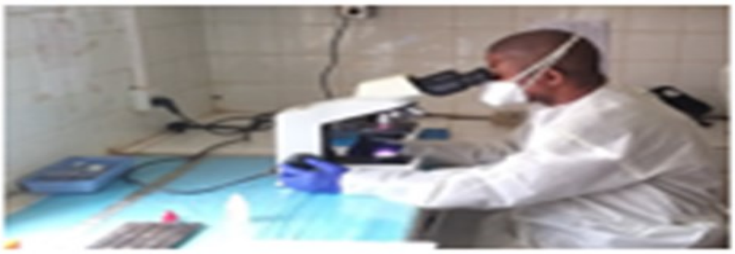
Sierra Leone






Malaria Indicator Survey 2021

SIERRA LEONE

Malaria Indicator Survey 2021

Final Report

National Malaria Control Programme

Statistics Sierra Leone

College of Medicine and Allied Health Services
University of Sierra Leone

Catholic Relief Services

Freetown, Sierra Leone

Utica International
Columbia, Maryland
United States

February 2022

This report summarizes the findings of the 2021 Sierra Leone Malaria Indicator Survey (SLMIS 2021). The survey was conducted at the request of the Ministry of Health and Sanitation (MoHS) through National Malaria Control Program (NMCP) and implemented by Statistics Sierra Leone (Stats SL); the College of Medicine and Allied Health Sciences, University of Sierra Leone (COMAHS); Catholic Relief Services (CRS). Financial and technical support for the survey was provided by the Global Fund to Fight AIDs, Tuberculosis, and Malaria (GFATM) through CRS while Utica International provided technical assistance.

Additional information about the SLMIS 2021 may be obtained from:

1. The headquarters of the Ministry of Health and Sanitation, Youyi Building, Brookfields, Freetown, Sierra Leone.
2. Utica International, 9342 Farewell Rd, Columbia MD, 21045 USA. Telephone +1-410 440 1313; Fax: +1-410 997 0617; E-mail: mohamedayad@uticaint.com; Internet: www.uticaint.com

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CONTENTS

TABLES AND FIGURES

PREFACE

Malaria remains one of the biggest public health challenges in Sierra Leone. Over the past several years, the country has made progress in defining the effort required to control the impact of malaria among its citizens. Such progress has included the development of a Sierra Leone National Malaria Elimination Strategic Plan (SLNMESP) 2021 – 2025, the revision of the following strategic documents such as guidelines for case management of malaria 5th Edition 2020, Social Behaviour Change Communication for Malaria in Pregnancy 2021, Insecticides Resistant, Monitoring and Management Plan 2017-2020, Integrated Vector Management Policy 2020,Integrated Vector Management Strategic Plan 2020-2024 to ensure that programme implementation is evidence-based. Success in malaria control relies on solid partnerships among all key players. The Ministry of Health and Sanitation (MoHS) of Sierra Leone and Catholic Relief Services (CRS) are co-implementing nationwide malaria control, preventionand treatment activities funded by the Global Fund.

The Malaria Indicator Survey is meant to gauge progress on outcomes and impact by measuring status of key malaria indicators. Under the leadership of the NMCP and the SLMIS Technical Working Group (TWG), CRS managed the implementation of the 2021 Sierra Leone Malaria Indicator Survey (SLMIS 2021) from June through August 2021. The TWG consisted of representatives from the MoHS (Directorate of Disease Prevention and Control, National Laboratory Services, Directorate of Planning and Policy Information, and the National Malaria Control Programme), Statistics Sierra Leone, University of Sierra Leone – College of Medicine and Allied Health Sciences, World Health Organization, and United Nations Children's Fund. The protocol was reviewed by the SLMIS 2021 TWG in collaboration with Utica International (survey firm). The SLMIS 2021 was designed to measure and evaluate the coverage of the core malaria control interventions defined in the 2016 – 2020 National Malaria Strategic Plan to help the country assess its implementation strategies.

The SLMIS 2021 measured most of the following Strategic Plan indicators: (1) Percentage of households with at least one insecticide-treated net (ITN); (2) Percentage of households with at least one ITN for every two persons who stayed in the household last night (Universal Coverage); (3) Percentage of children under age 5 who slept under an ITN last night; (4) Percentage of pregnant women age 15-49 who slept under an ITN last night; (5) 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 (Access); (6) Percentage of women age 15-49 with a live birth in the 2 years preceding the survey who, during the pregnancy preceding the last live birth, received two or more doses of SP/Fansidar; (7) Percentage of women age 15-49 with a live birth in the 2 years preceding the survey who, during the pregnancy preceding the last live birth, received three or more doses of SP/Fansidar; (8) Among children under age 5 with fever in the 2 weeks preceding the survey, percentage for whom advice or treatment was sought; (9) Among children under age 5 with fever in the 2 weeks preceding the survey, percentage who had blood taken from a finger or heel for testing; (10) Among children under age 5 with fever in the 2 weeks preceding the survey who took any antimalarial medication; (11) Percentage of children age 6 to 59 months with a positive Rapid Diagnostic Test (RDT) result; (12) Percentage of children age 60 to 119 months with a positive Rapid Diagnostic Test (RDT) result; (13) Percentage of children age 6 to 59 months with haemoglobin lower than 8.0 g/dl; and (14) Percentage of children age 60 to 119 months with haemoglobin lower than 8.0 g/dl.

My profound appreciation goes to the leadership of National Malaria Control Programme and team, MIS TWG and CRS for providing strategic direction that guided the planning, technical, administrative, and logistical phases of the SLMIS 2021 implementation. I also wish to express my appreciation to Global Fund for their financial support and to Utica International for their technical assistance at all stages of the survey, including the writing and final preparation of the report.

Honourable Dr. Austin Demby
Minister of Health and Sanitation Freetown
December 2021

ACKNOWLEDGEMENT

This Malaria Indicator Survey report 2021 was compiled and validated by various hardworking individuals from different institutions/organizations whose invaluable contributions cannot be overemphasized.

The National Malaria Control Programme (NMCP) of the Ministry of Health and Sanitation wishes to express our gratitude to the Honourable Minister of Health and Sanitation, Dr Austin Demby who approved and guided the process. Similarly, our thanks and appreciation goes to the Acting Chief Medical Officer, Dr. Sartie Kenneh for his leadership, commitment and guidance.

The support and active involvement of the officials of the MoHS, including various directorates and programmes are greatly acknowledged. We fully appreciate the financial support from the Global Fund. I wish to express my appreciation to Catholic Relief Services (CRS), Stats SL and the College of Medicine and Allied Health Services, University of Sierra Leone for the strong collaboration and overall support. Also thanking Utica International for their technical assistance at all stages of the survey, including the writing and final preparation of the report.

Sincere gratitude also goes to the coordinators, supervisors, interviewers, nurses, biomarker specialists, laboratory technical staff, data managers, slide managers, runners, drivers, and the entire field staff for their tireless efforts.

Finally, I thank all the households and respondents who generously gave their time to provide the information that formed the basis of this report.

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Dr. Ronald Carshon – Marsh
Programme Manager
National Malaria Control Programme
Ministry of Health and Sanitation

ACRONYMS AND ABBREVIATIONS

ACT	Artemisinin-based combination therapy
Ag	Antigen
AIDS	Acquired immune deficiency syndrome
AL	Artemether + lumefantrine
ANC	Antenatal care
ASAQ	Artesunate + amodiaquine
CAPI	Computer-assisted personal interviewing
CDC	US Centers for Disease Control and Prevention
COMAHS	College of Medicine and Allied Health Services
CRS	Catholic Relief Services
CSPro	Census Survey Processing Software
EA	Enumeration area
g/dl	Grams per decilitre
GDP	Gross domestic product
The Global Fund	Global Fund to Fight AIDS, Tuberculosis, and Malaria
GPS	Global positioning system
Hb	Haemoglobin
HIV	Human immunodeficiency virus
HRP-2	Histidine-rich protein 2
IMR	Infant mortality rate
IPTp	Intermittent preventive treatment in pregnancy
IPTi	Intermittent preventive treatment in infanty
IRMMP	Insecticide Resistance Monitoring and Mangement
IRS	Indoor residual spraying
ITN	Insecticide-treated net
LLIN	Long-lasting insecticidal net
LPG	Liquefied petroleum gas
MDGs	Millennium Development Goals
MICS	Multiple Indicator Cluster Survey
MIP	Malaria in pregnancy
MIS	Malaria Indicator Survey
MMR	Maternal mortality ratio/rate
MoHS	Ministry of Health and Sanitation
NMCP	National Malaria Control Programme
NMSP	National Malaria Strategic Plan
Pf	*Plasmodium falciparum*
PHU	Peripheral Health Unit
PPE	Personal protective equipment
RBM	Roll Back Malaria
RBM-MERG	Roll Back Malaria Monitoring & Evaluation Reference Group
RCH	Reproductive and child health
RDT	Rapid diagnostic test

SBCC	`Social Behavior Change Communication
SD (Bioline)	Standard Diagnostics
SLDHS	Sierra Leone Demographic and Health Survey
SLMIS	Sierra Leone Malaria Indicator Survey
SLPHC	Sierra Leone Population and Housing Census
SP	Sulphadoxine-pyrimethamine
SSL	Statistics Sierra Leone
TFR	`Total Fertility Rate
ToT	Training of Trainers
TWG	Technical working group
UNICEF	United Nations Children's Fund
USL	University of Sierra Leone
WHO	World Health Organizatio

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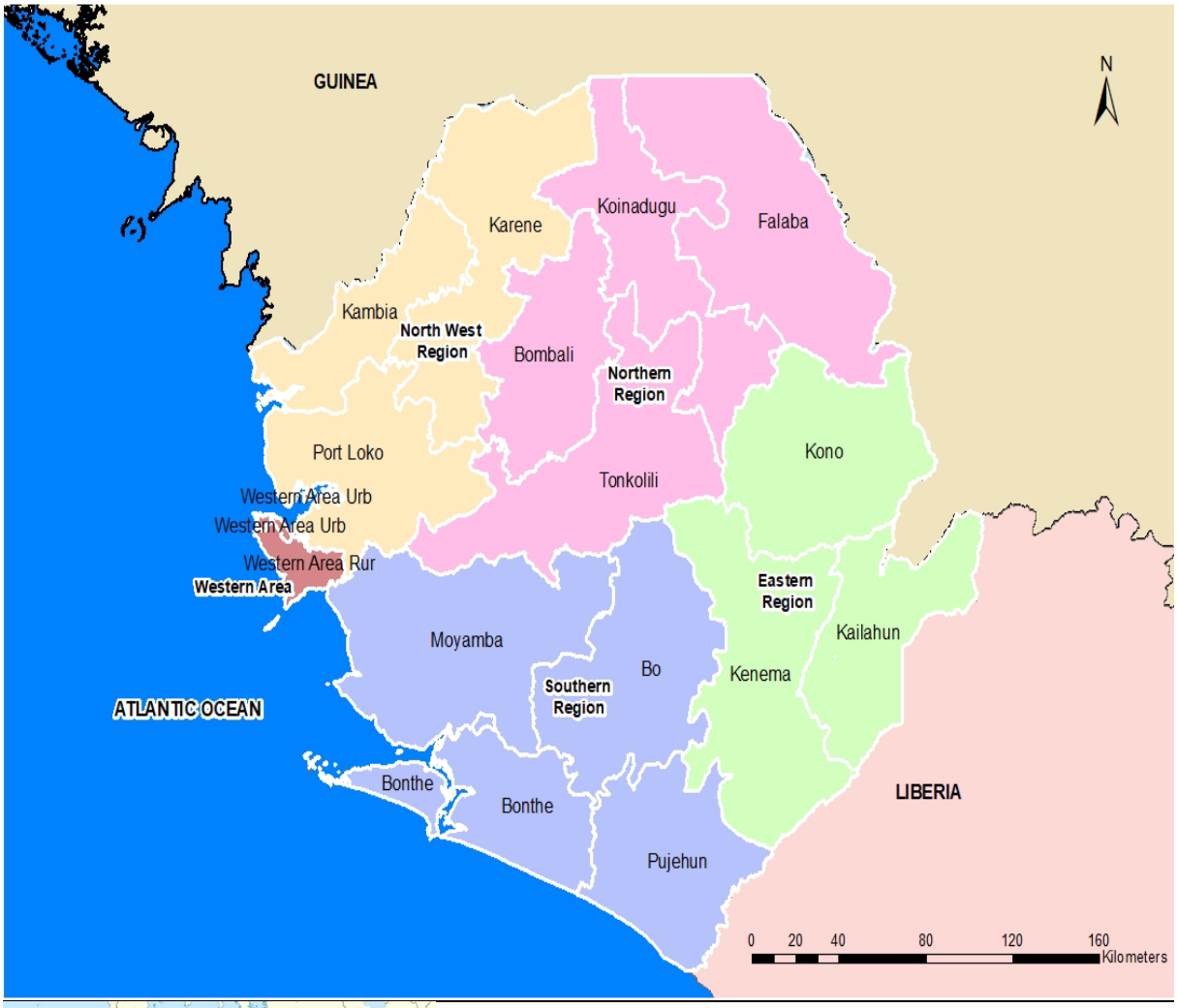

INTRODUCTION AND SURVEY METHODOLOGY 1

1.1 COUNTRY PROFILE

Sierra Leone a country in West Africa, has a special significance in the history of the transatlantic slave trade as a departure point for thousands of West African captives. It is located approximately 8.5° N 12.1° W between the 7th and 10th parallels north of the equator. It is bounded in the North by Guinea and in the South by Liberia and the Atlantic Ocean. The capital, Freetown, was founded as a home for repatriated former slaves in 1789. The country has one of the world's largest natural harbours.

According to the Population and Housing Census (PHC) of 2015, the total population at the time of the census was 7,092,113. There are 5 Regions and 16 Districts and the area of the country is 71,740 sq km (27,699 sq miles). The climate is tropical with two seasons – Rainy Season (May to October) and Dry Season (November to April. The official Language is English, but there are 23 living languages in the country. The most widely spoken (or major languages) are Mende, Temne, Limba and Krio. The two major religions are Islam and Christianity

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The Gross Domestic Product (GDP) in Sierra Leone was worth 3.87 billion US dollars in 2020, according to official data from the World Bank. Its value represents less than 0.01 percent of the world economy

With regard to the basic demographic and health indicators, the Sierra Leone Demographic and Health Survey of 2019 (SLDHS 2019) gave a Total Fertility Rate (TFR) of 4.2 children per woman and an Infant Mortality Rate (IMR – 1q0) of 75 deaths per 1,000 births). Data from the same survey show that Maternal Mortality Ratio (MMR) was high: 717 deaths per 100,000 live births, and that four in 5 births were delivered in a health facility (SLDHS 2019).

1.2 STRATEGIES FOR MALARIA PREVENTION

Malaria remains endemic in Sierra Leone with stable and perennial transmission in all parts of the country, but the situation has improved significantly over the past decade because of sustained investments in malaria control. Malaria mortality and case incidence in Sierra Leone reduced by more than 40% and 50% respectively between the year 2000 and 2015 (World Malaria Report 2016). Malaria Indicator Surveys 2013 and 2016 showed that parasite prevalence rates varied widely across districts with national average of 43% and 40% respectively Sierra Leone Malaria Indicator Surveys (SLMIS 2016).

Therefore, sustained scale-up for impact is required to reduce transmission to pre-elimination levels. Effort to achieve and sustain universal coverage and utilization of Long-Lasting Insecticidal Nets (LLINs) through mass campaigns and continuous routine distribution, as well as prompt access to malaria diagnosis with Rapid Diagnostic Tests (RDTs) or microscopy, and treatment with Artemisinin-based Combination Therapy (ACTs), are the key reasons for the observed improvement in malaria situation in Sierra Leone.

SLMIS 2016 indicated that the utilization of LLIN in households with nets was generally high: 63% of the household population, 71% of children under 5, and 75% of pregnant women using ITN, However, the overall access to ITN was low. The planned LLIN mass distribution campaign in 2017 and 2020 and continuous distribution through Reproductive and Child Health (RCH) services along with an effective Social Behavior Change Communication (SBCC) strategy are expected to improve access and sustain high ITN use in the general population. MoHS/NMCP has instituted Insecticide Resistance Monitoring and Management Plan (IRMMP 2017-2020) to maintain the effectiveness of existing vector control interventions.

1.3 Introduction and Survey Objectives

The 2021 Sierra Leone Malaria Indicator Survey (SLMIS 2021) was conducted at the request of the Ministry of Health and Sanitation (MoHS) through National Malaria Control Program (NMCP) and implemented by Statistics Sierra Leone (Stats SL); the College of Medicine and Allied Health Sciences, University of Sierra Leone (COMAHS); Catholic Relief Services (CRS). Financial and technical support for the survey was provided by the Global Fund to Fight AIDs, Tuberculosis, and Malaria (GFATM) through CRS while Utica International provided technical assistance.

The primary objective of the SLMIS 2021 is to provide current estimates of key malaria indicators. Specific objectives were:

- To measure the extent of ownership and use of mosquito nets
- To assess coverage of intermittent preventive treatment to protect pregnant women
- To identify practices and specific medications used for treating malaria among children under age 5
- To measure indicators of behaviour change communication messages, knowledge, and practices about malaria
- To measure the prevalence of malaria and anaemia among children age 6-119 months
- To assess knowledge, attitudes, and practices regarding malaria prevention and control
- To determine the *Plasmodium* species most prevalent in Sierra Leone

The findings from the SLMIS 2021 will assist policy makers and program managers in evaluating and designing programs and strategies for improving malaria prevention and control interventions in Sierra Leone.

1.4 Sample Design

The sample for SLMIS 2021 is a stratified sample selected in two stages from the sampling frame. Stratification is achieved by separating each district into urban and rural areas. In total, 31 sampling strata have been created since Western Area Urban district has only urban areas. It was intended to allow estimates of key indicators for the following domains:

- National
- Urban and rural areas
- Five regions: Northern, North-Western, Southern, Eastern and Western
- Sixteen administrative districts: Kailahun, Kenema, Kono, Bombali, Karene, Kambia, Falaba, Koinadugu, Port Loko, Tonkolili, Bo, Bonthe, Moyamba, Pujehun, Western rural and Western urban.

Data was disaggregated by district because the health system is managed by district.

The first stage of sampling frame involved selecting sample points (clusters) and Enumeration areas (EAs). This was delineated by Statistics Sierra Leone from the 2015 Sierra Leone Population and Housing Census (SLPHC) sampling frame. A total of 336 clusters were selected with probability proportionate to size from the 12,856 EAs covered in the 2015 SLPHC; of which, 119 were in urban areas and 217 in rural areas. Urban areas were oversampled within regions in order to produce a robust estimate for that domain.

The second stage involved random selection of a fixed number of 24 households per cluster from a roster of households in the sampled clusters using simple random sampling.

All of the sampled clusters underwent cluster updating, also known as household listing, to capture changes that might have occurred in the clusters and to update the household information. The updating was done before second stage selection of the secondary sampling units (households). A household listing operation was conducted in May 2021 in all of the selected EAs. The list of households was directly recorded on tablet PCs using the computer-assisted personal interviewing (CAPI) system. Twenty-four households were selected from each EA, for a total sample size of 8,064 households. Because of the approximately equal sample sizes in each district, the sample is not self-weighting at the national level. Results shown in this report have been weighted to account for the complex sample design. See Appendix A for additional details on the sampling procedures.

All women age 15-49 who were either permanent residents of the selected households or visitors who stayed in the household the night before the survey were eligible to be interviewed. With the parent's or guardian's consent, children age 6 months to age 9 years were tested for anaemia and malaria infection (see Appendix A for more details about the sample design).

1.5 QUESTIONNAIRES

Three types of questionnaires were used for the SLMIS 2021; the Household Questionnaire, the Woman's Questionnaire and the Biomarker Questionnaire. The questionnaires were adapted to reflect issues relevant to Sierra Leone. Modifications were done after a series of meetings with various stakeholders from the NMCP, other government ministries, agencies, non-governmental organisations including international partners. The questionnaires were programmed into tablet computers, which enabled the use of Computer-Assisted Personal Interviewing (CAPI) for the survey. The Biomarker Questionnaire was filled out on hard copy and then entered into the CAPI system.

The **Household Questionnaire** was used to list all of the usual members and visitors in the selected households. Basic information was collected on the characteristics of each person listed in the household, including age, sex and relationship to the head of the household. The data on age and sex of household members obtained from the questionnaire were used to identify women eligible for individual interviews and children age 6 months to age 9 years eligible for anaemia and malaria testing. Additionally, the Household Questionnaire captured information on characteristics of the household's dwelling unit, such as source of water, type of toilet facilities, materials used for the floor, ownership of various durable goods, and ownership and use of mosquito nets.

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

- Background characteristics (age, residential history, education, literacy, religion and ethnicity)
- Reproductive history for the last 5 years
- Preventive malaria treatment during pregnancy (IPTp) of the most recent birth
- Preventive malaria treatment in infants (IPTi) of the most recent birth
- Prevalence and treatment of fever among children under age 5 years
- Knowledge about malaria (symptoms, causes, prevention and types of antimalarial medications)
- Exposure and source of media messages about malaria

The **Biomarker Questionnaire** was used to record the results of the anaemia and malaria testing of children age 6 months to age 9 years.

1.6 ANAEMIA AND MALARIA TESTING

Blood samples for biomarker testing were collected via finger or heel pricks from children age 6 months to age 119 months. Each field team included one Biomarker technician who carried out anaemia and malaria testing by RDT and prepared the blood film. A nurse provided malaria medications for children who tested

positive for malaria by RDT in accordance with the approved national treatment guidelines. The child's parent or guardian provided informed consent for each test.

Anaemia testing. A single-use retractable, spring-loaded, sterile lancet was used to make a finger or heel prick. A drop of blood from this site was then collected in a microcuvette. Haemoglobin analysis was carried out on site using a battery-operated portable HemoCue® 801+ analyser, which produces a result in less than 1 minute. Results were given to the child's parent or guardian verbally and in writing. Parents of children with a haemoglobin level under 8g/dl were advised to take the child to a health facility for follow-up care and were given a referral letter with the haemoglobin reading to show to staff at the facility. Results of the anaemia test were recorded in the Biomarker Questionnaire and on the Child Anaemia and Malaria brochure that was left in the household that also contained information on the causes and prevention of anaemia.

Malaria testing with a Rapid Diagnostic Test (RDT). A drop of blood was used to test children for malaria with the SD BIOLINE Malaria Ag P.f/Pan rapid diagnostic test (RDT), which produces a result in 15 minutes. The SD BIOLINE Malaria Ag P.f/Pan test is a rapid, qualitative, and differential test for the detection of histidine-rich protein II (HRP-II) antigen of Plasmodium falciparum and common Plasmodium lactate dehydrogenase (pLDH) of Plasmodium species in human whole blood which is the major cause of malaria in Sierra Leone. The diagnostic test kit includes a disposable sample applicator that comes in a standard package. A tiny volume of blood is collected with the applicator and placed in the sample well of the testing device, and then four (4) drops of buffer are added to the appropriate well. As with anaemia testing, malaria RDT results were recorded in the Biomarker Questionnaire and on the Child Anaemia and Malaria Brochure that was left with the child's parent or guardian.

Children who tested positive for malaria according to the RDT and who had been treated with artemisinin-based combination therapy (ACT) within 2 weeks before the day of the interview were referred to a health facility if they continued to have a fever 2 days after the last dose of ACT. In addition, children who tested positive according to the RDT and met one of the following two criteria—a haemoglobin level below 8 g/dl or symptoms indicative of severe malaria—were considered to have severe malaria and were referred to a health facility for immediate treatment. Children who tested positive for uncomplicated malaria were offered a full course of medication according to the standard treatment guidelines in Sierra Leone. Age-appropriate doses of ACT were provided along with instructions on how to administer the medicine to the child.

Malaria testing by microscopy. In addition to the RDT, thick and thin blood films were prepared in the field. Each blood slide was given a barcode label, with a duplicate affixed to the Biomarker Questionnaire. An additional copy of the barcode label was affixed to a blood sample transmittal form to track blood samples from the field to the COMAHS-USL laboratory at Jui. The slide containing both thick film were dried and stored in slide boxes. The thin film was fixed in a dust-free environment and stored in slide boxes. The slide with both thick and thin film was collected regularly from the field and transported to COMAHS-USL laboratory at Jui for logging, staining, and microscopic examination. Upon arrival at the laboratory, the slides were scanned, assigned unique laboratory numbers, and stained with 3% Giemsa stain. Slides were examined under a microscope to determine the presence or absence of malaria parasites, speciation, and parasite density. If parasites were present, the microscopist counted both asexual parasites and white blood cells. All stained slides were read by two independent microscopists who were masked from the RDT results. Slides with discordant results between the first and second readers (discordant for either positivity or parasite density) were re-examined by a third microscopist supervisor to determine the final result.

1.7 Training of trainers and Pre-test of Tools

Prior to the start of the main fieldwork, a Training of Trainer (ToT) workshop and pre-test was conducted from 23 April–19 May 2021. During the ToT, field testing of tools was done to test the data collection programs on tablet computers, survey instruments and procedures. Participants who were mainly the technical working group members were trained on administering paper questionnaires using CAPI and collecting blood samples for anaemia and parasitaemia testing. At the end of the training of trainers, a debriefing session was heldSS and the questionnaires and CAPI application were modified based upon feedback from the pre-test.

1.8 Training of Field Staff

The training of field staff, which was coordinated by Stat-SL, NMCP, Utica International and other members of the technical working group, took place from 26 May to 18 June 2021. Stat SL in collaboration with NMCP and CRS recruited and trained 148 field staff which includes 37 interviewers, 37 interviewer-clinicians, 37 supervisors and 37 biomarker technicians to attend the 2-week interviewer, supervisor and biomarker training.

The first 5 days of the main training focused on learning about the survey, understanding fieldwork procedures and reviewing each of the survey questionnaires. The training used a variety of techniques including role plays, practice interviews with peers and quizzes. Participants in these sessions included supervisors, interviewers, interviewer-clinicians and biomarker technicians. On the fourth day, biomarker technicians split off from the group for biomarker-specific training.

The supervisors, interviewers and interviewer-clinicians were trained for an additional 5 days on CAPI procedures which composed of practice in assigning households to interviewers, administering the Household and Woman's Questionnaires, entering completed Biomarker Questionnaires into the CAPI system, handling errors in the field, closing clusters and transferring data to the central office.

Similarly, Biomarker technicians completed an additional 5-day training session on the Biomarker Questionnaire and procedures for obtaining consent, setting up stations for blood collection, collecting blood, measuring haemoglobin levels, conducting malaria rapid tests, and preparing thick and thin malaria blood films. Clinician-interviewers briefly joined one of the biomarker training sessions. The Biomarker technician training also included 2 days of clinic visits to allow for practice with children.

Following the training, fieldwork teams participated in 4 days of field practice in Western Area Rural District covering Waterloo and Songo including surrounding communities. Each team was assigned a cluster of 24 selected households to provide the team with experience in conducting interviews with respondents, collecting biomarkers and working collectively

1.9 Fieldwork

Thirty-two teams were organised for data collection. Each team consisted of 4 personnel; field supervisor, health professional to interview and administer treatment, experienced interviewer, biomarker to conduct biomarker testing including driver. The field staff also included 16 technical district coordinators and 16 district runners who were responsible for the collection and delivery of slides from the field teams to COMAHS-USL Laboratory at Jui. The team spent an average of 3-4 days working in a cluster. Information on selected clusters and sampled households was directly uploaded into supervisors' tablets. When eligible respondents were absent from their homes, a maximum of three revisits were made to offer respondents the opportunity to participate in the survey.

CRS arranged for printing of questionnaires, manuals, consent forms, brochures, field forms, field supplies (backpacks and identification cards, etc.). Coordination of fieldwork logistics was done by the technical working group members.

Data collection for the SLMIS 2021 was between 22nd June and 2nd August 2021. Supervision activities were conducted by national monitors comprising of technical working group members and implementing partners for at least once a week covering all 32 teams. In addition to the field supervision, a set of field check tables were run from the fieldwork data on the central office computer at the SLMIS 2021 Command Centre. Findings from review of these tables were discussed with the relevant stakeholders during supervisory visits or briefing sessions and appropriate measures taken to timely address issues. To facilitate communication and monitoring, each fieldworker was assigned a unique identification number. The Command Centre provided teams with CAPI-related troubleshooting support during data collection.

1.10 Training and Field Work in the Context of the Covid-19 Pandemic

During training, barrier measures were taken. These included hand disinfection, made available, with hydroalcoholic disinfectant gel; taking the body temperature of all training participants each morning before entering the room and offices assigned to the training; mandatory wearing of masks and respect for physical distancing.

During fieldwork, vehicles transporting the teams were disinfected twice a day, body temperature was taken from all team members before going into the vehicles and the wearing of masks in the field were mandatory, in addition to physical distancing between interviewers and respondents.

1.11 Data Processing

The SLMIS 2021 questionnaires were programmed using Census and Survey Processing (CSPro v6.3) software. The program was then uploaded into Android-based tablets that were used to collect data via CAPI. The CAPI applications, including the supporting applications and the applications for the Household, Biomarker and Woman's Questionnaires were programmed by Utica International. The field supervisors transferred data using internet to the Command Central based at the CRS head office in Freetown at the close of every cluster for processing.

