As shown in Table 3.3, more than half of the household population in Malawi (52 percent) have access to an ITN. Twenty-seven percent of the population slept in households with no ITN and, therefore, were not able to use an ITN. As expected, the proportion of persons with access to an ITN tends to decrease as household size increases. Thirty percent of the population stayed in households that own at least one ITN, while 27 percent slept in households that own two ITNs. One in eight Malawians (12 percent) slept in households with three ITNs, and 3 percent slept in households with four ITNs. Very few individuals slept in households with five or more ITNs.

Access to an ITN is highest for households in which two persons stayed in the household the night before the survey (64 percent), followed by three to five persons (53-57 percent).

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 the number of persons who stayed in the household the night before the survey, Malawi 2014

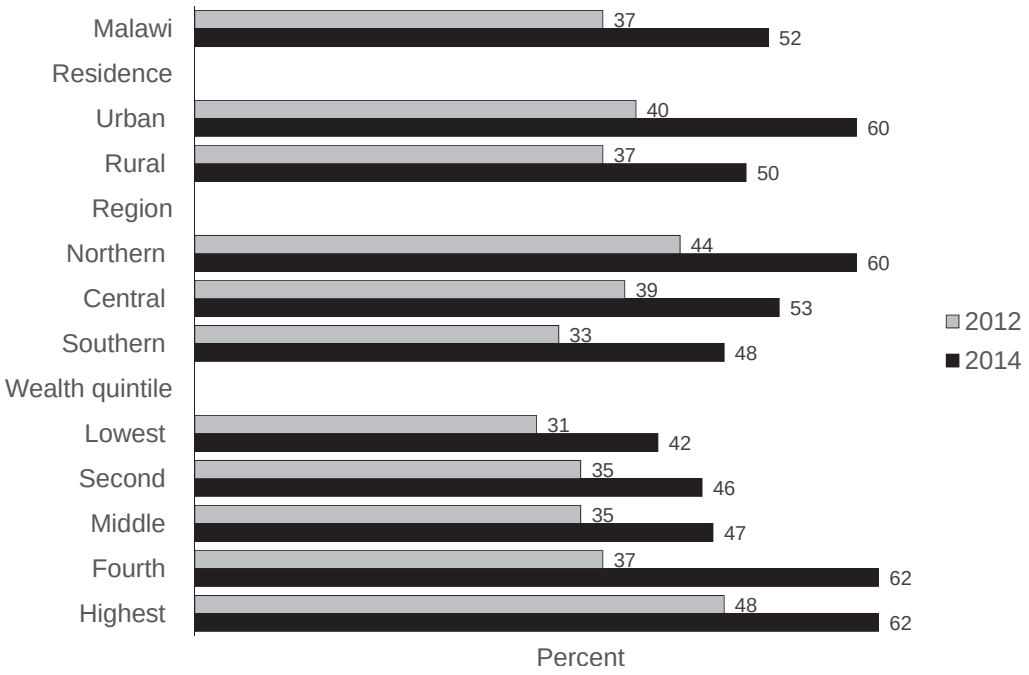
	Number of persons who stayed in the household the night before the survey								
Number of ITNs	1	2	3	4	5	6	7	8+	Total
0	50.5	36.4	28.3	27.4	23.6	25.1	28.5	22.3	27.0
1	40.4	45.8	44.8	36.8	26.8	19.9	19.4	18.7	29.8
2	6.3	16.3	21.3	25.2	35.5	34.0	26.8	20.2	26.9
3	2.4	0.8	5.2	7.9	10.4	16.6	17.9	25.3	11.9
4	0.4	0.8	0.3	0.9	2.4	3.7	5.7	9.6	3.1
5	0.0	0.0	0.1	0.9	1.1	0.4	0.9	1.4	0.7
6	0.0	0.0	0.0	0.0	0.0	0.2	0.8	2.2	0.4
7+	0.0	0.0	0.0	0.9	0.3	0.0	0.0	0.1	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	314	888	1,923	2,586	2,923	2,258	1,551	1,536	13,979
Percent with access to an ITN[1]	49.5	63.6	56.8	54.2	53.2	50.3	43.7	43.2	51.8

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

Figure 3.2 shows the trends in access to an ITN in the household, by residence and wealth quintile in 2012 and 2014. Overall, access to an ITN has increased from 37 percent in 2012 to 52 percent in 2014. The improvement in access to an ITN took place in all areas and affected households at all wealth levels. Variations in access to an ITN in 2014 were similar to those observed in 2012.

In 2014, people living in urban areas were more likely to have access to an ITN than their rural counterparts (60 percent and 50 percent, respectively). Residents of the Northern Region were more likely to have access to an ITN (60 percent) compared with those in the Central and Southern Regions (53 percent and 48 percent, respectively). Access to an ITN increased with household wealth status; ranging from 42 percent for persons living in households in the lowest wealth quintile to 62 percent for those living in households in the highest wealth quintile.

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



3.2.1 Use of Mosquito Nets by Household Population

Mosquito net coverage of the entire population is necessary to accomplish large reductions in the malaria burden. Although vulnerable groups, such as children under age 5 and pregnant women, should still be prioritised, the equitable and communal benefits of wide-scale ITN use by older children and adults should be promoted and evaluated by national malaria control programmes (Killeen et al., 2007). The 2014 MMIS asked about use of mosquito nets by household members during the night before the survey. These data are presented in Table 3.4.

Table 3.4 shows that 54 percent of the household population slept under any net the night before the survey, 53 percent slept under an ITN, and 52 percent slept under an LLIN. Overall, 57 percent of Malawians were covered by a vector control intervention the night before the survey; that is, they either slept under an ITN or slept in a dwelling sprayed with IRS in the past 12 months.

ITN use among the general population is highest for children under age 5 (67 percent) compared with other age groups. ITN use shows almost no variation by sex (53 percent for females and 52 percent for males). ITN use is higher in urban areas than in rural areas (57 percent and 52 percent, respectively). ITN use is slightly higher in the Northern Region (55 percent) than in the other regions (53 percent in the Central Region and 51 percent in the Southern Region).

In households that own at least one ITN, 72 percent of the population slept under an ITN the night before the survey. In these households, females were slightly more likely than males to sleep under an ITN

(73 percent and 71 percent, respectively). There was no difference by urban-rural residence in the percentage of the population who utilised an ITN the night before the survey (73 percent and 72 percent, respectively). Among households that own an ITN, Central Region residents (73 percent) were more likely than those living in other regions to sleep under an ITN (72 percent in the Southern Region and 69 percent in the Northern Region).

Table 3.4 Use of mosquito nets by persons in the household

Percentage of the de facto household population who slept the night before the survey under a mosquito net (treated or untreated), under an insecticide-treated net (ITN), under a long-lasting insecticidal net (LLIN), and under an ITN or in a dwelling in which the interior walls have been sprayed against mosquitoes (IRS) in the past 12 months; and among the de facto household population in households with at least one ITN, the percentage who slept under an ITN the night before the survey, by background characteristics, Malawi 2014

	Household population					Household population in households with at least one ITN[1]	
Background characteristic	Percentage who slept under any net last night	Percentage who slept under an ITN[1] last night	Percentage who slept under an LLIN last night	Percentage who slept under an ITN[1] last night or in a dwelling sprayed with IRS[2] in the past 12 months	Number	Percentage who slept under an ITN[1] last night	Number
Age (in years)							
<5	67.8	67.1	66.8	69.4	2,335	87.1	1,798
5-14	42.0	41.2	41.1	46.7	4,467	57.5	3,203
15-34	57.0	55.4	55.0	58.8	4,040	74.0	3,027
35-39	59.8	58.0	57.3	61.8	1,577	79.2	1,154
50+	53.0	51.5	51.4	55.5	1,371	76.4	924
Don't know/Missing	40.0	40.0	40.0	46.6	188	77.1	98
Sex							
Male	52.8	51.7	51.4	56.0	6,855	71.2	4,977
Female	54.6	53.3	53.0	57.1	7,125	72.6	5,227
Residence							
Urban	60.7	56.7	55.8	58.3	2,363	72.5	1,850
Rural	52.3	51.7	51.5	56.2	11,617	71.8	8,354
Region							
Northern	55.9	54.5	54.1	57.9	2,608	68.6	2,073
Central	54.8	53.2	52.7	56.6	5,475	73.3	3,976
Southern	51.6	51.0	51.0	55.9	5,896	72.4	4,156
Wealth quintile							
Lowest	45.6	45.3	45.2	52.4	2,790	71.4	1,773
Second	48.7	48.1	48.1	52.4	2,793	70.8	1,900
Middle	51.8	51.5	51.4	55.5	2,803	72.2	1,997
Fourth	61.5	60.2	60.2	63.6	2,812	73.1	2,318
Highest	60.9	57.4	56.2	58.9	2,782	72.0	2,216
Total	53.7	52.5	52.2	56.6	13,979	71.9	10,204

Note: Total includes 188 household population with missing information on age.
[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment (LLIN) or a net that has been soaked with insecticide within the past 12 months.
[2] Indoor residual spraying (IRS) is limited to spraying conducted by a government, private, or non-governmental organisation.

3.2.2 Use of Mosquito Nets by Children under Age 5

Children under age 5 are considered the most vulnerable to severe complications of malaria infection because they lack acquired immunity. Those living in areas of high malaria transmission naturally acquire immunity to the disease over time (Doolan et al., 2009). Acquired immunity is not the same as sterile immunity—that is, acquired immunity does not prevent *P. falciparum* infection but rather protects against severe disease and death. Age is an important factor in determining levels of acquired immunity to malaria. For about six months following birth, antibodies acquired from the mother during pregnancy provide protection to children born in areas of endemic malaria. This immunity is gradually lost, and children start to develop their own immunity to malaria. The pace at which immunity develops depends on exposure to malarial infection, and, in high malaria-endemic areas, children are thought to attain a high level of immunity by their fifth birthday. Such children may experience episodes of malaria illness but usually do not suffer from severe, life-threatening malaria.

Table 3.5 shows the use of mosquito nets by children under age 5. Nationally, 67 percent of Malawian children under age 5 slept under an ITN the night before the survey. Among households with at least one ITN, 87 percent of children under age 5 slept under an ITN the night before the survey. ITN utilisation among children tends to decrease with age. For example, children less than 1 year are 1.2 times

more likely to have slept under an ITN the night before the survey than children age 4 (78 percent and 64 percent, respectively). ITN utilisation varies only slightly by the child's sex (68 percent for girls compared with 66 percent for boys). Children in urban areas are more likely than children in rural areas to use ITNs (71 percent and 67 percent, respectively). Children living in the Northern Region are only slightly more likely than children in the Central Region and Southern Region to have slept under an ITN.

While the proportion of children under age 5 who slept under a mosquito net has increased since the 2012 MIS (56 percent), the strategic objective of the 2011-2016 Malaria Strategic Plan (NMCP, nd) of having 90 percent of children under age 5 sleep under a mosquito net has yet to be achieved.

Table 3.5 Use of mosquito nets by children

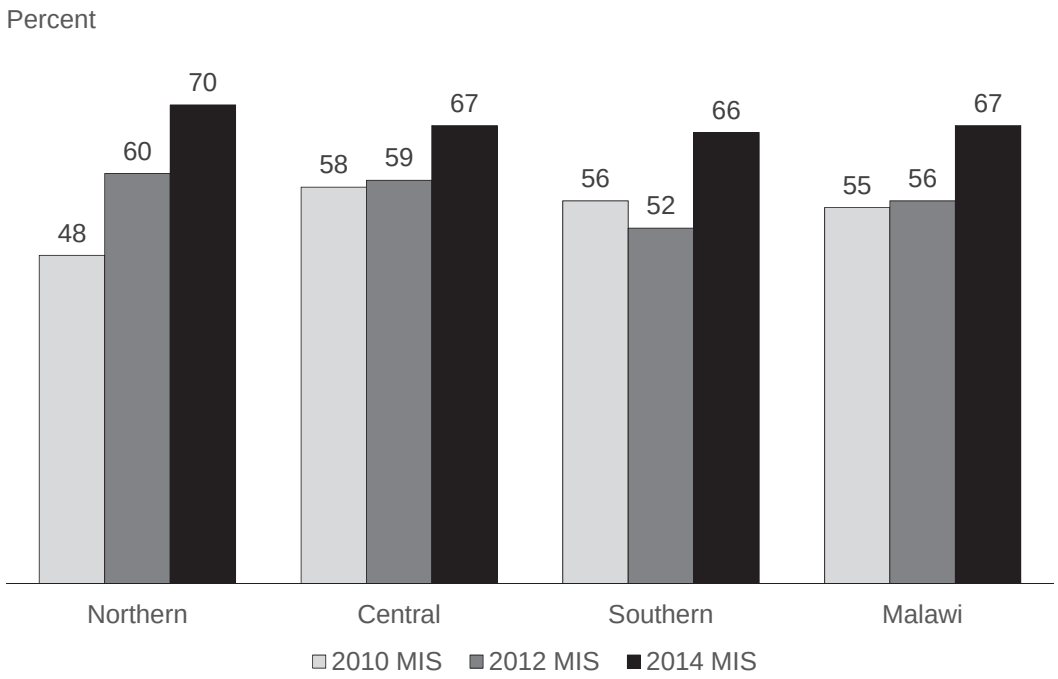
Percentage of children under age 5 who, the night before the survey, slept under a mosquito net (treated or untreated), under an insecticide-treated net (ITN), under a long-lasting insecticidal net (LLIN), and under an ITN or in a dwelling in which the interior walls have been sprayed against mosquitoes (IRS) in the past 12 months; and among children under age 5 in households with at least one ITN, the percentage who slept under an ITN the night before the survey, by background characteristics, Malawi 2014

	Children under age 5 in all households					Children under age 5 in households with at least one ITN[1]	
Background characteristic	Percentage who slept under any net last night	Percentage who slept under an ITN[1] last night	Percentage who slept under an LLIN last night	Percentage who slept under an ITN[1] last night or in a dwelling sprayed with IRS[2] in the past 12 months	Number of children	Percentage who slept under an ITN[1] last night	Number of children
Age (in years)							
<1	78.9	78.3	77.8	80.0	462	91.5	395
1	65.7	65.2	64.7	67.2	518	87.9	384
2	66.6	65.9	65.9	68.2	477	88.4	355
3	62.6	62.1	61.5	66.5	412	81.3	315
4	64.8	63.8	63.8	65.1	467	85.4	349
Sex							
Male	66.3	65.8	65.2	68.3	1,152	85.9	882
Female	69.2	68.4	68.4	70.4	1,184	88.3	917
Residence							
Urban	74.0	70.8	70.2	72.2	335	86.7	274
Rural	66.7	66.5	66.2	68.9	2,000	87.2	1,524
Region							
Northern	70.2	69.5	69.5	71.0	428	86.2	345
Central	67.8	66.7	65.9	68.9	905	86.8	696
Southern	66.7	66.4	66.4	69.2	1,003	87.9	757
Wealth quintile							
Lowest	60.1	60.1	60.1	64.6	561	87.9	383
Second	63.6	63.2	63.2	66.3	483	86.8	352
Middle	72.5	72.4	72.4	73.1	469	93.8	362
Fourth	73.2	72.4	72.4	73.4	441	84.3	379
Highest	72.3	69.6	67.7	71.1	382	82.5	322
Total	67.8	67.1	66.8	69.4	2,335	87.1	1,798

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

Figure 3.3 shows the use of mosquito nets by children under age 5 in the three Malawi MIS surveys. At the national level, ITN utilisation increased from 55 percent in 2010 to 56 percent in 2012 and 67 percent in 2014. The increase between 2012 and 2014 took place in all regions, but the most substantial increase was in the Southern Region, from 52 in 2012 to 66 percent in 2014.

Figure 3.3 **Trend in ITN use by children under age 5, 2010, 2012, and 2014**



In households with children under age 5 and having at least one mosquito net, respondents were asked the reasons that children did not use a mosquito net the night before the survey despite having a net available in the household. The possible reasons include those related to temperature (too hot or too cold), the child's preference (cries or afraid), access (not enough number of net or net used by adults), and condition of the net (not hung or not in good condition). Forty percent of households with at least one child under age 5 had at least one mosquito net. In only 5 percent of these households were children under age 5 reported to have *not* slept under a net the night before the survey (data not shown).

3.2.3 Use of Mosquito Nets by Pregnant Women

Pregnancy suppresses immunity, so women in their first pregnancy are at increased risk for severe malaria, compared with non-pregnant women. Pregnant women in their first pregnancies are at especially increased risk. In high transmission areas such as Malawi, malaria in pregnant women is often asymptomatic, but is frequently associated with anaemia and can interfere with the maternal-foetal exchange, leading to low-birth-weight infants. To prevent complications from malaria in pregnancy—such as anaemia, low birth weight, and trans-placental parasitaemia—the NMCP supports a three-pronged approach, including use of an ITN, provision of intermittent preventive treatment of malaria (IPTp), and effective case management of malaria and anaemia (NMCP, nd). Use of an ITN is the only means of prevention available to pregnant women in the first trimester. NMCP has set a target of 90 percent of pregnant women sleeping under an ITN by 2016.

Table 3.6 shows the use of mosquito nets by pregnant women by background characteristics. Overall, 62 percent of pregnant women in Malawi slept under an ITN the night before the survey. ITN utilisation among pregnant women is higher in urban areas (73 percent) than in rural areas (60 percent); it is also higher in the Northern Region (76 percent) than in the Central Region (61 percent) and the Southern Region (57 percent).

As expected, ITN use is considerably higher for pregnant women who live in households that own at least one ITN (85 percent) than for pregnant women in all households (62 percent). Variations in ITN utilisation by pregnant women in households with at least one ITN by background characteristics are similar to those for all households.

Table 3.6 Use of mosquito nets by pregnant women

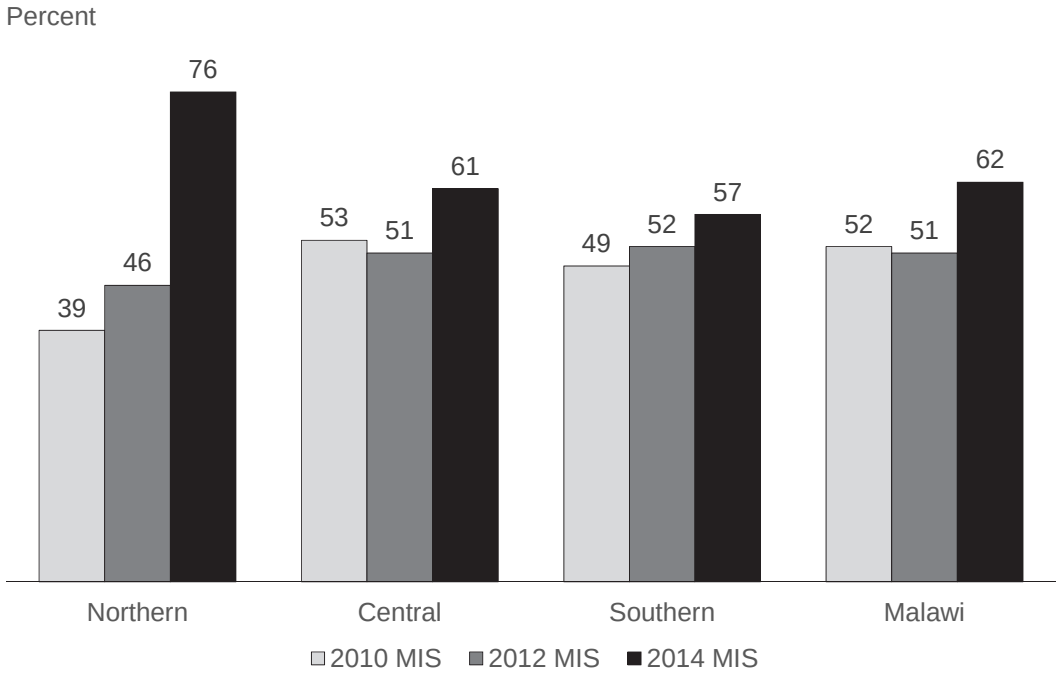
Percentage of pregnant women age 15-49 who, the night before the survey, slept under a mosquito net (treated or untreated), under an insecticide-treated net (ITN), under a long-lasting insecticidal net (LLIN), and under an ITN or in a dwelling in which the interior walls have been sprayed against mosquitoes (IRS) in the past 12 months; and among pregnant women age 15-49 in households with at least one ITN, the percentage who slept under an ITN the night before the survey, by background characteristics, Malawi 2014

	Pregnant women age 15-49 in all households					Pregnant women age 15-49 in households with at least one ITN[1]	
Background characteristic	Percentage who slept under any net last night	Percentage who slept under an ITN[1] last night	Percentage who slept under an LLIN last night	Percentage who slept under an ITN[1] last night or in a dwelling sprayed with IRS[2] in the past 12 months	Number of women	Percentage who slept under an ITN[1] last night	Number of women
Residence							
Urban	73.5	73.2	73.2	73.5	36	87.7	30
Rural	61.6	60.2	60.2	60.2	182	84.8	129
Region							
Northern	76.2	75.8	75.8	75.8	44	89.8	37
Central	62.3	60.8	60.8	60.9	93	87.2	65
Southern	58.1	56.9	56.9	56.9	81	80.4	57
Education							
No education	49.7	44.7	44.7	44.7	26	53.9	22
Primary	68.3	67.5	67.5	67.5	146	92.4	106
Secondary	(53.3)	(53.3)	(53.3)	(53.6)	41	(83.5)	26
More than secondary	*	*	*	*	*	*	5
Wealth quintile							
Lowest	58.8	58.8	58.8	(58.8)	32	*	19
Second	73.5	69.7	69.7	69.7	60	(86.8)	48
Middle	50.6	50.6	50.6	(50.6)	50	(78.9)	32
Fourth	77.7	77.2	77.2	(77.2)	38	(86.5)	34
Highest	55.2	55.0	55.0	55.2	40	(80.0)	27
Total	63.6	62.4	62.4	62.4	218	85.4	160

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 an estimate 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 (LLIN) or a net that has been soaked with insecticide within the past 12 months.
[2] Indoor residual spraying (IRS) is limited to spraying conducted by a government, private, or non-governmental organisation.

Figure 3.4 shows trends of ITN utilisation among pregnant women at the national and regional level. At the national level, there has been a considerable increase in ITN use among pregnant women, from 52 percent in 2010 to 62 percent in 2014. At the same time, ITN use among pregnant women in the Northern Region has almost doubled, from 39 percent in 2010 to 76 percent in 2014. The increase in ITN use in the Central and Southern regions is less dramatic, from 53 percent in 2010 to 61 percent in 2014 in the Central Region and from 49 percent in 2010 to 57 percent in 2014 in the Southern Region.

Figure 3.4 **Trend in use of ITN by pregnant women age 15-49, 2010, 2012, and 2014**



3.3 INTERMITTENT PREVENTIVE TREATMENT OF MALARIA IN PREGNANCY

In areas of high malaria transmission, by the time an individual reaches adulthood, she or he has acquired immunity that protects against severe disease. However, pregnant women—especially those pregnant for the first time—frequently regain their susceptibility to malaria.

Intermittent preventive treatment of malaria (IPTp) during pregnancy has been the standard of care in Malawi since 1993. The medicine used for IPT in pregnancy is sulphadoxine-pyrimethamine (SP) or SP/Fansidar (NMCP, nd). The previous national policy guidelines for IPT required a pregnant mother to take at least two treatment doses of SP during routine antenatal care (ANC) visits. In line with WHO guidance, in 2014 Malawi revised the national IPTp policy to recommend that eligible pregnant women receive SP/Fansidar at each scheduled antenatal care visit, with all pregnant women receiving a minimum of three doses during each pregnancy. At the time of data collection, training of health care workers on this policy had not been initiated and this data serves as a baseline for future comparison.

In the 2014 MMIS, women who had a live birth in the two years preceding the survey were asked several questions regarding the period of time they were pregnant with their most recent birth. They were asked if anyone told them during their pregnancy that pregnant women need to take medicine to keep them from getting malaria. They were also asked if they had taken any medicines to prevent malaria during that pregnancy and, if so, which medicine(s). If the respondent did not know the name of the medicine she took, interviewers were instructed to show her some examples of common antimalarials. They also were instructed to probe to see if she took three ‘big white tablets’ at the health facility (indicative of SP/Fansidar). If respondents had taken SP/Fansidar, they were further asked how many times they took it and whether they had received it during a prenatal care visit. The findings are presented in Table 3.10.

Use of cotrimoxazole prophylaxis for the prevention of opportunistic infections in HIV-infected women is a contraindication to receipt of IPTp-SP. Coverage figures are calculated from all women who gave birth in the last two years. In order to determine to what extent use of cotrimoxazole prophylaxis affected coverage levels, women were asked about cotrimoxazole use in their most recent pregnancy. Less

than 2 percent of all respondents reported having used any cotrimoxazole prophylaxis, suggesting that this is not a major issue affecting IPTp coverage.

Table 3.7 shows that 90 percent of pregnant women took an antimalarial drug during their last pregnancy. Almost all of these women took SP/Fansidar, and almost all of the women who took SP/Fansidar (89 percent) received the drug at an ANC visit.

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

Percentage of women age 15-49 with a live birth in the two years preceding the survey who, during the pregnancy preceding the last birth, took any antimalarial drug for prevention, who took one dose of SP/Fansidar, and who received Intermittent Preventive Treatment (IPTp)[1], by background characteristics, Malawi 2014

		SP/Fansidar		Intermittent preventive treatment				
				Two or more doses of IPTp		Three or more doses of IPTp		
Background characteristic	Percentage who took any antimalarial drug	Percentage who took any SP/Fansidar	Percentage who received any SP/Fansidar during an ANC visit	Percentage who took 2+ doses of SP/Fansidar	Percentage who took 2+ doses of SP/Fansidar and received at least one during ANC visit	Percentage who took 3+ doses of SP/Fansidar	Percentage who took 3+ doses of SP/Fansidar and received at least one during ANC visit	Number of women with a live birth in the two years preceding the survey
Residence								
Urban	93.0	93.0	92.8	62.4	62.3	9.0	9.0	146
Rural	89.8	89.8	87.9	64.7	63.5	13.2	12.5	799
Region								
Northern	94.8	94.8	94.0	68.7	67.9	9.6	8.8	157
Central	91.9	91.9	90.2	67.1	65.6	14.2	13.5	374
Southern	87.0	87.0	85.2	60.2	59.5	12.2	11.7	414
Education								
No education	87.6	87.6	86.7	67.5	67.0	16.9	16.9	159
Primary	92.8	92.8	91.1	65.9	64.5	12.5	11.4	597
Secondary	84.5	84.5	84.5	57.5	57.4	10.5	10.5	170
More than secondary	*	*	*	*	*	*	*	20
Wealth quintile								
Lowest	91.6	91.6	90.9	71.2	71.2	16.8	16.8	230
Second	87.7	87.7	87.3	61.2	60.8	16.7	16.7	189
Middle	94.6	94.6	91.1	67.0	63.5	12.2	9.8	186
Fourth	87.1	87.1	83.6	55.2	54.0	5.8	4.9	168
Highest	89.6	89.6	89.5	64.6	64.5	9.5	9.5	172
Total	90.3	90.3	88.7	64.3	63.3	12.6	12.0	945

Note: An asterisk indicates that an estimate is based on fewer than 25 unweighted cases and has been suppressed.
[1] IPTp: Intermittent preventive treatment during pregnancy is preventive treatment with two or more doses of SP/Fansidar.

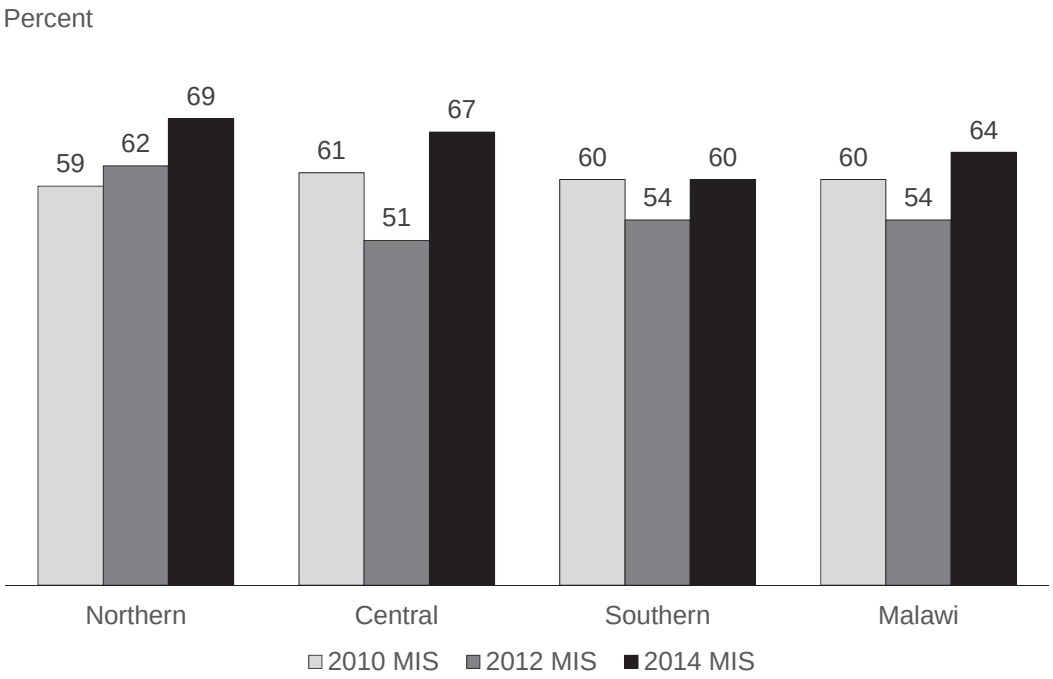
Sixty-four percent of women with a live birth in the two years preceding the survey reported taking two or more doses of SP/Fansidar and almost all of these women received at least one dose during an ANC visit. Thirteen percent of women took three or more doses of SP/Fansidar during pregnancy and 12 percent of women took at least one dose during an ANC visit. Thirteen percent of women reported taking three or more doses of SP/Fansidar during their last pregnancy. Almost all of the women who took three or more doses of SP/Fansidar received at least one during an ANC visit.

Urban women are slightly more likely than rural women to have taken an antimalarial drug during pregnancy (93 percent compared with 90 percent). However, rural women are more likely than urban women to take two or more doses of SP/Fansidar and received the drug during an ANC visit.

Among the regions, women living in the Northern Region are more likely (95 percent) than those living elsewhere to have taken an antimalarial drug during their last pregnancy. They are also more likely to take two doses of SP/Fansidar, but less likely than women in other regions to take three or more doses of the antimalarial drug. The practice of taking any SP/Fansidar during pregnancy varies little by household wealth status; however, women in the lowest wealth quintile are more likely than women in higher wealth quintiles to take two or more doses of SP/Fansidar.

Figure 3.5 compares IPTp use among women in the past two years. At the national level, use of IPTp (defined as the percentage of women who took two or more doses with at last one received at an ANC visit) during pregnancy in the 2014 MIS (64 percent) is higher than that reported in both the 2010 MIS (60 percent) and the 2012 MIS (54 percent). At the regional level, adherence to the recommended prevention measures for pregnant women—indicated by the proportion of women who received two or more doses of SP during pregnancy—has increased since 2012.

Figure 3.5 **Trend in percentage of pregnant women who gave birth in the two years before the survey who received two or more doses of SP, 2010, 2012, and 2014**



3.4 PREFERENCE FOR COLOUR AND SHAPE OF MOSQUITO NET

In the 2014 MMIS, all respondents were asked about their colour and shape preference, irrespective of whether the respondent reported owning a mosquito net.

Table 3.8 shows that more than half (56 percent) of households interviewed prefer blue mosquito nets, 32 percent prefer green mosquito nets, and 7 percent of households interviewed prefer white nets. Very few households prefer red, black, or any other colour of net. Blue nets are preferred by both urban and rural households. Preference for net colour varies by region. However, respondents in all regions prefer blue nets over the other colours. Net colour also has an association with the household's wealth. Preference for blue nets increases with the household's wealth quintile, while preference for green nets is highest among households in the lowest quintile.

Table 3.8 Preference for colour of mosquito net

Percent distribution of households by preference for colour of mosquito net, by background characteristics, Malawi 2014

Background characteristic	Blue	Green	Red	White	Black	Other	Don't know/No preference	Total	Number of households
Residence									
Urban	75.6	15.7	0.1	7.6	0.4	0.3	0.3	100.0	591
Rural	51.4	35.7	0.6	7.1	1.1	2.9	1.1	100.0	2,814
Region									
Northern	61.1	31.8	0.8	5.2	0.4	0.7	0.1	100.0	600
Central	50.7	34.7	0.8	9.4	2.3	0.8	1.3	100.0	1,317
Southern	57.7	30.3	0.1	6.1	0.1	4.7	1.0	100.0	1,488
Wealth quintile									
Lowest	40.6	47.6	0.9	5.7	1.1	2.2	1.8	100.0	691
Second	49.8	37.2	0.1	8.0	1.2	2.8	0.9	100.0	692
Middle	55.0	32.8	0.6	6.1	2.0	2.5	1.0	100.0	660
Fourth	57.7	31.3	0.9	6.8	0.3	2.0	1.0	100.0	659
Highest	74.5	12.8	0.0	9.2	0.4	2.9	0.2	100.0	704
Total	55.6	32.3	0.5	7.2	1.0	2.5	1.0	100.0	3,405

Table 3.9 shows that 69 percent of households prefer conical-shaped nets and 30 percent prefer rectangular-shaped nets. Conical nets are more popular among both urban and rural households (88 and 65 percent respectively). Preference for conical nets is noted in all the regions, with the Southern Region having the highest percentage of households preferring conical nets at 73 percent. Preference for conical nets increases with wealth quintile, from 54 percent for households in the lowest quintile to 89 percent for households in the highest quintile. Preference for rectangular nets decreases with wealth. Forty-four percent of households in the lowest wealth quintiles prefer rectangular nets compared with only 10 percent of households in the highest wealth quintile.

Table 3.9 Preference for shape of mosquito net

Percent distribution of households by preference for shape of mosquito net, by background characteristics, Malawi 2014

Background characteristic	Conical	Rectangular	Don't know/No preference	Total	Number of households
Residence					
Urban	87.6	12.1	0.3	100.0	591
Rural	64.6	33.5	1.9	100.0	2,814
Region					
Northern	66.2	33.8	0.0	100.0	600
Central	64.8	33.7	1.6	100.0	1,317
Southern	72.9	24.8	2.3	100.0	1,488
Wealth quintile					
Lowest	54.1	43.9	2.0	100.0	691
Second	60.6	37.1	2.2	100.0	692
Middle	68.2	30.0	1.8	100.0	660
Fourth	70.2	28.6	1.2	100.0	659
Highest	89.4	9.7	0.9	100.0	704
Total	68.6	29.8	1.6	100.0	3,405

Respondents were also asked about reasons for their net shape preference. Among respondents who reported a preference for conical nets, ease of use was mentioned as the most common reason for preference (77 percent), followed by size/dimensions of net (36 percent). Of those respondents who preferred rectangular nets, ease of use (40 percent), size/dimensions (40 percent), and appearance (32 percent) were the most commonly reported (Table 3.10).

Table 3.10 Preference for shape of mosquito net by reason

Among all households, percentage that preferred conical shape by reasons for net shape preference and percentage that preferred rectangular shape by reasons for net shape preference, by background characteristics, Malawi 2014

	Preference of conical shape						Preference of rectangular shape					
Background characteristic	Ease of use	Size/ dimensions	Looks nicer	Stronger	Other	Number of households that preferred conical shape	Ease of use	Size/ dimensions	Looks nicer	Stronger	Other	Number of households that preferred rectangular shape
Residence												
Urban	80.3	40.0	8.2	9.1	1.9	517	33.9	46.5	31.9	12.8	3.1	72
Rural	76.2	34.2	10.7	9.1	2.1	1,817	40.4	39.7	31.8	9.4	5.4	943
Region												
Northern	84.1	43.5	8.5	4.9	1.1	397	32.8	47.9	54.1	10.3	1.6	203
Central	75.7	31.2	8.7	9.7	3.8	853	54.4	35.5	20.5	8.2	2.9	443
Southern	75.7	35.9	11.8	10.2	1.0	1,085	26.7	41.5	33.3	10.9	10.0	369
Wealth quintile												
Lowest	71.3	30.6	11.1	14.7	3.7	373	50.2	39.8	26.9	7.0	3.6	303
Second	72.7	36.8	9.9	9.8	2.2	419	31.1	41.8	33.6	12.4	2.8	257
Middle	80.4	33.6	8.2	8.3	0.6	450	46.6	39.0	29.6	9.8	5.3	198
Fourth	76.2	42.1	10.8	6.8	2.3	462	33.7	39.6	37.8	6.8	7.0	189
Highest	81.9	34.0	10.6	7.7	1.9	629	26.4	40.6	37.3	18.1	16.5	68
Total	77.1	35.5	10.1	9.1	2.1	2,334	40.0	40.2	31.8	9.6	5.2	1,015

All respondents in possession of conical nets were asked if the net was altered to become a conical-shaped net (588 nets). Only six percent of conical nets were reported to have undergone alteration from one or more rectangular nets to become conical-shaped nets. In 92 percent of alterations to conical shape, only one rectangular net was used.

MANAGEMENT OF FEVER, ANAEMIA, AND MALARIA IN CHILDREN

4

Key Findings

- Thirty percent of children under age 5 had a fever in the two weeks prior to the survey. Of these children, advice or treatment was sought for 59 percent.
- One in three children (32 percent) with fever had blood taken from a finger or heel for testing.
- Half of children (48 percent) with fever were taken to a public sector facility for advice or treatment.
- Nine in ten children (92 percent) under age 5 with fever who took an antimalarial drug were given LA, the recommended malaria treatment in Malawi.
- Six percent of children age 6-59 months are severely anaemic; that is, they have a haemoglobin level of less than 8 g/dl.
- Analysis of blood smears by microscopy revealed that 33 percent of children age 6-59 months have malaria parasites.

This chapter presents data used to assess treatment implementation and health outcomes of the National Malaria Control Programme (NMCP). Data that are presented show the prevalence of fever in children under age 5 in the two weeks prior to the survey and treatment of fever in children, including the type of medicines administered to children with fever. The chapter also presents the prevalence of severe anaemia and malaria in children age 6-59 months.

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

Malaria case management, including the diagnosis and rapid treatment of all malaria cases with appropriate and effective antimalarial medicines, is one of the key strategic goals for malaria control in Malawi. Fever is a major manifestation of malaria and other acute infections in children. Most malarial fevers occur at home, prompt and effective treatment is critical to prevent morbidity and mortality related to malaria. The 2014 MMIS asked mothers whether their children under age 5 had a fever in the two weeks preceding the survey and, if so, whether any treatment was sought. Questions were also asked about blood testing, the types of medicines given to the child, and how soon and for how long the medications were taken.

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

Table 4.1 shows that 30 percent of children under age 5 had fever during the two weeks preceding the survey. The prevalence of fever is highest among children age 6-11 months, followed by those age 12-35 months. Male children are slightly more likely than female children to have had fever in the last two weeks (32 percent and 29 percent, respectively). The prevalence of fever is higher among rural children (32 percent) than urban children (23 percent). Children from the Northern Region and those whose mothers have secondary education are less likely than other children to have had fever in the two weeks before the survey. Children in households in the highest wealth quintile are less likely to have experienced fever (19 percent) than those in households in other wealth quintiles (29 percent or higher).

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

Percentage of children under age 5 with fever in the two weeks preceding the survey; and among children under age 5 with fever, the percentage for whom advice or treatment was sought from a health facility, provider, or pharmacy, the percentage who had blood taken from a finger or heel, the percentage who took artemisinin-based combination therapy (ACT), the percentage who took ACT the same or next day following the onset of fever, the percentage who took antimalarial medicines, and the percentage who took the medicines the same or next day following the onset of fever, by background characteristics, Malawi 2014

	Children under age 5		Children under age 5 with fever						
Background characteristic	Percentage with fever in the two weeks preceding the survey	Number of children	Percentage for whom advice or treatment was sought from a health facility, provider or pharmacy[1]	Percentage who had blood taken from a finger or heel for testing	Percentage who took ACT	Percentage who took ACT same or next day	Percentage who took antimalarial medicines	Percentage who took antimalarial medicines same or next day	Number of children
Age (in months)									
<6	11.8	238	(59.9)	(29.7)	(6.3)	(6.0)	(6.8)	(6.5)	28
6-11	38.0	225	61.9	35.6	26.7	24.3	26.7	24.3	86
12-23	37.0	524	68.3	40.6	50.4	40.3	55.8	43.5	194
24-35	34.9	436	59.3	30.1	47.6	37.5	48.8	38.7	152
36-47	30.3	386	47.2	27.7	31.2	23.1	36.9	27.9	117
48-59	23.8	401	49.5	23.4	34.8	25.8	36.5	27.5	95
Sex									
Male	31.6	1,087	54.1	30.6	37.4	30.3	41.0	32.8	344
Female	29.2	1,123	63.7	34.3	41.3	32.1	43.9	34.0	328
Residence									
Urban	22.7	323	53.9	36.9	22.7	20.9	26.9	25.1	73
Rural	31.7	1,887	59.4	31.9	41.4	32.4	44.3	34.4	599
Region									
Northern	25.3	396	63.1	39.0	38.7	32.4	38.9	32.6	100
Central	37.8	857	57.4	28.7	40.4	30.4	45.3	34.4	323
Southern	25.9	957	58.8	34.6	38.2	31.6	40.0	32.4	248
Mother's education									
No education	32.4	392	48.9	20.0	31.6	28.8	36.4	30.2	127
Primary	32.3	1,434	60.7	33.3	42.2	32.7	45.0	35.2	463
Secondary	20.0	347	65.3	52.4	38.6	28.0	41.2	30.7	69
More than secondary	(34.4)	36	*	*	*	*	*	*	13
Wealth quintile									
Lowest	36.4	540	55.0	23.5	38.0	29.3	40.2	30.9	196
Second	32.7	464	58.2	37.8	38.7	35.3	43.9	38.9	152
Middle	31.2	439	65.6	36.1	44.5	31.7	45.9	31.7	137
Fourth	28.6	410	59.3	30.4	40.2	30.3	44.3	34.4	117
Highest	19.4	357	56.3	42.1	32.9	27.5	35.5	30.2	69
Total	30.4	2,210	58.8	32.4	39.3	31.2	42.4	33.4	672

Note: Figures in parentheses are based on 25-49 unweighted cases. An asterisk indicates that an estimate is based on fewer than 25 unweighted cases and has been suppressed.
[1] Excludes market, shop, and traditional practitioner

Among children with fever, 59 percent were taken to a health facility, provider, or pharmacy for advice or treatment. Treatment seeking behaviour tends to decrease as age increases; children under 36 months are more likely to be taken for treatment than older children. The proportion of children taken for treatment is higher in the Northern Region than in other regions (63 percent, compared with 57 percent in the Central Region and 59 percent in the Southern Region). Attempts to treat children with fever generally increase with the mother's education. For example, treatment for fever was sought for about two-thirds (65 percent) of children whose mothers have at least a secondary education, compared with one-half (49 percent) of children whose mothers have no education.