Utica International provided technical assistance for data processing using the CSpro software at the Command Centre. Data received from the field teams was registered and checked for any inconsistencies and outliers. Data editing, cleaning, weighting and tabulation included an extensive range of structural and internal consistency checks. All identified anomalies were communicated to field teams to be resolved and then communicated to the Command Centre. The corrected data was saved in the master CSPro database which was used to produce final data sets and tables at the Command Centre at CRS head office in Freetown.

1.12 Ethical Considerations

The protocol for the SLMIS 2021 was approved by the Sierra Leone Ethics and Scientific Review Committee. All data including other information collected were confidential. Respondents' names and identification numbers were removed from the final electronic database during analysis. Blood samples were stored with barcodes identifiers to protect the respondents' identity. The risk and benefits of participation in the survey were explained to respondents and informed consent for the interview or blood collection was sought and obtained from all respondents.

1.13 Response Rates

Table 1.1 presents the results of the household and individual interviews. A total of 8,064 households were selected for the survey, of which 8,050 were occupied at the time of fieldwork. Among the occupied households, 7,990 were successfully interviewed, yielding a response rate of 99.3%. In the interviewed households 8,313 eligible women were identified for individual interviews and 8,300 were successfully interviewed yielding a response rate of 99.8%.

Table 1.1 Results of the household and individual interviews

Number of households, number of interviews and response rates according to residence (unweighted), Sierra Leone 2021

Result	Residence		Total
	Urban	Rural	
Household interviews			
Households selected	2,832	5,232	8,064
Households occupied	2,827	5,223	8,050
Households interviewed	2,813	5,177	7,990
Household response rate[1]	99.5	99.1	99.3
Interviews with women age 15-49			
Number of eligible women	3,090	5,223	8,313
Number of eligible women interviewed	3,084	5,216	8,300
Eligible women response rate[2]	99.8	99.9	99.8

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

CHARACTERISTICS OF HOUSEHOLDS AND WOMEN

2

Key Findings

- ***Drinking water:*** Overall 69% of households have access to an improved source of drinking water (81% in urban areas and 62% in rural areas).
- ***Sanitation:*** Fifty-seven percent use an improved toilet facility, 32% use an unimproved sanitation facility, and 12% do not use a facility.
- ***Household composition:*** The average household size is 5.1 persons; 65% of households are headed by men.
- ***Mobile phone ownership:*** Seventy two percent of households own a mobile phone (89% in urban areas and 61% in rural areas).
- ***Literacy:*** Forty percent of women age 15-49 are literate, that is women can read a whole sentence or part of a sentence.

Information on the socioeconomic characteristics of the household population in the SLMIS 2021 provides a context to interpret demographic and health indicators and can furnish an approximate indication of the representativeness of the survey. In addition, this information sheds light on the living conditions of the population.

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

2.1 DRINKING WATER SOURCES

Improved sources of drinking water
Include piped water, public taps, standpipes, tube wells, boreholes, protected dug wells and springs, rainwater, and bottled water.
Sample: Households

Basic drinking water service
Drinking water from an improved source provided either water is on the premises or round-trip collection time is 30 minutes or less.
Sample: De jure population

Limited drinking water service
Drinking water from an improved source, and round-trip collection time is more than 30 minutes.
Sample: De jure population

De jure population
All persons who are usual residents of the selected households, whether ornot they stayed in the household the night before the interview.

Improved sources of water protect against outside contamination so that water is more likely to be safe to drink. **Table 2.1** shows that 69% of households use an improved source of drinking water. The most common source of drinking water is tube well or borehole (26%), followed by public tap/standpipe (19%) and protected well (13%). Less than one in four households has water on the premises (24%), and 59% take 30 minutes or less (round trip) to obtain drinking water. The percentage of households using improved sources of drinking water is higher in urban areas (81%) than in rural areas (62%).

Trends: Use of improved sources of drinking water increased 2 percentage points from 67% in SLDHS 2019 to 69% in SLMIS 2021.

Urban and rural households rely on the same sources of drinking water. Thirty percent of urban households have tube well or borehole compared with 23% of rural households (**Figure 2.1**). The second improved source of drinking water is public tap/standpipe; it used by 21% of urban households and 18% of rural households. For protected well as a third source, urban households are less likely to obtain water from it (10%) than rural households (15%). Nine percent of urban households have to travel more than 30 minutes to fetch drinking water, compared with 13% of rural households (**Table 2.1.1**).

Figure 2.1 **Household drinking water by residence**

Percent distribution of households by source of drinking water

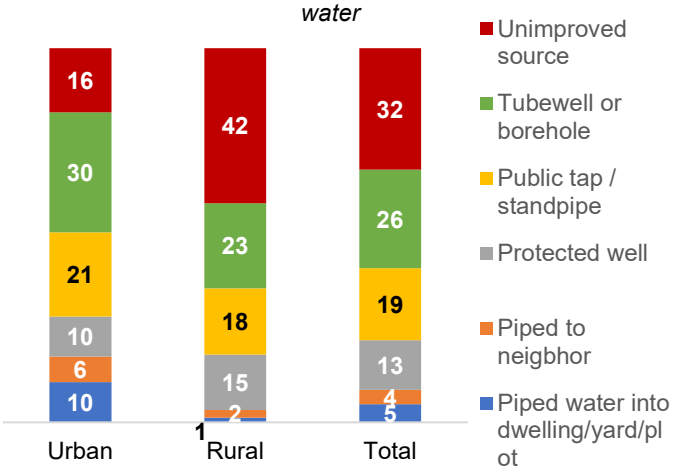


Table 2. 1.2 shows the drinking water service ladder by background characteristics. Overall, 82% of the household population has at least basic drinking water, and 18% has limited service. The percentage of the population with at least basic drinking water service ranges from 71% in Northern region to 89% in Southern region. Use of limited drinking water service generally decreases with increasing wealth, from 24% in the second wealth quintile to 10% in the highest quintile.

2.2 SANITATION

Improved toilet facilities

Flush/pour flush toilets that flush water and waste to a piped sewer system, septic tank, pit latrine, or unknown destination; ventilated improved pit (VIP) latrines; pit latrines with slabs; or composting toilets.

Sample: Households

Nationally, 24% of households use improved toilet facilities, 32% use unimproved sanitation facilities, and 12% engage in open defecation. Another 33% of households use an improved facility shared with other households (**Table 2.2.1** and **Figure 2.2**)

Nationally, 24% of households use improved toilet facilities, 32% use unimproved sanitation facilities,and 12% engage in open defecation. Another 33% of households use an improved facility shared with other households (**Table 2.2.1** and **Figure 2.2**).

More households in urban areas than rural areas use improved sanitation (82% versus 40%). The most commonly used improved toilet facilities in both urban and rural areas are pit latrines with slabs (48% and 32%, respectively). Use of both unimproved sanitation facilities and open defecationis higher in rural households (42% and 18%, respectively) than in urban households (16% and 1%, respectively).

Figure 2.2 Household sanitation facilities by residence

Percent distribution of households by type of toilet/latrine facilities

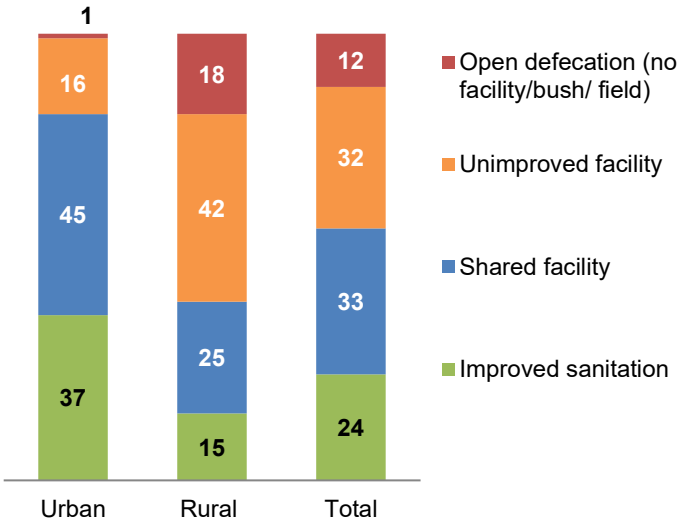


Table 2.2.2 shows the sanitation service ladder by background characteristics. Overall, 45% of the household population has at least basic service, and 18% has limited service. By malaria endemicity, the household population with at least basic service ranges from 38% in the Coast endemic zone and Highlandepidemic prone zone to 54% in the Low risk zone (**Table 2.4**). The percentage of the population using open defecation is highest in the Seasonal endemic zone (27%). As expected, use of unimproved sanitationfacilities decreases with increasing wealth.

Trends: The proportion of households with improved toilet facilities (shared or not shared) increased from 51% in the SLMIS 2016 to 57% in the SLMIS.2021.

Table 2.2.2 shows the sanitation service ladder by background characteristics. Overall, 26% of the household population has at least basic service, and 32% has limited service. By region, the household population with at least basic service ranges from 15% in North Western to 41% in Western (**Table 2.2.2**). As expected, use of improved sanitation facilities increases es with increasing wealth.

2.3 HOUSING CHARACTERISTICS

The SLMIS 2021 collected data on household features such as access to electricity, construction materials, number of sleeping rooms, and types of cooking technology and cooking fuels. These data, along with information on ownership of household durable goods, source of drinking water, and sanitation, contribute to the creation of the household wealth index and provide information that may be relevant for other health indicators.

2.3.1 Construction Materials

Earth/sand is the most common flooring material in Sierra Leone, used by 43% of households. A much higher percentage of rural households (62%) than urban households (16%) have earth/sand floors. Cement is the second most common flooring material, used by 41% of households: 56% among urban households and 30% among rural households (**Table 2.3**).

Trends: Use of cement for flooring material increased slightly from 39% in SLMIS 2016 to 41% in SLMIS 2021.

2.3.2 Rooms Used for Sleeping

The number of rooms a household uses for sleeping is an indicator of socioeconomic level and of crowding

in the household, which can facilitate the spread of disease. Fifty percent of households use three or more rooms for sleeping, 27% use two rooms, and 23% use only one room. There are urban-rural differences in the number of rooms used for sleeping; 31% of urban households use one room for sleeping, as compared with 17% of households in rural areas (**Table 2.3**).

Trends: The percentage of households in Sierra Leone using one room for sleeping decreased slightly from 25% in SLMIS 2016 to 23% in SLMIS 2021. Over the same period, there was an increase in the percentage of households using three or more rooms for sleeping (from 45% to 50%).

0

2.3.3 Electricity and Cooking Fuel

Overall, 28% of households in Sierra Leone have access to electricity, including 61% of urban households and 5% of rural households (**Table 2.3**). WHO guidelines for indoor air quality (WHO 2014) highlight the importance of addressing both fuel and technology for protecting public health. The guidelines identify and promote technologies and fuels that are efficient and recommend against the use of technologies that rely on solid fuels such as coal and wood as well as kerosene, a non-solid but highly polluting fuel. However, in Sierra Leone, almost all households use solid fuels for cooking (97%) with 94% among urban households and 99% among rural households The percentage of households using clean fuel for cooking is less than 2% (**Table 2.3**).

Trends: There has been an increase since the SLMIS 2016 in the percentage of households reporting access to electricity, from 20% to 28%. In the SLDHS 2019, the percentage was 23%.

2.4 Household Wealth

Household Durable Goods

The SLMIS 2021collected information on possession of household goods and means of transportation, ownership of agricultural land, and ownership of farm animals. Seventy-two percent of households own a mobile phone. Possession of a mobile phone is more common in urban households (89%) than rural households (61%). Approximately one in two households has a radio (49%), and only 22% have a television. Fourteen percent of households have a refrigerator, and 1% has a computer.
Five percent of households own a bicycle, 9% own a motorcycle or scooter, and 4% own a car or truck. Overall, 45% of households own agricultural land and 38% own farm animals. As expected, households in rural areas are more likely than households in urban areas to own agricultural land (65% versus 15%) and farm animals (48% versus 22%) (**Table 2.4**).

Wealth Index

Wealth index and Gini coefficient

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

The Gini coefficient (or Gini ratio) provides a measure of the level of concentration of wealth. A Gini coefficient of 0 indicates an equal distribution of wealth and a coefficient of 1, a totally unequal distribution. In other words, if every person in the country owns the same amount of wealth, the Gini coefficient would be 0. If one person in the country owns all of the wealth, then the Gini coefficient would be 1. Because of its nature, smaller areas are more likely to have lower values of the Gini coefficient because they are more likely to be homogeneous than are larger areas.

Sample: Households

Table 2.5 shows the distribution of the de jure household population by wealth quintile, according to residence, region and district. A majority of the urban population falls in the upper two wealth quintiles, while a majority of the rural population falls in the bottom two quintiles. Fifty percent of urban residents are in the highest wealth quintile, while 7% are in the lowest wealth quintile. In contrast, less than 1% of rural residents are in the highest wealth quintile and 29% are in the lowest quintile (**Figure 2.3**).

***Figure 2.3* Household wealth by residence**

Percent distribution of the de jure population by wealth quintiles

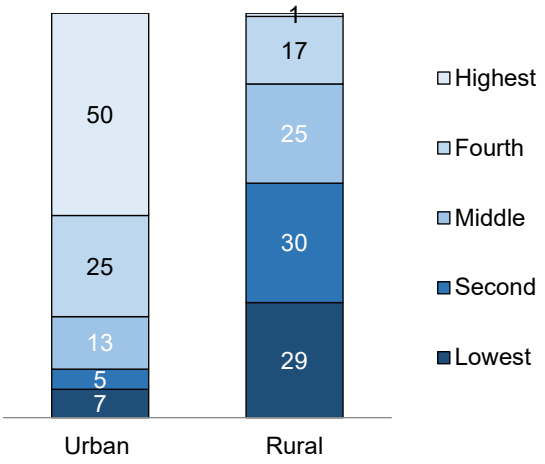


Table 2.5 shows that the concentration of wealth differs markedly by region. The Western Area has a much higher percentage of households in the highest wealth quintile (67%) than the North Western and Southern regions (5% and 8%, respectively). By district, Western Urban has the highest percentage of households in the wealthiest quintile 86% compared to Falaba which is the lowest (0.3%).

2.5 Household Population and Composition

Household

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

De facto population

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

De jure population

Defined above

How data are calculated

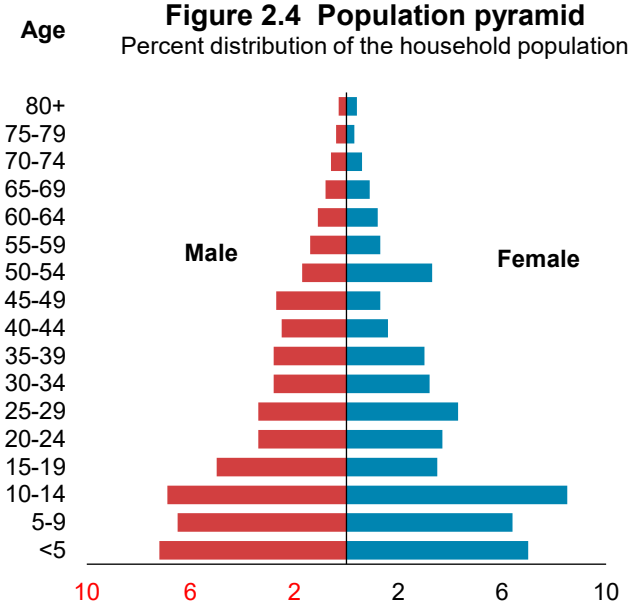
All tables are based on the de facto population, unless otherwise specified.

A total of 40,470 people stayed overnight in the 7,990 interviewed households (**Table 2.6**). The overall sexratio is 97 males per 100 females (49% males), and a majority of the population lives in rural areas (61%).

Age and sex are important demographic variables and are the primary basis of demographic classifications.**Table 2.6** shows the distribution of the de facto household population in the SLMIS 2021 by 5-year age groups, according to sex and residence. Nationally, 47% of the population falls into dependency age groups (0-14 and 65 or above). In rural areas, 49% of the population is in these dependency age groups, as compared with 44% of the population in urban areas. Forty-nine percent of the rural populationis age 0-17, compared with 47% ofthe urban population

The population pyramid in **Figure 2.4** shows the population distribution by sex and 5-year age groups. The broad base of the pyramid indicates that Sierra Leone's population is young, with 43% of the population under age 15.

Figure 2.4 Population pyramid
Percent distribution of the household population



In the SLMIS 2021, women aged 15-49 years old are selected for the individual questionnaire interview.

Table 2.7 presents the distribution of households by sex of head of household, household size, and mean size of households, according to residence. Nationally, about two thirds of households are headed bymen (65%); 35% are headed by women. Urban households are slightly more likely than rural householdsto be headed by women (37% versus 33%). Only 5 %t of households has one usual resident. On average, households consist of 5.1 persons.

2.6 Background Characteristics of Survey Respondents

A total of 8,300 women age 15-49 were interviewed with the Woman's Questionnaire (**Table 2.8**). Almost 6 in 10 women interviewed (56%) are under age 30, and 14% are age 40-49. The majority of respondents are Muslims (77%) and 23% are Christians. Approximately, six out of 10 women (58%) live in rural areas. The majority of women (51%) have no education, and only 2% have higher than secondary education.

Table 2.8 show that a total of 5,863 children under five born to the interviewed women were identified. The majority of the children live in rural areas (65%), 51 are boys and approximately half of children (49%) are age 3 to 4 years old.

2.7 Educational Attainment of Women

Studies have consistently shown that educational attainment has a strong effect on health behaviours and attitudes. Generally, the higher the level of education a woman has attained, the more knowledgeable she isabout use of health facilities and health management for herself and her children.

***Figure 2.5* Education of survey respondents by residence**
Percent distribution of women age 15-49 by highest level of schooling attended or completed

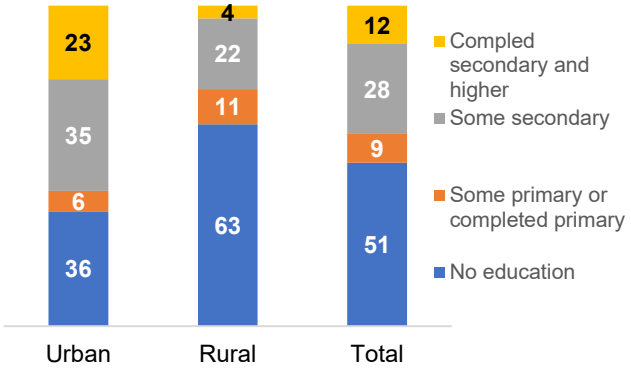


Table 2.9 shows the percent distribution of women age 15-49 by highest level of schooling attended or completed, and median years completed, according to background characteristics. Overall, 51% of women have no education, 7% have some primary education, and less than 3% attended or completed primary education and went no further. Twenty-eight percent of women have some secondary education, 10% completed secondary school, and an additional 2% have attended or completed more than secondary education (**Figure 2.5**).

Patterns by background characteristics

- Twenty-two percent of women in rural areas have some secondary education, as compared with 35% of women in urban areas (**Table 2.9**).
- By region, the percentage of women with no education is highest in North Western (66%) and lowest in Western (31% each).
- Women who completed high school education increases from 3% in the second wealth quintile to 24% in the highest wealth quintile.

2.8 LITERACY OF WOMEN

Literacy

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

Sample: Women age 15-49

Knowing the level and distribution of literacy among the population is an important factor in the design and delivery of health messages and interventions. **Table 2.10** shows that, overall, 40% of women age 15-49 in Sierra Leone are literate.

Trends: Literacy stayed at the same level of 40% between the SLMIS 2016 and SLMIS 2021.

Patterns by background characteristics

- Literacy varies by place of residence; 27% of women in rural areas are literate, as compared with 58% of women in urban areas
- By region, literacy among women ranges from 27% in North Western to 62% in Western.
- By district, the percentage of literate women is highest in Western Area Urban with 71% and lowest in Kambia with 18%.
- The percentage of literate women increases with increasing wealth, from 25% in the second wealth quintile to 69% in the highest wealth quintile.

2.9 EXPOSURE TO MASS MEDIA

Exposure to mass media

Respondents were asked how often they read a newspaper, listened to the radio, or watched television. Those who responded *at least once a week* are considered regularly exposed to that form of media.

Sample: Women age 15-49

All women were asked how often they listen to a radio or watch television, and women who were literate were asked how often they read a newspaper or magazine. Twenty-eight percent of women listen to the radio atleast once a week, 21% watch television at least once a week, and 8% read a newspaper at least once a week. Five percent of women are exposed to all three media at least once a week; 64% access none of thethree media at least once a week (**Table 2.11**).

Patterns by background characteristics

- Thirty-nine percent of women in urban areas watch television at least once a week, as compared with 7% of women in rural areas.

- Exposure to all three media sources varies by education, with less than 1% of women with no education/primary education and 46% of women with more than a secondary education accessing all three media at least once a week.

2.10 INTERNET USAGE

Use of the Internet

Respondents were asked if they have ever used the Internet from any device, if they used the Internet in the last 12 months, and, if so, how often they used it during the last month.

Sample: Women age 15-49

One in 5 women (20%) have used the Internet in the last 12 months. Among women who have used the Internet in the last 12 months, almost 2 in 3 (64%) used the Internet almost every day during the last month (**Table 2.12**).

Patterns by background characteristics

- Thirty-eight percent of women in urban areas have used the internet in the last 12 months compared to 7% of women in rural areas.
- Internet usage in the last 12 months is highest in Western region (47%) and lowest in Southern region 10%)..
- The percentage of women who have used the Internet in the last 12 months increases with increasing education, from 5% among women with no education to 96% among those with more than a secondary education.

2.11 CONCLUSIONS

- There have been slight improvements in household living conditions since the SLMIS 2016. For example, there has been an increase in the proportion of households using improved toilet facilities (51% in the SLMIS 2016 and 57% in the SLMIS.2021).
- The percentage of households in Sierra Leone using one room for sleeping decreased slightly from 25% in SLMIS 2016 to 23% in SLMIS 2021
- The percentage of households using solid fuels for cooking is extremely high (97%).
- More than one third of households (35%) is headed by women. Less than 5% of households have one-household member. On average, households in Sierra Leone consist of 5.1 persons.
- Seventy-two of women own any mobile phone, and one in 5 women (20%) have used the Internet in the last 12 months.
- Four in 10 women are literate (58% urban and 27% rural), and more than half of women (51%) have no education (36% urban and 63% rural).

List of Tables

For more information on characteristics of households and women, see the following tables:

- **Table 2.1.1 Household drinking water**
- **Table 2.1.2 Drinking water according to region, district and wealth**
- **Table 2.2.1 Household sanitation facilities**
- **Table 2.2.2 Sanitation facility type according to region, district and wealth**
- **Table 2.3 Household characteristics**
- **Table 2.4 Household possessions**
- **Table 2.5 Wealth quintiles**
- **Table 2.6 Household population by age, sex, and residence**
- **Table 2.7 Household composition**
- **Table 2.8 Sociodemographic characteristics of the survey respondents**
- **Table 2.9 Educational attainment of the women surveyed**
- **Table 2.10 Literacy of the women surveyed**
- **Table 2.11 Exposure to mass media**
- **Table 2.12 Internet usage**

Table 2.1.1 Household drinking water

Percent distribution of households and de jure population by source of drinking water, time to obtain drinking water, and treatment of drinking water, according to residence, Sierra Leone MIS 2021

Characteristic	Households			Population		
	Urban	Rural	Total	Urban	Rural	Total
Source of drinking water						
Improved source	**80.7**	**61.5**	**69.2**	**80.6**	**61.8**	**69.1**
Piped into dwelling / Piped to yard/plot	10.0	1.3	4.8	8.7	1.4	4.3
Piped to neighbor	6.4	2.0	3.8	6.3	1.9	3.7
Public tap / standpipe	20.9	17.9	19.2	21.1	18.3	19.4
Protected well	10.2	15.3	13.2	10.5	15.8	13.7
Tube well or borehole	30.3	23.1	26.0	31.0	22.4	25.7
Protected spring	1.9	1.7	1.8	1.9	1.8	1.9
Rainwater	0.5	0.2	0.3	0.6	0.2	0.3
Bottled water	0.4	0.0	0.1	0.4	0.0	0.1
Unimproved source	**19.3**	**38.5**	**30.8**	**19.4**	**38.2**	**30.9**
Unprotected well	5.9	11.0	8.9	6.2	10.7	8.9
Unprotected spring	1.8	9.3	6.3	2.0	9.3	6.4
Tanker truck / cart with small tank	0.7	0.4	0.5	0.6	0.4	0.5
Surface water (river/dam/lake/pond/stream/canal/irrigation channel)	1.2	17.6	11.0	1.3	17.6	11.2
Water sachets	9.3	0.2	3.9	8.9	0.1	3.5
Bottled water, unimproved source for cooking / washing hands	0.1	0.0	0.0	0.0	0.0	0.0
other source	0.3	0.1	0.2	0.5	0.1	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
Time to obtain drinking water (round trip)						
Water on premises[1]	37.6	14.8	24.0	36.3	14.8	23.2
30 minutes or less	48.9	65.6	58.8	49.5	65.6	59.3
More than 30 minutes	9.0	12.6	11.1	9.5	12.3	11.2
Don't know	4.5	7.1	6.0	4.7	7.3	6.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
Percentage with basic drinking water service [2]	86.2	80.3	82.7	85.3	80.2	82.2
Percentage with limited drinking water service [3]	13.5	19.7	17.2	14.2	19.7	17.5
Number	3,230	4,760	7,990	15,890	24,745	40,635

[1] Includes water piped to a neighbor and those reporting a round trip collection time of zero minutes

[2] Defined as drinking water from an improved source, provided either water is on the premises or round-trip collection time is 30 minutes or less. Includes safely managed drinking water, which is not shown separately.

[3] Drinking water from an improved source, provided round-trip collection time is more than 30 minutes or is unknown

Table 2.1.2 Drinking water according to region, district and wealth

Percent distribution of de jure population by drinking water source, percentage of de jure population with basic drinking water service, and percentage with limited drinking water service, according to region and wealth quintile, Sierra Leone MIS 2021

Background characteristic	Improved source of drinking water[1]	Unimproved source of drinking water[2]	Total	Percentage with basic drinking water service [2]	Percentage with limited drinking water service [3]	Number
Region						
Eastern	76.3	23.7	100.0	87.9	12.0	8,204
Northern	60.0	40.0	100.0	70.9	28.9	8,347
North Western	54.0	46.0	100.0	76.5	23.5	6,425
Southern	73.9	26.1	100.0	89.2	10.8	9,328
Western	77.4	22.6	100.0	84.5	14.5	8,331
District						
Kailahun	69.0	31.0	100.0	81.7	18.3	2,873
Kenema	79.1	20.9	100.0	97.8	2.2	3,222
Kono	81.6	18.4	100.0	81.4	18.4	2,202
Bombali	89.4	10.6	100.0	94.5	5.5	2,329
Falaba	40.4	59.6	100.0	59.8	39.3	995
Koinadugu	79.5	20.5	100.0	86.2	12.7	977
Tonkolili	43.5	56.5	100.0	56.1	43.8	4,019
Kambia	33.5	66.5	100.0	57.1	42.9	1,762
Karene	60.8	39.2	100.0	77.6	22.4	1,668
Port Loko	62.3	37.7	100.0	87.2	12.8	2,995
Bo	85.5	14.5	100.0	86.9	13.1	3,504
Bonthe	77.9	22.1	100.0	90.2	9.8	2,144
Moyamba	36.7	63.3	100.0	93.3	6.7	1,984
Pujehun	88.2	11.8	100.0	88.1	11.9	1,628
Western Area Rural	84.9	15.1	100.0	77.2	21.7	3,428
Western Area Urban	72.2	27.8	100.0	89.7	9.4	4,903
Wealth quintile						
Lowest	58.2	41.8	100.0	80.8	18.9	8,127
Second	55.4	44.6	100.0	75.8	24.1	8,142
Middle	70.9	29.1	100.0	79.2	20.8	8,124
Fourth	81.6	18.4	100.0	86.2	13.4	8,112
Highest	79.5	20.5	100.0	89.0	10.4	8,130
Total	69.1	30.9	100.0	82.2	17.5	40,635

[1] See Table 2.1.1 for definition of an improved source.
[2] See Table 2.1.1 for definition of an unimproved source.
[3] Defined as drinking water from an improved source, provided either water is on the premises or round-trip collection time is 30 minutes or less. Includes safely managed drinking water, which is not shown separately.
[4] Drinking water from an improved source, provided round-trip collection time is more than 30 minutes or is unknown

Table 2.2.1 Household sanitation facilities

Percent distribution of households and de jure population by type of toilet/latrine facilities, percent distribution of households and de jure population with a toilet/latrine facility by location of the facility, percentage of households and de jure population with basic sanitation services, and percentage with limited sanitation services, according to residence, Sierra Leone MIS 2021

Type and location of toilet/latrine facility	Households			Population		
	Urban	Rural	Total	Urban	Rural	Total
Improved facility	**82.4**	**39.7**	**57.0**	**81.9**	**41.3**	**57.2**
-Facility not shared	37.5	14.6	23.9	39.6	16.5	25.6
-Shared facility	44.9	25.1	33.1	42.3	24.8	31.6
Flush/pour flush to piped sewer system	0.6	0.0	0.3	0.6	0.0	0.3
Flush/pour flush to septic tank	18.0	0.5	7.5	17.1	0.4	6.9
Flush/pour flush to pit latrine	9.3	1.8	4.9	8.7	2.0	4.6
Flush/pour don't know where	0.4	0.0	0.2	0.4	0.0	0.2
Ventilated improved pit (VIP) latrine	5.9	1.3	3.1	6.6	1.4	3.4
Pit latrine with slab	47.6	31.9	38.3	47.8	33.6	39.2
Composting toilet	0.6	4.2	2.7	0.6	3.8	2.6
Unimproved facility	**16.4**	**41.9**	**31.6**	**17.0**	**40.2**	**31.1**
Flush/pour flush not to sewer/septic tank/pit latrine	1.0	0.7	0.8	1.0	0.7	0.8
Pit latrine without slab/open pit / Ventilated improved pit lat	12.3	37.4	27.3	12.9	35.6	26.7
Bucket toilet	0.3	0.2	0.3	0.3	0.2	0.2
Hanging toilet/hanging latrine	2.1	3.0	2.6	2.2	3.1	2.8
Other	0.7	0.6	0.6	0.6	0.5	0.6
Open defecation (no toilet / nature	**1.2**	**18.4**	**11.5**	**1.1**	**18.5**	**11.7**
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of households / population	3,230	4,760	7,990	15,890	24,745	40,635
Location of toilet facility						
In own dwelling	17.1	3.4	9.6	16.4	3.2	9.0
In own yard/plot	72.0	72.7	72.4	73.3	73.9	73.6
Elsewhere	10.9	23.9	18.0	10.3	23.0	17.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of households/population with a toilet/latrine facility	3,191	3,884	7,075	15,714	20,163	35,877
Percentage with basic sanitation service[1]	37.5	14.6	23.9	39.6	16.5	25.6
Percentage with limited sanitation service[2]	44.9	25.1	33.1	42.3	24.8	31.6
Number of households / population	3,230	4,760	7,990	15,890	24,745	40,635

[1] Defined as use of improved facilities that are not shared with other households. Includes safely managed sanitation service, which is not shown separately.
[2] Defined as use of improved facilities shared by 2 or more households

Table 2.2.2 Sanitation facility type according to region, district and wealth

Percent distribution of de jure population by type of sanitation, percentage of de jure population with basic sanitation service, and percentage with limited sanitation service, according to region and wealth quintile, Sierra Leone MIS 2021

Background characteristic	Type of sanitation: Improved sanitation facility[1]	Unimproved sanitation facility[2]	Open defecation	Total	Percentage with basic sanitation service[1]	Percentage with limited sanitation service[2]	Effectif
Region							
Eastern	60.2	31.2	8.6	100.0	22.5	37.8	8,204
Northern	49.6	49.8	0.6	100.0	24.8	24.8	8,347
North Western	43.9	43.6	12.5	100.0	15.1	28.8	6,425
Southern	45.0	21.5	33.5	100.0	22.0	23.0	9,328
Western	85.7	13.3	1.0	100.0	41.4	44.3	8,331
District							
Kailahun	48.6	31.0	20.4	100.0	13.9	34.7	2,873
Kenema	69.7	27.0	3.3	100.0	25.8	43.9	3,222
Kono	62.1	37.2	0.7	100.0	30.2	31.9	2,202
Bombali	75.0	24.6	0.4	100.0	47.0	28.0	2,329
Falaba	22.3	75.9	1.8	100.0	11.0	11.3	995
Koinadugu	47.1	52.9	0.0	100.0	25.1	22.0	977
Tonkolili	42.5	57.0	0.5	100.0	15.3	27.1	4,019
Kambia	52.3	40.6	7.1	100.0	13.7	38.6	1,762
Karene	48.4	36.8	14.8	100.0	15.7	32.7	1,668
Port Loko	36.4	49.2	14.3	100.0	15.6	20.8	2,995
Bo	48.6	21.7	29.7	100.0	24.2	24.4	3,504
Bonthe	41.0	20.6	38.3	100.0	13.1	27.9	2,144
Moyamba	40.9	16.7	42.4	100.0	22.0	18.9	1,984
Pujehun	45.3	29.1	25.6	100.0	26.9	18.4	1,628
Western Area Rural	79.8	19.2	1.0	100.0	43.0	36.8	3,428
Western Area Urban	89.8	9.1	1.0	100.0	40.3	49.5	4,903
Wealth quintile							
Lowest	44.8	37.0	18.2	100.0	13.6	31.2	8,127
Second	40.9	41.4	17.7	100.0	15.5	25.4	8,142
Middle	49.8	38.0	12.2	100.0	23.5	26.3	8,124
Fourth	59.1	30.9	10.0	100.0	27.4	31.8	8,112
Highest	91.3	8.2	0.5	100.0	47.8	43.6	8,130
Total	57.2	31.1	11.7	100.0	25.6	31.6	40,635

[1] See Table 2.3.1 for definition of an improved facility. [2] See Table 2.3.1 for definition of an unimproved facility. [3] Defined as use of improved facilities that are not shared with other households. Includes safely managed sanitation service, which is not shown separately. [4] Defined as use of improved facilities shared by 2 or more households

Table 2.3 Household characteristics

Percent distribution of households and de jure population by housing characteristics, percentage using solid fuel for cooking, percentage using clean fuel for cooking, and percent distribution by frequency of smoking in the home, according to residence, Sierra Leone MIS 2021

Housing characteristic	Households			Population		
	Urban	Rural	Total	Urban	Rural	Total
Electricity						
Yes	61.4	5.3	28.0	59.4	6.2	27.0
No	38.6	94.7	72.0	40.6	93.8	73.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Flooring material						
Earth, sand	15.8	62.1	43.4	15.8	61.2	43.5
Dung	0.2	2.8	1.8	0.2	2.4	1.6
Wood/planks	0.3	0.2	0.2	0.2	0.2	0.2
Palm/bamboo	0.2	1.1	0.7	0.2	1.0	0.7
Parquet or polished wood	0.3	0.5	0.4	0.4	0.6	0.5
Vinyl or asphalt strips	0.5	0.1	0.3	0.4	0.1	0.2
Ceramic tiles	23.3	1.5	10.3	22.2	1.7	9.7
Cement	55.8	30.3	40.6	57.5	32.0	42.0
Carpet	3.4	0.2	1.5	2.9	0.2	1.2
Other	0.2	1.3	0.8	0.2	0.8	0.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
Rooms used for sleeping						
One	30.7	17.2	22.6	20.7	9.7	14.0
Two	28.0	26.3	27.0	26.7	22.7	24.3
Three or more	41.3	56.4	50.3	52.5	67.6	61.7
Missing	0.0	0.1	0.0	0.0	0.1	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Cooking stove						
Electric stove	0.7	0.1	0.3	0.3	0.1	0.2
Solar cooker	0.1	0.0	0.0	0.2	0.0	0.1
Liquified petroleum gas (lpg) / Cooking gas stove	1.5	0.0	0.6	0.9	0.0	0.3
Piped natural gas stove	0.0	0.0	0.0	0.0	0.0	0.0
Biogas stove	1.3	0.0	0.5	1.1	0.0	0.5
Liquid fuel stove	0.1	0.0	0.1	0.1	0.0	0.1
Manufactured solid fuel stove	10.8	1.3	5.2	10.4	1.4	4.9
Traditional solid fuel stove	59.0	10.9	30.3	57.6	10.7	29.0
Three stone stove/open fire	24.2	86.8	61.5	28.1	87.5	64.3
No food cooked in household	1.5	0.8	1.1	0.6	0.2	0.4
Other	0.8	0.1	0.4	0.7	0.1	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
Percentage using solid fuel for cooking[1]	94.6	99.1	97.3	96.6	99.6	98.4
Percentage using clean fuel for cooking[2]	3.6	0.1	1.5	2.6	0.1	1.1
Number of households / population	3,230	4,760	7,990	15,890	24,745	40,635

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

Table 2.4 Household possessions

Percentage of households possessing various household effects, menas of transportation, agricultural land and livestock/farm animals by residence, Sierra Leone MIS 2021

Possession	Residence		Total
	Urban	Rural	
Household effects			
Radio	67.0	36.1	48.6
Television	50.6	2.8	22.1
Mobile phone	88.5	61.2	72.3
Computer	2.1	0.7	1.3
Non-mobile telephone	9.9	0.7	4.4
Refrigerator	34.1	1.0	14.4
Means of transport			
Bicycle	7.2	3.8	5.2
Animal drawn cart	0.8	0.6	0.7
Motorcycle/scooter	9.6	9.1	9.3
Car/truck	7.6	0.9	3.6
Boat with a motor	0.8	1.1	1.0
Boat without a motor	1.2	2.9	2.2
Ownership of agricultural land	15.1	64.9	44.8
Ownership of farm animals[1]	21.9	48.3	37.6
Number	3,230	4,760	7,990

[1] Cows, bulls, other cattle, horses, donkeys, mules, goats, sheep, or chickens/poultry

Table 2.5 Wealth quintiles

Percent distribution of the de jure population by wealth quintiles, and the Gini Coefficient, according to residence and region, Sierra Leone MIS 2021

Residence/region	Wealth quintile					Total	Number of persons	Gini coefficient
	Lowest	Second	Middle	Fourth	Highest			
Residence								
Urban	6.7	4.8	13.0	25.3	50.2	100.0	15,890	0.23
Rural	28.5	29.8	24.5	16.5	0.6	100.0	24,745	0.34
Region								
Eastern	34.8	19.8	20.7	16.0	8.6	100.0	8,204	0.32
Northern	16.6	29.3	27.0	17.4	9.7	100.0	8,347	0.28
North Western	18.3	29.2	20.2	27.4	4.9	100.0	6,425	0.33
Southern	27.4	21.8	22.8	20.4	7.5	100.0	9,328	0.37
Western	1.8	1.9	8.9	20.2	67.2	100.0	8,331	0.18
District								
Kailahun	46.5	27.4	13.5	8.5	4.1	100.0	2,873	0.36
Kenema	30.9	16.0	21.5	23.3	8.3	100.0	3,222	0.30
Kono	24.2	15.2	28.7	16.3	15.6	100.0	2,202	0.40
Bombali	9.6	15.5	23.2	28.1	23.6	100.0	2,329	0.33
Falaba	26.4	43.3	24.9	5.1	0.3	100.0	995	0.27
Koinadugu	14.9	32.1	31.5	16.9	4.6	100.0	977	0.31
Tonkolili	18.7	33.1	28.6	14.4	5.2	100.0	4,019	0.31
Kambia	27.9	32.8	21.7	15.4	2.3	100.0	1,762	0.36
Karene	20.1	43.0	25.5	10.2	1.1	100.0	1,668	0.29
Port Loko	11.7	19.3	16.3	44.0	8.6	100.0	2,995	0.31
Bo	30.0	18.6	18.5	16.6	16.3	100.0	3,504	0.46
Bonthe	23.9	16.8	23.0	33.5	2.9	100.0	2,144	0.32
Moyamba	34.2	35.1	23.8	6.2	0.7	100.0	1,984	0.34
Pujehun	19.3	20.0	31.5	27.3	2.0	100.0	1,628	0.36
Western Area Rural	4.3	4.1	18.7	32.8	40.1	100.0	3,428	0.23
Western Area Urban	0.0	0.4	2.1	11.4	86.1	100.0	4,903	0.14
Total	20.0	20.0	20.0	20.0	20.0	100.0	40,635	0.33

Table 2.6 Household population by age, sex, and residence

Percent distribution of the de facto household population by five-year age groups, according to sex and residence, Sierra Leone MIS 2021

	Residence								
	Urban			Rural					
Age	Male	Female	Total	Male	Female	Total	Male	Female	Total
<5	12.7	12.7	12.7	15.8	14.6	15.2	14.6	13.9	14.2
5-9	11.4	12.3	11.9	14.2	12.8	13.5	13.1	12.6	12.9
10-14	14.1	17.7	16.0	14.0	16.3	15.2	14.1	16.8	15.5
15-19	11.2	8.1	9.6	9.3	6.0	7.7	10.0	6.9	8.4
20-24	7.9	8.5	8.2	6.1	6.6	6.4	6.8	7.4	7.1
25-29	7.6	8.5	8.1	6.3	8.3	7.3	6.8	8.4	7.6
30-34	6.5	6.9	6.7	5.2	6.1	5.7	5.7	6.4	6.1
35-39	6.1	5.9	6.0	5.4	5.9	5.7	5.7	5.9	5.8
40-44	5.7	3.0	4.3	4.7	3.2	3.9	5.1	3.1	4.1
45-49	5.6	2.5	4.0	5.3	2.6	4.0	5.4	2.6	4.0
50-54	3.2	6.4	4.9	3.4	6.7	5.1	3.4	6.6	5.0
55-59	2.5	2.1	2.3	2.9	3.0	2.9	2.7	2.6	2.7
60-64	1.9	1.9	1.9	2.4	2.6	2.5	2.2	2.4	2.3
65-69	1.5	1.2	1.4	1.6	2.0	1.8	1.6	1.7	1.6
70-74	0.8	0.9	0.9	1.4	1.3	1.3	1.2	1.1	1.1
75-79	0.6	0.4	0.5	0.8	0.7	0.8	0.7	0.6	0.6
80 +	0.4	0.8	0.6	0.8	0.9	0.8	0.7	0.8	0.8
Don't know/missing	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.2	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Dependency age groups									
0-14	38.3	42.7	40.6	44.0	43.7	43.9	41.8	43.3	42.6
15-64	58.3	53.9	56.0	51.2	51.1	51.2	54.0	52.2	53.1
15-64	58.3	53.9	56.0	51.2	51.1	51.2	54.0	52.2	53.1
Don't know/missing	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.2	0.2
Total	154.9	150.7	152.8	146.6	146.2	146.4	149.8	148.0	148.9
Child and adult populations									
0-17	45.6	47.5	46.6	50.0	47.0	48.5	48.3	47.2	47.8
18+	54.3	52.4	53.3	49.8	52.7	51.3	51.6	52.5	52.1
Don't know/missing	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.2	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Adolescents 10-19	25.3	25.9	25.6	23.3	22.3	22.8	24.1	23.7	23.9
Effectif	7,702	8,117	15,819	12,259	12,391	24,651	19,962	20,508	40,470

Table 2.7 Household composition

Percent of households by sex of the head of household and by household size and, average household size, by place of residence, Sierra Leone MIS 2021

Background characteristic	Residence		Total
	Urban	Rural	
Household headship			
Male	62.6	66.7	65.1
Female	37.4	33.3	34.9
Total	100.0	100.0	100.0
Number of usual members			
1	6.0	3.8	4.7
2	8.3	6.5	7.2
3	15.0	13.2	13.9
4	19.4	19.6	19.5
5	18.1	18.9	18.6
6	11.9	14.1	13.2
7	7.9	9.6	8.9
8	5.0	5.5	5.3
9+	8.3	8.9	8.7
Total	100.0	100.0	100.0
Mean size of households	4.9	5.2	5.1
Number of households	3,230	4,760	7,990

Note: Table is based on de jure household members, i.e., usual residents. [1] Includes children with one dead parent and an unknown survival status of the other parent

Table 2.8 Sociodemographic characteristics of the survey respondents

Percent of surveyed women aged 15-49 and children under five by socio-demographic characteristics and months of interviews, Sierra Leone MIS 2021

	Women			Children age less than 5 years		
Age Group	Weighted percent	Weighted number	Unweighted number	Weighted percent	Weighted number	Unweighted number
Age (years)						
<1	na	na	na	13.6	788	772
1	na	na	na	17.3	1,003	989
2	na	na	na	20.7	1,199	1,186
3	na	na	na	24.0	1,390	1,440
4	na	na	na	24.5	1,420	1,476
Male	na	na	na	50.7	2,940	2,991
Female	na	na	na	49.3	2,861	2,872
Age						
15-19	17.0	1,414	1,422	na	na	na
20-24	18.1	1,500	1,514	na	na	na
25-29	20.7	1,720	1,714	na	na	na
30-34	15.6	1,297	1,251	na	na	na
35-39	14.5	1,203	1,201	na	na	na
40-44	7.7	641	655	na	na	na
45-49	6.3	525	543	na	na	na
Religion						
Christian	23.2	1,924	1,985	na	na	na
Muslim	76.7	6,370	6,310	na	na	na
Traditional	0.0	3	3	na	na	na
No religion	0.0	1	1	na	na	na
Residence						
Urban	42.3	3,513	3,084	34.8	2,020	1,791
Rural	57.7	4,787	5,216	65.2	3,780	4,072
Region						
Eastern	20.7	1,715	1,745	21.5	1,248	1,260
Northern	20.7	1,717	1,955	22.2	1,288	1,448
North Western	15.2	1,265	1,352	15.7	911	990
Southern	20.7	1,720	1,870	24.2	1,403	1,489
Western	22.7	1,883	1,378	16.4	951	676
Woman's education						
No education	51.1	4,242	4,356	na	na	na
Primary	9.0	743	792	na	na	na
Secondary	37.6	3,122	2,978	na	na	na
More than secondary	2.3	192	174	na	na	na
Wealth quintile						
Lowest	19.3	1,605	1,720	22.1	1,285	1,358
Second	18.8	1,561	1,702	20.8	1,205	1,293
Middle	20.1	1,666	1,808	21.0	1,217	1,334
Fourth	20.2	1,675	1,632	20.0	1,158	1,151
Highest	21.6	1,793	1,438	16.1	936	727
Total 15-49	100.0	8,300	8,300	100.0	5,800	5,863

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

Table 2.9 Educational level of the women surveyed

Distribution (in%) of women aged 15-49 according to the highest level of education attained or completed and median number of years of education completed, according to certain socio-demographic characteristics, Sierra Leone MIS 2021 ,

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	24.2	8.4	2.9	49.3	14.0	1.3	100.0	7.5	2,914
..15-19	16.1	8.8	3.5	62.3	9.3	0.0	100.0	7.6	1,414
..20-24	31.8	8.0	2.3	37.0	18.4	2.6	100.0	7.2	1,500
25-29	50.5	6.4	2.4	26.2	11.0	3.6	100.0	-	1,720
30-34	67.3	5.7	2.1	14.9	6.8	3.1	100.0	-	1,297
35-39	74.6	4.3	1.9	9.9	6.9	2.4	100.0	-	1,203
40-44	77.6	5.1	2.3	8.2	4.5	2.2	100.0	-	641
45-49	76.6	4.4	3.4	9.1	5.1	1.5	100.0	-	525
Residence									
Urban	35.7	3.9	2.1	35.4	18.0	4.9	100.0	7.5	3,513
Rural	62.5	8.3	2.8	22.0	4.0	0.4	100.0	-	4,787
Region									
Eastern	53.2	7.1	2.6	29.9	6.7	0.6	100.0	-	1,715
Northern	58.6	6.5	1.2	25.2	7.8	0.7	100.0	-	1,717
North Western	66.4	6.4	1.9	19.4	5.3	0.6	100.0	-	1,265
Southern	52.3	9.7	3.9	27.1	5.4	1.5	100.0	-	1,720
Western	31.0	2.9	2.7	34.1	22.0	7.2	100.0	8.2	1,883
District									
Kailahun	50.4	6.6	3.9	33.6	5.1	0.4	100.0	-	590
Kenema	55.0	8.6	2.4	27.4	5.8	0.8	100.0	-	643
Kono	54.1	5.4	1.3	28.8	9.8	0.6	100.0	-	501
Bombali	45.4	7.4	2.1	30.5	13.6	0.9	100.0	4.2	512
Falaba	70.5	6.4	1.2	15.4	5.5	1.0	100.0	-	192
Koinadugu	65.5	4.4	1.8	18.0	9.4	0.9	100.0	-	193
Tonkolili	62.3	6.5	0.6	26.0	4.3	0.4	100.0	-	816
Kambia	74.5	6.5	2.3	11.8	4.3	0.6	100.0	-	310
Karene	68.7	6.9	0.3	21.5	2.4	0.3	100.0	-	340
Port Loko	61.1	6.1	2.7	22.0	7.3	0.8	100.0	-	615
Bo	49.5	8.0	3.9	28.7	7.5	2.5	100.0	0.2	682
Bonthe	50.4	13.5	1.2	26.2	7.0	1.7	100.0	-	399
Moyamba	56.0	10.8	5.8	24.9	2.0	0.6	100.0	-	380
Pujehun	58.0	6.8	5.5	27.0	2.6	0.1	100.0	-	246
Western Area Rural	39.9	3.1	2.2	32.8	17.9	4.1	100.0	6.9	781
Western Area Urban	24.7	2.8	3.0	35.0	24.9	9.5	100.0	8.8	1,102
Wealth quintile									
Lowest	58.5	9.5	3.0	24.6	4.3	0.1	100.0	-	1,605
Second	64.5	8.7	2.5	21.3	2.9	0.1	100.0	-	1,561
Middle	56.1	6.3	2.5	27.2	7.0	0.9	100.0	-	1,666
Fourth	51.3	5.7	2.2	29.4	9.5	1.9	100.0	-	1,675
Highest	28.0	2.6	2.3	35.0	24.1	8.0	100.0	8.7	1,793
Total	51.1	6.5	2.5	27.7	9.9	2.3	100.0	-	8,300

Table 2.10 Literacy of the women surveyed

Distribution (in%) of women aged 15-49 by level of education attained and literacy level and percentage of literate women according to certain socio-demographic characteristics, Sierra Leone MIS 2021

Background characteristic	No schooling or primary school: Can read a whole sentence	Can read part of a sentence	Cannot read at all	No card with required language	Blind/visually impaired	Total	Percent-age literate[1]	Number of women
Age								
15-24	39.2	26.7	34.1	0.0	0.1	100.0	65.9	2,914
..15-19	43.8	31.5	24.6	0.0	0.1	100.0	75.3	1,414
..20-24	34.9	22.1	42.9	0.0	0.0	100.0	57.0	1,500
25-29	22.1	15.3	62.4	0.0	0.1	100.0	37.5	1,720
30-34	13.9	11.7	74.3	0.1	0.1	100.0	25.5	1,297
35-39	12.2	7.9	79.9	0.0	0.1	100.0	20.0	1,203
40-44	9.1	9.0	81.9	0.0	0.0	100.0	18.1	641
45-49	9.0	8.9	82.1	0.0	0.0	100.0	17.9	525
Residence								
Urban	38.8	19.5	41.7	0.0	0.1	100.0	58.2	3,513
Rural	12.4	14.8	72.7	0.0	0.1	100.0	27.2	4,787
Region								
Eastern	19.6	17.0	63.4	0.0	0.0	100.0	36.6	1,715
Northern	21.5	13.8	64.7	0.0	0.1	100.0	35.2	1,717
North Western	12.0	14.9	73.0	0.0	0.1	100.0	26.9	1,265
Southern	15.6	19.5	64.7	0.0	0.2	100.0	35.1	1,720
Western	44.1	18.0	37.8	0.1	0.0	100.0	62.1	1,883
District								
Kailahun	21.0	16.9	62.1	0.0	0.0	100.0	37.9	590
Kenema	16.8	17.2	66.0	0.0	0.0	100.0	34.0	643
Kono	21.7	16.9	61.5	0.0	0.0	100.0	38.5	501
Bombali	33.0	16.5	50.4	0.0	0.1	100.0	49.5	512
Falaba	13.0	9.8	77.2	0.0	0.0	100.0	22.8	192
Koinadugu	13.6	17.8	68.1	0.0	0.5	100.0	31.3	193
Tonkolili	18.1	12.1	69.7	0.0	0.0	100.0	30.3	816
Kambia	9.4	8.5	82.1	0.0	0.0	100.0	17.9	310
Karene	16.1	10.6	73.0	0.0	0.3	100.0	26.7	340
Port Loko	11.1	20.5	68.4	0.0	0.0	100.0	31.6	615
Bo	17.5	22.2	60.0	0.0	0.2	100.0	39.8	682
Bonthe	21.1	14.0	64.7	0.0	0.2	100.0	35.0	399
Moyamba	7.1	20.7	71.7	0.0	0.5	100.0	27.8	380
Pujehun	13.6	18.9	67.5	0.0	0.0	100.0	32.5	246
Western Area Rural	31.1	18.0	50.9	0.0	0.0	100.0	49.1	781
Western Area Urban	53.3	18.0	28.6	0.1	0.0	100.0	71.3	1,102
Wealth quintile								
Lowest	11.9	15.3	72.7	0.0	0.0	100.0	27.3	1,605
Second	10.9	14.5	74.4	0.0	0.2	100.0	25.4	1,561
Middle	19.2	16.0	64.6	0.0	0.2	100.0	35.3	1,666
Fourth	21.5	19.5	59.0	0.0	0.0	100.0	41.0	1,675
Highest	50.9	18.1	30.9	0.1	0.0	100.0	69.0	1,793
Total	23.6	16.8	59.6	0.0	0.1	100.0	40.3	8,300

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

Table 2.11 Exposure to mass media

Percentage of women age 15-49 who are exposed to specific media on a weekly basis, according to background characteristics, Sierra Leone MIS 2021

Background characteristic	Reads a newspaper at least once a week	Watches television at least once a week	Listens to the radio at least once a week	Accesses all three media at least once a week	Accesses none of the three media at least once a week	Number of women
Age						
15-19	9.9	22.9	26.6	6.6	63.7	1,414
20-24	10.5	23.4	30.8	6.9	60.3	1,500
25-29	6.7	21.5	28.5	5.2	64.6	1,720
30-34	5.2	18.9	26.5	4.2	66.1	1,297
35-39	5.8	20.4	28.2	4.9	65.3	1,203
40-44	5.6	17.2	29.0	3.5	64.9	641
45-49	6.4	17.1	28.5	4.8	65.9	525
Residence						
Urban	14.0	39.3	38.3	11.1	47.3	3,513
Rural	2.7	7.4	20.9	1.2	76.5	4,787
Region						
Eastern	5.1	14.8	30.8	2.2	64.8	1,715
Northern	3.2	11.8	21.2	1.5	74.8	1,717
North Western	3.4	8.9	19.9	1.7	75.7	1,265
Southern	3.6	8.3	20.7	2.2	76.3	1,720
Western	19.7	54.4	45.1	17.1	35.0	1,883
District						
Kailahun	3.8	22.6	36.4	0.5	57.6	590
Kenema	4.2	9.4	27.2	2.0	69.9	643
Kono	8.0	13.4	29.1	4.7	66.1	501
Bombali	5.0	23.8	36.3	2.3	56.5	512
Falaba	2.4	8.3	15.9	1.2	80.7	192
Koinadugu	7.9	19.0	19.6	6.4	74.8	193
Tonkolili	1.2	3.4	13.4	0.0	84.7	816
Kambia	0.7	9.2	33.5	0.5	64.2	310
Karene	1.7	3.5	18.6	0.0	77.5	340
Port Loko	5.7	11.7	13.7	3.3	80.4	615
Bo	4.6	10.4	26.5	2.6	70.1	682
Bonthe	2.8	7.8	16.3	2.4	79.3	399
Moyamba	3.7	7.7	20.9	2.4	77.3	380
Pujehun	1.5	1.6	9.8	0.0	89.1	246
Western Area Rural	10.7	37.0	34.3	8.7	51.4	781
Western Area Urban	26.1	66.7	52.7	23.1	23.3	1,102
Woman's education						
No education	0.3	9.5	19.7	0.2	76.1	4,242
Primary	2.4	14.7	23.9	0.7	70.2	743
Secondary	15.7	34.5	38.9	11.0	49.6	3,122
More than secondary	51.3	75.8	63.5	45.5	13.2	192
Wealth quintile						
Lowest	3.1	7.3	23.4	0.6	73.7	1,605
Second	1.7	6.3	19.2	0.4	78.6	1,561
Middle	3.4	10.1	23.3	2.0	73.6	1,666
Fourth	6.2	17.3	24.4	4.1	69.0	1,675
Highest	21.5	59.3	48.8	18.4	29.6	1,793
Total	7.5	20.9	28.3	5.4	64.1	8,300

Table 2.12 Internet usage

Percentage of women age 15-49 who have ever used the internet, and percentage who have used the internet in the past 12 months; and among women who have used the internet in the past 12 months, percent distribution by frequency of internet use in the past month, according to background characteristics, Sierra Leone MIS 2021