In the 2014 MMIS, mothers were asked whether children under age 5 with fever had blood taken from a finger or heel for testing, presumably for diagnostic purposes. It should be noted that the question did not ask which test was conducted. While the blood could have been taken for malaria testing, it could also have been taken for anaemia or other tests. The mother may or may not have known the reason that blood was taken from her child. Overall, 32 percent of children under age 5 with fever had a heel or finger prick; this is four and half times higher than the percentage reported for children with fever in the 2010 MMIS (7 percent). The percentage of children who had blood tested with a heel or finger prick varies by subgroup and follows a pattern similar to the differentials observed for children taken for advice or treatment. Blood testing is highest among children age 6-11 months; it is higher for children in urban areas

than in rural areas; and it is highest for children in the Northern Region compared with the other regions. The likelihood that a child is tested increases with both mother's education and household wealth status (wealth quintile). For example, the proportion of children who had blood taken from a finger or heel for testing increases from 20 percent among children whose mothers have no education, to 33 percent among children whose mothers have a primary education, to 52 percent among children whose mothers attended secondary school.

Table 4.1 also shows the percentage of children with fever who received prompt treatment. Overall, 39 percent with fever took artemisinin-based combination therapies (ACTs), the recommended treatment for malaria in Malawi. In Malawi, the most common ACT is artemether-lumefantrine, commonly known as LA. Of the children with fever, 31 percent took an ACT within 24 hours of onset of fever, or during the recommended time frame. By age, children 12-35 months were more likely than other children to have taken an ACT. Children in rural areas (41 percent) were more likely than children in urban areas (23 percent) to take an ACT.

Variation by background characteristics among children who took an ACT the same or next day are similar to the differentials observed for children that took an ACT. By age, children 12-35 months are more likely than other children to have taken an ACT the same or next day after onset of fever. There is no substantial difference by sex in the proportion of children who took an ACT the same or next day after onset of fever (30 percent for male children and 32 percent for female children). Children in the rural areas (32 percent) are more likely than children in the urban areas (21 percent) to take an ACT the same or next day after onset of fever.

Table 4.2 shows the percentage of children with fever for whom advice or treatment was sought by the source of treatment. The first (left column) is based on all children who had fever in the two weeks preceding the survey regardless of whether they received advice or treatment. The second (right column) is based on children with fever for whom advice or treatment was sought.

Table 4.2 Source of advice or treatment for children with fever

Among children under age 5 with fever in the two weeks preceding the survey, the percentage for whom advice or treatment was sought from specific sources; and among children under age 5 with fever in the two weeks preceding the survey for whom advice or treatment was sought, the percentage for whom advice or treatment was sought from specific sources, Malawi 2014

	Percentage for whom advice or treatment was sought from each source:	
Background characteristic	Among children with fever	Among children with fever for whom advice or treatment was sought
Any public sector source	47.8	71.5
Government hospital	14.3	21.4
Government health centre	20.1	30.1
Government health post	4.9	7.3
Mobile clinic	0.2	0.2
HAS	7.7	11.5
Other	0.8	1.2
CHAM/Mission	6.5	9.8
Hospital	3.2	4.7
Health Centre	3.4	5.1
Any private sector source	5.3	7.9
Private hospital/clinic	4.2	6.2
Pharmacy	0.6	1.0
Mobile clinic	0.2	0.4
Other private medical sector	0.2	0.3
Any other source	8.0	12.0
Shop	7.3	10.9
Other	0.7	1.1
Number of children	672	449

Data in the left column show that almost half of children (48 percent) with fever were taken to a public sector facility for advice or treatment, 7 percent went to a CHAM or Mission health facility; 5 percent went to a private sector source; and 8 percent went to other sources, primarily shops. Among children with fever for whom advice or treatment was sought, 72 percent were taken to a public sector facility, among which the most often facility visited is government health centre (30 percent).

4.2 MALARIA CASE MANAGEMENT AMONG CHILDREN

Details on the types and timing of antimalarial medicines given to children to treat fever are presented in Table 4.3. When interpreting the results, it is important to remember that the information is based on mothers' reports that their children had fever in the two weeks before the survey, and many mothers may not have known the specific medicine given to the child.

As shown in Table 4.3, the vast majority of children under age 5 with fever who took an antimalarial medicine were given LA (92 percent); 7 percent were given quinine, and 2 percent were given

SP/Fansidar. These findings show little change since 2012 when 91 percent of children under age 5 with fever were given LA; 9 percent were given quinine, and 2 percent took SP/Fansidar (NMCP, 2012). Children in rural areas are more likely than those in urban areas to have taken LA for treatment of fever (93 percent and 77 percent, respectively).

Among children with fever who took an antimalarial medicine, 73 percent took LA the same or next day after the onset of fever, or within the recommended period of time. Variations in type or timing of antimalarial medicine use by background characteristics should be interpreted with caution because the number of cases presented in the table is small. The pattern of treatment of children with fever who took antimalarial medicines has changed considerably since 2012, when 65 percent of children took LA the same or next day (NMCP, 2012).

Table 4.3 Type and timing of antimalarial medicines used

Among children under age 5 with fever in the two weeks preceding the survey who took any antimalarial medication, the percentage who took specific antimalarial medicines and the percentage who took each type of medicine the same or next day after developing fever, by background characteristics, Malawi 2014

	Percentage of children who took medicine:					Percentage of children who took medicine the same or next day:					Number of children with fever who took antimalarial medicine
Background characteristic	SP/ Fansidar	Amodia-quine	Quinine	AA/ASAQ	LA (Coartem)	SP/ Fansidar	Amodia-quine	Quinine	AA/ASAQ	LA (Coartem)	
Age (in months)											
<12	(0.0)	(0.5)	(0.5)	(0.0)	(99.5)	(0.0)	(0.5)	(0.0)	(0.0)	(91.1)	25
12-23	3.7	0.0	8.9	1.5	88.8	2.0	0.0	6.1	1.5	70.8	108
24-35	0.8	0.0	2.5	0.0	97.6	0.8	0.0	1.6	0.0	76.8	74
36-47	(0.5)	(0.0)	(19.7)	(0.0)	(84.4)	(0.5)	(0.0)	(13.3)	(0.0)	(62.6)	43
48-59	(4.6)	(0.0)	(0.0)	(0.0)	(95.4)	(4.6)	(0.0)	(0.0)	(0.0)	(70.8)	35
Sex											
Male	1.7	0.1	7.5	1.1	90.0	1.7	0.1	4.7	1.1	72.7	141
Female	2.8	0.0	6.7	0.0	94.3	1.5	0.0	4.7	0.0	73.1	144
Residence											
Urban	(5.2)	(0.7)	(9.4)	(8.0)	(76.6)	(5.2)	(0.7)	(9.4)	(8.0)	(69.9)	20
Rural	2.0	0.0	6.9	0.0	93.3	1.3	0.0	4.4	0.0	73.1	265
Region											
Northern	0.0	0.0	2.0	0.0	99.3	0.0	0.0	1.7	0.0	83.1	39
Central	3.6	0.0	10.5	1.1	88.0	2.4	0.0	8.2	1.1	66.1	147
Southern	1.1	0.1	4.0	0.0	95.5	1.1	0.1	0.8	0.0	78.9	99
Mother's education											
No education	3.9	0.3	9.0	0.0	86.8	0.0	0.3	3.5	0.0	79.1	46
Primary	2.2	0.0	4.8	0.0	93.9	2.2	0.0	3.6	0.0	72.7	208
Secondary	(0.0)	(0.0)	(20.9)	(0.0)	(93.5)	(0.0)	(0.0)	(15.4)	(0.0)	(67.9)	29
More than secondary	*	*	*	*	*	*	*	*	*	*	2
Wealth quintile											
Lowest	1.4	0.0	5.2	0.0	94.6	1.4	0.0	3.0	0.0	73.0	79
Second	2.4	0.2	9.4	0.0	88.0	2.4	0.2	5.6	0.0	80.4	67
Middle	2.9	0.0	1.0	0.0	97.1	0.0	0.0	0.0	0.0	69.2	63
Fourth	3.6	0.0	9.0	0.0	90.7	3.6	0.0	5.7	0.0	68.4	52
Highest	0.0	0.0	17.9	6.4	86.1	0.0	0.0	17.9	6.4	71.0	25
Total	2.2	0.0	7.1	0.6	92.2	1.6	0.0	4.7	0.6	72.9	285

Note: Figures in parentheses are based on 25-49 unweighted cases. An asterisk indicates that an estimate is based on fewer than 25 unweighted cases and has been suppressed.
ACT = Artemisinin-based combination therapy

4.3 ANAEMIA AND MALARIA PREVALENCE AMONG CHILDREN

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

A total of 1,990 children age 6-59 months living in households randomly selected for the 2014 MMIS were eligible for haemoglobin and malaria testing. The HemoCue system was used to measure the concentration of haemoglobin in the blood obtained from a finger prick. The SD Bioline Malaria Ag P.f rapid diagnostic test (RDT) was used to detect malaria in the blood from the same finger prick. Both tests were carried out in the field. In addition, a slide with finger prick blood sample was prepared in the field and sent to the Public Health laboratory for microscopy testing for malaria.

Table 4.4 shows the coverage of anaemia and malaria testing in children age 6-59 months. Of the 1,990 children eligible for haemoglobin and malaria testing, 97 percent were tested for anaemia and malaria. As shown in the table, the coverage levels are uniformly high across background characteristics.

Table 4.4 Coverage of testing for anaemia and malaria in children age 6-59 months

Percentage of eligible children age 6-59 months who were tested for anaemia and for malaria, by background characteristics (unweighted), Malawi 2014

Background characteristic	Percentage tested for: Anaemia	Malaria with RDT	Malaria by microscopy	Number of children eligible
Age (in months)				
6-8	94.6	92.0	93.8	112
9-11	98.0	97.1	98.0	102
12-17	97.5	96.3	97.1	242
18-23	97.9	96.6	97.5	236
24-35	97.7	96.5	96.8	431
36-47	98.1	96.9	97.1	414
48-59	96.9	96.7	96.2	453
Sex				
Male	96.6	95.4	96.3	1,011
Female	98.3	97.4	97.1	979
Residence				
Urban	95.7	95.4	94.9	588
Rural	98.1	96.8	97.5	1,402
Region				
Northern	98.8	97.1	98.3	593
Central	97.3	96.7	96.8	694
Southern	96.4	95.4	95.3	703
Mother's education				
No education	97.8	96.9	96.5	227
Primary	98.3	97.1	98.1	1,190
Secondary	96.7	95.5	95.5	335
More than secondary	(91.9)	(91.9)	(89.2)	37
Wealth quintile				
Lowest	96.2	94.4	95.9	393
Second	98.1	97.1	96.8	374
Middle	98.7	97.4	98.2	386
Fourth	98.7	98.2	97.9	387
Highest	95.8	95.1	95.1	450
Total	97.4	96.4	96.7	1,990

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

4.3.1 Anaemia Prevalence among Children

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

Table 4.5 shows that 6 percent of children age 6-59 months are severely anaemic; that is, they have a haemoglobin level less than 8 g/dl. Although anaemia is a serious public health problem in Malawi, severe anaemia has decreased since the two previous MIS surveys (12 percent in the 2010 MMIS and 9 percent in the 2012 MMIS). Children age 12-17 months (14 percent) are the most likely to be severely anaemic compared with other children, and in general, prevalence of severe anaemia decreases with age. Male children are more likely than female children to be severely anaemic (7 percent and 6 percent, respectively). Rural children are more likely than urban children to have severe anaemia (7 percent and 5 percent, respectively). By region, children in the Central Region are more likely to be severely anaemic than children in the other regions. The proportion of children with severe anaemia decreases with increasing level of mother's education and household wealth status. For example, 12 percent of children whose mothers have no education are severely anaemic compared with 3 percent of children whose mothers have at least a secondary education.

Table 4.5 Severe anaemia in children age 6-59 months

Percentage of children age 6-59 months with severe anaemia (haemoglobin lower than 8.0 g/dl), by background characteristics, Malawi 2014

Background characteristic	Percentage of children with haemoglobin <8.0 g/dl	Number of children
Age (in months)		
6-8	6.1	112
9-11	12.1	105
12-17	13.6	240
18-23	7.8	269
24-35	8.1	465
36-47	3.5	406
48-59	1.4	444
Sex		
Male	6.9	1,017
Female	5.9	1,024
Residence		
Urban	4.8	277
Rural	6.7	1,765
Region		
Northern	4.5	389
Central	7.3	777
Southern	6.5	876
SSDI District		
SSDI districts	6.6	1,195
Non SSDI districts	6.1	847
Mother's education[1]		
No education	12.4	334
Primary	6.2	1,193
Secondary	3.4	294
More than secondary	(0.0)	28
Wealth quintile		
Lowest	9.1	486
Second	8.0	426
Middle	4.5	405
Fourth	4.9	397
Highest	4.7	328
Total	6.4	2,041

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). Figures in parentheses are based on 25-49 unweighted cases.
[1] Includes children whose mothers are deceased

4.3.2 Malaria Prevalence among Children

In the 2014 MMIS, malaria prevalence among children age 6-59 months was measured in two ways. In the field, laboratory technicians used the SD Bioline Malaria Ag P.f RDT (mRDT) to diagnose malaria from finger prick blood samples. Children who tested positive for the presence of *P. falciparum* by the RDT were offered treatment with LA. In addition, laboratory technicians prepared thick blood smears that were brought back to the Public Health Laboratory at Community Health Services Unit for microscopic examination. Blood smears with parasites were classified as malaria positive. Table 4.6 presents the results of both tests.

As shown in the Table 4.6, using the mRDT, 37 percent of children age 6-59 months in Malawi were found to be positive for malaria. Analysis of blood smears by microscopy revealed a lower prevalence of malaria, 33 percent. Regardless of which diagnostic test was used, malaria prevalence increases with age, is more common among males, and decreases as mother's level of education increases; malaria prevalence also decreases, in general, as household wealth status (wealth quintile) increases. Based

on microscopy results, malaria prevalence is higher in rural areas (37 percent) than in urban areas (11 percent) and is highest in the Central Region (36 percent).

The differences in malaria prevalence observed between the mRDTs and microscopy are not unexpected. Microscopic analysis of blood smears for malaria parasites has long been considered the gold standard of malaria diagnosis. When performed under optimal conditions, it is highly sensitive (limit of detection is 5-10 parasites per microliter of blood). In comparison to microscopy, mRDTs have the advantage of being quick and easy to use, but are less sensitive. SD Bioline Malaria RDT, like many other commercially available mRDTs, detects the *P. falciparum*-specific protein HRP-2 rather than the parasite itself. Because HRP-2 remains in the blood for up to a month following parasite clearance with antimalarials (Moody, 2002), in areas highly endemic for *P. falciparum* malaria, its persistence could account for the higher prevalence of malaria detected using RDTs compared with microscopy.

Table 4.6 Prevalence of malaria in children age 6-59 months

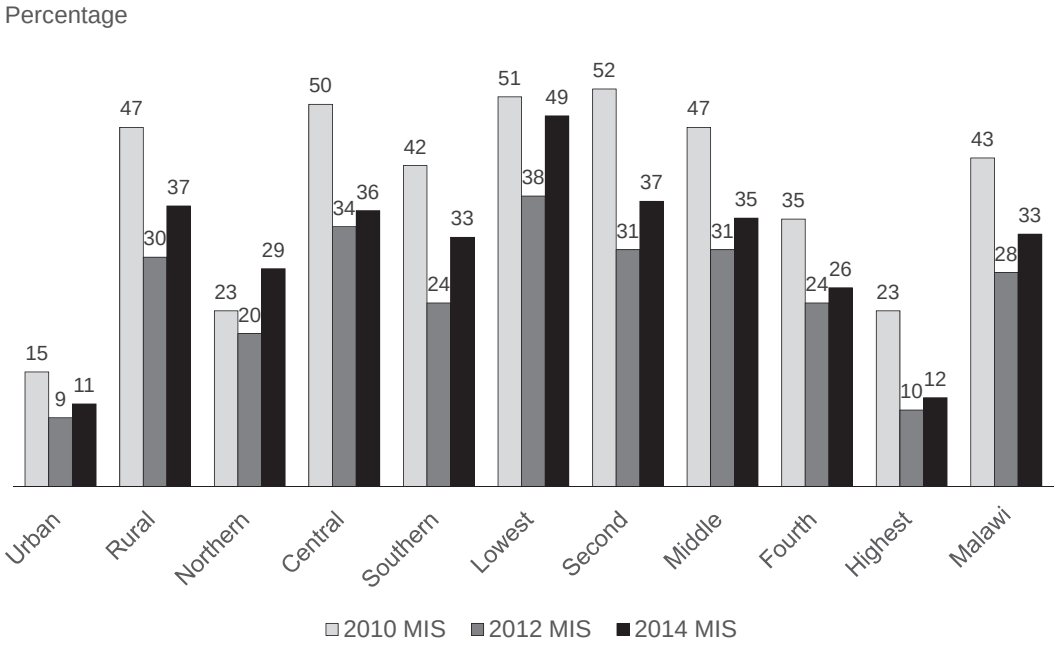
Percentage of children age 6-59 months classified as having malaria in two tests (RDT and microscopy), by background characteristics, Malawi 2014

	Malaria prevalence according to RDT		Malaria prevalence according to microscopy	
Background characteristic	RDT positive	Number of children tested	Microscopy positive	Number of children tested
Age (in months)				
6-8	16.8	109	20.6	112
9-11	28.4	104	30.4	105
12-17	27.2	231	19.0	237
18-23	32.8	266	28.0	269
24-35	39.1	455	35.5	458
36-47	43.7	389	37.5	401
48-59	43.9	436	41.4	440
Sex				
Male	39.9	993	34.6	1,014
Female	34.2	998	31.7	1,009
Residence				
Urban	11.9	276	10.8	275
Rural	41.1	1,715	36.7	1,748
Region				
Northern	24.7	379	28.5	387
Central	42.5	775	36.1	774
Southern	37.6	837	32.6	861
SSDI District				
SSDI districts	44.4	1,152	38.5	1,180
Non SSDI districts	27.0	838	25.7	843
Mother's education				
No education	52.4	320	41.8	327
Primary	38.3	1,159	34.1	1,188
Secondary	14.1	292	13.2	293
More than secondary	(13.1)	28	(15.1)	28
Wealth quintile				
Lowest	54.0	474	48.5	484
Second	43.3	402	37.3	415
Middle	38.8	394	35.1	402
Fourth	30.2	394	26.0	396
Highest	11.0	327	11.6	327
Total	37.1	1,991	33.2	2,023

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

Figure 4.1 shows the changes in malaria prevalence among children under age 5 based on microscopy results since 2010. At the national level, malaria prevalence among children less than age 5 declined from 43 percent to 33 percent.

Figure 4.1 **Prevalence of malaria among children under age 5, based on microscopy results, 2010, 2012, and 2014**



MALARIA KNOWLEDGE 5

Key Findings

- Knowledge of malaria among women in Malawi is widespread (93 percent).
- Eight in ten women (82 percent) are aware that mosquito bites cause malaria.
- Eighty-four percent of women say that the use of mosquito nets can prevent malaria.
- Twenty-two percent of Malawian women reported having seen or heard messages about malaria in the last six months.
- The most commonly cited source of information about malaria is radio (43 percent), followed by government clinic or hospital (40 percent).

One of the objectives of the 2014 MMIS was to assess general knowledge about malaria. All women who were interviewed in the survey were asked if they had ever heard of malaria and, if they responded yes, they were asked a series of questions about their knowledge of signs and symptoms, causes, and preventive measures.

5.1 KNOWLEDGE OF MALARIA

Table 5.1 presents information on knowledge of malaria among women age 15-49 in Malawi by background characteristics. The table shows the percentage of women who have heard of malaria; the percentage who recognize fever as a symptom of malaria; the percentage who know that mosquito bites cause malaria; and the percentage who know that mosquito nets are a method of malaria prevention.

Knowledge of malaria among women in Malawi is widespread; 93 percent of women have heard of malaria, with some variation across subgroups of women. Younger women are the least likely to have heard of malaria compared with older women. Urban women, women with the highest level of education, and women in the highest wealth quintile are more likely than other women to have heard of malaria. By region, women living in the Central Region are less likely to have heard of malaria compared with women living in the Northern Region and the Southern Region.

When asked to name the main symptoms of malaria, 72 percent of Malawian women mentioned fever. Variations in knowledge of fever as a malaria symptom among women are similar to variations found among women who have heard of malaria.