Background characteristic	Ever used the internet	Used the internet in the past 12 months	Number	Among respondents who have used the internet in the past 12 months, percentage who, in the past month, used internet: Almost every day	At least once a week	Less than once a week	Not at all	Missing	Total	Number
Age										
15-19	19.3	18.6	1,414	83.5	10.1	4.9	1.5	0.0	100.0	262
20-24	26.3	25.4	1,500	80.9	13.2	2.8	3.2	0.0	100.0	382
25-29	24.2	23.6	1,720	81.2	10.1	7.0	1.6	0.0	100.0	406
30-34	20.8	19.4	1,297	83.5	11.9	2.6	2.0	0.0	100.0	252
35-39	17.7	17.3	1,203	89.1	7.5	3.4	0.0	0.0	100.0	208
40-44	14.1	13.7	641	95.9	3.8	0.3	0.0	0.0	100.0	88
45-49	14.5	13.9	525	82.0	13.8	4.1	0.0	0.0	100.0	73
Residence										
Urban	39.1	38.0	3,513	86.0	9.8	2.7	1.4	0.0	100.0	1,336
Rural	7.5	7.0	4,787	74.1	13.6	9.8	2.5	0.0	100.0	334
Region										
Eastern	13.6	13.2	1,715	75.3	17.0	4.5	3.2	0.0	100.0	227
Northern	13.0	11.9	1,717	80.3	14.8	2.7	2.1	0.0	100.0	204
North Western	14.9	14.3	1,265	64.5	18.7	15.8	1.0	0.0	100.0	181
Southern	10.4	9.7	1,720	82.7	11.6	3.9	1.8	0.0	100.0	167
Western	48.3	47.3	1,883	90.6	6.1	2.0	1.3	0.0	100.0	890
District										
Kailahun	8.1	7.9	590	79.1	15.9	5.0	0.0	0.0	100.0	46
Kenema	14.1	13.9	643	63.7	20.3	8.7	7.2	0.0	100.0	89
Kono	19.4	18.7	501	85.2	13.8	0.0	1.0	0.0	100.0	94
Bombali	21.3	20.3	512	75.9	19.1	4.4	0.6	0.0	100.0	104
Falaba	8.0	7.8	192	(86.7)	(13.3)	(0.0)	(0.0)	(0.0)	(100.0)	15
Koinadugu	11.8	10.7	193	(79.5)	(16.3)	(0.0)	(4.1)	(0.0)	(100.0)	21
Tonkolili	9.3	7.9	816	(86.1)	(7.9)	(1.5)	(4.4)	(0.0)	(100.0)	65
Kambia	7.1	6.2	310	(83.3)	(5.8)	(11.0)	(0.0)	(0.0)	(100.0)	19
Karene	11.7	11.0	340	59.8	15.6	24.5	0.0	0.0	100.0	37
Port Loko	20.6	20.3	615	63.0	21.7	14.0	1.4	0.0	100.0	125
Bo	15.0	14.5	682	89.0	8.6	2.5	0.0	0.0	100.0	99
Bonthe	9.4	8.9	399	(74.7)	(22.7)	(2.6)	(0.0)	(0.0)	(100.0)	35
Moyamba	6.8	5.5	380	(85.4)	(6.8)	(2.1)	(5.7)	(0.0)	(100.0)	21
Pujehun	4.7	4.0	246	*	*	*	*	*	*	10
Western Area Rural	32.0	31.0	781	81.9	14.1	1.9	2.0	0.0	100.0	242
Western Area Urban	59.8	58.8	1,102	93.8	3.1	2.1	1.0	0.0	100.0	648
Woman's education										
No education	5.6	5.0	4,242	73.3	17.5	7.5	1.7	0.0	100.0	212
Primary	11.7	10.9	743	76.3	12.4	8.3	3.0	0.0	100.0	81
Secondary	39.2	38.2	3,122	84.2	10.4	3.6	1.8	0.0	100.0	1,193
More than secondary	96.1	96.1	192	95.0	2.9	2.1	0.0	0.0	100.0	184
Wealth quintile										
Lowest	5.5	5.0	1,605	72.2	16.0	8.2	3.6	0.0	100.0	81
Second	7.7	7.3	1,561	67.0	13.1	13.9	5.9	0.0	100.0	113
Middle	12.9	12.1	1,666	72.3	17.8	6.1	3.8	0.0	100.0	202
Fourth	17.5	16.8	1,675	78.5	14.1	5.5	1.9	0.0	100.0	282
Highest	56.8	55.3	1,793	90.2	7.4	1.9	0.5	0.0	100.0	992
Total	20.9	20.1	8,300	83.6	10.6	4.1	1.7	0.0	100.0	1,670

Figures in parentheses are based on 25-49 unweighted cases.
An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

MALARIA PREVENTION 3

Key Findings

- ***Ownership of Insecticide-Treated Nets (ITNs):*** 61% of households own at least one Insecticide-Treated Net (ITN).
- ***Sources of ITNs:*** 90% of ITNs owned by households were obtained from a mass distribution campaign.
- ***Access to an ITN:*** More than 4 in 10 people (43%) have access to an ITN. This means that 43% of the country's population could sleep under an ITN if each ITN in a household were used by two people.
- ***Use of ITNs:*** 72% of the de facto population in households owning at least one ITN slept under an ITN the night before the survey.
- ***Use of ITN by Children under age 5:*** 76% of children under 5 in households owning at least one ITN slept under an ITN the night before the survey.
- ***Use of ITN by pregnant women:*** 87% of pregnant women age 15-49 in households owning at least one ITN slept under an ITN the night before the survey.
- ***Intermittent Preventive Treatment (IPTp):*** 52% of women received three or more doses of Sulfadoxine Pyrimethamine (SP)/Fansidar during pregnancy.
- ***Intermittent Preventive Treatment (IPTi):*** Among children under 3 years, with card vaccination seen, 60% received three doses of Sulfadoxine Pyrimethamine (SP)/Fansidar during routine immunization.

This chapter describes the population coverage rates of some of the key malaria control interventions in Sierra Leone, including the ownership and use of Insecticide-Treated Nets (ITNs) and Intermittent Preventive Treatment in pregnancy (IPTp) and Intermittent Preventive Treatment (IPTi) in infants. Malaria control efforts focus on scaling-up these interventions.

The Sierra Leone Malaria Control Strategic Plan 2016-2020 envisages universal coverage of the population with ITNs through routine distribution and mass campaigns in order to reduce the burden of malaria (MoHS 2015a). ITNs are routinely distributed free of charge to children less than age one on successful completion of Penta 3 immunisation (third dose of a vaccine against diphtheria, pertussis, tetanus, *Haemophilus influenzae* type b, and hepatitis B) and to pregnant women during antenatal care (ANC) visit.

3.1 OWNERSHIP OF INSECTICIDE-TREATED NETS

Ownership of Insecticide-Treated Nets (ITN)
Households that have at least one Insecticide-Treated Net (ITN). An ITN is defined as a factory-treated net with insecticide, insect-growth regulator and/or synergist that does not require any further treatment.
Sample: Households

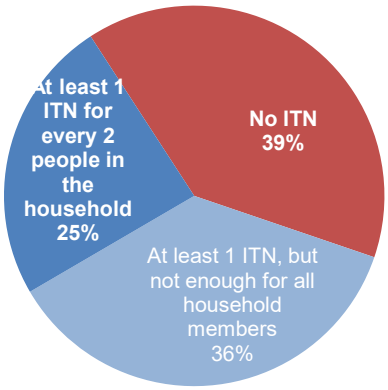
Full household ITN coverage
Percentage of households with at least one ITN for every two people.
Sample: Households

Overall, 61% of households have at least one mosquito net, and practically almost all mosquito nets owned by households in Sierra Leone are ITNs. The average number of ITNs per household is 1.2 (**Table 3.1**).

Twenty-five percent of households have at least one ITN for every two persons who stayed in the household the night preceding the survey. In other words, 25% of households own enough ITNs to cover all household members (**Table 3.1** and **Figure 3.1**). To offer maximum protection, ITN distribution needs to expand to reach the 39% of households that do not currently own any ITN and to provide enough ITNs for the 36% of households that own at least one ITN but have an insufficient supply for the number of household members (**Figure 3.1**).

***Figure 3.1* Household ownership of ITNs**

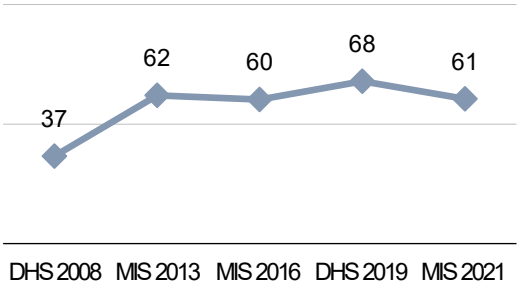
Percent distribution of households ownership



Trends: Ownership of ITNs in Sierra Leone increase from 60% in SLMIS 2016 to 68% in SLDHS 2019 but fall back to 61% in SLMIS 2021 (**Figure 3.2**).

***Figure 3.2* Trend of ITN ownership**

Percentage of households owning at least one insecticide-treated net (ITN)



Note: The definition of an ITN in surveys conducted prior to 2015 included nets that had been soaked with insecticides within the past 12 months.

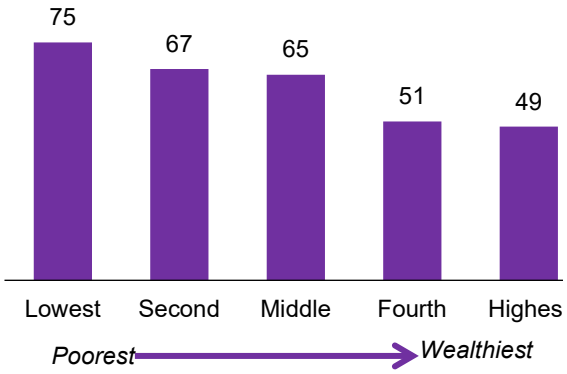
Patterns by background characteristics

- Household ownership of ITNs in Sierra Leone is higher in rural areas (66%) than urban areas (53%) areas (**Table 3.1**).
- Household ownership of ITNs declines with increasing wealth, from 75% in the lowest wealth quintile to 49% in the highest quintile (**Figure 3.3**).
- By region, household ownership of ITNs is highest in Eastern region (74%) and lowest in Western region (42%) (**Table 3.1**).

- The percentage of households owning at least one ITN for every two persons who stayed in the household the night preceding the survey is higher in rural areas (28%) than in urban areas (20%) **(Table 3.1)**.
- Full household ITN coverage is highest in Southern region (31%) and lowest in Western region (15%) **(Table 3.1)**.
- The percentage of households with at least one ITN for every two persons who stayed in the household the night preceding the survey is 20% and 26% in the highest and middle wealth quintiles respectively, as compared to 30% each in the lowest quintile (**Table 3.1**).

***Figure 3.3* ITN ownership by household wealth**

Percentage of households with at least one insecticide-treated net (ITN)

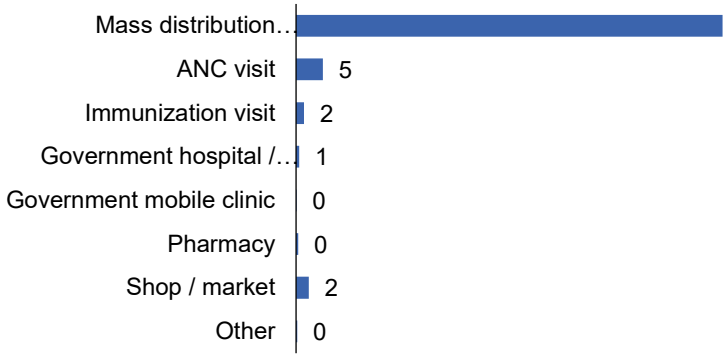


Source of Nets

Ninety percent (90%) of ITNs in Sierra Leone households were obtained through mass distribution campaigns, while 5% were obtained during ANC visits, 2% were obtained during routine immunization visits, and 2% were obtained from a shop or market (**Table 3.2** and **Figure 3.4**).

***Figure 3.4* Source of ITNs**

Percent distribution of insecticide-treated nets (ITNs) in interviewed households



Patterns by background characteristics

- Eighty-five percent (85%) of nets in urban areas and 92% in rural areas were obtained during mass campaign. However, the percentage of households obtaining nets from shop or market is higher in urban areas than rural areas (**Table 3.2**).
- By region, the percentage of households obtaining nets through mass campaigns is highest in Eastern region (94%) and lowest in the Western region (74%) (**Table 3.2**).
- Fifty-eight percent of mosquito nets obtained from shop or market were classified as other nets (any nets that are not ITNs) (**Table 3.2**).

Mosquito net preferences

Social marketing efforts make it easier to change behavior by making sure the necessary supports are not only available, but also easily accessible to the most people possible, and preferences for various social marketing goods significantly affect the consistent use of products. In this survey, the SLMIS 2021 assessed respondents'

preferences for shape, colour, and material of mosquito nets (**Table 3.3**). Most respondents (52%) prefer conical, 41% prefer rectangular, 5% opt for either and 2% did not have a clear preference. Sixty-two percent of respondents prefer the nets with blue colour, 29% prefer white, and 8% prefer green nets. Eighty-one percent of respondents preferred a soft net material, while 18% preferred a hard material.

Trends: The percentage of respondents who reported a preference for conical nets increased from 33% in the SLMIS 2013 to 54% in the SLMIS 2016, then declined slightly by two percentage points to 52% in the SLMIS 2021.

3.2 HOUSEHOLD ACCESS TO AND USE OF ITNS

Access to an ITN

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

Sample: De facto household population

Use of ITNs

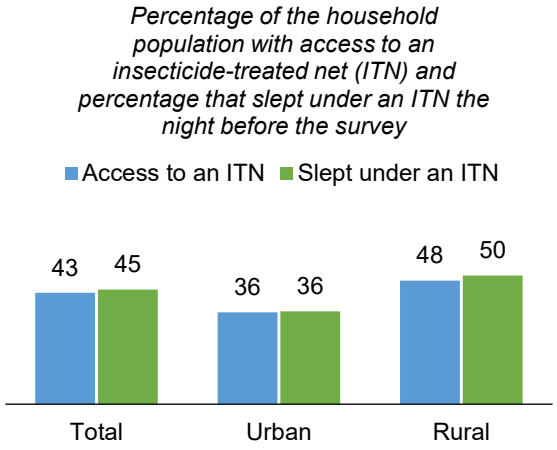
Percentage of the population that slept under an ITN the night before the survey.

Sample: De facto household population

Access to an ITN is measured by the proportion of the population that could sleep under an ITN if each ITN in the household were used by up to two people. Comparing ITN access and ITN use indicators can help programs identify if there is a behavioral gap in which available ITNs are not being used. If the difference between these indicators is substantial, the malaria programme may need to focus on behavior change and identify the main barriers to ITN use. This analysis helps malaria programmes determine whether they need to achieve higher ITN coverage, promote ITN use, or both.

Nationally, 43% of de facto household members in Sierra Leone who stayed in the household the night before the survey could sleep inside an ITN if each ITN were used by up to two people (**Table 3.4** and **Table 3.5**). The results showed that 45% of the population slept under an ITN the night before the survey (**Table 3.6** and **Figure 3.5**). Based on these two numbers, it is evident that there is only a small difference between ITN access and ITN use at the population level. Overall, 91% of ITNs were used the night before the survey (**Table 3.7**).

***Figure 3.5* Access to and use of ITNs by residence**



Patterns by background characteristics

- Access to ITNs is higher in rural areas (48%) than in urban areas (36%) (**Table 3.5**).
- The percentage of household residents with access to an ITN ranges from 53% among those in the lowest wealth quintile to 34% among those in the highest quintile **(Table 3.5).**
- ITN access among the de facto population ranges from a high of 52% in the Southern region to a low of 27% in the Western region **(Table 3.5)**.

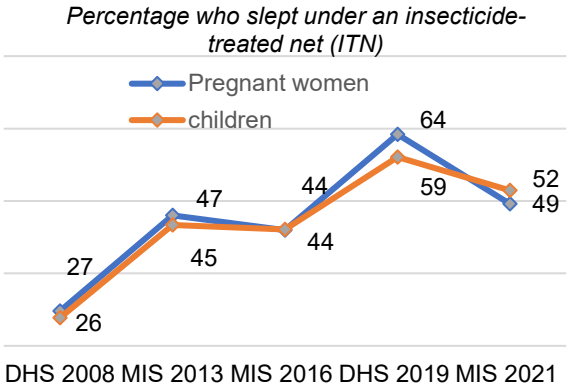
- Urban residents (36%) are less likely than rural residents (50%) to have slept under an ITN the night before the survey (**Table 3.6**).
- The difference between ITN access and ITN use is slightly higher among rural residents (2 percentage points) than urban residents (0 percentage point) (**Figure 3.5**).
- The percentage of the household population that slept under an ITN the night before the survey is highest in the Eastern region (55%) and lowest in the Western region (27%) (**Table 3.6**).
- Use of ITNs highest among households in the lowest wealth quintile to (57%) and lowest among households in the middle quintile (48%) and in the highest quintile (34%) (**Table 3.7**).

3.3 USE OF ITNS BY CHILDREN AND PREGNANT WOMEN

Half of children less than age 5 slept under an ITN the night before the survey. The percentage of children who slept under an ITN decreases with increasing age, from 59% among those age 0-11 months to 47% among those age 48-59 months (**Table 3.8**). Fifty-two percent of pregnant women slept under an ITN the night before the survey (**Table 3.9**).

Trends: Use of ITNs among children under age 5 increased from 26% in 2008 (SLDHS) to 49% in 2013 (SLMIS), slightly dropped to 44% in 2016 (SLMIS), then increased to 59% in 2019 (SLDHS) before dropping to 50% in 2021 (SLMIS). Trend in the use of ITNs by pregnant women have similar patterns to that of children under age 5 (**Figure 3.6**).

Figure 3.6 **Trends in use of ITNs by pregnant women and children**



Note: The definition of an ITN in surveys conducted prior to 2015 included nets that

Patterns by background characteristics

- A higher percentage of children under age 5 in rural (53%) than urban (43%) areas slept under an ITN the night before the survey (**Table 3.8**). A similar pattern was observed among pregnant women (54% and 48%, respectively) (**Table 3.9**).
- The proportions of children under age 5 and pregnant women who slept under an ITN the night before the survey are highest in the Eastern Region (60% and 61%, respectively) and lowest in the Western Region (33% and 26%, respectively) **(Table 3.8** and **Table 3.9**).

3.4 MALARIA IN PREGNANCY

Intermittent Preventive Treatment (IPTp) during pregnancy

Percentage of women who took three or more doses of Sulfadoxine - Pyrimethamine (SP)/Fansidar during their last pregnancy.

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

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

The World Health Organization (WHO) recommends a three-pronged approach for reducing the negative health effects associated with malaria in pregnancy: prompt diagnosis and treatment of confirmed infections, use of ITNs, and IPTp (WHO 2019).

The SLMIS 2021assessed use of antenatal care services for the last birth in the 2 years preceding the survey and IPTp usage during the pregnancy for the last birth in the 2 years preceding the survey among women age 15-49.

Antenatal care (ANC)

Overall, 96% of pregnant women received antenatal care from a skilled provider for their last birth in the past 2 years (**Table 3.11**). The skilled provider includes doctor, nurse/midwife, or health personnel. Less than 1% received care from a community health worker, a traditional birth attendant or others, and less than 4% did not receive any antenatal care.

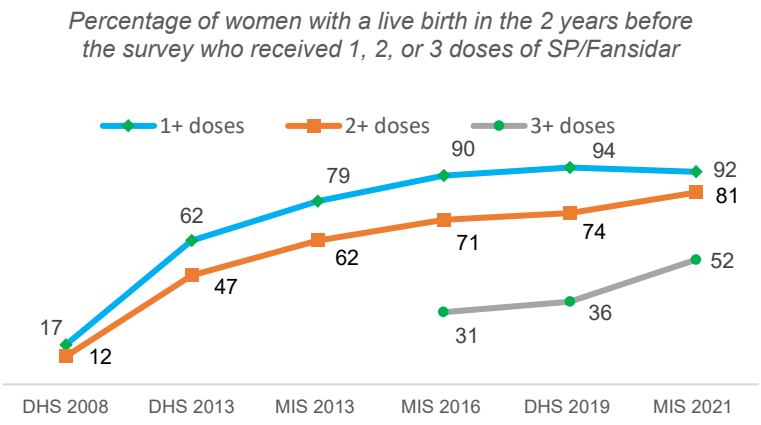
IPTp

Sulfadoxine-Pyrimethamine (SP), sold under the brand name Fansidar, is the recommended medicine for IPTp in Sierra Leone. The Ministry of Health and Sanitation had been implementing IPTp, defined as provision of at least two doses of SP/Fansidar to protect the mother and her child from malaria during routine ANC visits in the second and third trimesters of pregnancy (IPTp2+). The National Malaria Programme adopted the 2012 WHO recommendation to administer one dose of SP/Fansidar at each antenatal care visit after the first trimester, with at least 1 month between doses. The household survey indicator used to measure coverage of this intervention is the percentage of women with a live birth in the 2 years preceding the survey who received three or more doses of SP/Fansidar to prevent malaria during their most recent pregnancy (IPTp3+).

Figure 3.7

Trends in IPTp use by pregnant women

Ninety-two percent (92%) of women with a live birth in the 2 years preceding the survey reported having taken one or more doses of SP/Fansidar; 81% reported taking two or more doses, and 52% reported taking three or more doses (**Table 3.10**).



Trends: The percentage of pregnant women who reported taking two or more doses of SP/Fansidar has increased since 2008 (SLDHS), from 10% to

83% 2021 (SLMIS). There have also been increases in the percentage of women taking three or more doses (from 2016 (SLMIS) 31% to 52% 2021 (SLMIS) (**Figure 3.7**).

Patterns by background characteristics

- The proportion of women with a live birth in the 2 years preceding the survey who received three or more doses of SP/Fansidar is higher in rural areas (55%) than in urban areas (47%) (**Table 3.11**).
- Forty-three percent of women in the Western region received three or more doses of SP/Fansidar, as compared with 51% to 57% of women in the other regions.
- Eighty-four percent of women in Kambia district received three or more doses of SP/Fansidar.
- The percentage of women receiving SP/Fansidar (one or more, two or more, or three or more doses) do not have similar pattern with the level of household wealth (**Table 3.11**).

3.5 Malaria Prevention in Children

Table 3.12 gives the percentage of children born 0-35 months before the survey who received specific vaccines and intermittent preventive treatment (IPTi) at any time before the survey. Among children with vaccination card seen by the interviewer, overall, 66% of children under 3 years received measles 1 vaccine, 91% got DPT-HepB-Hib (Pentavalent) 2, and 82% received DPT-HepB-Hib (Pentavalent) 3.

With regard to ITPi medicine, according to the World Health Organization (WHO), IPTi is a full therapeutic course of antimalarial medicine delivered to infants through routine immunization services, regardless of whether the child is infected with malaria or not. Treatment is given 3 times during the first year of life at approximately 10 weeks, 14 weeks, and 9 months of age, corresponding to the routine vaccination schedule of the Expanded Programme on Immunization (EPI). **Table 3.12** shows that among children with vaccination card seen, 86% of children got ITPi 1, 75% received ITPi 2 and 59% got ITPi3.

3.6 Conclusion

- Ownership of ITNs is an important challenge for Sierra Leone malaria programme and remain unchanged since the past 5 years, where only 3 out of 5 households own an ITN. ITN is substantially less available in rural households than urban households.
- Less than half of the household population have access to an ITN and slept under an ITN.
- Only about half of the children and pregnant women, the high-risk groups of malaria infection, slept under the ITN. This figure had declined in the past two years.
- The IPTp program is a success as the percentage of pregnant women who were taking two or more doses and three or more doses increased steadily between 2008 and 2021, from 10% to 83%, and 31% to 52% respectively.

LIST OF TABLES

For more information on malaria, see the following tables:

Table 3.1 Household possession of mosquito nets

Percentage of households with at least one mosquito net (treated or untreated) and insecticide-treated net (ITN); average number of nets and ITNs per household; and percentage of households with at least one net and ITN per two persons who stayed in the household last night, according to background characteristics, Sierra Leone MIS 2021

	Percentage of households with at least one mosquito net		Average number of mosquito nets per household			Percentage of households with at least one net for every two people who stayed in the household last night		
Background Characteristic	Any mosquito net	An insecticide-treated mosquito net (ITN) [1]	Any mosquito net	An insecticide-treated mosquito net (ITN) [1]	Number of households	Any mosquito net	An insecticide-treated mosquito net (ITN) [1]	Number of households with at least one person who spent the last night in the household
Residence								
Urban	52.9	52.6	1.0	1.0	3,230	19.9	19.9	3,230
Rural	66.5	66.3	1.4	1.4	4,760	27.8	27.8	4,760
Region								
Eastern	73.7	73.5	1.4	1.4	1,642	27.6	27.5	1,642
Northern	60.8	60.5	1.2	1.2	1,581	23.4	23.4	1,581
North Western	59.9	59.7	1.2	1.2	1,308	27.1	27.1	1,308
Southern	69.5	69.2	1.6	1.6	1,695	30.6	30.6	1,695
Western	42.2	41.8	0.7	0.7	1,764	15.4	15.3	1,764
District								
Kailahun	79.0	78.8	1.4	1.4	545	25.6	25.5	545
Kenema	68.6	68.5	1.3	1.3	630	23.1	23.1	630
Kono	72.8	72.6	1.4	1.4	483	35.2	35.0	483
Bombali	62.8	62.6	1.3	1.3	438	23.0	23.0	438
Falaba	51.7	51.7	1.1	1.1	185	20.6	20.6	185
Koinadugu	74.2	73.1	1.9	1.9	173	41.4	41.4	173
Tonkolili	58.9	58.7	1.1	1.1	781	20.2	20.2	781
Kambia	42.8	42.8	0.9	0.9	327	14.5	14.5	327
Karene	81.4	81.1	1.8	1.8	319	38.5	38.5	319
Port Loko	58.0	57.6	1.1	1.1	662	27.7	27.7	662
Bo	77.1	76.9	1.8	1.8	628	32.3	32.3	628
Bonthe	71.1	70.6	1.7	1.7	346	24.6	24.6	346
Moyamba	80.0	79.7	1.9	1.9	352	39.8	39.8	352
Pujehun	45.7	45.7	1.0	1.0	358	25.0	25.0	358
Western Area Rural	49.6	49.4	0.9	0.9	632	17.6	17.4	632
Western Area Urban	38.0	37.6	0.6	0.6	1,132	14.2	14.2	1,132
Wealth quintile								
Lowest	75.6	75.4	1.7	1.7	1,429	29.5	29.5	1,429
Second	67.2	67.1	1.5	1.5	1,514	29.3	29.3	1,514
Middle	65.6	65.3	1.3	1.3	1,555	26.0	26.0	1,555
Fourth	50.8	50.5	0.9	0.9	1,719	19.3	19.2	1,719
Highest	49.8	49.4	0.9	0.9	1,773	20.6	20.5	1,773
Wealth quintile								
Lowest	75.6	75.4	1.7	1.7	1,429	29.5	29.5	1,429
Second	67.2	67.1	1.5	1.5	1,514	29.3	29.3	1,514
Middle	65.6	65.3	1.3	1.3	1,555	26.0	26.0	1,555
Fourth	50.8	50.5	0.9	0.9	1,719	19.3	19.2	1,719
Highest	49.8	49.4	0.9	0.9	1,773	20.6	20.5	1,773
Total	61.0	60.8	1.2	1.2	7,990	24.6	24.6	7,990

[1] An insecticide-treated mosquito net (ITN) is a mosquito net that has been industrially treated by the manufacturer and does not require additional treatment.

Table 3.2 Source of mosquito nets

Percent distribution of mosquito nets by source of net, according to background characteristics, Sierra Leone MIS 2021

Background Characteristic	Yes, campaign	Yes, antenatal care	Yes, immunization visit	Gov.hospital / health facilities	Government mobile clinic	Private mobile clinics	Private health facility	Pharmacy	Shop / market	CHW	NGO	School	Other	Don't know	Missing	Total	Number of mosquio nets
Type of mosquito nets																	
ITN[1]	89.9	5.0	1.5	0.6	0.1	0.0	0.0	0.4	2.2	0.0	0.0	0.0	0.1	0.1	0.0	100.0	9,755
Other[2]	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(58.4)	(5.9)	(3.4)	(0.0)	(9.9)	(22.4)	(0.0)	(100.0)	27
Residence																	
Urban	85.2	5.1	2.4	0.4	0.1	0.0	0.0	1.1	5.2	0.0	0.0	0.0	0.1	0.3	0.0	100.0	3,153
Rural	91.8	4.9	1.1	0.7	0.0	0.0	0.0	0.0	1.0	0.1	0.0	0.0	0.2	0.1	0.0	100.0	6,630
Region																	
Eastern	93.8	2.8	1.5	0.3	0.0	0.0	0.0	0.0	1.0	0.1	0.0	0.0	0.4	0.0	0.0	100.0	2,262
Northern	89.4	2.2	2.8	2.6	0.1	0.0	0.0	0.1	2.0	0.1	0.1	0.0	0.1	0.4	0.0	100.0	1,943
North Western	92.8	5.4	0.5	0.1	0.0	0.0	0.0	0.0	1.0	0.1	0.0	0.0	0.0	0.0	0.0	100.0	1,604
Southern	91.8	7.0	0.2	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	2,709
Western	74.1	8.3	3.8	0.0	0.1	0.0	0.0	2.8	10.3	0.0	0.0	0.0	0.1	0.5	0.0	100.0	1,264
District																	
Kailahun	97.9	0.7	1.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	100.0	786
Kenema	91.1	5.2	1.1	0.8	0.1	0.0	0.1	0.0	0.4	0.0	0.1	0.0	1.1	0.0	0.0	100.0	816
Kono	92.3	2.2	2.7	0.0	0.0	0.1	0.0	0.0	2.3	0.3	0.0	0.0	0.0	0.0	0.0	100.0	670
Bombali	93.4	1.3	1.8	0.2	0.0	0.0	0.0	0.0	2.3	0.0	0.2	0.0	0.0	0.8	0.0	100.0	560
Falaba	90.3	3.4	3.7	0.0	0.0	0.0	0.0	0.9	1.1	0.0	0.0	0.0	0.0	0.6	0.0	100.0	207
Koinadugu	85.5	2.5	9.7	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.6	0.0	100.0	329
Tonkolili	88.0	2.4	0.6	6.0	0.3	0.0	0.0	0.0	2.1	0.1	0.0	0.0	0.3	0.1	0.0	100.0	840
Kambia	83.1	11.3	2.6	0.4	0.0	0.0	0.0	0.0	2.4	0.3	0.0	0.0	0.0	0.0	0.0	100.0	307
Karene	95.4	3.5	0.1	0.1	0.0	0.0	0.0	0.0	0.7	0.1	0.0	0.0	0.0	0.0	0.0	100.0	572
Port Loko	94.9	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	100.0	725
Bo	98.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.1	0.1	0.0	100.0	1,114
Bonthe	88.2	10.3	0.6	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	100.0	571
Moyamba	82.3	16.4	0.1	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	100.0	675
Pujehun	95.8	2.9	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	100.0	347
Western Area Rural	79.8	10.3	1.6	0.0	0.0	0.0	0.0	0.0	8.0	0.0	0.0	0.0	0.3	0.0	0.0	100.0	545
Western Area Urban	69.8	6.7	5.4	0.0	0.2	0.0	0.1	4.9	12.1	0.0	0.0	0.0	0.0	0.8	0.0	100.0	719
Wealth quintile																	
Lowest	93.1	3.9	0.9	0.6	0.0	0.0	0.0	0.1	1.0	0.0	0.0	0.0	0.2	0.1	0.0	100.0	2,402
Second	92.4	4.3	0.9	0.9	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.1	0.2	0.0	0.0	100.0	2,248
Middle	91.9	5.0	1.2	0.7	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.1	0.1	0.0	100.0	2,043
Fourth	87.3	6.9	2.4	0.6	0.2	0.0	0.0	0.0	1.9	0.1	0.1	0.0	0.2	0.2	0.0	100.0	1,539
Highest	79.7	5.6	2.9	0.1	0.1	0.0	0.0	2.3	8.9	0.0	0.0	0.0	0.0	0.4	0.0	100.0	1,551
Total	89.7	5.0	1.5	0.6	0.1	0.0	0.0	0.4	2.4	0.0	0.0	0.0	0.1	0.1	0.0	100.0	9,783

[1] An insecticide-treated mosquito net (ITN) is a mosquito net that has been industrially treated by the manufacturer and does not require additional treatment.