Awareness that mosquitoes are the vectors for malaria transmission is key to the design of prevention programmes; overall, knowledge that a mosquito bite causes malaria and nets are a prevention method is high in Malawi (82 percent and 84 percent of women, respectively). Similar to other data presented, the differentials in knowledge across subgroups of women show the same pattern as the other two knowledge indicators.

Comparison of the 2014 MMIS results with the 2010 MMIS and 2012 MMIS results shows that knowledge of malaria has changed little in the past four years (Figure 5.1).

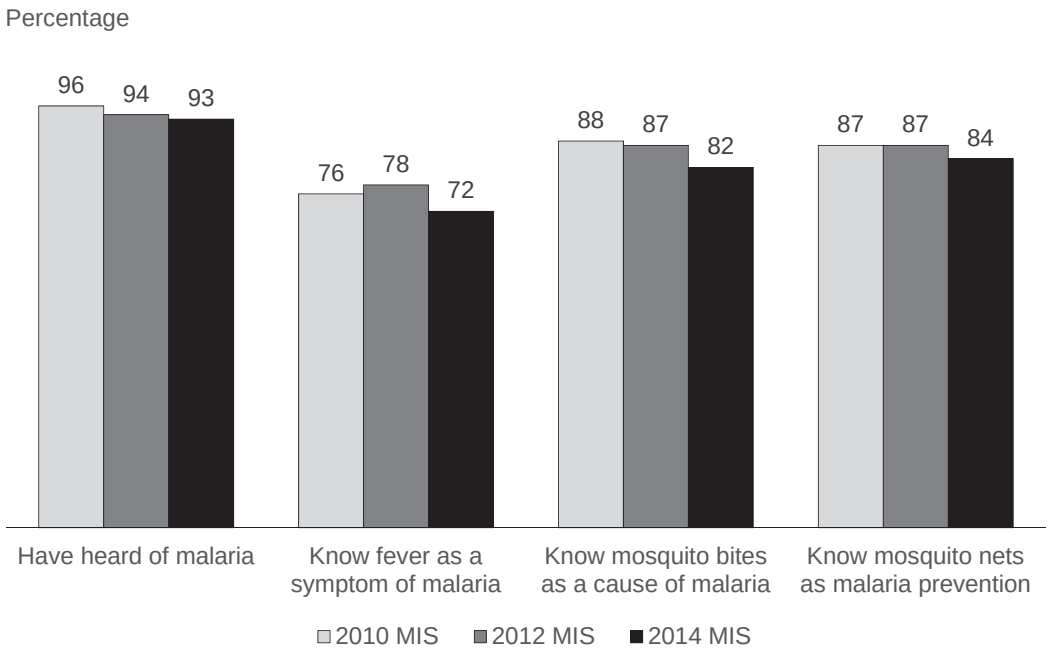
Table 5.1 Women's knowledge of malaria

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 the cause of malaria, and percentage who reported that sleeping under a mosquito net can protect against malaria, by background characteristics, Malawi 2014

Background characteristic	Percentage who have heard of malaria	Percentage who recognize fever as a symptom of malaria	Percentage who reported mosquito bites as a cause of malaria	Percentage who reported mosquito nets[1] as a prevention method	Number of women
Age					
15-19	88.8	53.1	76.2	78.0	507
20-24	89.8	71.2	78.5	80.1	623
25-29	95.2	80.5	85.6	89.1	518
30-34	96.0	81.1	86.2	87.7	498
35-39	96.0	79.3	86.0	86.2	374
40-44	92.4	69.0	79.1	80.7	239
45-49	92.8	67.2	83.3	79.9	139
Residence					
Urban	95.5	75.3	89.7	91.0	568
Rural	92.2	71.3	80.1	81.7	2,329
Region					
Northern	99.2	77.5	89.4	87.7	543
Central	88.1	71.7	75.8	77.8	1,182
Southern	94.6	70.0	84.7	87.3	1,172
Education					
No education	89.4	71.0	66.9	71.8	417
Primary	91.5	70.3	80.1	81.2	1,815
Secondary	98.6	75.9	96.3	97.0	594
More than secondary	98.3	93.7	98.3	98.2	70
Wealth quintile					
Lowest	86.3	71.4	69.2	71.5	549
Second	90.8	68.1	75.0	79.5	545
Middle	92.5	70.4	82.8	84.2	570
Fourth	95.5	77.3	86.7	86.4	568
Highest	97.8	72.9	93.4	93.5	665
Total	92.8	72.1	82.0	83.5	2,897

[1] Treated or untreated nets

Figure 5.1 **Trends in knowledge about malaria**



5.2 EXPOSURE TO MALARIA MESSAGES

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

In the 2014 MMIS, women were asked if they had heard or seen messages or information about malaria in the six months preceding the survey. If they answered yes, the women were asked how long ago they had heard or seen the most recent message, the source of the message, and the content of the message. These questions differ from those asked in the 2010 MMIS, which did not have a time reference for exposure to malaria messages. For this reason, results from the 2010 MMIS are not comparable to those of the 2012 and 2014 MMIS.

Table 5.2 shows the percentage of women age 15-49 who had heard or seen a malaria message in the last six months, by background characteristics. It also shows, for these women, the average number of months before the survey that the message was heard or seen, the percentage who reported a government clinic or hospital as the message source, and the percentage who heard or saw a message about the importance of sleeping under a mosquito net.

Table 5.2 Messages about malaria

Percentage of women age 15-49 who heard or saw a message or information about malaria in the last six months; and among those women, average number of months ago malaria message was heard, percentage who reported government hospital/clinic as source of malaria message, and percentage who reported seeing/hearing a message about the importance of sleeping under a mosquito net, by background characteristics, Malawi 2014

			Among women who heard or saw malaria message in last six months:			
Background characteristic	Percentage who heard or saw malaria message in last six months	Number of women	Average number of months ago malaria message heard	Percentage who reported government hospital/clinic as the source of malaria message	Percentage who reported seeing/hearing message about the importance of sleeping under a mosquito net	Number of women
Age						
15-19	18.4	507	1.1	33.8	64.1	93
20-24	21.8	623	1.3	44.2	56.2	136
25-29	23.6	518	1.1	46.4	50.6	122
30-34	22.6	498	1.1	36.9	54.3	112
35-39	20.8	374	1.0	28.1	36.1	78
40-44	24.8	239	1.1	58.8	37.4	59
45-49	30.7	139	(0.6)	(29.8)	(26.5)	43
Residence						
Urban	27.3	568	1.0	34.4	49.6	155
Rural	21.0	2,329	1.1	42.2	49.9	489
Region						
Northern	33.3	543	1.0	42.3	60.5	180
Central	26.0	1,182	1.1	38.8	42.1	307
Southern	13.3	1,172	1.2	40.9	52.7	156
Education						
No education	9.3	417	(0.8)	(41.8)	(53.1)	39
Primary	20.5	1,815	1.2	42.6	40.4	371
Secondary	35.0	594	1.0	37.5	64.6	208
More than secondary	36.1	70	(0.8)	(27.3)	(62.0)	25
Wealth quintile						
Lowest	14.4	549	1.6	55.5	47.4	79
Second	19.6	545	1.2	49.7	32.3	107
Middle	20.8	570	1.0	46.1	54.3	119
Fourth	25.6	568	1.1	31.9	50.5	145
Highest	29.1	665	0.9	31.6	57.3	194
Total	22.2	2,897	1.1	40.3	49.8	644

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

Twenty-two percent of Malawian women reported having heard or seen messages about malaria in the last six months. Exposure to malaria messages is higher in urban areas than in rural areas (27 percent and 21 percent, respectively). Women living in the Northern Region (33 percent) are more likely than women in the other regions to report having heard or seen malaria messages in the six months preceding the survey. Exposure to malaria messages increases with level of education and household wealth status. For example, 9 percent of women with no education heard or saw a malaria message in the six months before the survey, compared with 21 percent of women with primary education, 35 percent of women with secondary education, and 36 percent of women with more than secondary education. Similarly, women in households in the highest wealth quintile are about twice as likely as women in households in the lowest wealth quintile to have heard or seen a malaria message (29 percent and 14 percent, respectively). When asked about the time since they heard the message in the past six months, women reported, on average, that the last time they heard a message on malaria was about 1.1 months before the survey.

Table 5.2 shows that 40 percent of women reported a government hospital or clinic as the source of the malaria messages. In rural areas and in the Northern Region, women are more likely to report this type of facility as a source of malaria messages than other facilities.

Women who said they heard or saw messages on malaria were asked about the type of messages they heard or saw. Table 5.2 shows that 50 percent of women reported hearing or seeing a message about the importance of sleeping under a mosquito net to prevent malaria. The likelihood of hearing or seeing messages about the importance of using a mosquito net is the same in urban and rural areas and higher in the Northern Region than in the other regions. Exposure to net utilisation messages increases with women's level of education and household wealth status.

Table 5.3 shows the sources where women heard or saw a message about malaria in the past 6 months. The most commonly cited source was radio (43 percent), followed by a government clinic or hospital (40 percent) and community health workers (11 percent). Nine percent of women were exposed to a message about malaria that came from a friend or family member. Only 4 percent of women who heard or saw a malaria message said they saw the message on television; about 1 percent of women reported being exposed to a malaria message in the workplace, at drama groups, from peer educators, on a billboard, or from the newspaper.

Rural women were more likely than urban women to have been exposed to a malaria message at a government hospital or clinic (42 percent and 34 percent, respectively); urban women are more likely than rural women to have heard a malaria message on the radio (63 percent and 36 percent, respectively) or to have seen a malaria message on television (13 percent and 1 percent, respectively). Community health workers are more commonly cited as malaria message sources by women in rural areas than women in urban areas (15 percent and 2 percent, respectively).

Table 5.3 Source of malaria messages

Percentage of women age 15-49 who have heard or seen a message about malaria in the past 6 months by source of malaria message and background characteristics, Malawi 2014

Background characteristic	Government clinic/ hospital	Community health worker	Friends/ family	Workplace	Drama groups	Peer educators	Poster/ billboard	Television	Radio	Newspaper	Other	Any source	Number of women
Age													
15-19	33.8	2.8	15.6	0.0	0.0	2.6	2.6	1.2	50.2	5.8	7.6	100.0	93
20-24	44.2	7.1	8.9	0.0	0.2	1.6	0.0	5.3	39.6	1.9	2.3	97.8	136
25-29	46.4	12.7	4.3	0.2	0.4	3.3	3.4	2.0	41.6	1.5	1.0	100.0	122
30-34	36.9	16.9	5.3	0.2	0.0	0.2	1.4	6.3	46.4	1.5	0.8	100.0	112
35-39	28.1	14.2	11.7	0.0	0.0	0.1	2.7	4.6	43.7	0.0	0.7	100.0	78
40-44	58.8	5.6	4.8	0.0	0.3	0.0	0.0	1.9	26.7	0.0	3.4	100.0	59
45-49	29.8	27.5	14.6	4.3	0.0	0.0	0.3	6.0	48.9	0.0	2.6	100.0	43
Residence													
Urban	34.4	1.5	11.0	0.3	0.5	1.8	3.8	13.2	63.3	4.2	2.3	99.8	155
Rural	42.2	14.5	8.0	0.4	0.0	1.3	0.9	1.0	36.1	1.0	2.5	99.4	489
Region													
Northern	42.3	12.8	3.0	1.0	0.0	0.8	1.5	4.1	36.3	0.4	2.5	98.3	180
Central	38.8	11.6	12.0	0.0	0.1	1.3	1.9	3.9	46.4	1.3	1.6	100.0	307
Southern	40.9	9.1	8.7	0.3	0.4	2.3	1.2	3.6	42.6	4.4	4.1	100.0	156
Education													
No education	(41.8)	(11.8)	(18.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(49.9)	(0.0)	(2.9)	100.0	39
Primary	42.6	13.6	9.7	0.0	0.1	1.6	1.3	1.4	33.7	1.6	2.8	99.2	371
Secondary	37.5	8.1	6.2	1.0	0.3	0.8	0.8	7.0	54.5	1.1	1.7	100.0	208
More than secondary	(27.3)	(3.9)	(0.6)	(1.0)	(0.0)	(6.2)	(16.0)	(21.2)	(64.0)	(12.8)	(3.1)	100.0	25
Wealth quintile													
Lowest	55.5	18.3	5.0	0.0	0.0	0.2	0.0	0.0	21.5	0.0	3.1	96.6	79
Second	49.7	16.8	18.4	0.0	0.2	1.2	2.5	1.9	17.3	0.0	5.0	100.0	107
Middle	46.1	16.6	1.1	0.0	0.0	1.1	1.5	2.2	35.7	2.1	2.6	99.8	119
Fourth	31.9	10.5	10.1	0.0	0.0	2.4	0.0	0.0	48.9	1.7	1.0	100.0	145
Highest	31.6	2.9	8.5	1.2	0.3	1.4	3.0	10.6	64.8	3.3	1.8	100.0	194
Total	40.3	11.3	8.7	0.4	0.1	1.4	1.6	3.9	42.6	1.8	2.5	99.5	644

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

REFERENCES

African Development Bank Group (AfDB). 2014. *Malawi Economic Outlook*. African Economic Outlook (AEO). Tunis, Tunisia: African Development Bank Group. Available at: http://www.afdb.org/en/countries/southern-africa/malawi/malawi-economic-outlook/

Bradley, A.K., B.M. Greenwood, A.M. Greenwood, K. Marsh, P. Byass, S. Tulloch, and R. Hayes. 1986. "Bed-nets (Mosquito-nets) and Morbidity from Malaria." *Lancet* 2 (8500): 204-7.

Doolan, D.L., C. Dobaño, and J.K. Baird. 2009. "Acquired Immunity to Malaria." *Clinical Microbiology Review* 22(1): 13-36.

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

Hossain, M.I., and F.C. Curtis. 1989. "Permethrin-impregnated Bednets: Behavioural and Killing Effects on Mosquitoes." *Medical and Veterinary Entomology* 3(4): 367-76.

Killeen, G.F., T.A. Smith, H.M. Ferguson, H. Mshinda, S. Abdulla, C. Lengeler, and S.P. Kachur. 2007. "Preventing Childhood Malaria in Africa by Protecting Adults from Mosquitoes with Insecticide-Treated Nets." *PLoS Medicine* 4(7): e229.

Lengeler, C. 2004. "Insecticide-treated Bed Nets and Curtains for Preventing Malaria." *Cochrane Database of Systematic Reviews* (2): CD000363.

Lindsay, S.W., and M.E. Gibson. 1988. "Bednets Revisited—Old Idea, New Angle." *Parasitology Today* (10): 270-2.

Lines, J.D., J. Myamba, and C.F. Curtis. 1987. "Experimental Hut Trials of Permethrin-impregnated Mosquito Nets and Eave Curtains against Malaria Vectors in Tanzania." *Medical and Veterinary Entomology* 1(1): 37-51.

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

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

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

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

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

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

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

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

Steinhardt, L.C., J. Chinkhumba, A. Wolkon, M. Luka, M. Luhanga, J. Sande, J. Oyugi, D. Mathanga, and J. Skarbinski. 2014. "Quality of Malaria Case Management in Malawi: Results from a Nationally Representative Health Facility Survey." *PloS ONE* 9(2): e89050, doi: 10.1371/journal.pone.0089050.

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

Wongsrichanalai, C., M.J. Barcus, S. Muth, A. Sutamihardja, and W.H. Wernsdorfer. 2007. "A Review of Malaria Diagnostic Tools: Microscopy and Rapid Diagnostic Test (RDT)." *American Journal of Tropical Medicine and Hygiene* 77 (6 Suppl):119-127.

World Health Organization (WHO). 2011. *World Malaria Report.* Geneva: World Health Organization.

World Health Organization (WHO). 2014. *WHO Recommendations for Achieving Universal Coverage with Long-lasting Insecticidal Nets in Malaria Control*. September 2013 (revised March 2014), Global Malaria Programme. Geneva: World Health Organization.

WHO/Global Malaria Program. 2007. *Insecticide Treated Mosquito Net: A WHO Position Statement.* Geneva: World Health Organization.

WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation. 2005. *Water for Life: Making It Happen.* Geneva: World Health Organization and UNICEF.

SAMPLE DESIGN

Appendix A

A.1 Sampling Frame and Stratification

Malawi is administratively divided into 3 regions and 28 districts. The 2014 MMIS sample was designed to provide estimates for the country as a whole, for urban and rural areas separately, and for each of the regions:

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

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

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

Each district is subdivided into traditional authorities. For statistical purposes, each traditional authority is subdivided into standard enumeration areas (SEAs). The 2008 National Population and Housing Census demarcated these SEAs and determined the number of households in each one. The sampling frame of the 2014 MMIS is the list of SEAs developed from the 2008 census, stratified by region and urban and rural strata.

A.2 Sample Allocation and Selection

A.2.1 Sample Allocation

To meet the objective of providing reliable estimates for key indicators of the sample domains, a total sample of 140 SEAs—50 in urban areas and 90 in rural areas—and 3,500 households was allocated based on a power allocation between regions and between different types of residence within each region. The Northern Region and urban areas within all regions were over-sampled in order to produce robust estimates for these domains. Therefore, the MMIS sample was not proportional to the population for regions (Northern, Central and Southern regions) or residence (urban-rural area) and required a final weighting adjustment to provide valid estimates for every domain of the survey. Adjustments to the proportional distribution were made as shown in Table A1.

Table A.1 Sample and total population proportion by stratum, 2014 Malawi MIS

	Northern			Central			Southern			Malawi		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Population proportion	0.015	0.100	0.115	0.063	0.355	0.418	0.065	0.403	0.468	0.142	0.858	1.000
Sample proportion	0.071	0.214	0.286	0.143	0.214	0.357	0.143	0.214	0.357	0.357	0.643	1.000
Number of selected households	250	750	1,000	500	750	1,250	500	750	1,250	1,250	2,250	3,500

The SEAs were selected with probability proportional to size from a list of approximately 12,569 SEAs covered in the 2008 census. The SEA size was the number of residential households recorded in the census. Once the households were allocated to the different strata, the number of SEAs to be selected was calculated based on an average cluster take of 25 completed interviews of all respondents.

In the second stage, 25 households were selected in each selected SEA using systematic sampling from a list of households in the SEA. Because it has been almost six years since the census, a fresh

household listing was undertaken before the survey was fielded. The National Statistical Office (NSO) assisted in listing the households in the SEAs. As part of this exercise, the listing teams also drew up the necessary maps and recorded the geographic coordinates of each SEA.

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

Table A.2 Distribution of SEAs by Urban/Rural location for districts in Northern Region, 2014 Malawi MIS

District	Urban	Rural	Total
Chitipa	2	3	5
Karonga	2	5	7
Mzimba	0	16	16
Mzuzu City	4	0	4
Nkhatabay	0	4	4
Rumphi	2	2	4
Total	10	30	40

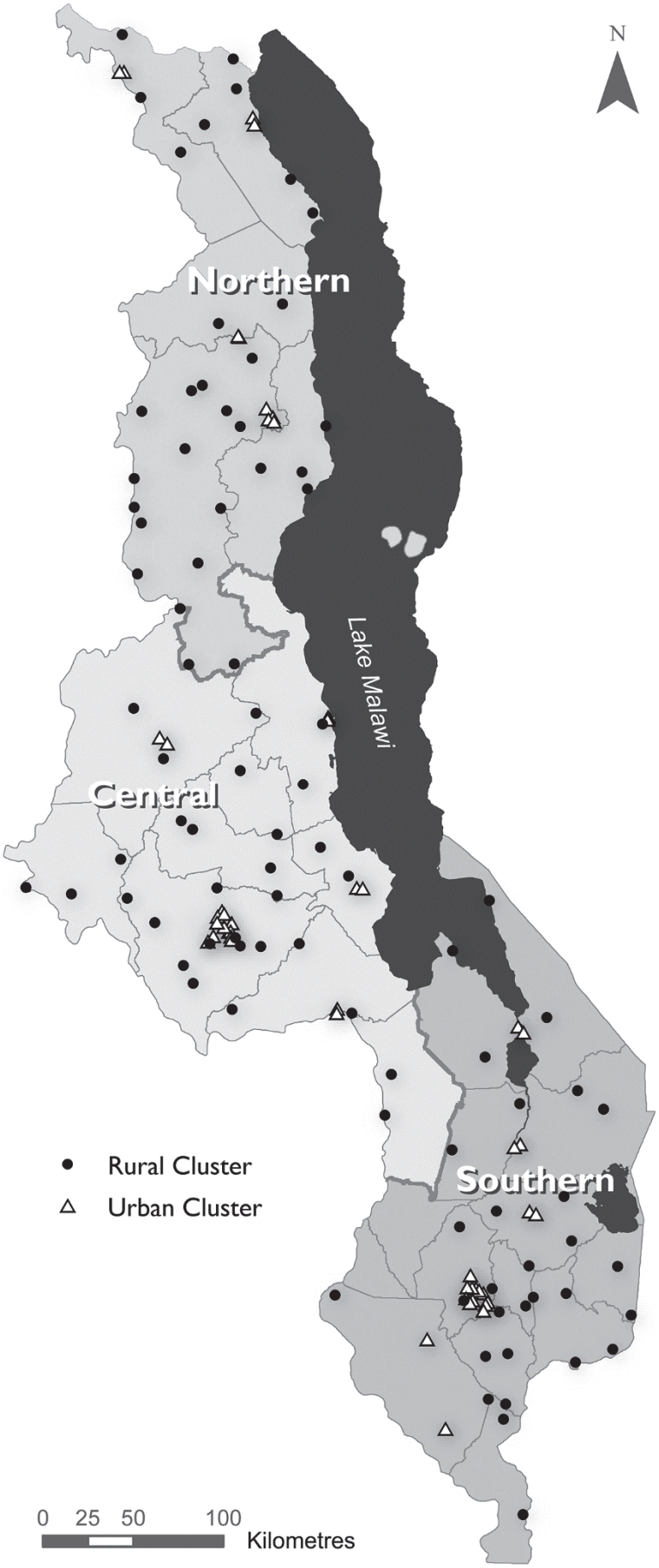
Table A.3 Distribution of SEAs by Urban/Rural location for districts in Central Region, 2014 Malawi MIS

District	Urban	Rural	Total
Dedza	2	3	5
Dowa	0	4	4
Kasungu	2	3	5
Lilongwe	0	9	9
Lilongwe City	12	0	12
Mchinji	0	3	3
Nkhota kota	2	2	4
Ntcheu	0	2	2
Ntchisi	0	2	2
Salima	2	2	4
Total	20	30	50

Table A.4 Distribution of SEAs by Urban/Rural location for districts in Southern Region, 2014 Malawi MIS

District	Urban	Rural	Total SEAs
Balaka	0	2	2
Blantyre	0	2	2
Blantyre City	12	0	12
Chikwawa	2	2	4
Chiradzulu	0	2	2
Machinga	2	2	4
Mangochi	2	4	6
Mulanje	0	4	4
Nsanje	0	2	2
Phalombe	0	2	2
Thyolo	0	4	4
Zomba	0	4	4
Zomba City	2	0	2
Total	20	30	50

Figure A.1 **Location of selected SEAs in the 2014 Malawi MIS**



A.2.2 Selection of Clusters

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

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

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

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

(ii) Calculate the cumulated size of each SEA.