Table 3.3 Preferences of mosquito net

Percent distribution of household by preferred shape of mosquito net, by preferred colour of mosquito net and by preferred hardness of mosquito material, according to background characteristics, Sierra Leone MIS 2021

Background characteristic	Preferred shape					Preferred colour					Preferred hardness of net material				
	Conical	Rect-angular	Either	Don't know	Total	White	Blue	Green	Other	Total	Soft (poly-ester)	Hard (poly-ethyl-ene)	Don't know	Total	Number
Residence															
Urban	64.9	28.1	6.0	1.0	100.0	33.3	59.3	6.5	0.8	100.0	88.3	10.9	0.8	100.0	3,230
Rural	42.6	49.7	4.9	2.8	100.0	26.3	64.3	8.7	0.7	100.0	75.8	23.0	1.1	100.0	4,760
Region															
Eastern	66.4	31.4	2.2	0.0	100.0	28.5	61.9	8.9	0.7	100.0	71.4	28.5	0.0	100.0	1,642
Northern	41.8	39.5	9.2	9.6	100.0	31.8	63.8	3.0	1.3	100.0	72.4	22.9	4.7	100.0	1,581
North Western	37.4	57.9	4.1	0.6	100.0	29.1	66.1	4.2	0.5	100.0	84.6	15.3	0.1	100.0	1,308
Southern	41.4	55.4	3.0	0.2	100.0	19.1	65.4	14.8	0.6	100.0	84.6	15.3	0.1	100.0	1,695
Western	67.0	24.8	8.0	0.2	100.0	36.9	55.6	6.9	0.6	100.0	90.7	9.0	0.2	100.0	1,764
District															
Kailahun	58.2	40.7	1.1	0.0	100.0	32.7	58.3	8.7	0.3	100.0	66.0	34.0	0.0	100.0	529
Kenema	66.2	31.4	2.4	0.0	100.0	25.8	61.9	10.8	1.5	100.0	74.2	25.8	0.0	100.0	630
Kono	75.6	21.4	3.0	0.0	100.0	27.4	65.7	6.8	0.2	100.0	73.8	26.1	0.1	100.0	483
Bombali	48.8	35.6	15.1	0.5	100.0	42.3	55.8	0.9	0.9	100.0	84.2	15.8	0.0	100.0	438
Falaba	53.4	43.4	2.7	0.5	100.0	15.8	70.8	10.5	2.9	100.0	49.8	50.2	0.0	100.0	190
Koinadugu	48.0	45.1	6.7	0.2	100.0	21.4	71.5	6.6	0.4	100.0	69.1	30.7	0.2	100.0	173
Tonkolili	33.6	39.4	7.9	19.1	100.0	32.1	64.9	1.6	1.4	100.0	72.0	18.5	9.5	100.0	781
Kambia	20.4	72.0	7.6	0.0	100.0	22.5	70.3	6.4	0.8	100.0	84.8	15.2	0.0	100.0	327
Karene	54.8	41.4	3.8	0.0	100.0	21.5	71.9	5.8	0.9	100.0	68.8	31.2	0.0	100.0	319
Port Loko	37.4	58.8	2.6	1.3	100.0	36.1	61.3	2.4	0.2	100.0	92.1	7.7	0.2	100.0	662
Bo	53.9	45.0	0.9	0.2	100.0	15.2	70.3	13.3	1.2	100.0	85.3	14.7	0.0	100.0	639
Bonthe	34.8	60.8	4.4	0.0	100.0	16.0	64.4	18.8	0.9	100.0	93.9	6.1	0.0	100.0	346
Moyamba	27.1	69.5	3.0	0.4	100.0	21.5	63.8	14.7	0.0	100.0	84.5	15.1	0.3	100.0	352
Pujehun	39.5	54.6	5.6	0.3	100.0	26.9	59.1	13.9	0.1	100.0	74.4	25.6	0.0	100.0	358
Western Area Rural	76.2	17.3	6.2	0.3	100.0	31.2	58.0	10.0	0.8	100.0	91.1	8.7	0.2	100.0	632
Western Area Urban	61.8	29.0	9.0	0.1	100.0	40.1	54.3	5.1	0.5	100.0	90.5	9.2	0.2	100.0	1,132
Wealth quintile															
Lowest	46.5	48.1	4.4	1.0	100.0	25.0	65.2	8.3	1.5	100.0	74.8	24.9	0.3	100.0	1,429
Second	45.3	47.3	5.2	2.2	100.0	28.4	63.6	7.6	0.5	100.0	75.5	23.9	0.6	100.0	1,514
Middle	48.1	42.1	5.1	4.8	100.0	25.1	65.4	8.7	0.7	100.0	78.1	19.7	2.2	100.0	1,555
Fourth	48.1	44.9	5.0	1.9	100.0	25.4	64.9	9.3	0.4	100.0	83.1	15.9	0.9	100.0	1,719
Highest	67.5	25.0	6.7	0.8	100.0	40.3	53.7	5.2	0.8	100.0	90.6	8.5	0.9	100.0	1,773
Total	51.6	41.0	5.3	2.1	100.0	29.1	62.3	7.8	0.8	100.0	80.8	18.1	1.0	100.0	7,990

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

Percent distribution of the de facto household population by number of ITNs the household owns, according to number of persons who stayed in the household the night before the survey, Sierra Leone MIS 2021

	Number of persons who stayed in the household the night before the survey								
Number of ITNs[1]	1	2	3	4	5	6	7	8+	Total
0	52.7	43.2	39.9	40.1	39.0	35.3	37.7	36.6	38.1
1	42.8	44.3	36.8	26.5	19.8	16.1	14.2	10.3	19.4
2	2.9	10.3	19.1	23.9	24.9	23.1	19.1	16.0	20.3
3	0.6	1.4	3.6	7.8	12.9	19.1	21.1	17.2	14.0
4	0.9	0.9	0.4	1.3	2.8	4.7	5.4	10.8	5.0
5	0.0	0.0	0.0	0.3	0.6	1.5	1.9	5.4	2.1
6	0.0	0.0	0.0	0.0	0.0	0.1	0.2	2.2	0.6
7	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.8	0.2
8+	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.7	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	384	1,177	3,418	6,175	7,318	6,299	4,965	10,734	40,470
Percentage of de facto population with access an ITN[1]	47.3	56.8	47.8	46.6	44.2	46.3	40.9	37.5	43.4

[1] An insecticide-treated mosquito net (ITN) is a mosquito net that has been industrially treated by the manufacturer and does not require additional treatment.

[2] Percentage of the de facto household population that could have slept under an ITN if each ITN in the household was used by a maximum of two people.

Table 3.5 Access to an ITN

Percentage of the de facto population with access to an ITN in the household, by background characteristics, Sierra Leone MIS 2021

Background Characteristic	Percentage of de facto population with access an ITN[1]	Defacto population
Residence		
Urban	36.1	15,819
Rural	48.2	24,651
Region		
Eastern	50.6	8,164
Northern	42.1	8,313
North Western	44.7	6,405
Southern	51.9	9,292
Western	27.2	8,295
District		
Kailahun	50.4	2,872
Kenema	47.2	3,187
Kono	54.7	2,200
Bombali	43.0	2,315
Falaba	38.3	990
Koinadugu	56.3	973
Tonkolili	38.9	4,008
Kambia	31.7	1,757
Karene	62.0	1,667
Port Loko	42.7	2,981
Bo	56.7	3,499
Bonthe	49.8	2,122
Moyamba	59.3	1,984
Pujehun	37.0	1,620
Western Area Rural	29.5	3,420
Western Area Urban	25.6	4,875
Wealth quintile		
Lowest	53.2	8,099
Second	49.2	8,100
Middle	46.1	8,096
Fourth	34.5	8,091
Highest	34.1	8,083
Total	43.4	40,470

[1] Percentage of the de facto household population that could have slept under an ITN if each ITN in the household was used by a maximum of two people.

Table 3.6 Use of mosquito nets by persons in the household

Percentage of the de facto household population who slept the night before the survey under a mosquito net (treated or untreated) and under an insecticide-treated net (ITN); and among the de facto household population in households with at least one ITN, percentage who slept under an ITN the night before the survey, according to background characteristics, Sierra Leone MIS 2021

	Household population			Household population in households with at least one ITN[1]	
Background Characteristic	Percentage who slept under any mosquito net last night	Percentage who slept under an ITN[1] last night	Household population	Percentage who slept under an ITN[1] last night	Number
age group					
<5	49.7	49.6	5,800	76.1	3,780
5-14	39.2	39.1	11,435	62.9	7,105
15-34	41.8	41.8	11,833	69.6	7,097
35-49	51.9	51.8	5,608	82.7	3,510
50+	49.4	49.4	5,724	80.6	3,507
DK/Missing	61.7	61.7	69	92.9	46
Sex					
Male	42.2	42.1	19,962	68.4	12,282
Female	47.2	47.1	20,508	75.7	12,764
Residence					
Urban	36.4	36.3	15,819	67.4	8,510
Rural	50.1	50.0	24,651	74.5	16,535
Region					
Eastern	55.3	55.2	8,164	74.7	6,032
Northern	45.6	45.6	8,313	75.1	5,046
North Western	42.8	42.8	6,405	70.6	3,879
Southern	51.7	51.7	9,292	73.0	6,579
Western	27.0	26.8	8,295	63.4	3,509
District					
Kailahun	55.9	55.8	2,872	71.8	2,229
Kenema	50.2	50.0	3,187	72.1	2,209
Kono	60.7	60.6	2,200	82.3	1,619
Bombali	47.9	47.8	2,315	76.0	1,456
Falaba	41.9	41.9	990	79.2	524
Koinadugu	52.4	52.4	973	75.1	679
Tonkolili	43.5	43.5	4,008	73.7	2,369
Kambia	32.3	32.2	1,757	67.8	833
Karene	57.2	57.2	1,667	70.0	1,362
Port Loko	41.0	40.9	2,981	72.4	1,684
Bo	57.6	57.6	3,499	74.5	2,706
Bonthe	47.7	47.7	2,122	66.6	1,520
Moyamba	60.1	60.1	1,984	76.0	1,567
Pujehun	35.5	35.5	1,620	74.0	778
Western Area Rural	31.5	31.4	3,420	68.4	1,569
Western Area Urban	23.8	23.7	4,875	59.4	1,941
Wealth quintile					
Lowest	56.9	56.8	8,099	75.6	6,085
Second	51.7	51.6	8,100	76.4	5,477
Middle	47.8	47.8	8,096	73.5	5,264
Fourth	32.8	32.7	8,091	64.2	4,115
Highest	34.4	34.2	8,083	67.4	4,105
Total	44.7	44.6	40,470	72.1	25,045

[1] An insecticide-treated mosquito net (ITN) is a mosquito net that has been industrially treated by the manufacturer and does not require additional treatment.

Table 3.7 Use of existing ITNs

Percentage of insecticide-treated nets (ITNs) that were used by anyone the night before the survey, according to background characteristics, Sierra Leone MIS 2021

Background Characteristic	Percentage of existing ITNs[1] used last night	Number of ITNs[1]
Residence		
Urban	89.8	3,142
Rural	90.8	6,613
Region		
Eastern	95.7	2,255
Northern	93.3	1,934
North Western	88.0	1,602
Southern	86.4	2,709
Western	88.8	1,256
District		
Kailahun	98.0	784
Kenema	90.6	812
Kono	99.2	669
Bombali	94.3	550
Falaba	94.9	207
Koinadugu	83.7	329
Tonkolili	95.9	840
Kambia	94.1	306
Karene	87.3	571
Port Loko	85.9	725
Bo	87.9	1,114
Bonthe	83.4	571
Moyamba	86.4	674
Pujehun	86.1	347
Western Area Rural	96.2	541
Western Area Urban	83.2	715
Wealth quintile		
Lowest	92.7	2,398
Second	91.5	2,243
Middle	92.8	2,042
Fourth	83.9	1,530
Highest	88.9	1,542
Total	90.5	9,755

[1] An insecticide-treated mosquito net (ITN) is a mosquito net that has been industrially treated by the manufacturer and does not require additional treatment.

Table 3.8 Use of mosquito nets by children

Percentage of children under age 5 who, the night before the survey, slept under a mosquito net (treated or untreated) and under an insecticide-treated net (ITN); and among children under age 5 in households with at least one ITN, percentage who slept under an ITN the night before the survey, according to background characteristics, Sierra Leone MIS 2021

	Children under 5 years in the households			Children under 5 years in the households with at least one ITN[1]	
Background Characteristic	Percentage who slept under any mosquito net last night	Percentage who slept under an ITN[1] last night	Number of children	Percentage who slept under an ITN[1] last night	Number of children
Age in months					
<12	59.9	59.4	788	82.4	568
12-23	54.2	54.2	1,003	80.7	674
24-35	46.7	46.7	1,199	76.1	736
36-47	45.6	45.6	1,390	71.5	886
48-59	47.3	47.2	1,420	73.2	916
Sex					
Male	49.3	49.2	2,940	75.9	1,906
Female	50.1	50.0	2,861	76.3	1,874
Residence					
Urban	43.4	43.3	2,021	74.1	1,179
Rural	53.0	53.0	3,780	77.0	2,601
Region					
Eastern	60.4	60.3	1,248	80.7	932
Northern	46.4	46.4	1,288	75.1	795
North Western	44.2	44.1	908	70.1	572
Southern	58.1	58.1	1,406	77.8	1,050
Western	32.8	32.5	951	71.8	431
District					
Kailahun	66.9	66.8	425	84.0	338
Kenema	54.1	53.9	543	77.6	377
Kono	61.7	61.7	290	81.0	221
Bombali	49.4	49.1	352	73.5	235
Falaba	43.2	43.2	130	77.3	73
Koinadugu	54.6	54.6	143	76.3	102
Tonkolili	43.6	43.6	658	75.2	382
Kambia	34.1	33.8	217	64.8	113
Karene	52.3	52.3	230	64.1	188
Port Loko	44.9	44.9	461	76.5	271
Bo	62.6	62.6	576	77.5	465
Bonthe	57.8	57.8	335	76.9	252
Moyamba	63.6	63.6	292	78.8	236
Pujehun	38.9	38.9	198	79.5	97
Western Area Rural	35.1	35.1	459	71.5	225
Western Area Urban	30.7	30.2	492	72.0	206
Wealth quintile					
Lowest	61.2	61.2	1,285	79.7	986
Second	52.2	52.1	1,205	77.6	809
Middle	51.5	51.5	1,217	75.6	830
Fourth	37.2	37.0	1,158	68.6	624
Highest	43.8	43.5	936	76.6	532
Total	49.7	49.6	5,800	76.1	3,780

Note: Table is based on children who stayed in the household the night before the interview.
[1] An insecticide-treated mosquito net (ITN) is a mosquito net that has been industrially treated by the manufacturer and does not require additional treatment.

Table 3.9 Use of mosquito nets by pregnant women

Percentage of pregnant women age 15-49 who, the night before the survey, slept under a mosquito net (treated or untreated) and under an insecticide-treated net (ITN); and among pregnant women age 15-49 in households with at least one ITN, percentage who slept under an ITN the night before the survey, according to background characteristics, Sierra Leone MIS 2021

	Among pregnant women age 15-49 in all households			Among pregnant women age 15-49 in households with at least one ITN[1]	
Background Characteristic	Percentage who slept under any mosquito net last night	Percentage who slept under an ITN[1] last night	Number of pregnant women	Percentage who slept under an ITN[1] last night	Number of pregnant women
Residence					
Urban	48.2	48.2	186	88.0	102
Rural	54.1	54.1	398	86.7	248
Region					
Eastern	60.5	60.5	121	87.6	84
Northern	56.8	56.8	146	90.3	92
North Western	51.6	51.6	122	79.6	79
Southern	54.1	54.1	124	87.3	77
Western	(26.4)	(26.4)	71	*	19
District					
Kailahun	(60.1)	(60.1)	42	(81.3)	31
Kenema	(55.4)	(55.4)	57	(88.8)	36
Kono	(73.1)	(73.1)	22	*	17
Bombali	*	*	16	*	11
Falaba	(80.6)	(80.6)	22	(93.8)	19
Koinadugu	(49.9)	(49.9)	20	(89.5)	11
Tonkolili	50.2	50.2	89	(87.2)	51
Kambia	(24.9)	(24.9)	26	*	10
Karene	(77.0)	(77.0)	34	(87.9)	29
Port Loko	49.0	49.0	63	(77.3)	40
Bo	(50.2)	(50.2)	38	*	24
Bonthe	(48.8)	(48.8)	42	(89.7)	23
Moyamba	(67.8)	(67.8)	32	(89.2)	24
Pujehun	*	*	12	*	6
Western Area Rural	*	*	28	*	10
Western Area Urban	(20.7)	(20.7)	42	*	9
Education					
No education	46.9	46.9	291	87.1	157
Primary	67.7	67.7	63	85.0	51
Secondary	54.8	54.8	220	87.3	138
More than secondary	*	*	10	*	6
Wealth quintile					
Lowest	52.1	52.1	112	80.0	73
Second	64.7	64.7	139	91.3	99
Middle	51.6	51.6	137	87.8	80
Fourth	45.4	45.4	118	84.0	64
Highest	41.5	41.5	78	(94.1)	35
Total	52.2	52.2	584	87.1	351

Note: Table is based on women who stayed in the household the night before the interview.
[1] An insecticide-treated mosquito net (ITN) is a mosquito net that has been industrially treated by the manufacturer and does not require additional treatment
Figures in parentheses are based on 25-49 unweighted cases.
An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

Table 3.10 Use of Intermittent Preventive Treatment (IPTp) by women during pregnancy

Percentage of women age 15-49 with a live birth in the 2 years preceding the survey who, during the pregnancy that resulted in the last live birth, received one or more doses of SP/Fansidar, received two or more doses of SP/Fansidar, and received three or more doses of SP/Fansidar, according to background characteristics, Sierra Leone MIS 2021

Background Characteristic	Percentage who received one or more doses of SP/Fansidar	Percentage who received two or more doses of SP/Fansidar	Percentage who received three or more doses of SP/Fansidar	Number of women with a live birth in the 2 years preceding the survey
Residence				
Urban	94.8	82.7	46.7	568
Rural	90.0	79.2	55.4	1,009
Region				
Eastern	95.2	86.0	51.0	349
Northern	87.5	71.7	53.3	401
North Western	92.1	86.5	56.5	209
Southern	92.1	80.4	56.3	363
Western	92.8	81.8	43.0	254
District				
Kailahun	94.3	83.1	44.9	106
Kenema	95.0	85.7	58.3	164
Kono	96.3	89.5	43.6	81
Bombali	95.0	85.8	65.6	102
Falaba	(76.7)	(75.3)	(55.6)	24
Koinadugu	94.4	84.7	72.0	38
Tonkolili	84.3	63.2	44.7	235
Kambia	94.9	92.3	83.6	60
Karene	88.3	68.9	33.1	39
Port Loko	92.0	89.6	50.0	110
Bo	96.4	87.9	63.0	160
Bonthe	92.0	66.7	37.2	96
Moyamba	87.5	86.3	74.7	68
Pujehun	83.7	73.8	44.4	38
Western Area Rural	92.7	80.7	31.2	127
Western Area Urban	93.0	82.8	54.8	127
Education				
No education	90.2	81.3	53.0	850
Primary	93.2	75.7	51.2	184
Secondary	93.9	81.2	51.6	520
More than secondary	*	*	*	23
Wealth quintile				
Lowest	91.1	79.0	52.2	365
Second	93.1	80.6	60.9	333
Middle	91.8	80.8	49.7	334
Fourth	87.8	76.4	44.7	308
Highest	96.0	87.4	53.6	237
Total	91.8	80.5	52.3	1,577

Note: Table is based on women who stayed in the household the night before the interview.
Figures in parentheses are based on 25-49 unweighted cases.
An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

Table 3.11 Antenatal care

Percent distribution of women age 15-49 who had a live birth in the 2 years preceding the survey by antenatal care (ANC) provider during pregnancy for the most recent birth and the percentage receiving antenatal care from a skilled provider for the most recent birth, according to background characteristics, Sierra Leone MIS 2021

Background characteristic	Antenatal care provider				No ANC	Total	Percentage receiving antenatal care from a skilled provider[1]	Number of women
	Doctor, nurse/midwife or health personnel	Community health worker	Traditional birth attendant	Other				
Age at birth								
<20	95.7	0.0	0.3	0.9	3.1	100.0	95.7	278
20-34	95.8	0.2	0.1	0.0	3.8	100.0	95.8	1,129
35-49	96.2	0.0	0.3	0.0	3.5	100.0	96.2	170
Birth order								
1	96.4	0.0	0.1	0.6	3.0	100.0	96.4	431
2-3	94.6	0.4	0.3	0.0	4.7	100.0	94.6	607
4-5	96.0	0.0	0.0	0.0	4.0	100.0	96.0	379
6+	99.0	0.0	0.3	0.0	0.7	100.0	99.0	160
Residence								
Urban	95.0	0.4	0.3	0.4	3.8	100.0	95.0	568
Rural	96.3	0.0	0.1	0.0	3.6	100.0	96.3	1,009
Region								
Eastern	97.3	0.0	0.0	0.0	2.7	100.0	97.3	349
Northern	95.3	0.0	0.1	0.0	4.6	100.0	95.3	401
North Western	95.1	0.5	0.8	0.0	3.7	100.0	95.1	209
Southern	97.0	0.0	0.0	0.0	3.0	100.0	97.0	363
Western	93.7	0.6	0.2	0.9	4.6	100.0	93.7	254
District								
Kailahun	99.0	0.0	0.0	0.0	1.0	100.0	99.0	106
Kenema	96.3	0.0	0.0	0.0	3.7	100.0	96.3	164
Kono	97.2	0.0	0.0	0.0	2.8	100.0	97.2	81
Bombali	97.0	0.0	0.0	0.0	3.0	100.0	97.0	102
Falaba	98.5	0.0	1.5	0.0	0.0	100.0	98.5	24
Koinadugu	92.0	0.0	0.0	0.0	8.0	100.0	92.0	38
Tonkolili	94.8	0.0	0.0	0.0	5.2	100.0	94.8	235
Kambia	100.0	0.0	0.0	0.0	0.0	100.0	100.0	60
Karene	99.2	0.0	0.0	0.0	0.8	100.0	99.2	39
Port Loko	90.9	0.9	1.5	0.0	6.7	100.0	90.9	110
Bo	96.9	0.0	0.0	0.0	3.1	100.0	96.9	160
Bonthe	95.1	0.0	0.0	0.0	4.9	100.0	95.1	96
Moyamba	98.3	0.0	0.0	0.0	1.7	100.0	98.3	68
Pujehun	100.0	0.0	0.0	0.0	0.0	100.0	100.0	38
Western Area Rural	93.6	0.0	0.3	1.9	4.2	100.0	93.6	127
Western Area Urban	93.9	1.2	0.0	0.0	4.9	100.0	93.9	127
Education								
No education	95.1	0.1	0.2	0.0	4.5	100.0	95.1	850
Primary	97.6	0.0	0.0	0.0	2.4	100.0	97.6	184
Secondary	96.3	0.3	0.1	0.5	2.9	100.0	96.3	520
More than secondary	100.0	0.0	0.0	0.0	0.0	100.0	100.0	23
Wealth quintile								
Lowest	96.7	0.0	0.0	0.0	3.3	100.0	96.7	365
Second	97.1	0.0	0.1	0.0	2.7	100.0	97.1	333
Middle	94.5	0.0	0.1	0.7	4.6	100.0	94.5	334
Fourth	93.3	0.3	0.5	0.0	5.9	100.0	93.3	308
Highest	97.9	0.6	0.0	0.0	1.5	100.0	97.9	237
Total	95.9	0.2	0.2	0.2	3.7	100.0	95.9	1,577

Note: If more than one source of ANC was mentioned, only the provider with the highest qualifications is considered in this tabulation.
[1] Skilled provider includes doctor, nurse/midwife, or health personnel.

Table 3.12 Use of intermittent preventive treatment (IPTi) by Infants

Percentage children born 0-35 months before the survey with card seen who received specific vaccines and intermittent preventive treatment (IPTi) for Infants at any time before the survey, according to background characteristics, Sierra Leone MIS 2021

Background characteristic	DPT-HepB-Hib (Pentavalent) 2	IPTi1	DPT-HepB-Hib (Pentavalent) 3	IPTi2	Measles 1	ITPi3	Number of children
Sex							
Male	87.9	83.3	78.3	71.2	64.6	56.2	599
Female	90.7	87.7	81.8	78.7	67.0	61.2	614
Birth order							
1	86.4	85.5	75.9	71.2	60.5	54.4	302
2 - 3	92.6	90.3	82.3	80.4	70.2	64.2	442
4 - 5	87.0	80.4	78.8	70.0	64.9	55.4	301
6+	90.0	82.5	84.3	76.4	65.6	57.8	168
Residence							
Urban	89.4	88.1	80.8	74.3	67.7	59.9	446
Rural	89.3	84.0	79.7	75.4	64.7	58.0	767
Region							
Eastern	97.0	92.2	91.1	79.6	75.3	63.8	310
Northern	86.9	81.3	71.4	71.1	59.3	50.1	248
North Western	77.7	76.8	69.8	63.2	51.7	45.9	132
Southern	91.3	85.8	84.5	81.3	69.2	63.9	308
Western	85.3	85.9	74.3	71.2	63.5	61.6	215
District							
Kailahun	97.9	91.0	84.3	53.4	64.9	43.8	96
Kenema	96.8	90.8	93.0	88.6	76.7	66.4	138
Kono	96.3	96.3	96.3	96.3	86.2	84.3	76
Bombali	100.0	98.3	95.0	93.0	89.9	80.0	58
Falaba	*	*	*	*	*	*	10
Koinadugu	94.6	92.8	92.8	92.8	84.2	87.4	21
Tonkolili	81.6	75.0	61.9	62.1	47.2	36.1	159
Kambia	58.8	56.6	49.0	43.8	40.9	33.5	56
Karene	94.5	94.5	94.5	64.0	49.2	41.5	30
Port Loko	89.5	89.5	78.7	85.9	66.2	63.7	46
Bo	96.4	94.1	88.2	82.8	64.8	62.9	128
Bonthe	88.3	77.6	85.1	76.4	72.7	60.1	84
Moyamba	87.2	80.1	75.4	81.9	68.5	64.1	71
Pujehun	87.0	87.0	88.9	88.9	81.8	81.8	25
Western Area Rural	88.7	90.4	73.9	77.4	68.4	66.4	116
Western Area Urban	81.3	80.5	74.8	63.9	57.7	56.1	99
Education							
No education	89.2	84.8	80.1	73.3	64.5	56.9	672
Primary	86.0	82.6	75.0	70.9	60.4	56.9	132
Secondary	90.2	88.0	81.2	79.3	69.7	62.6	391
More than secondary	*	*	*	*	*	*	17
Wealth quintile							
Lowest	91.2	84.4	82.0	75.1	66.8	60.6	289
Second	84.8	81.2	77.1	70.3	61.4	48.9	264
Middle	91.7	87.6	78.8	76.2	64.4	58.9	249
Fourth	88.5	87.3	76.2	72.7	64.8	58.1	199
Highest	90.5	88.5	86.3	81.5	72.6	68.6	212
Total	89.3	85.6	80.1	75.0	65.8	58.7	1,213

Note: Only the question on measles vaccine for card not seen or no card was asked. For the other types of vaccines, the questions were not asked.

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

MALARIA IN CHILDREN 4

Key Findings

- ***Fever prevalence:*** Seventeen percent of children under age 5 had fever in the 2 weeks before the survey.
- ***Care-seeking for fever:*** Advice or treatment was sought for 75% of children with fever in the 2 weeks before the survey.
- ***Testing:*** Sixty-eight percent of children age 6-59 months with fever received a finger or heel prick for testing.
- ***Type of antimalarial drug used:*** Among children under 5 with a recent fever who received an antimalarial, 91% received artemisinin combination therapy.
- ***Severe anaemia:*** Three percent of children age 6-59 months and 2% of children age 5-9 years old have a haemoglobin level less than 8g/dl.
- ***Malaria:*** Twenty-two percent of children age 6-59 months and 27% of children 5 to 9 years tested positive for malaria via microscopy.

This chapter presents data useful for assessing how well fever management strategies are implemented. Specific topics include care seeking for febrile children, diagnostic testing of children with fever, and therapeutic use of antimalarial drugs. Prevalence of malaria and low blood hemoglobin concentration among children age 6-59 months and 5 to 9 years are also discussed.

4.1 CARE SEEKING FOR FEVER IN CHILDREN

- **Care seeking for children under 5 with fever**
- Percentage of children under 5 with a fever in the 2 weeks before the survey for whom advice or treatment was sought from a health provider, a health facility, or a pharmacy.
- ***Sample:*** Children under 5 with a fever in the two weeks before the survey

One of the key case management objectives of the National Malaria Control Program (NMCP) is to ensure that all suspected malaria cases have access to confirmatory diagnosis and receive effective treatment.

Fever is a key symptom of malaria and other acute infections in children. Malaria fevers require prompt and effective treatment to prevent malaria morbidity and mortality. Seventeen percent of children under age 5 had fever in the 2 weeks preceding the survey. Advice or treatment was sought for 75% of the children with fever

in the 2 weeks preceding the survey, and timely care seeking (the same or next day following fever onset) occurred for 40% of the febrile children (**Table 4.1**).

Among children with recent fever for whom care was sought, advice or treatment from the public health sector was received more often than from other sources (71%). Only 3% sought advice from a private sector source. Among children seeking care from public health facilities, advice or treatment was largely sought at government health centers (52%), and government hospitals (17%) (**Table 4.2**).

Trends: Advice or treatment seeking among children with recent fever increased from 44% in 2008 to 63% in SLMIS 2013, 71% in SLMIS 2016 and 75% in SLMIS 2021.

Patterns by background characteristics

- The percentage of children under age 5 with recent fever ranges from 13% in Eastern region to 25% in Southern region (**Table 4.1**).
- The percentage of children under age 5 with recent fever is highest among those in the middle wealth quintile (20%) and lowest among those in the highest wealth quintile (11%).
- Advice or treatment for children with recent fever was sought slightly more often in rural areas than in urban areas (77% vs 73%).

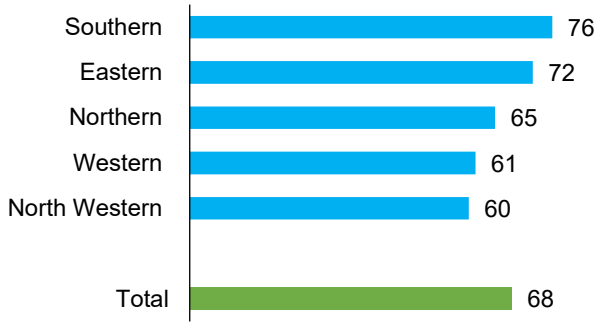
4.2 Diagnostic Testing of Children with Fever

- **Diagnosis of malaria in children under age 5 with fever**
- Percentage of children under age 5 with a fever in the two weeks before the survey who had blood taken from a finger or heel for testing. This is a proxy measure of diagnostic testing for malaria.
- ***Sample:*** Children under age 5 with a fever in the two weeks before the survey

National Malaria Control Program policy recommends prompt parasitological confirmation by microscopy or, alternatively, by rapid diagnostic tests (RDTs) for all patients suspected of malaria before treatment is started. Adherence to this policy cannot be directly measured through household surveys; however, the SLMIS 2021 asked interviewed women with children under age 5 who had a fever in the 2 weeks before the survey if the child had blood taken from a finger or heel for testing during the illness. This information is used as a proxy measure for adherence to the NMCP policy of conducting diagnostic testing for all suspected malaria cases.

Figure 4.1 **Diagnostic testing of children with fever by region**

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



In the SLMIS 2021, 68% of children with a fever in the 2 weeks before the survey had blood taken from a finger or heel, presumably for malaria testing (**Table 4.1**).

Trends: The percentage of children with a fever in the 2 weeks preceding the survey who had blood taken from a finger or heel for testing increased from 37% in the SLMIS 2013 to 51% in the SLMIS 2016, 61% in SLDHS 2019, and 68% in SLMIS 2021. This positive trend shows improved adherence to the malaria treatment policy of testing before treatment.

Patterns by background characteristics

- The percentage of children under age 5 with recent fever who had blood taken from a finger or heel for testing ranges from 60% in the North-Western region to 76% in Southern region (**Figure 4.1**).

4.3 Use of Recommended Antimalarials

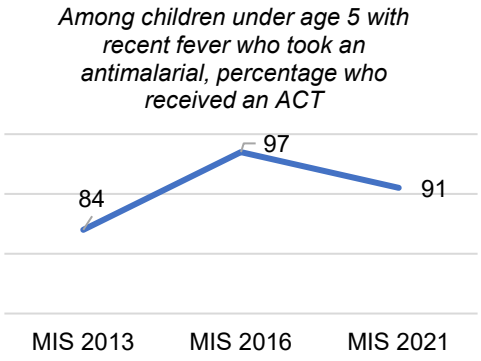
Artemisinin-based combination therapy for children under age 5 with fever

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

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

Sierra Leone adopted artemisinin-based combination therapy (ACT), specifically artesunate-amodiaquine (ASAQ), as first-line treatment for uncomplicated P. falciparum malaria in 2005. The revised national policy for antimalarials include artemether-lumefantrine (AL) as the drug of choice for the treatment of uncomplicated P. falciparum malaria and AS+AQ as alternative, parenteral artesunate, artemether and quinine are recommended for the treatment of severe malaria. Sulphadoxine-Pyrimethamine (SP) for intermittent preventive treatment in pregnancy (IPTp) and (IPTi) in infants (2016). The SLMIS 2021 results showed that 91% of children under age 5 with recent fever took an antimalarial drug. Most children with recent fever who took an antimalarial received ACT (91%) (**Table 4.3**). Twenty-two percent received SP, 9% were given chloroquine, and 7% received quinine.

Figure 4.2 **Trends in ACT use by children under age 5**



Trends: Among children under age 5 with recent fever who took an antimalarial, the percentage who received ACT increased from 84% in SLMIS 2013 to 97% in SLMIS 2016 before decreasing slightly to 91% in 2021 (**Figure 4.2**).

4.4 Prevalence of Low Haemoglobin in Children

Prevalence of low haemoglobin in children

Percentage of children age 6-59 months and children 5-9 years old who had a haemoglobin measurement of less than 8 grams per decilitre (g/dl) of blood. The cut off of 8 g/dl is often used to classify malaria-related anaemia.

Sample: Children age 6-59 months and 5-9 years old.

Anaemia, defined as a reduced level of haemoglobin in the blood, decreases the amount of oxygen reaching the tissues and organs of the body and reduces their capacity to function. Anaemia is associated with impaired motor and cognitive development in children. The main causes of anaemia in children are malaria and inadequate intake of iron, folate, vitamin B12, and other nutrients. Other causes of anaemia include intestinal worms, haemoglobinopathy, and sickle cell disease. Although anaemia is not specific to malaria, trends in anaemia prevalence can reflect malaria morbidity, and they respond to changes in the coverage of malaria interventions (Korenromp et al. 2004). Malaria interventions have been associated with a 60% reduction in the risk of anaemia using a cutoff of 8.0 g/dl (Roll Back Malaria Partnership 2003).

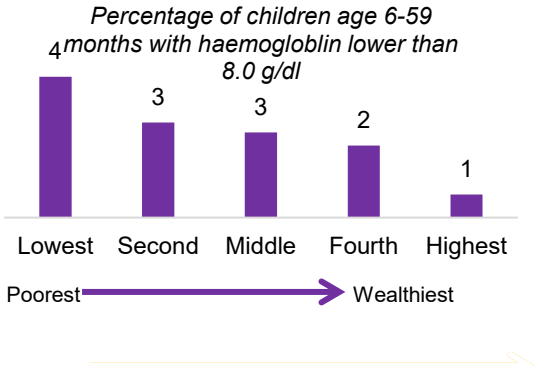
During the SLMIS 2021, consent was obtained and testing for anaemia was conducted among almost all (95%) eligible children age 6-59 months and (92%) children age 5 to 9 years old from the interviewed households (**Tables 4.4.1 and 4.4.2**). **Tables 4.5.1 and 4.5.2** show the percentage of children age 6-59 months classified as having low haemoglobin levels (less than 8.0 g/dl). Overall, 3% of children age 6-59 months and 2% of children age 5 to 9 years old have low haemoglobin levels.

Trends: The percentage of children age 6-59 months with low haemoglobin levels has decreased steadily over time, from 16% in SLMIS 2013 to 10% in SLMIS 2016, 7% in SLDHS 2019 and 3% in SLMIS 2021.

Patterns by background characteristics

- By region, the prevalence of low haemoglobin levels in children age 6-59 months ranges from less than 1% in Western region to 3% in Southern, North western and Eastern regions (**Table 4.5.1**).
- The prevalence of low haemoglobin levels among children age 6-59 months is higher in rural than urban areas (4% and 1%, respectively).
- The percentage of children age 6-59 months with low haemoglobin levels associates with the level of household wealth (**Figure 4.3**).
- The percentage of children age 5-9 years is higher among the second wealth quintile (4%) and lowest in the highest quintile (0.4%) (**Table 4.5.2)**

Figure 4.3 **Low haemoglobin in children by household wealth**



4.5 Prevalence of Malaria in Children

Malaria prevalence in children

Percentage of children age 6-59 months and children age 5-9 years classified as infected with malaria according to microscopy results.

Sample: Children age 6-59 months and 5-9 years old.

Malaria is endemic in all regions of Sierra Leone. Those living in areas of high malaria transmission acquire partial immunity to the disease over time (Doolan et al. 2009). However, many people, including children, may have malaria parasites in their blood without showing any signs of infection. Such asymptomatic infections not only contribute to further transmission of malaria but also increase the risk of anaemia and other associated morbidity among the infected individuals.

In the SLMIS 2021, all children age 6-59 months and 5-9 years old from the interviewed households were eligible for malaria testing. Testing with malaria rapid diagnostic tests (RDTs) was successfully carried out among 96%6of eligible children, and 93% were tested for malaria by microscopy (**Table 4.4.1**). Among the children 5-9 years old the response rates for RDT and for microscopic testing are 95% and 92% respectively (**Table 4.4.2**).

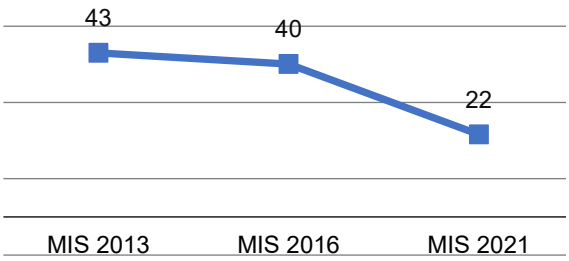
Twenty-two percent of children age 6-59 months and 25% of children age 5-9 years old tested positive for malaria parasites according to microscopy results (**Tables 4.6.1 and 4.6.2**). Rapid diagnostic tests were done in conjunction with microscopy to facilitate treatment of infected children during the survey fieldwork. Results from these RDTs are also presented in **Tables 4.6.1 and 4.6.2** for reference. Thirty-nine percent of children age 6-59 months and 50% of children age 5-9 years old tested positive for malaria antigens according to RDT results.

The SLMIS 2021 was conducted at the peak of malaria season. Normally, a spike in malaria cases occurs during this period. Previous surveys that incorporated malaria testing included the SLMIS 2016. That survey was conducted during a similar period when malaria transmission was at its peak. It is worth noting that the SLMIS 2013 was implemented during the dry season

Trends: The percentage of children under age 5 testing positive for malaria according to microscopy has decreased from 40% in SLMIS 2016 to 22% in SLMIS 2021 (**Figure 4.4**).

Figure 4.4 **Trends in malaria prevalence among children**

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

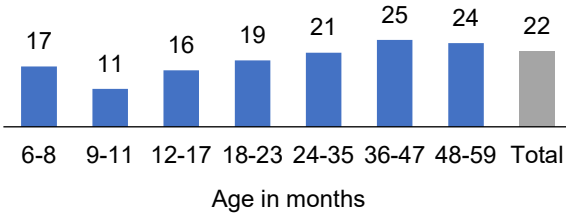


Patterns by background characteristics

- Malaria prevalence according to microscopy among children age 6-59 is 17% among children age 6-8 months and dropped to 11% among those 9-11 months. Then the prevalence generally increases with increasing age from 11% among children age 9-11% months to 25% among those age 36-47 months and 24% among those age 48-59 months (**Figure 4.5**).
- The percentage of children age 6-59 with malaria according to microscopy is about two times as high in rural areas (26%) as in urban areas (14%).
-

Figure 4.5 **Prevalence of malaria in children by age**

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

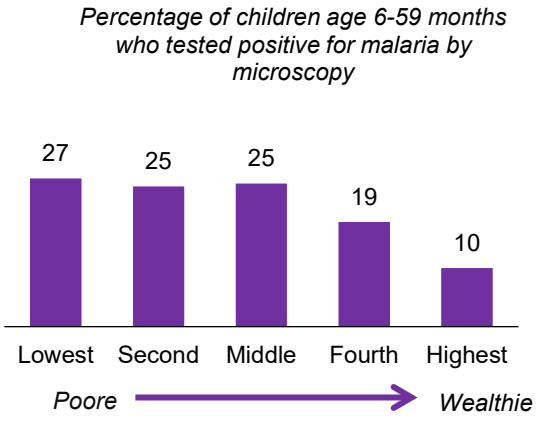


- Malaria prevalence according to microscopy decreases with increasing wealth, from 27% in the lowest wealth quintile to 10% in the highest quintile (**Figure 4.6**).

- By region, the percentage of children with malaria according to microscopy is highest in Northern region (25%) and lowest in Western region (11%).

- The malaria prevalence according to microscopy among children aged 5-9 years old is twice as high in rural areas (34%) than in urban areas (17%), decreases with the increase of household wealth (from 37% in the lowest quintile to 10% in the highest quintile), and it is highest in the Eastern region (33%) and lowest in the Western region (15%) (**Table 4.6.2**).

***Figure 4.6* Prevalence of malaria in children by household wealth**



- The malaria prevalence among children aged 5-9 years old is higher (27%) than that among children 6-59 months (22%).

4.6 MALARIA SPECIES

Several species of malaria parasites exist; *Plasmodium falciparum* (*Pf*) is the predominant species in Sierra Leone, causing the majority of illnesses among patients. It also causes the most severe form of the disease among children and leads to poor pregnancy outcomes in pregnant women. There are other important species including *Plasmodium.malariae (Pm)*, *Plasmodium ovale*, and *Plasmodium vivax*. The delineation of malaria species is important as it guides a country's malaria diagnostic strategy.

The SLMIS 2021 obtained results for malaria species in the population sampled. Among children age 6-59 months who tested positive for malaria, 97% had a *P. falciparum* infection, 1% had a *P. malariae* infection, and 0.1% had both a *P. falciparum* and *P. malariae* infections (**Table 4.7.1**).

Table 4.7.2 shows that among children age 5-9 years who tested positive for malaria, the majority had also *P. falciparum* (96%). Three percent had *P.malariae* and 0.3% had both *P. falciparum* and *P. malariae.*

4.7 CONCLUSIONS

- It is encouraging to see that an increasing number of women took their children for advices and treatment when they had fever. This improvement in knowledge and attitude may have contributed to the decline in severity and mortality of malaria.

- This survey shows that healthcare facility adherence to the malaria treatment policy of testing before treatment improved overtime as more children with a fever in the 2 weeks preceding the survey who had blood taken from a finger or heel for testing increased from 37% in 2013 to 68% in 2021.

- Two outcome indicators indicate that the malaria programmed has been successfully. (1) The level of heamoglobin of less than 8g/dl that indicates the severity of malaria in children also declined substantially as the percentage of children age 6-59 months with low haemoglobin levels has decreased from 16% in 2013 to 3% in 2021. (2) The prevalence of malaria among children under age 5 has decreased from 43% in

2013 to 22% in 2021.

List of Tables

For more information on characteristics of households and women, see the following tables:

- **Table 4.1 Prevalence, care seeking and diagnosis of children with fever**
- **Table 4.2 Source of advice or treatment for children with fever**
- **Table 4.3 Type of antimalarial drugs used**
- **Table 4.4.1 Coverage of testing for anaemia and malaria in children 6-59 months**
- **Table 4.4.2 Coverage of testing for anaemia and malaria in children 5-9 years**
- **Table 4.5.2 Haemoglobin <8.0 g/dl in children 6-59 months**
- **Table 4.5.2 Haemoglobin <8.0 g/dl in children 5-9 years**
- **Table 4.6.1 Prevalence of malaria in children 6-59 months**
- **Table 4.6.2 Prevalence of malaria in children 5-9 years**
- **Table 4.7.1 Malaria species in children 6-59 months**
- **Table 4.7.1 Malaria species in children 5-9 years**

Table 4.1 Prevalence, care seeking and diagnosis of children with fever

Percentage of children under age 5 with fever in the 2 weeks preceding the survey; and among children under age 5 with fever, the percentage for whom advice or treatment was sought, the percentage for whom advice or treatment was sought the same or next day, and the percentage for whom blood was taken from a finger or heel for testing, Sierra Leone MIS 2021

	Children under 5		Children under 5 with fever			
Background characteristic	Percentage with fever in the 2 weeks preceding the survey	Number of children	Percentage for whom advice or treatment was sought[1]	Percentage for whom advice or treatment was sought the same or next day	Percentage who had blood taken from a finger or heel for testing	Number of children
Age in months						
<12	17.1	719	77.4	46.0	62.4	123
12-23	20.5	850	73.6	40.5	67.8	174
24-35	16.8	916	75.9	41.1	76.1	153
36-47	16.4	1,009	76.2	33.2	66.7	165
48-59	15.7	893	72.5	42.4	67.5	140
Sex						
Male	16.1	2,203	76.3	41.8	66.9	354
Female	18.4	2,184	73.9	38.9	69.6	402
Residence						
Urban	16.7	1,565	72.3	33.6	63.2	261
Rural	17.5	2,821	76.5	43.8	71.0	495
Region						
Eastern	12.7	963	74.6	49.3	72.0	123
Northern	17.3	974	71.6	26.2	64.9	168
North Western	15.0	731	57.5	27.7	59.9	109
Southern	24.7	975	85.5	55.8	76.3	241
Western	15.5	744	75.5	30.7	60.8	115
District						
Kailahun	12.7	306	(84.7)	(67.9)	(79.5)	39
Kenema	14.0	415	62.6	31.3	66.0	58
Kono	11.6	251	(87.7)	(64.0)	(76.7)	29
Bombali	17.2	279	82.3	33.1	77.6	48
Falaba	22.8	92	(77.2)	(17.2)	(42.0)	21
Koinadugu	17.2	101	(95.0)	(27.1)	(83.5)	17
Tonkolili	16.2	498	58.4	23.4	58.9	81
Kambia	19.8	183	60.3	33.0	86.1	36
Karene	13.0	175	(61.4)	(38.4)	(51.3)	23
Port Loko	13.5	373	(53.8)	(19.0)	(44.9)	50
Bo	29.4	445	92.0	68.0	89.0	131
Bonthe	25.7	230	72.9	48.6	55.0	59
Moyamba	16.2	199	(85.6)	(38.8)	(59.8)	32
Pujehun	17.0	97	*	*	*	16
Western Area Rural	20.1	374	(85.5)	(33.4)	(66.8)	75
Western Area Urban	10.7	370	(56.5)	(25.5)	(49.5)	40
Mother's education						
No education	15.6	2,687	75.2	42.6	70.3	420
Primary	21.3	414	82.8	39.8	75.3	88
Secondary	19.6	1,224	71.9	35.8	61.6	240
More than secondary	12.6	62	*	*	*	8
Wealth quintile						
Lowest	19.1	968	72.7	41.7	69.1	185
Second	16.4	882	77.7	38.8	73.8	145
Middle	20.0	932	72.9	43.9	64.5	186
Fourth	17.8	896	76.0	33.8	65.9	159
Highest	11.3	709	78.8	44.1	70.0	80
Total	17.2	4,387	75.1	40.3	68.3	756

[1] Skilled provider includes doctor, nurse/midwife, or health personnel.
Figures in parentheses are based on 25-49 unweighted cases.
An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

Table 4.2 Source of advice or treatment for children with fever

Percentage of children under age 5 with fever in the 2 weeks preceding the survey for whom advice or treatment was sought from specific sources; and among children under age five 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, by background characteristics, Sierra Leone MIS 2021

	Percentage for which advice or treatment was sought from each source:	
Source	Among children with fever	Among children with fever for whom advice or treatment was sought
Any public sector source	71.1	93.9
Government hospital	17.4	23.0
Government health center (PHU)	52.1	68.8
Mobile clinic	0.7	0.9
Community health worker	4.9	6.5
Other public sector	0.2	0.3
Any private sector source	3.0	3.9
Private hospital	0.9	1.3
Private clinic	0.1	0.1
Mission faith-based hospital	0.4	0.5
Pharmacy	1.3	1.7
Mobile clinic	0.3	0.4
NGO hospital	0.0	0.0
Any other source	1.2	1.6
Shop	0.3	0.4
Traditional practitioner	0.6	0.9
Itinerant drug seller	0.2	0.3
Other	0.5	0.7
Number of children	756	572

PHU = Peripheral Health Unit

Table 4.3 Type of antimalarial drugs used

Among children under age 5 with fever in the 2 weeks preceding the survey who took any antimalarial medication, the percentage who took specific antimalarial drugs, by background characteristics, Sierra Leone MIS 2021

	Percentage of children who took:				
Background characteristic	Any ACT	Chloroquine	SP/ Fansidar	Quinine	Number of children with fever who took antimalarial drug
Age in months					
< 6	(91.0)	(5.1)	(23.4)	(5.0)	45
6-11	97.0	7.4	11.7	7.8	67
12-23	89.3	9.5	22.8	9.8	163
24-35	92.5	11.6	27.2	5.0	144
36-47	91.9	11.6	22.0	7.0	160
48-59	87.7	6.5	23.0	6.4	136
Sex					
Male	89.6	9.4	24.0	9.7	337
Female	92.4	9.4	21.3	4.6	377
Residence					
Urban	92.7	11.6	23.1	8.6	251
Rural	90.2	8.1	22.2	6.2	463
Region					
Eastern	83.6	2.1	24.6	1.8	119
Northern	91.2	21.7	30.2	18.7	140
North Western	95.8	6.0	26.8	3.3	104
Southern	91.0	6.6	17.3	3.8	237
Western	94.5	10.7	17.9	8.4	113
District					
Kailahun	(73.4)	(0.8)	(51.6)	(0.0)	37
Kenema	91.4	2.2	8.7	2.2	55
Kono	(79.9)	(3.3)	(25.5)	(3.3)	29
Bombali	(87.2)	(45.5)	(63.3)	(33.4)	43
Falaba	*	*	*	*	10
Koinadugu	(100.0)	(25.7)	(25.7)	(25.7)	17
Tonkolili	91.0	8.6	13.2	9.4	71
Kambia	87.4	9.3	35.1	3.2	35
Karene	(100.0)	(0.0)	(26.7)	(0.0)	22
Port Loko	(100.0)	(6.5)	(20.7)	(5.0)	47
Bo	86.9	2.1	15.6	4.5	130
Bonthe	94.8	0.0	6.8	0.0	58
Moyamba	(100.0)	(40.9)	(47.0)	(10.1)	31
Pujehun	*	*	*	*	15
Western Area Rural	(98.2)	(5.2)	(4.6)	(7.2)	75
Western Area Urban	(87.4)	(21.4)	(44.4)	(10.7)	38
Mother's education					
No education	90.2	7.4	21.1	6.3	393
Primary	93.0	10.7	15.5	3.3	81
Secondary	91.6	11.7	27.4	9.1	232
More than secondary	*	*	*	*	8
Wealth quintile					
Lowest	88.8	4.3	12.8	4.7	174
Second	92.5	9.0	28.8	3.1	132
Middle	93.3	7.0	21.4	5.1	179
Fourth	89.2	12.6	26.6	11.6	148
Highest	92.0	20.5	28.3	14.4	80
Total	91.1	9.4	22.5	7.0	714

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

Table 4.4.1 Coverage of testing for anaemia and malaria

Percentage of eligible children age 6-59 months who were tested for anaemia and malaria, by background characteristics, Sierra Leone MIS 2021

Background characteristic	Percentage tested for: Anemia	Malaria by RDT	Malaria by microscopy	Number of children
Age in months				
6-8	94.8	82.8	79.4	233
9-11	93.5	94.0	91.1	168
12-17	94.6	93.7	91.1	572
18-23	95.6	98.5	94.9	409
24-35	95.2	97.0	92.9	1,106
36-47	94.8	96.1	92.3	1,373
48-59	96.5	97.9	95.2	1,400
Sex				
Male	95.1	95.8	92.7	2,666
Female	95.5	96.3	92.6	2,595
Mother's interview status				
Interviewed	94.7	95.6	91.8	3,701
Not interviewed[1]	96.7	97.1	94.6	1,560
Residence				
Urban	96.2	97.6	93.1	1,613
Rural	94.9	95.3	92.5	3,648
Region				
Eastern	99.0	98.1	96.1	1,161
Northern	93.4	92.4	87.3	1,249
North Western	91.5	93.3	89.2	883
Southern	95.6	98.6	95.8	1,363
Western	97.4	97.9	95.0	605
District				
Kailahun	98.5	98.3	95.9	412
Kenema	99.6	98.7	96.7	455
Kono	97.5	96.3	94.7	323
Bombali	95.9	95.1	85.8	344
Falaba	85.2	83.9	73.5	223
Koinadugu	92.2	90.4	90.0	270
Tonkolili	97.2	96.7	94.7	393
Kambia	88.4	96.4	95.1	224
Karene	94.2	94.2	86.6	276
Port Loko	91.4	90.9	87.7	383
Bo	98.7	98.1	97.9	466
Bonthe	86.0	98.0	89.2	344
Moyamba	98.0	100.0	99.0	305
Pujehun	100.0	98.7	97.5	238
Western Area Rural	96.6	97.0	93.6	266
Western Area Urban	97.9	98.5	96.2	339
Mother's highest educational level[2]				
No education	94.5	95.2	91.5	2,302
Primary	95.0	94.8	90.8	382
Secondary	95.0	96.7	92.7	972
Higher than secondary	(97.8)	(100.0)	(97.8)	45
Wealth quintile				
Lowest	95.8	96.6	94.1	1,227
Second	93.8	94.6	90.6	1,137
Middle	95.1	95.6	92.3	1,194
Fourth	95.7	96.2	92.7	1,044
Highest	97.0	98.0	94.1	659
Total	95.3	96.0	92.7	5,261

Note: Table is based on children who stayed in the household the night before the interview. Figures in parentheses are based on 25-49 unweighted cases

[1] Includes children whose mothers are deceased

[2] Includes only children age 6-59 months whose mothers were interviewed with the Womanâ€™s Questionnaire

Table 4.4.2 Coverage of testing for anaemia and malaria

Percentage of eligible children age 5 to 9 years who were tested for anaemia and malaria, by background characteristics, Sierra Leone MIS 2021

Background characteristic	Percentage tested for: Anemia	Malaria by RDT	Malaria by microscopy	Number of children
Age in years				
5	94.8	96.7	92.6	421.0
6	92.1	95.6	91.4	407.0
7	92.8	94.1	90.8	390.0
8	92.2	94.5	91.5	398.0
9	91.4	93.3	91.4	255.0
Sex				
Male	93.3	94.9	91.9	947.0
Female	92.2	95.0	91.2	924.0
Residence				
Urban	94.5	96.4	93.1	634.0
Rural	91.9	94.3	90.8	1,237.0
Region				
Eastern	98.5	98.8	98.5	402.0
Northern	88.1	88.8	81.7	436.0
North Western	90.4	91.6	87.3	322.0
Southern	92.2	99.1	95.8	450.0
Western	95.8	96.6	95.4	261.0
District				
Kailahun	98.5	98.5	97.7	132.0
Kenema	99.4	100.0	100.0	156.0
Kono	97.5	97.5	97.5	119.0
Bombali	89.8	89.8	79.6	137.0
Falaba	78.2	78.2	67.3	101.0
Koinadugu	90.9	90.9	88.3	77.0
Tonkolili	92.3	94.9	91.5	117.0
Kambia	86.7	88.8	85.7	98.0
Karene	88.8	89.8	86.7	98.0
Port Loko	94.4	95.2	88.9	126.0
Bo	98.0	98.7	98.0	149.0
Bonthe	71.2	99.0	86.5	104.0
Moyamba	99.2	100.0	99.2	127.0
Pujehun	98.6	98.6	98.6	69.0
Western Area Rural	92.2	92.2	91.2	102.0
Western Area Urban	98.1	99.4	98.1	159.0
Wealth quintile				
Lowest	92.0	93.9	90.7	410.0
Second	90.8	94.0	89.2	434.0
Middle	93.9	95.6	93.2	429.0
Fourth	92.5	95.3	92.1	318.0
Highest	95.7	96.8	93.2	280.0
Total	92.8	95.0	91.6	1,871.0

Note: Table is based on children who stayed in the household the night before the interview

Table 4.5.1 Haemoglobin <8.0 g/dl in children

Percentage of children age 6-59 months with haemoglobin lower than 8.0 g/dl, by background characteristics, Sierra Leone 2021

Background characteristic	Hemoglobin level < 8.0 g/dl	Number of children
Age in months		
6-8	2.9	228
9-11	0.8	183
12-17	3.1	549
18-23	3.7	403
24-35	2.6	1,056
36-47	3.1	1,289
48-59	1.9	1,305
Sex		
Male	3.5	2,531
Female	1.7	2,481
Mother's interview status		
Interviewed	2.5	3,577
Not interviewed[1]	2.9	1,435
Residence		
Urban	0.7	1,751
Rural	3.6	3,261
Region		
Eastern	3.0	1,146
Northern	2.4	1,059
North Western	3.2	752
Southern	3.3	1,228
Western	0.9	828
District		
Kailahun	1.3	388
Kenema	3.8	514
Kono	4.0	252
Bombali	2.5	305
Falaba	3.7	98
Koinadugu	3.3	111
Tonkolili	1.8	541
Kambia	3.3	152
Karene	4.3	196
Port Loko	2.5	403
Bo	2.7	523
Bonthe	4.0	265
Moyamba	5.5	254
Pujehun	1.1	181
Western Area Rural	1.9	385
Western Area Urban	0.0	443
Mother's highest educational level[2]		
No education	2.4	2,210
Primary	4.8	332
Secondary	2.1	982
Higher than secondary	(0.0)	53
Wealth quintile		
Lowest	4.2	1,119
Second	2.9	1,004
Middle	2.6	1,053
Fourth	2.2	1,013
Highest	0.7	824
Total	2.6	5,013

Note: Table is based on children who stayed in the household the night before the interview.
Hemoglobin is measured in grams per deciliter (g/dl). Figures in parentheses are based on 25-49 unweighted cases.
[1] Includes children whose mothers are deceased;
[2] Includes only children age 6-59 months whose mothers were interviewed with the Womanâ€™s Questionnaire.