(iii) Calculate the sampling numbers

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

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

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

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

A.3 Selection of Households

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

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

(i) The sampling interval for each category was calculated:

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

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

(ii) A random number (R) between 1 and the interval *I* was generated; the first selection will hence be *R*.

(iii) The interval to the random number to get the next selection was added.

(iv) The interval was repeatedly added until the desired sample size was achieved.

A.4 ESTIMATION PROCEDURE

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

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

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

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

$$P_{2hi} = \frac{n_{hi}}{N_{hi}}$$

The overall household weight or inflation factor is:

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

where P_{1hi} is the first-stage sampling probability of (SEA), a_h is the number of SEAs selected in stratum *h*, M_{hi} is the size (households according to the census frame) of the ith SEA in stratum *h*, ΣM_{hi} is the total size of stratum *h*, P_{2hi} is the household's selection probability, n_{hi} is the number of households selected in i^{th} SEA from stratum *h*, and N_{hi} is the total number of households listed in i^{th} SEA from stratum *h*.

Let y_{hij} be an observation on variable *y* for the jth household in the ith SEA from the hth stratum.

Then the estimated total for the hth stratum is:

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

where, y_h is the estimated total for the hth stratum, w_{hi} is the weight for the jth household in the ith SEA of the hth stratum, a_h is the number of selected SEAs in the hth stratum, and n_h is the number of sample households in the hth stratum. The national estimate (y) is given by:

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

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

A.5 SAMPLE IMPLEMENTATION

Table A.5 Sample implementation: Women

Percent distribution of households and eligible women by results of the household and individual interviews, and household, eligible women, and overall women response rates, according to urban-rural residence and region (unweighted), Malawi MIS 2014

	Residence		Region			
Result	Urban	Rural	Northern	Central	Southern	Total
Selected households						
Completed (C)	96.9	97.5	97.1	96.1	98.6	97.3
Household present but no competent respondent at home (HP)	0.1	0.1	0.0	0.2	0.0	0.1
Refused (R)	0.3	0.0	0.0	0.2	0.2	0.1
Dwelling not found (DNF)	0.1	0.0	0.1	0.1	0.0	0.1
Household absent (HA)	0.8	0.7	1.0	1.2	0.0	0.7
Dwelling vacant/address not a dwelling (DV)	1.4	1.1	1.1	1.6	1.0	1.2
Dwelling destroyed (DD)	0.2	0.1	0.4	0.1	0.0	0.1
Other (O)	0.2	0.4	0.3	0.6	0.2	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of sampled households	1,250	2,251	1,000	1,251	1,250	3,501
Household response rate (HRR)[1]	99.5	99.8	99.9	99.5	99.8	99.7
Eligible women						
Completed (EWC)	98.5	99.3	99.8	98.5	98.9	99.0
Not at home (EWNH)	0.8	0.2	0.0	0.5	0.7	0.4
Refused (EWR)	0.2	0.1	0.0	0.2	0.2	0.1
Incapacitated (EWI)	0.4	0.3	0.2	0.7	0.1	0.3
Other (EWO)	0.2	0.1	0.0	0.2	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of women	1,121	1,805	871	1,052	1,003	2,926
Eligible women response rate (EWRR)[2]	98.5	99.3	99.8	98.5	98.9	99.0
Overall women response rate (ORR)[3]	98.0	99.2	99.7	98.0	98.7	98.7

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

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

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

$$OWRR = HRR * EWRR/100$$

ESTIMATES OF SAMPLING ERRORS *Appendix* B

The estimates from a sample survey are affected by two types of errors: 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 2014 Malawi Malaria Indicator Survey (Malawi MIS) to minimise 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 2014 Malawi MIS is only one of many samples that could have been selected from the same population, using the same design and expected size. Each of these samples would yield results that differ somewhat from the results of the actual sample selected. Sampling errors are a measure of the variability among all possible samples. Although the degree of variability is not known exactly, it can be estimated from the survey results.

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

If the sample of respondents had been selected as a simple random sample, it would have been possible to use straightforward formulas for calculating sampling errors. However, the 2014 Malawi MIS sample is the result of a multi-stage stratified design, and, consequently, it was necessary to use more complex formulas. Sampling errors are computed in either ISSA or SAS, using programs developed by ICF International. These programs use the Taylor linearisation method of variance estimation for survey estimates that are means, proportions, or ratios like the ones in the Malawi MIS survey.

The Taylor linearisation 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:

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

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 hth stratum,

y_{hi} is the sum of the weighted values of variable y in the ith cluster in the hth stratum,

x_{hi} is the sum of the weighted number of cases in the ith cluster in the hth 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 2014 Malawi MIS are calculated for selected variables considered to be of primary interest. The results are presented in this appendix for the country as a whole, for urban and rural areas, and for the three regions in the country: Northern, Central, and Southern. For each variable, the type of statistic (mean, proportion, or rate) and the base population are given in Table B.1. Tables B.2 through B.7 present the value of the statistic (R), its standard error (SE), the number of 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 selected 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 0.304, and its standard error is 0.022. Therefore, to obtain the 95 percent confidence limits, one adds and subtracts twice the standard error to the sample estimate, i.e., 0.304 ± 2×0.022. There is a high probability (95 percent) that the *true* proportion of children that have fever in the last two weeks is between 0.260 and 0.348.

For the total sample, the value of the DEFT, averaged over all variables, is 2.167. This means that, due to multi-stage clustering of the sample, the average standard error is increased by a factor of 2.167 over that in an equivalent simple random sample.

Table B.1 List of selected variables for sampling errors, Malawi MIS 2014

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

Table B.2 Sampling errors: Total sample, Malawi MIS 2014

Variable	Value (R)	Standard error (SE)	Number of cases Unweighted (N)	Number of cases Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits R-2SE	Confidence limits R+2SE
No education	0.144	0.013	2,897	2,897	2.044	0.093	0.117	0.171
At least some secondary education	0.230	0.021	2,897	2,897	2.713	0.092	0.187	0.272
Ownership of at least one ITN	0.702	0.023	3,405	3,405	2.881	0.032	0.657	0.747
Child slept under an ITN last night	0.671	0.024	2,237	2,335	2.057	0.036	0.623	0.719
Pregnant women slept under an ITN last night	0.624	0.043	233	218	1.312	0.069	0.538	0.710
Received 2+ doses of SP/Fansidar during antenatal visit	0.633	0.028	883	945	1.754	0.043	0.578	0.688
Child has fever in last 2 weeks	0.304	0.022	2,062	2,210	2.168	0.073	0.260	0.348
Child sought care/treatment from a health facility	0.588	0.032	594	672	1.664	0.054	0.524	0.651
Child took ACT	0.393	0.030	594	672	1.541	0.076	0.334	0.453
Child has anaemia (Haemoglobin <8.0 g/dl)	0.064	0.009	1,939	2,041	1.602	0.143	0.046	0.083
Child has malaria (based on rapid test)	0.371	0.036	1,918	1,991	3.024	0.096	0.299	0.442
Child has malaria (based on microscopy test)	0.332	0.037	1,925	2,023	3.244	0.110	0.258	0.405

Table B.3 Sampling errors: Urban sample, Malawi MIS 2014

Variable	Value (R)	Standard error (SE)	Number of cases Unweighted (N)	Number of cases Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits R-2SE	Confidence limits R+2SE
No education	0.047	0.008	1,104	568	1.275	0.172	0.031	0.064
At least some secondary education	0.559	0.039	1,104	568	2.583	0.069	0.482	0.637
Ownership of at least one ITN	0.754	0.020	1,211	591	1.577	0.026	0.714	0.793
Child slept under an ITN last night	0.708	0.037	671	335	1.893	0.052	0.635	0.782
Pregnant women slept under an ITN last night	0.732	0.083	70	36	1.606	0.113	0.567	0.898
Received 2+ doses of SP/Fansidar during antenatal visit	0.623	0.060	290	146	2.070	0.096	0.504	0.742
Child has fever in last 2 weeks	0.227	0.027	631	323	1.542	0.117	0.174	0.280
Child sought care/treatment from a health facility	0.539	0.076	135	73	1.700	0.140	0.388	0.690
Child took ACT	0.227	0.048	135	73	1.335	0.211	0.132	0.323
Child has anaemia (Haemoglobin <8.0 g/dl)	0.048	0.017	563	277	1.906	0.361	0.013	0.083
Child has malaria (based on rapid test)	0.119	0.033	561	276	2.450	0.272	0.054	0.185
Child has malaria (based on microscopy test)	0.108	0.029	558	275	2.227	0.266	0.050	0.165

Table B.4 Sampling errors: Rural sample, Malawi MIS 2014

Variable	Value (R)	Standard error (SE)	Number of cases Unweighted (N)	Number of cases Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits R-2SE	Confidence limits R+2SE
No education	0.168	0.016	1,793	2,329	1.786	0.094	0.136	0.199
At least some secondary education	0.149	0.021	1,793	2,329	2.487	0.141	0.107	0.191
Ownership of at least one ITN	0.691	0.027	2,194	2,814	2.687	0.038	0.638	0.744
Child slept under an ITN last night	0.665	0.027	1,566	2,000	1.875	0.041	0.610	0.719
Pregnant women slept under an ITN last night	0.602	0.047	163	182	1.152	0.079	0.508	0.697
Received 2+ doses of SP/Fansidar during antenatal visit	0.635	0.031	593	799	1.583	0.048	0.573	0.696
Child has fever in last 2 weeks	0.317	0.025	1,431	1,887	1.989	0.080	0.266	0.368
Child sought care/treatment from a health facility	0.594	0.035	459	599	1.523	0.059	0.524	0.663
Child took ACT	0.414	0.033	459	599	1.419	0.081	0.347	0.480
Child has anaemia (Haemoglobin <8.0 g/dl)	0.067	0.010	1,376	1,765	1.438	0.154	0.046	0.087
Child has malaria (based on rapid test)	0.411	0.039	1,357	1,715	2.678	0.096	0.332	0.490
Child has malaria (based on microscopy test)	0.367	0.040	1,367	1,748	2.855	0.110	0.286	0.447

Table B.5 Sampling errors: Northern sample, Malawi MIS 2014

Variable	Value (R)	Standard error (SE)	Number of cases Unweighted (N)	Number of cases Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits R-2SE	Confidence limits R+2SE
No education	0.061	0.016	869	543	1.937	0.258	0.029	0.092
At least some secondary education	0.275	0.044	869	543	2.895	0.160	0.187	0.363
Ownership of at least one ITN	0.779	0.021	971	600	1.610	0.028	0.736	0.822
Child slept under an ITN last night	0.695	0.042	655	428	1.987	0.061	0.611	0.779
Pregnant women slept under an ITN last night	0.758	0.077	77	44	1.519	0.101	0.604	0.912
Received 2+ doses of SP/Fansidar during antenatal visit	0.679	0.051	240	157	1.722	0.075	0.577	0.780
Child has fever in last 2 weeks	0.253	0.037	594	396	2.156	0.148	0.179	0.328
Child sought care/treatment from a health facility	0.631	0.046	147	100	1.252	0.072	0.539	0.722
Child took ACT	0.387	0.066	147	100	1.624	0.170	0.255	0.518
Child has anaemia (Haemoglobin <8.0 g/dl)	0.045	0.011	586	389	1.377	0.252	0.023	0.068
Child has malaria (based on rapid test)	0.247	0.055	576	379	2.825	0.221	0.137	0.356
Child has malaria (based on microscopy test)	0.285	0.060	583	387	3.160	0.211	0.165	0.406

Table B.6 Sampling errors: Central sample, Malawi MIS 2014

Variable	Value (R)	Standard error (SE)	Number of cases Unweighted (N)	Number of cases Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits R-2SE	Confidence limits R+2SE
No education	0.159	0.017	1,036	1,182	1.534	0.110	0.124	0.194
At least some secondary education	0.231	0.035	1,036	1,182	2.631	0.150	0.161	0.300
Ownership of at least one ITN	0.697	0.026	1,202	1,317	1.930	0.037	0.645	0.748
Child slept under an ITN last night	0.667	0.029	786	905	1.514	0.044	0.609	0.726
Pregnant women slept under an ITN last night	0.608	0.065	76	93	1.223	0.107	0.478	0.738
Received 2+ doses of SP/Fansidar during antenatal visit	0.656	0.033	312	374	1.242	0.050	0.591	0.722
Child has fever in last 2 weeks	0.378	0.036	724	857	1.928	0.096	0.305	0.450
Child sought care/treatment from a health facility	0.574	0.042	252	323	1.379	0.072	0.491	0.657
Child took ACT	0.404	0.035	252	323	1.189	0.088	0.333	0.474
Child has anaemia (Haemoglobin <8.0 g/dl)	0.073	0.016	675	777	1.579	0.215	0.042	0.104
Child has malaria (based on rapid test)	0.425	0.049	671	775	2.434	0.115	0.327	0.524
Child has malaria (based on microscopy test)	0.361	0.041	672	774	2.202	0.113	0.279	0.443

Table B.7 Sampling errors: Southern sample, Malawi MIS 2014

Variable	Value (R)	Standard error (SE)	Number of cases Unweighted (N)	Number of cases Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Confidence limits R-2SE	Confidence limits R+2SE
No education	0.167	0.026	992	1,172	2.165	0.154	0.116	0.219
At least some secondary education	0.208	0.034	992	1,172	2.599	0.162	0.140	0.275
Ownership of at least one ITN	0.676	0.043	1,232	1,488	3.243	0.064	0.589	0.763
Child slept under an ITN last night	0.664	0.045	796	1,003	2.274	0.068	0.573	0.754
Pregnant women slept under an ITN last night	0.569	0.069	80	81	1.144	0.122	0.430	0.707
Received 2+ doses of SP/Fansidar during antenatal visit	0.595	0.048	331	414	1.833	0.081	0.499	0.691
Child has fever in last 2 weeks	0.259	0.033	744	957	2.032	0.126	0.194	0.325
Child sought care/treatment from a health facility	0.588	0.063	195	248	1.863	0.108	0.461	0.715
Child took ACT	0.382	0.060	195	248	1.762	0.157	0.262	0.503
Child has anaemia (Haemoglobin <8.0 g/dl)	0.065	0.016	678	876	1.524	0.239	0.034	0.096
Child has malaria (based on rapid test)	0.376	0.065	671	837	3.253	0.174	0.245	0.507
Child has malaria (based on microscopy test)	0.326	0.073	670	861	3.659	0.225	0.179	0.472

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 2014

	Women		Men			Women		Men	
Age	Number	Percent	Number	Percent	Age	Number	Percent	Number	Percent
0	259	3.6	217	3.2	36	73	1.0	77	1.1
1	244	3.4	250	3.6	37	55	0.8	45	0.7
2	226	3.2	235	3.4	38	48	0.7	109	1.6
3	210	2.9	216	3.1	39	76	1.1	43	0.6
4	229	3.2	231	3.4	40	75	1.1	87	1.3
5	197	2.8	178	2.6	41	48	0.7	38	0.5
6	255	3.6	246	3.6	42	52	0.7	61	0.9
7	248	3.5	234	3.4	43	30	0.4	31	0.5
8	239	3.4	243	3.5	44	27	0.4	43	0.6
9	225	3.2	202	3.0	45	41	0.6	92	1.3
10	263	3.7	287	4.2	46	38	0.5	38	0.6
11	154	2.2	187	2.7	47	20	0.3	26	0.4
12	234	3.3	221	3.2	48	29	0.4	32	0.5
13	234	3.3	186	2.7	49	7	0.1	31	0.4
14	258	3.6	194	2.8	50	120	1.7	63	0.9
15	74	1.0	136	2.0	51	28	0.4	28	0.4
16	85	1.2	121	1.8	52	65	0.9	45	0.7
17	99	1.4	92	1.3	53	25	0.4	14	0.2
18	116	1.6	138	2.0	54	23	0.3	25	0.4
19	121	1.7	98	1.4	55	42	0.6	30	0.4
20	163	2.3	111	1.6	56	25	0.3	27	0.4
21	121	1.7	92	1.3	57	15	0.2	25	0.4
22	106	1.5	112	1.6	58	28	0.4	12	0.2
23	119	1.7	77	1.1	59	25	0.3	10	0.1
24	93	1.3	99	1.4	60	76	1.1	43	0.6
25	136	1.9	110	1.6	61	20	0.3	7	0.1
26	121	1.7	75	1.1	62	14	0.2	13	0.2
27	80	1.1	58	0.8	63	9	0.1	11	0.2
28	84	1.2	123	1.8	64	9	0.1	15	0.2
29	102	1.4	54	0.8	65	30	0.4	26	0.4
30	132	1.8	146	2.1	66	12	0.2	13	0.2
31	109	1.5	65	0.9	67	13	0.2	16	0.2
32	96	1.4	117	1.7	68	21	0.3	9	0.1
33	69	1.0	45	0.7	69	13	0.2	7	0.1
34	88	1.2	68	1.0	70+	173	2.4	150	2.2
35	104	1.5	93	1.4	Don't know/ missing	29	0.4	161	2.3
					Total	7,125	100.0	6,855	100.0

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

Table C.2 Age distribution of eligible and interviewed women

De facto household population of women age 10-54, interviewed women age 15-49; and percent distribution and percentage of eligible women who were interviewed (weighted), by five-year age groups, Malawi MIS 2014

Age group	Household population of women age 10-54	Interviewed women age 15-49		Percentage of eligible women interviewed
		Number	Percentage	
10-14	1,142	na	na	na
15-19	494	489	17.4	98.9
20-24	603	596	21.2	98.9
25-29	522	513	18.3	98.3
30-34	494	490	17.4	99.1
35-39	356	354	12.6	99.3
40-44	232	232	8.2	100.0
45-49	136	135	4.8	99.6
50-54	261	na	na	na
15-49	2,838	2,809	100.0	99.0

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

Table C.3 Completeness of reporting

Percentage of observations missing information for selected demographic and health questions (weighted), Malawi MIS 2014

Subject	Percentage with information missing	Number of cases
Month only (Births in the 15 years preceding the survey)	0.05	2,572
Month and year (Births in the 15 years preceding the survey)	0.00	2,572
Age at death (Deceased children born in the 15 years preceding the survey)	0.00	17
Age/date at first union[1] (Ever married women age 15-49)	0.00	2,897
Respondent's education (All women age 15-49)	0.00	2,897
Diarrhoea in last 2 weeks (Living children 0-59 months)	0.00	2,210
Anaemia (Living children age 6-59 months from the Household Questionnaire)	2.42	2,092

[1] Both year and age missing

SURVEY PERSONNEL

Appendix D

STEERING COMMITTEE

Prof. Malcolm Molyneux (Chairperson)
Doreen Ali
Misheck Luhanga
Austin Gumbo
Clifton Gondwe
Peter Troell
Wilfred Dodoli
Isaac Chirwa
Kamija Phiri
Don Manthanga

FIELDWORK TEAMS (DISTRICTS)

Team 1
Field Supervisor: Symon Nyondo
Interviewer 1: Sarah J. Msowoya
Interviewer 2: Violet Jere
Lab Tech 1: Irack Munamie
Lab Tech 2: Thomas Mughogho

Team 2
Field Supervisor: Mabvuto J. Banda
Interviewer 1: Alice Msukwa
Interviewer 2: Jean Mkandawire
Lab Tech 1: Dokiso Soko
Lab Tech 2: Moses Gondwe