Table 4.5.2 Haemoglobin <8.0 g/dl in children

Percentage of children age 6 to 9 years with haemoglobin lower than 8.0 g/dl, by background characteristics, Sierra Leone 2021

Background characteristic	Hemoglobin level < 8.0 g/dl	Number of children
Age in years		
5	1.1	399
6	3.0	392
7	3.0	341
8	1.0	368
9	0.6	219
Sex		
Male	1.8	885
Female	1.9	834
Residence		
Urban	1.0	691
Rural	2.4	1,027
Region		
Eastern	2.9	388
Northern	1.0	334
North Western	0.8	257
Southern	3.6	388
Western	0.3	352
District		
Kailahun	6.4	117
Kenema	1.3	169
Kono	1.4	103
Bombali	1.4	115
Falaba	3.1	40
Koinadugu	1.0	31
Tonkolili	0.0	147
Kambia	0.0	62
Karene	1.7	63
Port Loko	0.8	132
Bo	2.8	174
Bonthe	1.5	67
Moyamba	7.9	100
Pujehun	0.0	47
Western Area Rural	0.0	134
Western Area Urban	0.6	218
Wealth quintile		
Lowest	1.5	331
Second	4.0	359
Middle	2.0	381
Fourth	0.9	297
Highest	0.6	351
Total	1.8	1,719

Note: Table is based on children who stayed in the household the night before the interview.
Hemoglobin is measured in grams per deciliter (g/dl).

Table 4.6.1 Prevalence of malaria in children

Percentage of children age 6-59 months classified in two tests as having malaria, by background characteristics, Sierra Leone MIS 2021

	Prevalence of malaria according to the RDTs		Prevalence of malaria by microscopy	
Background characteristic	RDT positive	Number of children	Positive microscopy	Number of children
Age in months				
6-8	17.6	200	16.7	193
9-11	17.1	187	10.9	183
12-17	27.6	546	16.1	530
18-23	37.4	412	19.3	398
24-35	39.9	1,073	21.3	1,030
36-47	43.1	1,306	24.9	1,262
48-59	47.0	1,324	23.9	1,289
Sex				
Male	40.0	2,551	23.1	2,477
Female	38.7	2,498	20.1	2,407
Mother's interview status				
Interviewed	37.8	3,609	20.4	3,482
Not interviewed[1]	43.2	1,439	24.6	1,403
Residence				
Urban	26.1	1,781	14.2	1,706
Rural	46.5	3,268	25.6	3,179
Region				
Eastern	46.1	1,136	24.4	1,110
Northern	48.3	1,048	24.7	1,001
North Western	47.8	763	21.9	731
Southern	36.0	1,265	23.8	1,232
Western	16.2	837	10.5	810
District				
Kailahun	47.8	385	23.0	374
Kenema	49.6	509	24.8	499
Kono	35.6	250	24.7	245
Bombali	30.8	303	12.8	281
Falaba	56.8	96	27.3	83
Koinadugu	52.7	108	35.1	108
Tonkolili	55.8	538	28.6	527
Kambia	53.6	165	24.6	162
Karene	50.1	197	17.5	182
Port Loko	44.3	401	22.9	386
Bo	33.7	520	25.4	520
Bonthe	34.2	301	19.0	274
Moyamba	41.9	259	24.7	256
Pujehun	37.9	180	25.8	177
Western Area Rural	25.9	386	14.2	367
Western Area Urban	8.0	451	7.5	443
Mother's highest educational level[2]				
No education	41.1	2,222	23.2	2,147
Primary	41.3	330	19.2	318
Secondary	30.3	1,003	14.7	964
Higher than secondary	(16.8)	54	(14.7)	53
Wealth quintile				
Lowest	48.2	1,122	26.5	1,100
Second	46.4	1,011	24.7	969
Middle	44.8	1,060	25.3	1,026
Fourth	35.4	1,018	18.6	981
Highest	16.8	838	10.4	808
Total	39.3	5,048	21.6	4,884

Note: Table is based on children who stayed in the household the night before the interview. Figures in parentheses are based on 25-49 unweighted cases.
[1] Includes children whose mothers are deceased;
[2] Includes only children age 6-59 months whose mothers were interviewed with the Womanâ€™s Questionnaire...

Table 4.6.2 Prevalence of malaria in children

Percentage of children age 5 to 9 years classified in two tests as having malaria, by background characteristics, Sierra Leone MIS 2021

Background characteristic	Prevalence of malaria according to the RDTs		Prevalence of malaria by microscopy	
	RDT positive	Number of children	Positive microscopy	Number of children
Age in years				
5	49.3	406	26.9	392
6	48.8	406	20.6	389
7	46.8	347	28.6	337
8	53.1	375	28.4	366
9	53.9	223	32.3	218
Sex				
Male	49.6	897	25.4	873
Female	50.6	860	28.3	829
Residence				
Urban	38.2	704	16.7	685
Rural	58.0	1,053	33.7	1,016
Region				
Eastern	58.7	389	33.4	388
Northern	51.3	338	26.3	313
North Western	61.7	260	26.9	247
Southern	52.7	414	31.4	402
Western	27.9	356	14.8	352
District				
Kailahun	64.7	117	35.4	116
Kenema	60.6	170	31.8	170
Kono	49.5	103	34.1	103
Bombali	35.0	115	13.6	103
Falaba	57.8	40	23.0	34
Koinadugu	59.1	31	38.7	30
Tonkolili	60.2	151	33.0	144
Kambia	69.6	63	30.5	61
Karene	64.6	64	25.1	62
Port Loko	56.6	133	26.1	123
Bo	47.3	174	30.7	174
Bonthe	54.2	92	32.1	80
Moyamba	59.2	101	29.0	100
Pujehun	55.3	47	38.5	47
Western Area Rural	55.5	134	25.6	133
Western Area Urban	11.3	222	8.2	219
Wealth quintile				
Lowest	64.9	337	36.6	329
Second	58.1	375	33.1	355
Middle	57.9	386	29.9	378
Fourth	44.5	306	23.8	297
Highest	23.7	353	10.3	344
Total	50.1	1,757	26.8	1,702

Note: Table is based on children who stayed in the household the night before the interview

Table 4.7.1 Malaria species in children 6-59 months

Among children age 6 months to 59 months of age with malaria parasites, percentage infected with specific species of Plasmodium and combination of species identified by microscopy, according to background characteristics, Sierra Leone MIS 2021

Background characteristic	Positive for Pf	Positive for Pm	Positive for Pf+Pm	Number of children with malaria
Age in months				
6-8	(98.1)	(0.0)	(0.0)	32
9-11	*	*	*	20
12-17	95.9	4.1	0.0	86
18-23	96.2	2.7	0.0	77
24-35	98.4	0.9	0.0	219
36-47	97.3	0.6	0.3	314
48-59	97.1	0.6	0.0	308
Sex				
Male	97.8	1.0	0.2	571
Female	96.9	1.2	0.0	484
Mother's interview status				
Interviewed	97.1	1.0	0.1	710
Not interviewed	97.8	1.2	0.0	346
Residence				
Urban	96.7	1.7	0.0	242
Rural	97.6	0.9	0.1	813
Region				
Eastern	98.9	0.4	0.0	271
Northern	98.6	0.9	0.4	247
North Western	95.5	0.7	0.0	160
Southern	97.2	1.7	0.0	293
Western	93.3	2.4	0.0	85
District				
Kailahun	98.9	1.1	0.0	86
Kenema	98.8	0.0	0.0	124
Kono	99.3	0.0	0.0	60
Bombali	(94.2)	(6.4)	(2.7)	36
Falaba	(97.0)	(0.0)	(0.0)	23
Koinadugu	97.9	0.0	0.0	38
Tonkolili	100.0	0.0	0.0	151
Kambia	94.6	2.9	0.0	40
Karene	(84.0)	(0.0)	(0.0)	32
Port Loko	100.0	0.0	0.0	88
Bo	96.0	2.7	0.0	132
Bonthe	98.6	1.4	0.0	52
Moyamba	97.9	0.0	0.0	63
Pujehun	97.9	1.7	0.0	46
Western Area Rural	(94.1)	(3.9)	(0.0)	52
Western Area Urban	*	*	*	33
Mother's highest educational level[2]				
No education	97.8	0.4	0.0	499
Primary	97.9	0.0	0.0	61
Secondary	96.2	3.7	0.7	142
Higher than secondary	*	*	*	8
Wealth quintile				
Lowest	96.9	1.1	0.0	291
Second	98.1	0.9	0.0	239
Middle	96.6	1.6	0.4	259
Fourth	98.5	1.1	0.0	182
Highest	96.9	0.0	0.0	84
Total	97.4	1.1	0.1	1,055

Note: No cases of Plasmodium ovale were found.
Figures in parentheses are based on 25-49 unweighted cases. An asterisk indicates that a Figure is based on fewer than 25 unweighted cases and has been suppressed.
Pf = Plasmodium falciparum Pm = Plasmodium malariae; [1] Includes children whose mothers are deceased; [2] Includes only children age 6-59 months whose mothers were interviewed with the Womanâ€™s Questionnaire

Table 4.7.2 Malaria species in children 5-9 years

Among children age 5 to 9 years of ag with malaria parasites, percentage infected with specific species of Plasmodium and combination of species identified by microscopy, according to background characteristics, Sierra Leone MIS 2021

Background characteristic	Positive for Pf	Positive for Pm	Positive for Pf+Pm	Number of children with malaria
Age in years				
5	98.2	1.6	0.0	106
6	94.1	3.1	0.0	80
7	96.7	1.9	0.0	96
8	95.8	4.2	1.1	104
9	91.2	5.8	0.0	70
Sex				
Male	97.1	2.3	0.5	222
Female	94.1	4.0	0.0	234
Residence				
Urban	97.6	2.6	1.0	114
Rural	94.8	3.3	0.0	342
Region				
Eastern	98.5	0.0	0.0	129
Northern	96.2	2.7	0.0	82
North Western	94.9	6.8	1.7	66
Southern	92.0	4.6	0.0	126
Western	(96.5)	(3.5)	(0.0)	52
District				
Kailahun	(100.0)	(0.0)	(0.0)	41
Kenema	98.2	0.0	0.0	54
Kono	(97.2)	(0.0)	(0.0)	35
Bombali	*	*	*	14
Falaba	*	*	*	8
Koinadugu	(98.2)	(0.0)	(0.0)	12
Tonkolili	(95.2)	(3.4)	(0.0)	48
Kambia	(100.0)	(6.2)	(6.2)	19
Karene	*	*	*	16
Port Loko	(100.0)	(0.0)	(0.0)	32
Bo	(92.2)	(7.8)	(0.0)	53
Bonthe	(79.6)	(6.2)	(0.0)	26
Moyamba	(100.0)	(0.0)	(0.0)	29
Pujehun	(96.2)	(0.0)	(0.0)	18
Western Area Rural	*	*	*	34
Western Area Urban	*	*	*	18
Wealth quintile				
Lowest	91.2	6.2	1.0	120
Second	97.6	2.4	0.0	117
Middle	95.0	3.7	0.0	113
Fourth	98.1	0.0	0.0	71
Highest	(100.0)	(0.0)	(0.0)	36
Total	95.5	3.2	0.3	456

Note: No cases of Plasmodium ovale were found.
Figures in parentheses are based on 25-49 unweighted cases. An asterisk indicates that a Figure is based on fewer than 25 unweighted cases and has been suppressed.

MALARIA KNOWLEDGE, EXPOSURE TO MALARIA MESSAGES, AND BELIEFS 5

Key Findings

Knowledge of causes and symptoms of malaria:

- The majority of women (98%) reported mosquito bites as the cause of malaria.
- The most frequently reported signs and symptoms of malaria by women were fever (84%) and headache (50%).

Sources of malaria messages:

- Over two-thirds of women (68%) had heard or seen a malaria message in the 6 months preceding the survey
- Eighty-three percent of women cited government hospital/clinic as the main source of information on malaria.

Malaria prevention:

- Among women who had heard or seen a message in the last 6 months, 96% reported sleeping under a treated mosquito net as a way to avoid getting malaria.

Malaria treatment:

- Eighty-three percent of women cited artemisinin-based combination therapy (ACT) as the main medicine to treat malaria,

This chapter assesses the extent to which malaria communication messages reach women age 15-49 and the channels through which women receive such messages. The chapter also provides data on women's basic knowledge about causes, symptoms, prevention, and treatment of malaria.

5.1 General Knowledge, and Knowledge of Causes and Symptoms

General Knowledge

Data on malaria knowledge were obtained by asking women age 15-49 the following questions: "Have you ever heard of an illness called malaria?" Nearly all women (96%) know about malaria **(Table 5.1)**. In the SLMIS 2016, malaria knowledge decreased slightly by 2% (98%).

The percentage of women who have heard about malaria has changed very little regardless of age, residence, region, wealth quintile and education.

Knowledge of causes of malaria

Percentage of women age 15-49 who recognise mosquito bites as a cause of malaria

Sample: Women age 15-49 who have heard of malaria

During the survey, women age 15-49 were asked about the cause(s) of malaria. **Tables 5.2.1** and **Table 5.2.2** show that the majority of women (98%) reported mosquito bites as the cause of malaria. This is followed by those who reported that dirty surroundings and drinking dirty water can cause malaria (23% and 14% respectively).. The percentages for other reported causes of malaria are very low, varying between less than 1% for witchcraft and 8% for eating dirty food.

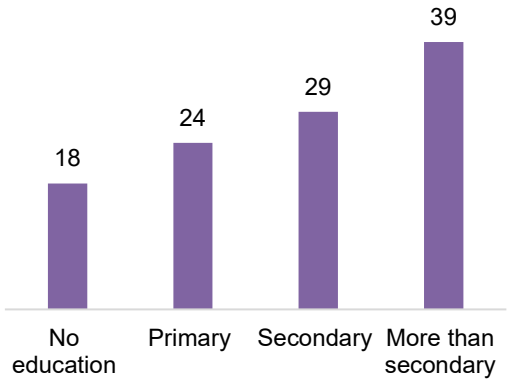
Trends: In the SLMIS 2016, the proportion of mosquito bites as the cause of malaria was 94%, compared to 98% in the SLMIS 2021

Patterns by background characteristics

- Knowledge of mosquito bites (98%) as the main cause of malaria was high among women across all subgroups.
- The belief that irty surroundings (23%) can cause malaria was more prevalent among highly educated women than women with no education (**Figure 5.1**).
- The percentage of women who believed that drinking dirty water can cause malaria was the highest in the Western Region (22%) and the lowest in the Northern Region (5%) (**Table 5.2.2**).

Figure 5.1 **Knowledge of malaria causes by education**

Percentage of women 15-49 who know that dirty surrounding cause malaria



Knowledge of symptoms of malaria

Knowledge of symptoms of malaria

Percentage of interviewed women who know various symptoms of malaria

Sample: Women age 15-49 who have heard of malaria

Respondents were asked about the signs and symptoms that a person with malaria presents. The most frequently reported signs and symptoms were fever (84%), headache (50%) and feeling cold (49%). Some respondents also reported excessive sweating (27%), loss of appetite (23%), body ache or joint pain (18%), body weakness (18%), pale eyes (16%), nausea and vomiting (14%) and dizziness (13%). The percentages for other reported signs and symptoms of malaria are very low, 3% for anaemia and 5% for jaundice (**Table 5.3.1** and **Table 5.3.2**).

Trends: The percentage of women who mentioned fever as a symptom of malaria has increased from the SLMIS 2016 to the SLMIS 2021 (69% and 84%, respectively).

Patterns by background characteristics

- The percentage of women who recognised fever as a symptom of malaria is lowest in Southern (80%) and highest in North-Western (88%).
- The percentage of women mentioning fever as a symptom of malaria is lowest in Pujehun (62%) followed by Tonkolili (76%) and is highest in Falaba and Port Loko (93%).
- The percentage of women reporting headache as another main symptom is highest among women with more than secondary education (61%) and the lowest among those with primary education (45%).

5.2 SOURCES OF MALARIA MESSAGES

Exposure to communication messages

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

Sample: Women age 15-49

A crucial element in the fight to eliminate malaria is the ability to inform and educate people on the causes and ways to avoid getting it. Exposure to information is the critical first step in increasing knowledge of practices and services that may influence an individual to adopt or change a behaviour. The target population's ability to recall messages about malaria is an indicator of the success of communication activities.

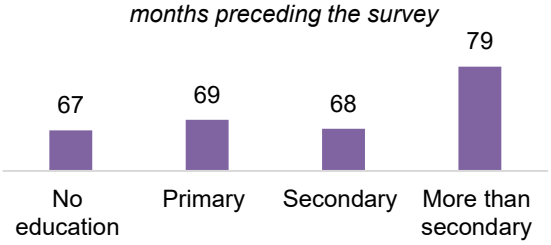
To assess the coverage of malaria communication programmes, women were asked if they had seen or heard any messages about malaria prevention in the 6 months preceding the survey. Women who had heard or seen messages were further asked about the source of the messages.

Regardless of the source, over two-thirds of women (68%) had heard or seen a malaria message in the 6 months preceding the survey. Among those who had seen or heard a malaria message, government hospital/clinic was the most commonly cited source of information with over eight in ten women (83%) reporting that they had seen or heard amalaria message when visiting government health institutions. Other commonly cited sources for malaria messages by women were a community health worker (71%), their own home (61%), radio/TV (54%) and friends (44%) (**Table 5.4.1 and 5.4.2**).

Trends: The percentage of women who have seen or heard a malaria message in the past 6 months decreased from 82% in SLMIS 2016 to 68% in SLMIS 2021. However, the percentage of women seeing or hearing malaria messages when visiting government hospitals or clinics increased from 69% in 2016 to 83% in 2021.

***Figure 5.2* Media exposure to malaria messages by education**

Percentage of women age 15-49 who saw or heard a message on malaria in the 6 months preceding the survey



Patterns by background characteristics

- By education, 67% of women with no education have seen or heard a malaria message compared to 79% of women with more than secondary education (**Figure 5.2**).
- The percentage of women who have seen or heard a malaria message in the past 6 months ranges from 61% in North-Western to 75% in Southern (**Table 5.4.2**).

5.3 Knowledge on Malaria Prevention

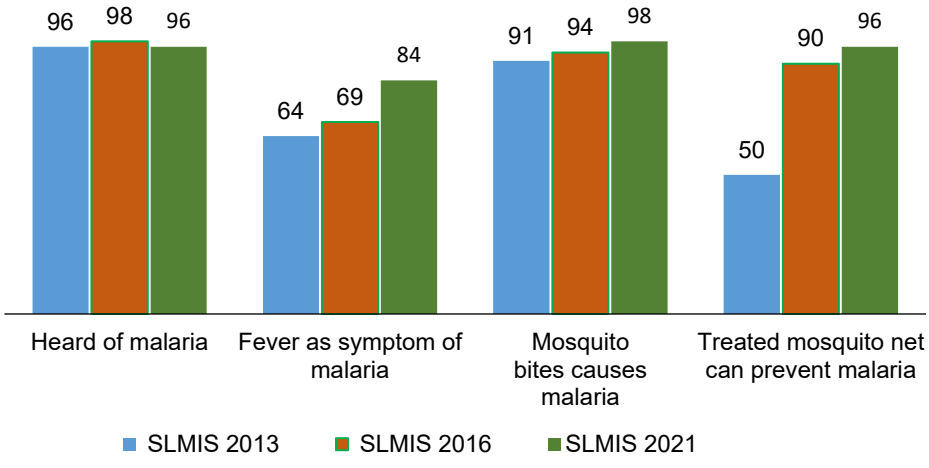
Improved knowledge on malaria prevention, such as increasing use of insecticide-treated nets (ITNs), is a fundamental step towards changing behaviour. Women age 15-49 who had heard or seen a malaria message in the last 6 months were asked to cite things people can do to prevent themselves from getting malaria.

Ninety-six percent of women reported sleeping under a treated mosquito net as a way to prevent malaria. Other commonly cited measures included avoiding mosquito bites (38%), using mosquito coils (32%), keeping surroundings clean (23%), taking preventive medicine (21%), and use mosquito repellent (19%) (**Table 5.5.1** and **Table 5.5.2**).

Figure 3 summarizes the trends of malaria general knowledge, knowledge of malaria main symptom (fever), knowledge of malaria main cause (mosquito bites) and knowledge on malaria main prevention (treated mosquito nets). Generally, the figure on knowledge shows an increasing trend from 2013 to 2021.

***Figure 5.3* Trends in knowledge of symptoms, causes, and prevention of malaria**

Percentage of women who have heard of malaria, mentioned fever a symptom of malaria, mosquito bite causes malaria, and treated mosquito net can prevent malaria

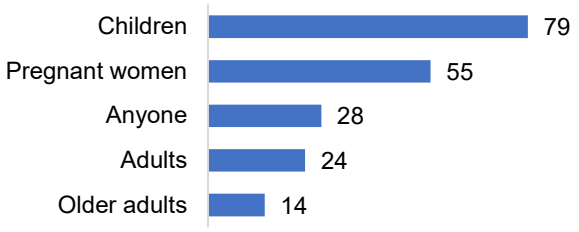


5.4 People Most at Risk of Getting Malaria and their knowledge on Malaria Treatment

Women age 15-49 were asked the following question: *In your opinion, which people are most at risk of getting malaria*? Eight in ten women (79%) cited children, followed by pregnant women (55%). The other groups identified by the respondents include anyone (28%), adults (24%) and older adults (13%) (**Table 5.61** and **Figure 5.4**).

Figure 5.4 **People most at risk to get malaria**

Percentage of women who gave opinion about the people most at risk of getting malaria



Women were also asked about the medicines to treat malaria. Eighty-three percent cited artemisinin-based combination therapy (ACT) as the preferred medicine to treat malaria, 28% mentioned SP/Fansidar, and 22% cited Aspirin/Panadol/Paracetamol. Other medicines were mentioned such as traditional medicines/herbs (12%) and Quinine (8%) **Tables 5.6.1 and 5.6.2**).\

Patterns by background characteristics

- The percentage of women who cited ACT is higher in urban areas (86%) compared to rural areas (80%). However, the percentage of women who cited SP/Fansidar is higher in rural areas (31%) than in urban areas (26%) (**Table 5.6.1**).
- By region, the percentage of women who mentioned ACT varies from 70% in Northern to 96% in North Western (**Table 5.6.2**).
- The highest percentage of respondents who cited ACT is in in the district of Port Loko (98%) and the lowest percentage is in the districts of Tonkolili (62%) and Kenema (66%) (Table 5.6.2).

5.5 Perceived Susceptibility, Severity, and Self-efficacy

Risk involves the following components: the likelihood of a specific event occurring (perceived susceptibility) multiplied by the magnitude of consequences associated with that event (perceived severity) (Douglas 1986). "Self-efficacy refers to people's confidence in their ability to perform a specific behaviour".

During the survey, a series of statements were read to capture respondents' perceptions of malaria susceptibility, their beliefs regarding the severity of the consequences of malaria, and their perceived self-efficacy to perform specific malaria-related behaviours. Eighty-nine percent of women perceive that their families and communities are at risk for malaria. Similarly, 77% of women believe that the consequences of malaria are serious. Fifty-six percent of women disagree that getting malaria is not a problem, because it can be easily treated, and 67% disagree that only weak children can die from malaria (**Table 5.7**).

Seventy-nine percent of women say that they are confident in their ability to perform specific malaria-related behaviours. This includes women who agree that they can sleep under a mosquito net for the entire

night (74%) when there are lots of mosquitoes or agree that they can sleep under a mosquito net for the entire night when there are few mosquitoes (72%) (**Table 5.7**).

Patterns by background characteristics

- The percentage of women who perceive that their families and communities are at risk of malaria ranges from 86% in Northern to 92% in Eastern (**Table 5.7**).
- By district, the percentage of women who perceive that their families and communities are at risk of malaria ranges from the lowest at 74% in Falaba to the highest at 96% in Karene and Moyamba (**Table 5.7)**.
- Women in rural areas (78%) than urban areas (75%) feel that the consequences of malaria are serious (**Table 5.7**).
- The percentage of women who feel that the consequences of malaria are serious in their families and communities ranges from 67% in Southern to 91% in North Western (**Figure 5.5**).
- The percentage of women who are confident in their ability to perform specific malaria-related behaviours ranges from 74% in North Western to 84% in Eastern (**Table 5.7**).).

Figure 5.5 **Perception about malaria risk by region**

Percentage of women age 15-49 who perceive that their families and communities are at risk from malaria

5.6 Attitudes toward Malaria-related Behaviours and Norms

People who view a behaviour favourably or positively are more likely to adopt the behaviour. Those with favourable attitudes toward a behaviour anticipate beneficial outcomes (e.g., prompt care seeking ensures peace of mind) or feel that the behaviour has positive attributes (e.g., sleeping under a net feels safe).

Women were asked whether it is best to start giving a child with a fever any medicine they have at home. If they disagreed with this statement, they were considered to have a favourable attitude towards specific malaria-related behaviours. Overall, 53% of women had a favourable attitude towards specific malaria behaviours (**Table 5.8**).

Beliefs about what others do and what others think often guide our actions. These types of beliefs are called norms. Malaria programmes can influence behaviours if they portray certain behaviours as socially unacceptable or socially desirable. Fifty percent of women believe that the majority of people in their community currently practise specific malaria-related behaviours (**Table 5.8**). This includes women who agree that people in their community usually take their children to a health care provider on the same day or the day after they develop a fever or agree that people in the community who have a mosquito net usually sleep under a mosquito net every night.

Patterns by background characteristics

- The percentage of women who disagree that when a child has a fever, it is best to start giving that child any medicine ranges from less than 52% among those with no education to 60% among those with more than a secondary education (**Table 5.**8).

- The percentage of women who believe that the majority of people in their community currently practise specific malaria-related behaviours is higher in rural areas (53%) than in urban areas (45%) (**Table 5.8**)

- The percentage of women who believe that the majority of people in their community currently practise specific malaria-related behaviours range from 36% among those in Western to 64% among those in Eastern (**Table 5.8**).

5.7 CONCLUSIONS

- While nearly all women aged 15-49 who recognize that mosquito bites cause malaria and sleeping under a mosquito net prevents malaria infection, much fewer of them sleep under a mosquito net. Dissociation between knowledge of malaria prevention and its practices required further studies for the benefit of the malaria prevention in Sierra Leone.