Team 3
Field Supervisor: Pilirani Msiska
Interviewer 1: Carolyn Chipeta
Interviewer 2: Zawadi Lungu Tembo
Lab Tech 1: Kalengo Patrick
Lab Tech 2: Herbert Chiumia

Team 4
Field Supervisor: MacLean Changadeya
Interviewer 1: Thereza Ziba
Interviewer 2: Charity Banda
Lab Tech 1: Patrick Mbulaje
Lab Tech 2: Mwayi Luka

Team 5
Field Supervisor: Charity Potani
Interviewer 1: Evelyn Zambasa
Interviewer 2: Catherine Nakoma
Lab Tech 1: George Seda
Lab Tech 2: Tobias Alidu

Team 6
Field Supervisor: Allan Jumbe
Interviewer 1: Doris Namanja
Interviewer 2: Sellina Nlashi
Lab Tech 1: Tawfeeq Qassim
Lab Tech 2: Christine Kaliwo

Team 7
Field Supervisor: Samuel Gama
Interviewer 1: Chifundo Banda
Interviewer 2: Florence Sande
Interviewer 3: Bernadeta Mazibuko
Lab Tech 1: Limbani Banda
Lab Tech 2: Malipher Kautale
Lab Tech 3: Sandram Kamwendo

Team 8
Field Supervisor: Alick Sixpence
Interviewer 1: Chrissy Maulidi
Interviewer 2: Jane Somanje
Lab Tech 1: Beatrice Mwinjiro
Lab Tech 2: Doroth Moyo

Team 9
Field Supervisor: Beatrice Kamanga
Interviewer 1: Shyreen Chithambo
Interviewer 2: Annie Chaura Zoya
Lab Tech 1: Christine Kaliwo
Lab Tech 2: Frida Bandawe

Team 10
Field Supervisor: Beatrice Nindi
Interviewer 1: Mirriam Maseko
Interviewer 2: Edah Lipipa
Lab Tech 1: Cidreck White
Lab Tech 2: Thoko Noniwa

Team 11
Field Supervisor: Agnes J. Banda
Interviewer 1: Ivy Kalinde
Interviewer 2: Regina Juwa
Lab Tech 1: Agnes Lakudzala
Lab Tech 2: Judith Tasosa

Alternate Team Supervisors
Dubulao Moyo
Evans Kaunda
Clifton Gondwe

REGIONAL SUPERVISORS

Biomarkers
Madingore Yassin
Mathews Mhone
Innocent Zungu
Sandy Jere
Kingsley Manda

National Supervisors and Coordination
Doreen Ali
Misheck Luhanga (Survey Coordinator)
Austin Gumbo
Ben Chilima
John Chiphwanya
Wilfred Dodoli
Isaac Chirwa
Innocent Zungu

Laboratory Analysis
Madingore Yassin
Gloria Chisuwo Magola
Mathews Mhone
James Kaphiyo
Innocent Zungu
James Kaphiyo
Philip Ntambo
Enock Maulana

Data Processing Supervisors and PDA Support
Khumbo Ngwira
Hope Kanike

Report Authors
Doreen Ali
Misheck Luhanga
Austin Gumbo
John Chiphwanya
Wilfred Dodoli
John Zoya
John Sande
Evans Kaunda
Shadreck Mulenga

ICF INTERNATIONAL STAFF

Sri Poedjastoeti (Country Manager)
Mahmoud Elkasabi
Keith Purvis
Kimberly Peven
Nancy Johnson
Chris Gramer

ICF Consultants
Geofrey Lutwama
K.K. Bakunda
Sam N. Lubwama

QUESTIONNAIRES

Appendix E

2014 MALAWI MALARIA INDICATOR SURVEY
HOUSEHOLD QUESTIONNAIRE

IDENTIFICATION

PLACE NAME _____

DISTRICT _____

CLUSTER NUMBER . . . . . .

HOUSEHOLD NUMBER . . . . . .

NAME OF HOUSEHOLD HEAD _____

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE				DAY
				MONTH
				YEAR 2 0 1 4
INTERVIEWER'S NAME				INT. NUMBER
RESULT*				RESULT
NEXT VISIT: DATE				TOTAL NUMBER OF VISITS
TIME				

*RESULT CODES:

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

TOTAL PERSONS IN HOUSEHOLD

TOTAL ELIGIBLE WOMEN

LINE NO. OF RESPONDENT TO HOUSEHOLD QUESTIONNAIRE

LANGUAGE OF QUESTIONNAIRE** **ENGLISH** 4

LANGUAGE OF INTERVIEW** . . . . . .

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

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

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

INTRODUCTION AND CONSENT

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

GIVE CARD WITH CONTACT INFORMATION

Do you have any questions?
May I begin the interview now?

SIGNATURE OF INTERVIEWER:_____ DATE: _____

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

HOUSEHOLD SCHEDULE

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

CODES FOR Q. 3: RELATIONSHIP TO HEAD OF HOUSEHOLD

01 = HEAD
02 = WIFE OR HUSBAND
03 = SON OR DAUGHTER
04 = SON-IN-LAW OR DAUGHTER-IN-LAW
05 = GRANDCHILD
06 = PARENT
07 = PARENT-IN-LAW
08 = BROTHER OR SISTER
09 = OTHER RELATIVE
10 = ADOPTED/FOSTER/STEPCHILD
11 = NOT RELATED
98 = DON'T KNOW

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	WOMEN AGE 15-49	CHILDREN AGE 0-5
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
	Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with the head of the household. AFTER LISTING THE NAMES AND RECORDING THE RELATIONSHIP AND SEX FOR EACH PERSON, ASK QUESTIONS 2A-2C TO BE SURE THAT THE LISTING IS COMPLETE. THEN ASK APPROPRIATE QUESTIONS IN COLUMNS 5-10 FOR EACH PERSON.	What is the relationship of (NAME) to the head of the household? SEE CODES BELOW.	Is (NAME) male or female?	Does (NAME) usually live here?	Did (NAME) stay here last night?	How old is (NAME)? IF 95 OR MORE, RECORD '95'.	CIRCLE LINE NUMBER OF ALL WOMEN AGE 15-49	CIRCLE LINE NUMBER OF ALL CHILDREN AGE 0-5
			M F	Y N	Y N	IN YEARS		
11			1 2	1 2	1 2		11	11
12			1 2	1 2	1 2		12	12
13			1 2	1 2	1 2		13	13
14			1 2	1 2	1 2		14	14
15			1 2	1 2	1 2		15	15
16			1 2	1 2	1 2		16	16
17			1 2	1 2	1 2		17	17
18			1 2	1 2	1 2		18	18
19			1 2	1 2	1 2		19	19
20			1 2	1 2	1 2		20	20

TICK HERE IF CONTINUATION SHEET USED ☐

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

2B) Are there any other people who may not be members of your family, such as domestic servants, lodgers, or friends who usually live here? YES ☐ → ADD TO TABLE NO ☐

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

CODES FOR Q. 3: RELATIONSHIP TO HEAD OF HOUSEHOLD

01 = HEAD
02 = WIFE OR HUSBAND
03 = SON OR DAUGHTER
04 = SON-IN-LAW OR DAUGHTER-IN-LAW
05 = GRANDCHILD
06 = PARENT
07 = PARENT-IN-LAW
08 = BROTHER OR SISTER
09 = OTHER RELATIVE
10 = ADOPTED/FOSTER/STEPCHILD
11 = NOT RELATED
98 = DON'T KNOW

HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
101	What is the main source of drinking water for members of your household?	PIPED WATER PIPED INTO DWELLING . . . . . 11 PIPED TO YARD/PLOT . . . . . 12 PUBLIC TAP/STANDPIPE . . . . . 13 TUBE WELL OR BOREHOLE . . . . . 21 DUG WELL PROTECTED WELL . . . . . 31 UNPROTECTED WELL . . . . . 32 WATER FROM SPRING PROTECTED SPRING . . . . . 41 UNPROTECTED SPRING . . . . . 42 RAINWATER . . . . . 51 TANKER TRUCK . . . . . 61 CART WITH SMALL TANK . . . . . 71 SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/ IRRIGATION CHANNEL) . . . . . 81 BOTTLED WATER . . . . . 91 OTHER _____ 96 (SPECIFY)	104 104
102	Where is that water source located?	IN OWN DWELLING . . . . . 1 IN OWN YARD/PLOT . . . . . 2 ELSEWHERE 3	104
103	How long does it take to go there, get water, and come back?	MINUTES . . . . . [ ][ ][ ] DON'T KNOW 998	
104	What kind of toilet facility do members of your household usually use?	FLUSH OR POUR FLUSH TOILET . . . . . 11 PIT LATRINE VENTILATED IMPROVED PIT LATRINE . . . . . 21 PIT LATRINE WITH SLAB . . . . . 22 PIT LATRINE WITHOUT SLAB/ OPEN PIT . . . . . 23 COMPOSTING TOILET . . . . . 31 BUCKET TOILET . . . . . 41 HANGING TOILET/HANGING LATRINE . . . . . 51 NO FACILITY/BUSH/FIELD . . . . . 61 OTHER _____ 96 (SPECIFY)	 107
105	Do you share this toilet facility with other households?	YES . . . . . 1 NO 2	 107
106	How many households use this toilet facility?	NO. OF HOUSEHOLDS IF LESS THAN 10 . . . . . [0][ ] 10 OR MORE HOUSEHOLDS . . . . . 95 DON'T KNOW 98	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
107	Does your household have: Electricity? A radio? A television? A cellular phone? A telephone (landline)? A refrigerator?	YES NO ELECTRICITY . . . . . 1 2 RADIO . . . . . 1 2 TELEVISION . . . . . 1 2 CELL PHONE . . . . . 1 2 TELEPHONE (LANDLINE) . . . . . 1 2 REFRIGERATOR 1 2	
108	What type of fuel does your household mainly use for cooking?	ELECTRICITY . . . . . 01 LPG/NATURAL GAS . . . . . 02 BIOGAS . . . . . 03 KEROSENE . . . . . 04 COAL, LIGNITE . . . . . 05 CHARCOAL . . . . . 06 WOOD . . . . . 07 STRAW/SHRUBS/GRASS . . . . . 08 ANIMAL DUNG . . . . . 09 NO FOOD COOKED IN HOUSEHOLD . . . . . 95 OTHER _____ 96 (SPECIFY)	
109	MAIN MATERIAL OF THE FLOOR. RECORD OBSERVATION.	NATURAL FLOOR EARTH/SAND . . . . . 11 DUNG . . . . . 12 RUDIMENTARY FLOOR WOOD PLANKS . . . . . 21 PALM/BAMBOO . . . . . 22 BROKEN BRICKS . . . . . 23 FINISHED FLOOR PARQUET OR POLISHED WOOD . . . . . 31 VINYL OR ASPHALT STRIPS . . . . . 32 CERAMIC TILES . . . . . 33 CEMENT . . . . . 34 CARPET . . . . . 35 OTHER _____ 96 (SPECIFY)	
110	MAIN MATERIAL OF THE ROOF. RECORD OBSERVATION.	NATURAL ROOFING NO ROOF . . . . . 11 THATCH/PALM LEAF . . . . . 12 RUDIMENTARY ROOFING RUSTIC MAT . . . . . 21 PALM/BAMBOO/GRASS . . . . . 22 WOOD PLANKS . . . . . 23 CARDBOARD . . . . . 24 FINISHED ROOFING IRON SHEETS . . . . . 31 WOOD . . . . . 32 CALAMINE/CEMENT FIBER . . . . . 33 CERAMIC TILES . . . . . 34 CEMENT . . . . . 35 ROOFING SHINGLES . . . . . 36 OTHER _____ 96 (SPECIFY)	

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

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
117	How many of the following animals does this household own? IF NONE, ENTER '00'. IF 95 OR MORE, ENTER '95'. IF UNKNOWN, ENTER '98'. Goats? Pigs? Cattle? Sheep? Poultry (chickens, ducks, pigeons)? Other? _____ (SPECIFY)	GOATS . . . . . [ ][ ] PIGS . . . . . [ ][ ] CATTLE . . . . . [ ][ ] SHEEP . . . . . [ ][ ] POULTRY . . . . . [ ][ ] OTHER . . . . . [ ][ ]	
118	Does any member of this household have a bank account?	YES . . . . . 1 NO 2	
119	At any time in the past 12 months, has anyone come into your dwelling to spray the interior walls against mosquitoes?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 121
119A	How many months ago was the house sprayed? IF LESS THAN 1 MONTH AGO, RECORD '00'	MONTHS . . . . . [ ][ ]	
120	Who sprayed the house?	OTHER GOVERNMENT WORKER/ PROGRAMME . . . . . 1 PRIVATE COMPANY . . . . . 2 NONGOVERNMENTAL ORGANIZATION (NGO) . . . . . 3 OTHER _____ . . . . . 6 (SPECIFY) DON'T KNOW 8	
120A	At any time in the past 12 months, have the walls in your dwelling been plastered or painted?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 121
120B	How many months ago were the walls plastered or painted? IF LESS THAN 1 MONTH AGO, RECORD '00'	MONTHS . . . . . [ ][ ]	
121	Does your household have any mosquito nets that can be used while sleeping?	YES . . . . . 1 NO 2	→ 130
122	How many mosquito nets does your household have? IF 7 OR MORE NETS, RECORD '7'.	NUMBER OF NETS . . . . . [ ]	
122A	Has anyone in your household ever sold or given away a mosquito net?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 130

		NET #1	NET #2	NET #3
123	ASK THE RESPONDENT TO SHOW YOU ALL THE NETS IN THE HOUSEHOLD IF MORE THAN 3 NETS, USE ADDITIONAL QUESTIONNAIRE(S).	OBSERVED . . . . . 1 NOT OBSERVED 2	OBSERVED . . . . . 1 NOT OBSERVED 2	OBSERVED . . . . . 1 NOT OBSERVED 2
123A	OBSERVE (OR ASK ABOUT) THE CONDITION OF THE MOSQUITO NET: DOES THE NET HAVE HOLES IN IT (HOLES THE SIZE OF THE TIP OF YOUR THUMB OR LARGER)?	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2
123B	OBSERVE (OR ASK) THE COLOR OF THE MOSQUITO NET.	GREEN . . . . . 01 DARK BLUE . . . 02 LIGHT BLUE . . . 03 RED . . . . . 04 BLACK . . . . . 05 WHITE . . . . . 06 OTHER 96	GREEN . . . . . 01 DARK BLUE . . . 02 LIGHT BLUE . . . 03 RED . . . . . 04 BLACK . . . . . 05 WHITE . . . . . 06 OTHER 96	GREEN . . . . . 01 DARK BLUE . . . 02 LIGHT BLUE . . . 03 RED . . . . . 04 BLACK . . . . . 05 WHITE . . . . . 06 OTHER 96
123C	OBSERVE (OR ASK) THE SHAPE OF THE MOSQUITO NET.	CONICAL . . . . . 1 RECTANGLE . . . . . 2 (SKIP TO 123F) ← OTHER 6	CONICAL . . . . . 1 RECTANGLE . . . . . 2 (SKIP TO 123F) ← OTHER 6	CONICAL . . . . . 1 RECTANGLE . . . . . 2 (SKIP TO 123F) ← OTHER 6
123D	Was this net altered to become a conical net?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 123F) ← DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (SKIP TO 123F) ← DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (SKIP TO 123F) ← DON'T KNOW 8
123E	How many nets were used to make the mosquito net conical?	ONE NET . . . . . 1 TWO NETS . . . . . 2 THREE OR MORE NETS 3	ONE NET . . . . . 1 TWO NETS . . . . . 2 THREE OR MORE NETS 3	ONE NET . . . . . 1 TWO NETS . . . . . 2 THREE OR MORE NETS 3
123F	Is the net hanging for sleeping?	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2
124	How many months ago did your household get the mosquito net? IF LESS THAN ONE MONTH AGO, RECORD '00'.	MONTHS AGO . . . [ ][ ] MORE THAN 36 MONTHS AGO . . . 95 NOT SURE 98	MONTHS AGO . . . [ ][ ] MORE THAN 36 MONTHS AGO . . . 95 NOT SURE 98	MONTHS AGO . . . . [ ][ ] MORE THAN 36 MONTHS AGO . . . 95 NOT SURE 98

		NET #1	NET #2	NET #3
125	Is this net a long-lasting net, retreatable, or an untreated net? OBSERVE OR ASK THE BRAND/ TYPE OF MOSQUITO NET. **ITN/LONG-LASTING NET** DURANET (GREEN, SQUARE) OLYSNET (LIGHT BLUE, SQUARE) LIFENET (WHITE, SQUARE) PERMANET (GREEN, SQUARE) **CONVENTIONAL NETS: CAN BE RETREATABLE OR UNTREATED** SAFI NET (DARK BLUE, CONICAL) THERE ARE OTHER BRANDS **BE AWARE THAT MANY BRANDS MAY EXIST AND BE DISTRIBUTED BY DIFFERENT ORGANIZATIONS.**	**ITN/LONG-LASTING NET** DURANET . . . . . 11 OLYSET . . . . . 12 LIFENET . . . . . 13 PERMANET . . . 14 OTHER/ DK BRAND . . . 16 **RETREATABLE NET** SAFI NET . . . . . 21 OTHER/ DK BRAND . . . 26 **UNTREATED NET** SAFI NET . . . . . 31 OTHER/ DK BRAND . . . 36 **OTHER** _____ 41 (SPECIFY) **DK BRAND** 98	**ITN/LONG-LASTING NET** DURANET . . . . . 11 OLYSET . . . . . 12 LIFENET . . . . . 13 PERMANET . . . 14 OTHER/ DK BRAND . . . 16 **RETREATABLE NET** SAFI NET . . . . . 21 OTHER/ DK BRAND . . . 26 **UNTREATED NET** SAFI NET . . . . . 31 OTHER/ DK BRAND . . . 36 **OTHER** _____ 41 (SPECIFY) **DK BRAND** 98	**ITN/LONG-LASTING NET** DURANET . . . . . 11 OLYSET . . . . . 12 LIFENET . . . . . 13 PERMANET . . . 14 OTHER/ DK BRAND . . . 16 **RETREATABLE NET** SAFI NET . . . . . 21 OTHER/ DK BRAND . . . 26 **UNTREATED NET** SAFI NET . . . . . 31 OTHER/ DK BRAND . . . 36 **OTHER** _____ 41 (SPECIFY) **DK BRAND** 98
125A	When you received this net, did it come with a treatment kit?	YES . . . . . 1 NO . . . . . 2 NOT SURE 8	YES . . . . . 1 NO . . . . . 2 NOT SURE 8	YES . . . . . 1 NO . . . . . 2 NOT SURE 8
126	Since you got the net, was it ever soaked or dipped in a liquid to kill or repel mosquitoes?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 128) ←┤ NOT SURE 8	YES . . . . . 1 NO . . . . . 2 (SKIP TO 128) ←┤ NOT SURE 8	YES . . . . . 1 NO . . . . . 2 (SKIP TO 128) ←┤ NOT SURE 8
127	How many months ago was the net last soaked or dipped? IF LESS THAN ONE MONTH AGO, RECORD '00'.	MONTHS AGO . . . [ ][ ] MORE THAN 24 MONTHS AGO 95 NOT SURE 98	MONTHS AGO . . . [ ][ ] MORE THAN 24 MONTHS AGO . . . 95 NOT SURE 98	MONTHS AGO . . . . [ ][ ] MORE THAN 24 MONTHS AGO 95 NOT SURE 98
127A	Did you pay to have the net soaked or dipped?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 128) ←┤ NOT SURE 8	YES . . . . . 1 NO . . . . . 2 (SKIP TO 128) ←┤ NOT SURE 8	YES . . . . . 1 NO . . . . . 2 (SKIP TO 128) ←┤ NOT SURE 8
127B	How much did you pay to soak or dip the net?	COST IN KWACHA [ ][ ][ ][ ] DON'T KNOW 9998	COST IN KWACHA [ ][ ][ ][ ] DON'T KNOW 9998	COST IN KWACHA [ ][ ][ ][ ] DON'T KNOW 9998

		NET #1	NET #2	NET #3
128	Where did you obtain the net?	GOVT. CLINIC/ HOSPITAL ..... 01 NEIGHBORHOOD HEALTH COMMITTEE (NHC) ..... 02 COM. HEALTH WORKER (CHW) ..... 03 SHOP ..... 04 PHARMACY ..... 05 WORKPLACE ..... 06 OTHER _____ 96 (SPECIFY) DON'T KNOW 98	GOVT. CLINIC/ HOSPITAL ..... 01 NEIGHBORHOOD HEALTH COMMITTEE (NHC) ..... 02 COM. HEALTH WORKER (CHW) ..... 03 SHOP ..... 04 PHARMACY ..... 05 WORKPLACE ..... 06 OTHER _____ 96 (SPECIFY) DON'T KNOW 98	GOVT. CLINIC/ HOSPITAL ..... 01 NEIGHBORHOOD HEALTH COMMITTEE (NHC) ..... 02 COM. HEALTH WORKER (CHW) ..... 03 SHOP ..... 04 PHARMACY ..... 05 WORKPLACE ..... 06 OTHER _____ 96 (SPECIFY) DON'T KNOW 98
128A	Did you purchase the net?	YES ..... 1 NO ..... 2 (SKIP TO 129) ←┤ NOT SURE 8	YES ..... 1 NO ..... 2 (SKIP TO 129) ←┤ NOT SURE 8	YES ..... 1 NO ..... 2 (SKIP TO 129) ←┤ NOT SURE 8
128B	How much did you pay for the net when you purchased it?	COST IN KWACHA [ ][ ][ ][ ] DON'T KNOW 9998	COST IN KWACHA [ ][ ][ ][ ] DON'T KNOW 9998	COST IN KWACHA [ ][ ][ ][ ] DON'T KNOW 9998
129	Did anyone sleep under this mosquito net last night?	YES ..... 1 NO ..... 2 (SKIP TO 130C) ←┤ NOT SURE 8	YES ..... 1 NO ..... 2 (SKIP TO 130C) ←┤ NOT SURE 8	YES ..... 1 NO ..... 2 (SKIP TO 130C) ←┤ NOT SURE 8
129A	Who slept under this mosquito net last night? RECORD THE PERSON'S NAME AND LINE NUMBER FROM THE HOUSEHOLD SCHEDULE.	NAME_____ LINE NO. ..... [ ][ ] NAME_____ LINE NO. ..... [ ][ ] NAME_____ LINE NO. ..... [ ][ ] NAME_____ LINE NO. ..... [ ][ ]	NAME_____ LINE NO. ..... [ ][ ] NAME_____ LINE NO. ..... [ ][ ] NAME_____ LINE NO. ..... [ ][ ] NAME_____ LINE NO. ..... [ ][ ]	NAME_____ LINE NO. ..... [ ][ ] NAME_____ LINE NO. ..... [ ][ ] NAME_____ LINE NO. ..... [ ][ ] NAME_____ LINE NO. ..... [ ][ ]
130		NEXT NET; OR, IF NO MORE NETS, GO TO 131.	NEXT NET; OR, IF NO MORE NETS, GO TO 131.	COLUMN OF A NEW QUESTIONNAIRE; OR, IF NO MORE NETS, GO TO 131.

		NET #1	NET #2	NET #3
131	ANY CHILDREN UNDER AGE 5 WHO DID NOT SLEEP UNDER A MOSQUITO NET YES ☐ NO ☐ → 131B NAME OF CHILD(REN): _____ _____			
131A	Why did (NAME OF CHILD) (and (NAME OF CHILD)) not sleep under a mosquito net last night? Any other reason? RECORD ALL MENTIONED.	TOO HOT . . . . . A TOO COLD . . . . . B CHILD CRIES . . . . . C CHILD AFRAID . . . . . D NOT ENOUGH NET . . . . . E NET NOT HUNG UP . . . . . F USED BY ADULTS . . . . . G NET NOT USED WHEN TRAVELING H NET NOT IN GOOD CONDIITION . . . . I NET BAD FOR CHILDREN'S HEALTH . . . . . J OTHER _____ X (SPECIFY)		
131B	If you have a choice, what color of mosquito net do you prefer?	BLUE 1 GREEN . . . . . 2 RED . . . . . 3 WHITE . . . . . 4 BLACK . . . . . 5 OTHER _____ 6 (SPECIFY) DK/NO PREFERENCE 8		
131C	If you have a choice, what shape of mosquito net do you prefer?	CONICAL . . . . . 11 RECTANGULAR . . . . . 2 → 131E DK/NO PREFERENCE . . . . . 8 → 201		
131D	What are the reasons why you prefer a conical-shaped net over a rectangular-shaped net? Anything else? CIRCLE ALL MENTIONED.	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)		→ 201

		NET #1	NET #2	NET #3
131E	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)	→ 201

2014 MALAWI MALARIA INDICATOR SURVEY
BIOMARKER QUESTIONNAIRE

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

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 0-5

201	CHECK COLUMN 9 IN HOUSEHOLD SCHEDULE. RECORD THE LINE NUMBER AND NAME FOR ALL ELIGIBLE CHILDREN 0-5 YEARS IN QUESTION 202. IF MORE THAN SIX CHILDREN, USE ADDITIONAL QUESTIONNAIRE(S).			
		CHILD 1	CHILD 2	CHILD 3
202	LINE NUMBER FROM COLUMN 9 NAME FROM COLUMN 2	LINE NUMBER . . . . . [ ][ ] NAME _____	LINE NUMBER . . . . . [ ][ ] NAME _____	LINE NUMBER . . . . . [ ][ ] NAME _____
203	IF MOTHER INTERVIEWED, COPY MONTH AND YEAR OF BIRTH FROM BIRTH HISTORY AND ASK DAY; IF MOTHER NOT INTERVIEWED, ASK: What is (NAME)'s birth date?	DAY . . . . . [ ][ ] MONTH . . . . . [ ][ ] YEAR [ ][ ][ ][ ]	DAY . . . . . [ ][ ] MONTH . . . . . [ ][ ] YEAR [ ][ ][ ][ ]	DAY . . . . . [ ][ ] MONTH . . . . . [ ][ ] YEAR [ ][ ][ ][ ]
204	CHECK 203: CHILD BORN IN JANUARY 2008 OR LATER?	YES . . . . . 1 NO . . . . . 2 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW)	YES . . . . . 1 NO . . . . . 2 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW)	YES . . . . . 1 NO . . . . . 2 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW)
205	CHECK 203: WAS CHILD BORN IN MONTH OF INTERVIEW OR FIVE PREVIOUS MONTHS?	YES . . . . . 1 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW) NO 2	YES . . . . . 1 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW) NO 2	YES . . . . . 1 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, END INTERVIEW) NO 2
206	LINE NUMBER OF PARENT/ OTHER ADULT RESPONSIBLE FOR THE CHILD (FROM COLUMN 1 OF HOUSEHOLD SCHEDULE). RECORD '00' IF NOT LISTED.	LINE NUMBER . . . . . [ ][ ]	LINE NUMBER . . . . . [ ][ ]	LINE NUMBER . . . . . [ ][ ]
207	ASK CONSENT FOR ANEMIA TEST FROM PARENT/OTHER ADULT IDENTIFIED IN 206 AS RESPONSIBLE FOR CHILD.	As part of this survey, we are asking children all over the country to take an **anemia** test. Anemia is a serious health problem that usually results from poor nutrition, infection, or chronic disease. This survey will assist the government to develop programs to prevent and treat anemia. We ask that all children born in 2008 or later take part in anemia testing in this survey and give a few drops of blood from a finger or heel. The equipment used to take the blood is clean and completely safe. It has never been used before and will be thrown away after each test. The blood will be tested for anemia immediately, and the result will be told to you right away. The result will be kept strictly confidential and will not be shared with anyone other than members of our survey team. Do you have any questions? You can say yes to the test, or you can say no. It is up to you to decide. Will you allow (NAME OF CHILD) to participate in the anemia test?		

208	CIRCLE THE APPROPRIATE CODE AND SIGN YOUR NAME.	GRANTED . . . . . 1 _____ (SIGN) REFUSED . . . . . 2 NOT PRESEN. . . . . 5 OTHER 6	GRANTED . . . . . 1 _____ (SIGN) REFUSED . . . . . 2 NOT PRESEN. . . . . 5 OTHER 6	GRANTED . . . . . 1 _____ (SIGN) REFUSED . . . . . 2 NOT PRESEN. . . . . 5 OTHER 6
209	ASK CONSENT FOR MALARIA TEST FROM PARENT/OTHER ADULT IDENTIFIED IN 206 AS RESPONSIBLE FOR CHILD.	As part of this survey, we are asking that children all over the country take a test to see if they have **malaria**. Malaria is a serious illness caused by a parasite transmitted by a mosquito bite. This survey will help the government to develop programs to prevent malaria. We ask that all children born in 2008 or later take part in malaria testing in this survey and give a few drops of blood from a finger or heel. The equipment used to take the blood is clean and completely safe. It has never been used before and will be thrown away after each test. (We will use blood from the same finger prick made for the anemia test). One blood drop will be tested for malaria immediately, and the result will be told to you right away. A few blood drops will be collected on a slide and taken to a laboratory for testing. You will not be told the results of the laboratory testing. All results will be kept strictly confidential and will not be shared with anyone other than members of our survey team. Do you have any questions? You can say yes to the test, or you can say no. It is up to you to decide. Will you allow (NAME OF CHILD) to participate in the malaria testing?		
210	CIRCLE THE APPROPRIATE CODE AND SIGN YOUR NAME.	GRANTED . . . . . 1 _____ (SIGN) REFUSED . . . . . 2 NOT PRESEN. . . . . 5 OTHER 6	GRANTED . . . . . 1 _____ (SIGN) REFUSED . . . . . 2 NOT PRESEN. . . . . 5 OTHER 6	GRANTED . . . . . 1 _____ (SIGN) REFUSED . . . . . 2 NOT PRESEN. . . . . 5 OTHER 6
211	PREPARE EQUIPMENT AND SUPPLIES ONLY FOR THE TEST(S) FOR WHICH CONSENT HAS BEEN OBTAINED AND PROCEED WITH THE TEST(S).			
212	BAR CODE LABEL	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT 99994 REFUSED . . . . . 99995 OTHER . . . . . 99996 PUT THE 2ND BAR CODE LABEL ON THE SLIDE AND THE 3RD ON THE TRANSMITTAL FORM.	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT 99994 REFUSED . . . . . 99995 OTHER . . . . . 99996 PUT THE 2ND BAR CODE LABEL ON THE SLIDE AND THE 3RD ON THE TRANSMITTAL FORM.	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT 99994 REFUSED . . . . . 99995 OTHER . . . . . 99996 PUT THE 2ND BAR CODE LABEL ON THE SLIDE AND THE 3RD ON THE TRANSMITTAL FORM.
213	RECORD HEMOGLOBIN LEVEL HERE AND IN THE ANEMIA AND MALARIA BROCHURE.	G/DL [ ][ ].[ ] NOT PRESENT . . . . 994 REFUSED . . . . . 995 OTHER 996	G/DL [ ][ ].[ ] NOT PRESENT . . . . 994 REFUSED . . . . . 995 OTHER 996	G/DL [ ][ ].[ ] NOT PRESENT . . . . 994 REFUSED . . . . . 995 OTHER 996
214	RECORD RESULT CODE OF THE MALARIA RDT	TESTED . . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . . 3 OTHER . . . . . 6 (SKIP TO 216)	TESTED . . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . . 3 OTHER . . . . . 6 (SKIP TO 216)	TESTED . . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . . 3 OTHER . . . . . 6 (SKIP TO 216)
215	RECORD THE RESULT OF THE MALARIA RDT HERE AND IN THE ANEMIA AND MALARIA BROCHURE.	POSITIVI. . . . . 1 (SKIP TO 218) NEGATIVE . . . . . 2 OTHER 6	POSITIVI. . . . . 1 (SKIP TO 218) NEGATIVE . . . . . 2 OTHER 6	POSITIVI. . . . . 1 (SKIP TO 218) NEGATIVE . . . . . 2 OTHER 6
216	CHECK 213 HEMOGLOBIN RESULT	BELOW 8.0 G/DL, SEVERE ANEMIA 1 8.0 G/DL OR ABOVE 2 NOT PRESENT . . . . . 4 REFUSED . . . . . 5 OTHER . . . . . 6 (SKIP TO 229)	BELOW 8.0 G/DL, SEVERE ANEMIA 1 8.0 G/DL OR ABOVE 2 NOT PRESENT . . . . . 4 REFUSED . . . . . 5 OTHER . . . . . 6 (SKIP TO 229)	BELOW 8.0 G/DL, SEVERE ANEMIA 1 8.0 G/DL OR ABOVE 2 NOT PRESENT . . . . . 4 REFUSED . . . . . 5 OTHER . . . . . 6 (SKIP TO 229)

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 0-5

217	**SEVERE ANEMIA REFERRAL** STATEMENT	The anemia test shows that (NAME OF CHILD) has severe anemia. Your child is very ill and must be taken to a health facility immediately. SKIP TO 229		
218	Does (NAME) suffer from any of following illnesses or symptoms: Extreme weakness (Prostration)? Heart problems? Loss of consciousness? Rapid or difficult breathing? Seizures? Abnormal bleeding? Jaundice (Yellow Skin)? Dark urine (brown)?	EXTREME WEAKNESS A HEART PROBLEM . . . B LOSS OF CONSCIOUSNESS C RAPID BREATHIN(. . . D SEIZURES . . . . . E BLEEDING . . . . . F JAUNDICE . . . . . G DARK URINE . . . . . H	EXTREME WEAKNESS A HEART PROBLEM . . . B LOSS OF CONSCIOUSNESS C RAPID BREATHIN(. . . D SEIZURES . . . . . E BLEEDING . . . . . F JAUNDICE . . . . . G DARK URINE . . . . . H	EXTREME WEAKNESS A HEART PROBLEM . . . B LOSS OF CONSCIOUSNESS C RAPID BREATHIN(. . . D SEIZURES . . . . . E BLEEDING . . . . . F JAUNDICE . . . . . G DARK URINE . . . . . H
219	CHECK 218 ANY CODE CIRCLED?	NO CODE CIRCLE . . 1 ANY CODE CIRCLED 2 (SKIP TO 222)	NO CODE CIRCLE . . 1 ANY CODE CIRCLED 2 (SKIP TO 222)	NO CODE CIRCLE . . 1 ANY CODE CIRCLED 2 (SKIP TO 222)
220	CHECK 213 HEMOGLOBIN RESULT	BELOW 8.0 G/DL, SEVERE ANEMIA 1 (SKIP TO 222) 8.0 G/DL OR ABOVE 2 NOT PRESENT . . . . . 4 REFUSED . . . . . 5 OTHER 6	BELOW 8.0 G/DL, SEVERE ANEMIA 1 (SKIP TO 222) 8.0 G/DL OR ABOVE 2 NOT PRESENT . . . . . 4 REFUSED . . . . . 5 OTHER 6	BELOW 8.0 G/DL, SEVERE ANEMIA 1 (SKIP TO 222) 8.0 G/DL OR ABOVE 2 NOT PRESENT . . . . . 4 REFUSED . . . . . 5 OTHER 6
221	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 222) NO . . . . . 2 (SKIP TO 224)	YES . . . . . 1 (SKIP TO 222) NO . . . . . 2 (SKIP TO 224)	YES . . . . . 1 (SKIP TO 222) NO . . . . . 2 (SKIP TO 224)
222	**SEVERE MALARIA REFERRAL** STATEMENT	The malaria test shows that (NAME OF CHILD) has malaria. Your child also has symptoms of severe malaria. The malaria treatment I have will not help your child, and I cannot give you the medication. Your child is very ill and must be taken to a health facility right away. SKIP TO 229		
223	**ALREADY TAKING [FIRST LINE MEDICATION] REFERRAL** STATEMENT	You have told me that (NAME OF CHILD) has already received medication for malaria. Therefore, I cannot give you additional medication. However, the test shows that he/she is positive for malaria. If your child has a fever for two days after the last dose of medication, you should take the child to the nearest health facility for further examination. SKIP TO 229		
224	READ INFORMATION FOR MALARIA TREATMENT AND CONSENT STATEMENT TO PARENT OR OTHER ADULT RESPONSIBLE FOR THE CHILD	The malaria test shows that your child has malaria. We can give you free medicine. The medicine is called Arthemether-Lumefantrine or LA. LA is very effective and in a few days it should get rid of the fever and other symptoms. You do not have to give the child the medicine. This is up to you. Please tell me whether you accept the medicine or not.		
225	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
226	RECORD THE RESULT CODE OF **MALARIA TREATMENT OR REFERRAL**	MEDICATION GIVEN 1 MEDS REFUSEI . . . . . 2 SEVERE MALARIA REFERRAL . . . . . 3 ALREADY TAKING MEDS REFERRAL . . . . . 4 OTHER 6	MEDICATION GIVEN 1 MEDS REFUSEI . . . . . 2 SEVERE MALARIA REFERRAL . . . . . 3 ALREADY TAKING MEDS REFERRAL . . . . . 4 OTHER 6	MEDICATION GIVEN 1 MEDS REFUSEI . . . . . 2 SEVERE MALARIA REFERRAL . . . . . 3 ALREADY TAKING MEDS REFERRAL . . . . . 4 OTHER 6
227	GO BACK TO 203 IN NEXT COLUMN OF THIS QUESTIONNAIRE OR IN THE FIRST COLUMN OF THE NEXT PAGE; IF NO MORE CHILDREN, END INTERVIEW.			

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

210	CIRCLE THE APPROPRIATE CODE AND SIGN YOUR NAME.	GRANTED . . . . . 1 _____ (SIGN) REFUSED . . . . . 2 NOT PRESEN . . . . . 5 OTHER 6	GRANTED . . . . . 1 _____ (SIGN) REFUSED . . . . . 2 NOT PRESEN . . . . . 5 OTHER 6	GRANTED . . . . . 1 _____ (SIGN) REFUSED . . . . . 2 NOT PRESEN . . . . . 5 OTHER 6
211	PREPARE EQUIPMENT AND SUPPLIES ONLY FOR THE TEST(S) FOR WHICH CONSENT HAS BEEN OBTAINED AND PROCEED WITH THE TEST(S).			
212	BAR CODE LABEL	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT 99994 REFUSED . . . . . 99995 OTHER . . . . . 99996 PUT THE 2ND BAR CODE LABEL ON THE SLIDE AND THE 3RD ON THE TRANSMITTAL FORM.	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT 99994 REFUSED . . . . . 99995 OTHER . . . . . 99996 PUT THE 2ND BAR CODE LABEL ON THE SLIDE AND THE 3RD ON THE TRANSMITTAL FORM.	PUT THE 1ST BAR CODE LABEL HERE. NOT PRESENT 99994 REFUSED . . . . . 99995 OTHER . . . . . 99996 PUT THE 2ND BAR CODE LABEL ON THE SLIDE AND THE 3RD ON THE TRANSMITTAL FORM.
213	LEVEL HERE AND IN THE ANEMIA AND MALARIA BROCHURE.	G/DL [ ][ ] . [ ] NOT PRESENT . . . . 994 REFUSED . . . . . 995 OTHER 996	G/DL [ ][ ] . [ ] NOT PRESENT . . . . 994 REFUSED . . . . . 995 OTHER 996	G/DL [ ][ ] . [ ] NOT PRESENT . . . . 994 REFUSED . . . . . 995 OTHER 996
214	RECORD RESULT CODE OF THE MALARIA RDT	TESTED . . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . . 3 OTHER . . . . . 6 (SKIP TO 216)	TESTED . . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . . 3 OTHER . . . . . 6 (SKIP TO 216)	TESTED . . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . . 3 OTHER . . . . . 6 (SKIP TO 216)
215	RECORD THE RESULT OF THE MALARIA RDT HERE AND IN THE ANEMIA AND MALARIA BROCHURE.	POSITIV . . . . . 1 (SKIP TO 218) NEGATIVE . . . . . 2 OTHER 6	POSITIV . . . . . 1 (SKIP TO 218) NEGATIVE . . . . . 2 OTHER 6	POSITIV . . . . . 1 (SKIP TO 218) NEGATIVE . . . . . 2 OTHER 6
216	CHECK 213 HEMOGLOBIN RESULT	BELOW 8.0 G/DL, SEVERE ANEMIA 1 8.0 G/DL OR ABOVE 2 NOT PRESENT . . . . . 4 REFUSED . . . . . 5 OTHER . . . . . 6 (SKIP TO 229)	BELOW 8.0 G/DL, SEVERE ANEMIA 1 8.0 G/DL OR ABOVE 2 NOT PRESENT . . . . . 4 REFUSED . . . . . 5 OTHER . . . . . 6 (SKIP TO 229)	BELOW 8.0 G/DL, SEVERE ANEMIA 1 8.0 G/DL OR ABOVE 2 NOT PRESENT . . . . . 4 REFUSED . . . . . 5 OTHER . . . . . 6 (SKIP TO 229)
217	**SEVERE ANEMIA REFERRAL** STATEMENT	The anemia test shows that (NAME OF CHILD) has severe anemia. Your child is very ill and must be taken to a health facility immediately. SKIP TO 229		
218	Does (NAME) suffer from any of following illnesses or symptoms: Extreme weakness (Prostration)? Heart problems? Loss of consciousness? Rapid or difficult breathing? Seizures? Abnormal bleeding? Jaundice (Yellow Skin)? Dark urine (brown)?	EXTREME WEAKNESS A HEART PROBLEM . . . B LOSS OF CONSCIOUSNESS C RAPID BREATHIN . . . D SEIZURES . . . . . E BLEEDING . . . . . F JAUNDICE . . . . . G DARK URINE . . . . . H	EXTREME WEAKNESS A HEART PROBLEM . . . B LOSS OF CONSCIOUSNESS C RAPID BREATHIN . . . D SEIZURES . . . . . E BLEEDING . . . . . F JAUNDICE . . . . . G DARK URINE . . . . . H	EXTREME WEAKNESS A HEART PROBLEM . . . B LOSS OF CONSCIOUSNESS C RAPID BREATHIN . . . D SEIZURES . . . . . E BLEEDING . . . . . F JAUNDICE . . . . . G DARK URINE . . . . . H

219	CHECK 218 ANY CODE CIRCLED?	NO CODE CIRCLE . . 1 ANY CODE CIRCLED 2 (SKIP TO 222) ↵	NO CODE CIRCLE . . 1 ANY CODE CIRCLED 2 (SKIP TO 222) ↵	NO CODE CIRCLE . . 1 ANY CODE CIRCLED 2 (SKIP TO 222) ↵
220	CHECK 213 HEMOGLOBIN RESULT	BELOW 8.0 G/DL, SEVERE ANEMIA 1 (SKIP TO 222) ↵ 8.0 G/DL OR ABOVE 2 NOT PRESENT . . . . . 4 REFUSED . . . . . 5 OTHER 6	BELOW 8.0 G/DL, SEVERE ANEMIA 1 (SKIP TO 222) ↵ 8.0 G/DL OR ABOVE 2 NOT PRESENT . . . . . 4 REFUSED . . . . . 5 OTHER 6	BELOW 8.0 G/DL, SEVERE ANEMIA 1 (SKIP TO 222) ↵ 8.0 G/DL OR ABOVE 2 NOT PRESENT . . . . . 4 REFUSED . . . . . 5 OTHER 6
221	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 222) ↵ NO . . . . . 2 (SKIP TO 222) ↵	YES . . . . . 1 (SKIP TO 222) ↵ NO . . . . . 2 (SKIP TO 222) ↵	YES . . . . . 1 (SKIP TO 222) ↵ NO . . . . . 2 (SKIP TO 222) ↵
222	**SEVERE MALARIA REFERRAL** STATEMENT	The malaria test shows that (NAME OF CHILD) has malaria. Your child also has symptoms of severe malaria. The malaria treatment I have will not help your child, and I cannot give you the medication. Your child is very ill and must be taken to a health facility right away. SKIP TO 229		
223	**ALREADY TAKING [FIRST LINE MEDICATION] REFERRAL** STATEMENT	You have told me that (NAME OF CHILD) has already received medication for malaria. Therefore, I cannot give you additional medication. However, the test shows that he/she is positive for malaria. If your child has a fever for two days after the last dose of medication, you should take the child to the nearest health facility for further examination. SKIP TO 229		
224	READ INFORMATION FOR MALARIA TREATMENT AND CONSENT STATEMENT TO PARENT OR OTHER ADULT RESPONSIBLE FOR THE CHILD	The malaria test shows that your child has malaria. We can give you free medicine. The medicine is called Arthemether-Lumefantrine or LA. LA is very effective and in a few days it should get rid of the fever and other symptoms. You do not have to give the child the medicine. This is up to you. Please tell me whether you accept the medicine or not.		
225	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
226	RECORD THE RESULT CODE OF **MALARIA TREATMENT OR REFERRAL**	MEDICATION GIVEN 1 MEDS REFUSE . . . . . 2 SEVERE MALARIA REFERRAL . . . . . 3 ALREADY TAKING MEDS REFERRAL . . . . . 4 OTHER 6	MEDICATION GIVEN 1 MEDS REFUSE . . . . . 2 SEVERE MALARIA REFERRAL . . . . . 3 ALREADY TAKING MEDS REFERRAL . . . . . 4 OTHER 6	MEDICATION GIVEN 1 MEDS REFUSE . . . . . 2 SEVERE MALARIA REFERRAL . . . . . 3 ALREADY TAKING MEDS REFERRAL . . . . . 4 OTHER 6
227	GO BACK TO 203 IN NEXT COLUMN OF THIS QUESTIONNAIRE OR IN THE FIRST COLUMN OF AN ADDITIONAL QUESTIONN IF NO MORE CHILDREN, END INTERVIEW.			

TREATMENT FOR CHILDREN WITH POSITIVE MALARIA TESTS

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

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

INSERT DOSING SCHEDULE

INSERT DOSAGE INSTRUCTIONS

ALSO TELL THE PARENT/ADULT RESPONSIBLE FOR THE CHILD (10):
If (NAME) has a fever for [TWO DAYS] after completing the last dose of LA, you should take him/her to a health professional for treatment right away.

2014 MALAWI MALARIA INDICATOR SURVEY
WOMAN'S QUESTIONNAIRE

IDENTIFICATION

PLACE NAME _____

DISTRICT _____

CLUSTER NUMBER . . . . . .

HOUSEHOLD NUMBER . . . . . .

NAME OF HOUSEHOLD HEAD _____

NAME AND LINE NUMBER OF WOMAN _____

INTERVIEWER VISITS

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

*RESULT CODES:

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

LANGUAGE OF QUESTIONNAIRE** **ENGLISH** — 4

LANGUAGE OF INTERVIEW** . . . . . .

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

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

**LANGUAGE CODES:

1 CHICHEWA	3 YAO	6 OTHER _____ (SPECIFY)
2 TUMBUKA	4 ENGLISH	

SUPERVISOR	OFFICE EDITOR	KEYED BY
NAME _____		

SECTION 1. RESPONDENT'S BACKGROUND

INTRODUCTION AND CONSENT

INFORMED CONSENT

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

In case you need more information about the survey, you may contact the person listed on the card that has already been given to your household.
Do you have any questions? May I begin the interview now?

SIGNATURE OF INTERVIEWER: _____ DATE: _____

RESPONDENT AGREES TO BE INTERVIEWEI . . . 1 ↓ RESPONDENT DOES NOT AGREE TO BE INTERVIE . . . 2 → END

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
101	RECORD THE TIME.	HOUR . . . . . [ ][ ] MINUTES . . . . . [ ][ ]	
102	In what month and year were you born?	MONTH . . . . . [ ][ ] DON'T KNOW MONTH . . . . . 98 YEAR . . . . . [ ][ ][ ][ ] DON'T KNOW YEAR 9998	
103	How old were you at your last birthday? COMPARE AND CORRECT 102 AND/OR 103 IF INCONSISTENT.	AGE IN COMPLETED YEARS [ ][ ]	
104	Have you ever attended school?	YES . . . . . 1 NO 2	→ 108
105	What is the highest level of school you attended: primary, secondary, or higher?	PRIMARY . . . . . 1 SECONDARY . . . . . 2 HIGHER 3	
106	What is the highest (grade/form/year) you completed at that level? IF COMPLETED LESS THAN ONE YEAR AT THAT LEVEL, RECORD '00'.	CLASS/FORM/YEAR . . . . . [ ][ ]	
107	CHECK 105: PRIMARY ☐ ↓ SECONDARY OR HIGHER ☐		→ 109

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
108	Now I would like you to read this sentence to me. SHOW CARD TO RESPONDENT. IF RESPONDENT CANNOT READ WHOLE SENTENCE, PROBE: Can you read any part of the sentence to me?	CANNOT READ AT ALL . . . . . 1 ABLE TO READ ONLY PARTS OF SENTENCE . . . . . 2 ABLE TO READ WHOLE SENTENCE 3 NO CARD WITH REQUIRED LANGUAGE_____ 4 (SPECIFY LANGUAGE) BLIND/VISUALLY IMPAIRED 5	
109	What is your religion?	CATHOLIC . . . . . 01 CCAP . . . . . 02 ANGLICAN . . . . . 03 SEVENTH DAY ADVENT./BAPTI . . . 04 OTHER CHRISTIA . . . . . 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 NGON . . . . . 08 OTHER_____ 96 (SPECIFY)	

SECTION 2. REPRODUCTION

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
201	Now I would like to ask about all the births you have had during your life. Have you ever given birth?	YES . . . . . 1 NO 2	 → 206
202	Do you have any sons or daughters to whom you have given birth who are now living with you?	YES . . . . . 1 NO 2	 → 204
203	How many sons live with you? And how many daughters live with you? IF NONE, RECORD '00'.	SONS AT HOME . . . . . [ ][ ] DAUGHTERS AT HOM . . . . . [ ][ ]	
204	Do you have any sons or daughters to whom you have given birth who are alive but do not live with you?	YES . . . . . 1 NO 2	 → 206
205	How many sons are alive but do not live with you? And how many daughters are alive but do not live with you? IF NONE, RECORD '00'.	SONS ELSEWHERE . . . . . [ ][ ] DAUGHTERS ELSEWHERE [ ][ ]	
206	Have you ever given birth to a boy or girl who was born alive but later died? IF NO, PROBE: Any baby who cried or showed signs of life but did not survive?	YES . . . . . 1 NO 2	 → 208
207	How many boys have died? And how many girls have died? IF NONE, RECORD '00'.	BOYS DEAD . . . . . [ ][ ] GIRLS DEAD . . . . . [ ][ ]	
208	SUM ANSWERS TO 203, 205, AND 207, AND ENTER TOTAL. IF NONE, RECORD '00'.	TOTAL BIRTHS . . . . . [ ][ ] NONE 00	 → 224
209	CHECK 208: Just to make sure that I have this right: you have had in TOTAL _____ births during your life. Is that correct? YES ☐ ↓ NO ☐ → PROBE AND CORRECT 201-208 AS NECESSARY.		
210	CHECK 208: ONE BIRTH ☐ ↓ Was this child born in the last six years? TWO OR MORE BIRTHS ☐ ↓ How many of these children were born in the last six years? IF NO CIRCLE '00.'	TOTAL IN THE LAST 6 YEARS . . . . . [ ][ ] NONE 00	 → 224

211 Now I would like to record the names of all your births **in the last six years**, whether still alive or not, starting with the most recent one you had.

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

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

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
221	Have you had any live births since the birth of (NAME OF MOST RECENT BIRTH)? IF YES, RECORD BIRTH(S) IN TABLE	YES . . . . . 1 NO 2	
222	COMPARE 210 WITH NUMBER OF BIRTHS IN HISTORY ABOVE AND MARK: NUMBERS ARE SAME ☐ ↓ NUMBERS ARE DIFFERENT ☐ → (PROBE AND RECONCILE.)		
223	CHECK 215: ENTER THE NUMBER OF BIRTHS IN 2006 OR LATER.	NUMBER OF BIRTHS . . . . ☐ NONE 0	
224	Are you pregnant now?	YES . . . . . 1 NO . . . . . 2 UNSURE 8	→ 226
225	How many months pregnant are you? RECORD NUMBER OF COMPLETED MONTHS.	MONTHS . . . . . ☐☐	
226	CHECK 223: ONE OR MORE BIRTHS IN 2008 OR LATER ☐ ↓ NO BIRTHS IN 2008 OR LATER OR IS BLANK ☐ →		501

SECTION 3A. PREGNANCY AND INTERMITTENT PREVENTATIVE TREATMENT

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
301	CHECK 215: ENTER IN THE TABLE THE NAME AND SURVIVAL STATUS OF THE MOST RECENT BIRTH. Now I would like to ask some questions about your last pregnancy that resulted in a live birth.		
301A	FROM 212 AND 216, LINE 01:	LAST BIRTH NAME _____ LIVING ☐ DEAD ☐	
302	When you were pregnant with (NAME), did you see anyone for antenatal care for this pregnancy?	YES . . . . . 1 NO 2	→ 304
303	Whom did you see? Anyone else? PROBE TO IDENTIFY EACH TYPE OF PERSON AND RECORD ALL MENTIONED.	HEALTH PERSONNEL DOCTOR/CLINICAL OFFICER . . . A NURSE/MIDWIF . . . . . B PATIENT ATTENDANT . . . . . C HSA . . . . . D OTHER PERSON TRADITIONAL BIRTH ATTENDANT E OTHER _____ X (SPECIFY)	
303A	How many times did you receive antenatal care during this pregnancy?	NUMBER OF TIMES . . . . . ☐☐ DON'T KNOW 98	
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	→ 310B
307	How many times did you take (SP/Fansidar or Novidar SP) during this pregnancy?	TIMES . . . . . ☐☐	
308	CHECK 303: ANTENATAL CARE FROM HEALTH PERSONNEL DURING THIS PREGNANCY — CODE 'A', 'B' OR 'C' CIRCLED ☐	OTHER ☐	→ 309A
309	Did you get the (SP/Fansidar) during any antenatal care visit, during another visit to a health facility or from another source? CIRCLE ALL MENTIONED.	ANTENATAL VISIT . . . . . A ANOTHER FACILITY VISIT . . . . . B OTHER SOURCE C	→ 310B
309A	CHECK 309: SP FROM ANTENATAL VISIT — CODE 'A' CIRCLED ☐	OTHER ☐	→ 310B
309B	How many times did you take (SP/Fansidar or Novidar SP) during an antenatal visit?	TIMES . . . . . ☐☐	

310	Did you take the (SP/Fansidar or Novidar SP) under direct observation by the health worker each time?	YES . . . . . 1 NO 2	→ 310B
310A	How many times did you take the (SP/Fansidar or Novidar SP) under observation by the health worker?	TIMES . . . . . [ ][ ]	
310B	During this pregnancy, did you take Cotrimoxazole to keep you from getting malaria?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 311
310C	How long did you take Cotrimoxazole during this pregnancy?	DAYS . . . . . 1 [ ][ ] WEEKS . . . . . 2 [ ][ ] MONTHS. . . . . 3 [ ][ ] DON'T KNOW 998	
311	CHECK 215 AND 216: ONE OR MORE LIVING CHILDREN BORN IN 2008 OR LATER → GO TO 401 NO LIVING CHILDREN BORN IN 2008 OR LATER → 501		

SECTION 4. FEVER IN CHILDREN

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

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

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____	SECOND-FROM-LAST BIRTH NAME _____
407	CHECK 406:	TWO OR MORE CODES CIRCLED ☐ ↓ ONLY ONE CODE CIRCLED ☐ → (SKIP TO 409)	TWO OR MORE CODES CIRCLED ☐ ↓ ONLY ONE CODE CIRCLED ☐ → (SKIP TO 409)	TWO OR MORE CODES CIRCLED ☐ ↓ ONLY ONE CODE CIRCLED ☐ → (SKIP TO 409)
408	Where did you first seek advice or treatment? USE LETTER CODE FROM 406.	FIRST PLACE . . . ☐	FIRST PLACE . . . ☐	FIRST PLACE . . . ☐
408A	How far is your house from the (FIRST PLACE IN 408)?	LESS THAN 15 KM . 1 15 KM + ... 2	LESS THAN 15 KM . 1 15 KM + ... 2	LESS THAN 15 KM . 1 15 KM + ... 2
408B	How much did you spend on transport to and from the (FIRST PLACE IN 408)?	COST IN KWACHA ☐☐☐☐☐ FREE . . . . . 99995 DON'T KNOW 99998	COST IN KWACHA ☐☐☐☐☐ FREE . . . . . 99995 DON'T KNOW 99998	COST IN KWACHA ☐☐☐☐☐ FREE . . . . . 99995 DON'T KNOW 99998
408C	Did you take any days off work in order to care for your child's sickness?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 409) ←	YES . . . . . 1 NO . . . . . 2 (SKIP TO 409) ←	YES . . . . . 1 NO . . . . . 2 (SKIP TO 409) ←
408D	How many days did you take take off work to care for your child's illness?	DAYS ..... ☐☐	DAYS ..... ☐☐	DAYS ..... ☐☐
409	At any time during the illness, did (NAME) have blood taken from his/her finger or heel for testing?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 409C) ← DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (SKIP TO 409C) ← DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (SKIP TO 409C) ← DON'T KNOW 8
409A	Was the blood tested for malaria?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 409C) ← DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (SKIP TO 409C) ← DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (SKIP TO 409C) ← DON'T KNOW 8

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

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____	SECOND-FROM-LAST BIRTH NAME _____
412	CHECK 411: ANY CODE A-H CIRCLED?	YES ☐ NO ☐ (GO TO 429)	YES ☐ NO ☐ (GO TO 429)	YES ☐ NO ☐ (GO TO 429)
413	CHECK 411: SP/FANSIDAR/NOVIDAR SP ('A') GIVEN	CODE 'A' CIRCLED ☐ CODE 'A' NOT CIRCLED ☐ (SKIP TO 415)	CODE 'A' CIRCLED ☐ CODE 'A' NOT CIRCLED ☐ (SKIP TO 415)	CODE 'A' CIRCLED ☐ CODE 'A' NOT CIRCLED ☐ (SKIP TO 415)
414	How long after the fever started did (NAME) first take SP/Fansidar/Novidar SP?	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . . 3 DON'T KNOW 8
415	CHECK 411: CHLOROQUINE ('B') GIVEN	CODE 'B' CIRCLED ☐ CODE 'B' NOT CIRCLED ☐ (SKIP TO 417)	CODE 'B' CIRCLED ☐ CODE 'B' NOT CIRCLED ☐ (SKIP TO 417)	CODE 'B' CIRCLED ☐ CODE 'B' NOT CIRCLED ☐ (SKIP TO 417)
416	How long after the fever started did (NAME) first take chloroquine?	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . . 3 DON'T KNOW 8
417	CHECK 411: AMODIAQUINE ('C') GIVEN	CODE 'C' CIRCLED ☐ CODE 'C' NOT CIRCLED ☐ (SKIP TO 419)	CODE 'C' CIRCLED ☐ CODE 'C' NOT CIRCLED ☐ (SKIP TO 419)	CODE 'C' CIRCLED ☐ CODE 'C' NOT CIRCLED ☐ (SKIP TO 419)
418	How long after the fever started did (NAME) first take AMODIAQUINE?	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . . 3 DON'T KNOW 8

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

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____	SECOND-FROM-LAST BIRTH NAME _____
423	CHECK 411: ARTESUNATE (F) GIVEN	CODE 'F' CIRCLED ☐ CODE 'F' NOT CIRCLED ☐ (SKIP TO 425)	CODE 'F' CIRCLED ☐ CODE 'F' NOT CIRCLED ☐ (SKIP TO 425)	CODE 'F' CIRCLED ☐ CODE 'F' NOT CIRCLED ☐ (SKIP TO 425)
424	How long after the fever started did (NAME) first take ARTESUNATE?	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . . 3 DON'T KNOW 8
425	CHECK 411: AA/ASAQ (COMBINED AMODIAQUINE AND ARTE-SUNATE) (G) GIVEN	CODE 'G CIRCLED ☐ CODE 'G' NOT CIRCLED ☐ (SKIP TO 427)	CODE 'G CIRCLED ☐ CODE 'G' NOT CIRCLED ☐ (SKIP TO 427)	CODE 'G CIRCLED ☐ CODE 'G' NOT CIRCLED ☐ (SKIP TO 427)
426	How long after the fever started did (NAME) first take AA/ASAQ?	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . . 3 DON'T KNOW 8
427	CHECK 411: OTHER ANTIMALARIAL ('H') GIVEN	CODE 'H' CIRCLED ☐ CODE 'H' NOT CIRCLED ☐ (GO BACK TO 403 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 429)	CODE 'H' CIRCLED ☐ CODE 'H' NOT CIRCLED ☐ (GO BACK TO 403 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 429)	CODE 'H' CIRCLED ☐ CODE 'H' NOT CIRCLED ☐ (GO TO 403 IN NEXT-TO-LAST COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, GO TO429)

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____	SECOND-FROM-LAST BIRTH NAME _____
428	How long after the fever started did (NAME) first take (OTHER ANTIMALARIAL)?	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . . 3 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . . 3 DON'T KNOW 8
429	Was (NAME) admitted in a hospital the last 12 months?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 430)	YES . . . . . 1 NO . . . . . 2 (SKIP TO 430)	YES . . . . . 1 NO . . . . . 2 (SKIP TO 430)
430		GO BACK TO 403 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 501.	GO BACK TO 403 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 501.	GO TO 403 IN MOST RECENTCOLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, GO TO 501.

SECTION 5. KNOWLEDGE OF MALARIA

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

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

511	Has anyone ever provided you with information on malaria at your home?	YES . . . . . 1 NO 2	→ 515
512	Who gave you the information at your home? Anybody else? RECORD ALL MENTIONED.	HEALTH CARE WORKER . . . . . A COMMUNITY HEALTH WORKER . . . B FRIENDS/FAMILY . . . . . C EMPLOYER . . . . . D PEER EDUCATORS . . . . . E OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
513	How long ago did someone visit your house to provide you with information about malaria?	MONTHS AGO . . . . . [ ][ ]	
514	What type of messages about malaria did you hear or saw? Anything else? RECORD ALL MENTIONED.	MALARIA IS DANGEROUS . . . . . A MALARIA CAN KILL . . . . . B MOSQUITO SPREAD MALARIA . . . C SLEEPING UNDER A MOSQUITO NET IS IMPORTAN . . . . . 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 ACTIVITIES . . . . . J OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
515	CHECK HOUSEHOLD QUESTIONNAIRE 121: HAS MOSQUITO NET [ ] ↓ HAS NO MOSQUITO NET [ ] → 523		
516	Has the community health worker in your village ever helped hang a mosquito net in this house?	YES . . . . . 1 NO 2	
517	Has any mosquito net in this house been used for any reason other than sleeping?	YES . . . . . 1 NO 2	→ 523
518	What was it used for? Anything else? RECORD ALL MENTIONED.	FISHING . . . . . A COVER/PROTECTION . . . . . B WINDOW SCREEN . . . . . C CLOTHING/WEDDING VEIL . . . . . D OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
523	RECORD THE TIME.	HOUR . . . . . [ ][ ] MINUTES . . . . . [ ][ ]	

INTERVIEWER'S OBSERVATIONS

TO BE FILLED IN AFTER COMPLETING INTERVIEW

COMMENTS ABOUT RESPONDENT:

COMMENTS ON SPECIFIC QUESTIONS:

ANY OTHER COMMENTS:

SUPERVISOR'S OBSERVATIONS

NAME OF SUPERVISOR: _____ DATE: _____