- About four in five women indicate that children are at high risk of malaria infection, only slightly more than half of them agree that pregnant women are the high-risk group. This finding will help the malaria programme to continue improving its message.

  The knowledge of ACT is 84%. However, it is challenging that in certain districts this knowledge is as low as only 62%.

LIST OF TABLES

For detailed information on malaria, see the following tables:

- **Table 5.1 Knowledge of malaria**
- **Table 5.2.1 Knowledge of causes of malaria by background characteristics**
- **Table 5.2.2 Knowledge of causes of malaria by region and district**
- **Table 5.3.1 Knowledge of malaria symptoms by background characteristics**
- **Table 5.3.2 Knowledge of malaria symptoms by region and district**
- **Table 5.4.1 Media exposure to malaria messages by background characteristics**
- **Table 5.4.2 Media exposure to malaria message by region and district**
- **Table 5.5.1 Knowledge of ways to avoid malaria by background characteristics**
- **Table 5.5.1 Knowledge of ways to avoid malaria by region and district**
- **Table 5.6.1 Knowledge of malaria treatment by background characteristics**
- **Table 5.6.1 Knowledge of malaria treatment by region and district**
- **Table 5.7 Malaria susceptibility, severity, and self-efficacy**
- **Table 5.8 Attitudes toward malaria-related behaviours and malaria norms**

Table 5.1 Knowledge of malaria

Percentage of women aged 15-49 years who heard of malaria by background characteristics, Sierra Leone MIS 2021

Background Characteristic	Has heard of Malaria	Number of respondents
Age		
15-19	94.0	1,412
20-24	96.0	1,495
25-29	96.5	1,720
30-34	96.9	1,293
35-39	96.2	1,203
40-44	97.4	641
45-49	96.2	535
Residence		
Urban	97.0	3,513
Rural	95.4	4,787
Region		
Eastern	97.7	1,715
Northern	91.2	1,717
North Western	96.4	1,265
Southern	98.1	1,720
Western	97.0	1,883
District		
Kailahun	98.2	591
Kenema	97.0	642
Kono	97.5	501
Bombali	97.5	511
Karene	98.1	342
Kambia	97.1	310
Falaba	76.5	192
Koinadugu	92.7	194
Port Loko	95.1	612
Tonkolili	90.4	814
Bo	99.5	683
Bonthe	97.7	397
Moyamba	95.8	381
Pujehun	98.6	245
Western rural	98.4	785
Western urban	96.0	1,097
Education		
No education	95.1	4,242
Primary	95.1	743
Secondary	97.4	3,122
More than secondary	98.0	192
Wealth quintile		
Lowest	96.2	1,605
Second	93.9	1,561
Middle	96.4	1,666
Fourth	95.5	1,675
Highest	98.0	1,793
Total	96.1	8,300

Table 5.2.1 Knowledge of causes of malaria

Among women age 15-49, the percentage who cite specific causes of malaria, according to background characteristics, Sierra Leone MIS 2021

Background Characteristic	Mosquito bites	Eating immature sugarcane	Eating cold food	Eating dirty food	Drinking beer / palm wine	Drinking dirty water	Getting soaked with rain	Cold or changing weather	Witchcraft	injection drug	Eating oranges or mangoes	Eating plenty oil	Sharing razors / blades	Bed bugs	Dirty surroundings	Other	Don't know	Total woman who have heard of malaria
Age																		
15-19	98.0	4.1	4.0	8.9	1.9	14.6	3.3	4.7	0.0	0.1	4.3	3.7	0.0	0.9	24.1	0.5	0.4	1,328
20-24	98.9	3.5	3.0	7.3	2.2	13.6	2.6	2.9	0.0	0.0	2.5	3.8	0.1	0.8	24.8	0.6	0.4	1,436
25-29	98.0	4.2	3.8	8.4	2.3	14.2	2.3	3.2	0.1	0.1	4.2	3.4	0.1	1.1	22.4	0.3	0.1	1,660
30-34	97.9	3.5	3.3	6.0	2.4	12.3	1.4	3.4	0.1	0.1	3.1	3.0	0.3	0.8	21.9	0.5	0.5	1,254
35-39	98.1	2.9	2.8	7.2	2.3	12.0	3.0	3.7	0.1	0.0	3.3	3.9	0.1	0.5	21.5	0.0	0.4	1,157
40-44	97.1	2.7	1.9	7.1	2.5	16.9	3.2	4.2	0.2	0.0	2.4	3.9	0.2	0.5	25.2	0.6	0.2	624
45-49	97.5	4.2	3.6	9.2	1.8	14.0	4.5	5.3	0.1	0.1	4.7	3.8	0.2	1.4	25.0	0.1	0.9	515
Residence																		
Urban	97.5	4.2	3.6	9.2	1.8	14.0	4.5	5.3	0.1	0.1	4.7	3.8	0.2	1.4	25.0	0.1	0.9	515
Rural	97.5	3.4	3.0	7.4	2.2	10.5	2.9	4.3	0.1	0.1	3.5	3.3	0.2	1.0	21.4	0.5	0.5	4,566
Education																		
No education	97.7	3.3	3.1	7.8	2.7	12.3	2.9	3.8	0.1	0.0	3.6	3.4	0.2	0.8	18.3	0.4	0.4	4,036
Primary	96.2	4.3	4.0	9.3	2.1	15.6	3.8	6.4	0.1	0.0	4.0	4.1	0.2	2.0	24.2	0.8	1.1	707
Secondary	99.0	4.0	3.3	7.2	1.6	15.0	2.3	3.1	0.1	0.1	3.4	3.9	0.1	0.7	28.7	0.4	0.1	3,042
More than secondary	98.8	3.6	4.5	6.2	1.2	16.8	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	38.8	0.0	0.4	188
Wealth quintile																		
Lowest	98.2	2.7	3.3	8.1	2.3	11.8	3.8	7.5	0.0	0.0	3.7	4.0	0.1	1.5	21.3	0.8	0.4	1,544
Second	96.8	4.0	2.5	9.0	1.9	13.2	3.8	4.2	0.2	0.0	3.4	3.2	0.3	1.5	21.5	0.3	0.5	1,466
Middle	98.4	2.7	3.3	7.3	2.3	10.7	2.9	3.1	0.1	0.2	4.2	3.6	0.0	0.7	21.5	0.7	0.3	1,606
Fourth	97.9	3.8	3.3	6.5	2.7	13.7	1.8	2.3	0.0	0.1	2.5	2.7	0.1	0.3	24.0	0.1	0.5	1,600
Highest	99.0	4.9	4.0	7.6	2.0	18.8	1.4	1.7	0.0	0.0	3.7	4.4	0.1	0.4	27.5	0.1	0.2	1,756
Total	98.1	3.6	3.3	7.7	2.2	13.7	2.7	3.7	0.1	0.1	3.5	3.6	0.1	0.8	23.3	0.4	0.3	7,973

Table 5.2.2 Knowledge of causes of malaria

Among women age 15-49, the percentage who cite specific causes of malaria, according to region and district, Sierra Leone MIS 2021

Background Characteristic	Mosquito bites	Eating immature sugarcane	Eating cold food	Eating dirty food	Drinking beer / palm wine	Drinking dirty water	Getting soaked with rain	Cold or changing weather	Witchcraft	injection drug	Eating oranges or mangoes	Eating plenty oil	Sharing razors / blades	Bed bugs	Dirty surroundings	Other	Don't know	Total woman who have heard of malaria
Region																		
Eastern	98.1	0.9	1.8	7.4	2.0	13.3	4.6	7.8	0.0	0.0	1.6	0.2	0.0	0.7	24.2	0.1	0.4	1,675
Northern	96.7	7.2	4.4	5.5	3.0	5.3	2.1	2.3	0.1	0.1	4.3	2.6	0.2	0.6	14.9	0.4	0.6	1,566
North Western	98.1	2.4	2.4	12.1	1.6	13.0	4.6	4.3	0.2	0.1	4.2	9.4	0.3	1.2	26.9	0.5	0.3	1,220
Southern	98.3	3.7	4.0	6.6	2.6	13.3	2.0	3.3	0.0	0.1	3.1	2.9	0.2	1.5	21.1	0.8	0.3	1,687
Western	99.1	3.8	3.8	7.9	1.8	22.3	0.9	1.1	0.0	0.1	4.4	4.3	0.0	0.3	29.4	0.1	0.2	1,826
District																		
Kailahun	98.4	0.0	1.0	13.8	0.4	17.1	10.1	13.0	0.0	0.0	0.6	0.1	0.0	1.2	19.7	0.1	0.0	581
Kenema	97.4	2.3	3.2	4.2	4.9	14.4	2.6	5.3	0.0	0.0	1.6	0.5	0.0	0.4	16.8	0.3	0.6	623
Kono	98.6	0.0	0.8	3.8	0.3	7.4	0.6	5.0	0.0	0.0	2.8	0.0	0.0	0.5	38.7	0.0	0.6	488
Bombali	97.9	17.8	10.5	10.7	3.7	7.7	2.1	1.7	0.4	0.2	1.2	0.3	0.5	1.1	14.1	0.9	0.7	498
Falaba	96.1	1.7	3.4	4.1	1.2	6.8	2.9	5.2	0.0	0.0	2.1	1.5	0.0	2.7	25.5	0.2	0.0	147
Koinadugu	93.9	4.1	4.9	5.3	14.5	4.5	2.5	1.7	0.0	0.0	21.9	20.6	0.1	0.0	3.3	0.0	1.7	179
Tonkolili	96.6	2.0	0.4	2.2	0.2	3.6	1.6	2.0	0.0	0.1	2.5	0.0	0.0	0.0	16.0	0.4	0.4	736
Kambia	98.1	5.4	6.8	34.5	1.9	33.1	18.0	15.2	0.8	0.3	9.2	29.2	1.2	4.7	24.0	1.3	1.1	301
Karene	98.7	0.3	1.7	8.6	1.4	9.8	0.7	1.7	0.0	0.0	6.1	4.6	0.0	0.3	21.6	0.3	0.0	335
Port Loko	97.7	2.0	0.6	2.6	1.5	4.5	0.0	0.2	0.0	0.0	0.5	2.0	0.0	0.0	31.4	0.0	0.0	583
Bo	98.2	1.0	3.1	3.8	1.4	14.1	1.1	1.7	0.0	0.2	1.9	2.0	0.1	0.6	23.8	0.2	0.2	680
Bonthe	98.6	0.2	0.6	4.0	0.0	5.8	4.4	6.8	0.0	0.0	3.3	3.7	0.3	4.0	20.6	2.8	0.4	388
Moyamba	97.8	15.0	10.6	15.3	8.5	22.7	1.6	2.7	0.0	0.0	4.4	4.7	0.6	0.7	18.5	0.2	0.2	366
Pujehun	98.5	0.0	1.9	5.8	1.2	8.5	1.2	3.3	0.0	0.0	4.3	1.4	0.0	1.3	18.7	0.5	1.0	242
Western rural	99.4	0.5	0.0	3.6	0.0	13.3	0.4	0.8	0.0	0.1	2.6	0.1	0.0	0.7	29.6	0.3	0.0	772
Western urban	98.9	6.3	6.5	11.0	3.1	29.0	1.3	1.3	0.0	0.1	5.8	7.4	0.0	0.0	29.2	0.0	0.3	1,053
Total	98.1	3.6	3.3	7.7	2.2	13.7	2.7	3.7	0.1	0.1	3.5	3.6	0.1	0.8	23.3	0.4	0.3	7,973

Table 5.3.1 Knowledge of malaria symptoms

Among women who have ever heard of malaria, percentage of women age 15-49 who know various symptoms of malaria, by background characteristics, Sierra Leone MIS 2021

Background Characteristic	Fever	Excessive sweating	Feeling cold	Headache	Nausea and vomiting	Diarrhoea	Dizziness	Loss of appetite	Body ache or joint pain	Pale eyes	Body weakness	Refusing to eat or drink	Jaundice	Dark urine	Low blood (anaemia)	Other	Don't know	Total woman who have heard of malaria
Age																		
15-19	80.3	26.9	50.2	51.9	13.6	5.4	13.3	21.5	15.8	15.4	16.9	4.4	4.9	11.1	2.2	0.4	0.6	1,328
20-24	84.5	26.7	48.3	50.2	12.7	5.6	13.4	24.7	17.8	17.3	20.7	5.9	5.3	9.7	2.8	0.1	0.3	1,436
25-29	85.5	26.8	48.9	51.6	14.0	4.7	14.1	22.7	18.2	14.6	18.6	3.8	3.5	9.2	3.1	0.1	0.2	1,660
30-34	82.4	27.4	46.3	48.2	13.0	4.1	11.3	21.5	18.2	15.2	18.2	2.8	4.4	9.3	1.9	0.1	0.5	1,253
35-39	85.2	24.0	49.7	45.9	14.0	4.7	12.1	22.2	18.6	13.2	16.0	4.5	4.6	8.2	2.9	0.3	0.3	1,157
40-44	85.7	29.1	50.2	49.3	13.3	6.2	14.3	24.3	22.8	17.1	19.0	3.8	4.8	8.9	1.7	0.3	0.2	624
45-49	81.9	29.5	53.2	49.5	17.6	4.4	15.0	24.7	21.7	17.8	20.1	5.5	4.9	9.5	4.2	0.3	0.4	515
Residence																		
Urban	85.5	28.4	48.4	50.7	17.0	5.5	16.9	29.6	23.3	21.1	22.7	5.9	4.9	10.9	2.8	0.1	0.2	3,407
Rural	82.4	25.7	49.6	49.0	11.3	4.6	10.4	17.8	14.7	11.4	15.2	3.2	4.3	8.4	2.5	0.2	0.5	4,566
Education																		
No education	82.8	25.6	49.0	48.6	13.0	5.1	11.0	19.8	15.6	12.9	15.2	3.6	4.4	8.1	2.6	0.1	0.4	4,036
Primary	82.0	25.3	48.0	44.5	12.6	6.0	12.8	22.2	18.0	16.5	19.6	4.1	4.0	9.7	3.1	0.0	0.9	706
Secondary	84.8	27.9	50.0	51.7	14.5	4.6	15.3	26.2	21.4	18.5	21.7	5.4	5.0	11.3	2.7	0.3	0.2	3,042
More than secondary	92.2	42.8	41.3	60.8	21.1	4.5	28.6	37.6	31.4	19.6	27.9	3.0	2.4	9.2	0.4	0.0	0.4	188
Wealth quintile																		
Lowest	79.4	20.5	48.4	44.6	9.8	4.5	11.2	20.7	20.0	14.9	22.2	4.3	7.2	11.0	2.9	0.1	0.5	1,544
Second	81.1	24.3	51.2	49.3	12.9	5.2	10.6	18.3	16.3	10.2	13.6	2.2	3.8	7.2	1.5	0.3	0.6	1,466
Middle	82.6	22.1	48.3	46.8	12.1	4.6	12.8	23.5	14.1	15.5	18.5	3.8	4.2	10.3	2.5	0.3	0.3	1,606
Fourth	85.6	31.5	45.6	49.7	13.5	6.0	11.2	20.2	14.5	16.4	17.3	4.5	4.3	9.6	3.6	0.1	0.3	1,600
Highest	89.1	34.6	51.7	57.2	19.6	4.6	19.2	30.4	26.0	19.7	20.0	6.5	3.6	9.3	2.7	0.0	0.2	1,756
Total	83.7	26.9	49.1	49.7	13.7	5.0	13.2	22.9	18.4	15.5	18.4	4.3	4.6	9.5	2.6	0.2	0.4	7,973

Table 5.3.2 Knowledge of malaria symptoms

Among women who have ever heard of malaria, percentage of women age 15-49 who know various symptoms of malaria, by region and district, Sierra Leone MIS 2021

Background Characteristic	Fever	Excessive sweating	Feeling cold	Headache	Nausea and vomiting	Diarrhoea	Dizziness	Loss of appetite	Body ache or joint pain	Pale eyes	Body weakness	Refusing to eat or drink	Jaundice	Dark urine	Low blood (anaemia)	Other	Don't know	Total woman who have heard of malaria
Region																		
Eastern	82.7	20.5	47.1	48.6	9.9	3.4	10.0	21.9	21.0	15.6	27.4	5.6	9.5	10.4	1.8	0.2	0.2	1,675
Northern	83.7	33.7	55.1	52.9	13.2	3.2	13.1	22.8	15.6	15.3	12.7	5.7	6.1	8.5	3.3	0.3	0.5	1,565
North Western	88.0	26.4	50.0	50.6	14.2	5.7	7.1	12.9	11.4	7.7	10.6	3.1	2.8	6.6	2.0	0.0	0.1	1,220
Southern	80.3	24.2	41.8	43.2	12.3	6.6	14.3	18.5	13.3	14.1	13.8	2.9	3.3	11.6	3.9	0.3	0.8	1,687
Western	85.0	29.5	51.9	53.5	18.7	6.0	19.1	34.5	27.6	22.1	24.5	4.2	1.2	9.4	2.1	0.1	0.2	1,826
District																		
Kailahun	85.4	14.3	44.3	36.6	13.7	0.8	5.3	18.9	32.9	11.9	33.7	0.2	13.9	17.3	1.2	0.0	0.0	581
Kenema	79.5	29.3	39.2	46.4	10.3	4.4	13.9	16.1	12.7	14.0	19.5	5.8	12.2	9.2	1.6	0.4	0.0	623
Kono	84.1	16.6	60.2	66.2	4.6	5.3	10.6	32.3	16.9	21.5	29.2	11.5	0.5	3.4	2.8	0.0	0.6	488
Bombali	90.4	62.7	55.4	54.1	21.1	4.8	20.0	34.7	26.4	34.2	26.1	14.8	11.0	20.5	9.5	0.1	0.6	498
Falaba	92.5	20.3	38.8	60.8	11.1	4.9	5.4	16.3	19.3	6.4	6.7	0.8	0.4	1.9	1.1	0.0	0.6	147
Koinadugu	91.8	14.6	50.2	65.2	12.6	3.2	4.8	5.5	4.6	1.8	7.5	1.1	1.3	0.3	0.0	0.0	2.0	179
Tonkolili	75.5	21.6	59.2	47.4	8.7	1.7	12.1	20.4	10.2	7.6	6.2	1.7	5.1	3.8	0.5	0.6	0.0	736
Kambia	78.7	27.6	59.0	61.9	15.4	11.4	16.9	21.9	20.7	18.1	18.1	12.0	6.5	8.2	3.4	0.0	0.5	301
Karene	87.2	26.2	65.4	43.4	16.2	6.5	3.5	13.5	15.6	1.7	12.8	0.5	4.0	12.0	0.5	0.0	0.0	335
Port Loko	93.2	26.0	36.5	49.0	12.3	2.3	4.1	7.9	4.1	5.7	5.4	0.0	0.1	2.7	2.2	0.0	0.0	582
Bo	79.8	16.0	28.4	38.9	9.1	6.2	11.9	22.6	16.3	12.2	14.5	4.2	5.1	9.4	2.2	0.0	0.5	680
Bonthe	81.5	29.3	59.4	48.8	21.6	3.6	22.7	14.6	7.3	19.3	15.7	0.9	3.4	18.7	3.6	1.0	1.1	388
Moyamba	91.0	46.3	45.3	50.9	13.5	13.9	11.4	17.2	10.8	9.4	8.8	1.9	1.7	9.9	6.7	0.0	0.9	365
Pujehun	62.3	6.3	46.9	33.9	4.8	1.5	12.5	15.8	19.4	19.3	16.9	4.0	0.5	9.9	4.8	0.4	1.3	242
Western rural	76.1	10.1	43.7	33.4	10.8	5.5	8.4	39.7	27.7	26.4	34.8	1.2	0.8	14.5	1.0	0.2	0.0	772
Western urban	91.5	43.7	57.9	68.3	24.4	6.4	27.0	30.6	27.6	19.0	17.0	6.4	1.5	5.6	2.9	0.0	0.2	1,053
Total	83.7	26.9	49.1	49.7	13.7	5.0	13.2	22.9	18.4	15.5	18.4	4.3	4.6	9.5	2.6	0.2	0.4	7,973

Table 5.4.1 Media exposure to malaria messages by background characteristics

Percentage of women age 15-49 who have seen or heard a malaria message in the past 6 months, and among those who have seen or heard a malaria message in the past 6 months, percentage who cite specific sources for malaria messages, by region and district, Sierra Leone MIS 2021

Background Characteristic	Percentage who have seen or heard a malaria message in the past 6 months	Total women	Government clinic/hospital	Com health worker / Com health club / School health club	Home	Drama groups	Peer educator	Com meeting	Town crier	Poster	TV / Radio	Newspaper	Faith	Friends	Other	Total woman who have seen or heard a malaria message in the past 6 months
Age																
15-19	62.8	**1,412**	74.8	69.2	66.0	11.2	17.6	24.0	19.5	31.6	53.5	7.2	16.3	47.3	2.6	886
20-24	66.7	**1,495**	84.5	69.0	62.7	7.3	11.4	23.7	18.4	25.2	54.7	6.2	16.3	42.6	2.5	997
25-29	68.0	**1,720**	86.4	72.6	60.5	6.2	14.1	28.7	18.6	25.5	55.0	7.1	16.7	43.2	2.2	1,170
30-34	73.1	**1,293**	85.5	71.5	58.8	6.2	11.6	24.6	18.7	20.9	51.4	4.8	17.0	41.5	2.0	945
35-39	68.8	**1,203**	83.4	72.2	59.1	6.9	12.4	28.5	20.0	21.1	55.4	5.6	15.7	43.0	2.2	828
40-44	68.3	**641**	83.2	69.6	58.1	8.5	14.4	33.8	21.8	22.3	57.0	6.0	18.3	44.6	1.3	437
45-49	66.7	**535**	83.3	72.8	61.0	7.4	11.7	28.5	17.5	26.5	56.3	6.2	21.7	43.4	1.5	357
Residence																
Urban	66.7	**535**	83.3	72.8	61.0	7.4	11.7	28.5	16.1	35.8	56.3	6.2	21.7	43.4	1.5	357
Rural	67.3	**4,787**	81.4	72.6	57.6	5.5	11.0	25.2	21.4	16.6	41.5	1.9	14.1	40.3	2.5	3,222
Education																
No education	67.2	**4,242**	84.1	70.8	59.0	4.6	10.0	25.9	19.7	16.7	46.4	1.7	14.7	39.4	1.8	2,850
Primary	69.1	**743**	83.2	70.7	60.1	6.6	13.1	27.5	24.7	23.0	52.1	2.7	17.8	48.4	3.2	514
Secondary	67.5	**3,122**	82.2	71.6	64.4	11.0	17.3	27.2	17.6	34.6	62.9	11.0	18.8	47.6	2.1	2,108
More than secondary	78.6	**192**	79.2	67.2	58.8	17.1	22.2	32.8	10.8	48.0	94.2	35.9	30.5	48.0	6.2	151
Wealth quintile																
Lowest	72.9	**1,605**	82.6	70.6	64.1	6.4	11.4	26.6	25.0	20.0	43.2	1.8	15.6	47.2	3.7	1,169
Second	64.0	**1,561**	84.5	75.7	50.8	5.0	9.9	26.1	20.9	17.7	39.5	1.2	13.3	36.3	2.4	1000
Middle	66.4	**1,666**	83.2	66.4	61.0	4.8	10.5	23.1	20.5	18.9	50.2	4.1	15.2	39.4	1.5	1,107
Fourth	68.7	**1,675**	82.5	70.5	61.2	7.3	14.1	23.7	16.0	21.4	55.2	5.3	13.8	44.1	1.0	1,150
Highest	66.7	**1,793**	83.3	72.1	66.8	13.6	20.1	33.7	13.7	44.3	80.9	17.5	25.8	49.3	2.2	1,196
Total	67.7	**8,300**	83.2	71.0	61.1	7.6	13.4	26.7	19.1	24.8	54.4	6.2	16.9	43.5	2.2	5,622

5.4.2 Media exposure to malaria messages by background characteristics

Percentage of women age 15-49 who have seen or heard a malaria message in the past 6 months, and among those who have seen or heard a malaria message in the past 6 months, percentage who cite specific sources for malaria messages, by region and district, Sierra Leone MIS 2021

Background Characteristic	Percentage who have seen or heard a malaria message in the past 6 months	**Total women**	Government clinic/hospital	Com health worker / Com health club / School health club	Home	Drama groups	Peer educator	Com meeting	Town crier	Poster	TV / Radio	Newspaper	Faith	Friends	Other	Total woman who have seen or heard a malaria message in the past 6 months
Region																
Eastern	71.0	**1,715**	88.1	66.1	68.9	3.1	4.7	15.5	15.7	51.9	51.9	2.5	7.0	47.4	2.1	1,218
Northern	63.4	**1,717**	79.3	65.5	50.2	7.0	15.1	26.1	18.9	42.2	42.2	4.5	11.2	30.8	4.7	1,089
North Western	61.0	**1,265**	79.7	72.8	53.8	2.0	2.6	11.4	12.0	36.3	36.3	1.1	11.2	43.7	1.6	772
Southern	75.4	**1,720**	80.7	75.9	61.9	8.7	16.8	34.9	27.0	51.3	51.3	3.7	23.8	42.5	0.3	1,297
Western	66.2	**1,883**	86.6	74.3	66.8	14.7	23.4	39.2	44.5	82.0	82.0	17.1	28.0	52.0	2.2	1,246
District																
Kailahun	61.9	**591**	84.3	86.2	66.0	1.4	3.0	12.8	3.6	45.0	45.0	0.4	2.7	35.4	0.6	366
Kenema	86.8	**642**	89.9	50.9	75.6	2.6	3.3	14.1	22.9	52.1	52.1	2.2	7.6	64.5	4.3	558
Kono	60.6	**501**	88.4	69.3	58.7	5.9	9.5	21.4	16.9	59.9	59.9	5.9	11.1	30.4	0.0	303
Bombali	60.3	**511**	74.1	80.3	66.7	13.4	26.9	43.5	27.1	53.7	53.7	10.7	21.5	48.5	2.9	308
Falaba	46.0	**192**	80.9	73.3	44.4	5.2	4.7	36.9	16.8	43.4	43.4	0.0	22.3	25.7	22.7	88
Koinadugu	57.3	**194**	91.7	88.4	67.8	15.9	48.8	61.5	23.2	31.1	31.1	8.3	25.2	56.8	0.0	111
Tonkolili	70.9	**814**	79.5	52.1	39.1	2.1	3.9	8.5	14.0	38.1	38.1	1.2	1.4	17.2	3.7	577
Kambia	69.5	**310**	90.2	63.3	73.7	1.7	4.4	24.0	35.1	62.8	62.8	0.5	30.9	58.4	4.1	215
Karene	49.7	**342**	84.8	85.2	23.2	1.4	2.1	11.5	5.7	30.8	30.8	1.7	3.4	13.6	0.6	170
Port Loko	63.1	**612**	71.5	72.6	56.2	2.5	1.7	4.3	2.0	23.9	23.9	1.2	3.7	48.6	0.8	387
Bo	89.9	**683**	79.9	72.1	53.1	5.2	13.7	25.9	22.5	54.2	54.2	2.9	14.7	28.1	0.2	614
Bonthe	72.2	**397**	73.7	68.0	57.4	6.7	17.9	18.6	19.5	53.4	53.4	3.4	10.6	28.7	1.2	287
Moyamba	82.6	**381**	93.2	92.5	86.6	19.2	25.8	69.7	46.3	51.3	51.3	5.7	59.2	88.1	0.0	315
Pujehun	30.7	**245**	65.8	69.8	48.3	0.9	0.9	26.8	12.8	16.9	16.9	0.9	0.9	18.6	0.0	75
Western rural	73.4	**785**	88.4	69.2	60.9	6.7	17.6	26.7	15.8	75.1	75.1	12.4	18.1	44.7	1.6	576
Western urban	61.0	**1,097**	85.0	78.8	71.8	21.6	28.4	50.0	69.3	87.9	87.9	21.1	36.5	58.2	2.7	669
Total	67.7	**8,300**	83.2	71.0	61.1	7.6	13.4	26.7	24.8	54.4	54.4	6.2	16.9	43.5	2.2	5,622

Table 5.5.1 Knowledge of ways to avoid malaria

Among women age 15-49 who have ever heard of malaria the percentage of women, who cite specific ways to avoid getting malaria, according to background characteristics, Sierra Leone MIS 2021

Background Characteristic	Percentage who know of ways to avoid getting malaria	Woman who have seen or heard a malaria message in the past 6 months	Sleep under a treated net	Use mosquito repellent	Avoid mosquito bites	Take prevention medication	Indoor Residual Sprays (IRS)	Use mosquito coils	Cut around house	Eliminate stagnant water	Keep surroundings clean	Burn leaves	Cut the grass	Don't drink dirty water	Don't eat bad food (immature sugarcane / leftover food)	Use mosquito screens on windows	Don't get soaked in rain	Store bought insect killer	Other	Woman who know of ways to avoid getting malaria
Age																				
15-19	94.4	**886.**	95.7	19.6	41.3	20.2	15.9	37.9	9.9	12.5	27.3	7.2	8.2	3.6	1.3	4.2	2.0	0.2	0.6	836
20-24	95.0	**997**	97.8	20.3	39.1	22.7	16.0	31.3	10.6	11.3	23.5	5.6	7.5	3.8	0.9	3.2	1.5	0.1	0.1	947
25-29	95.8	**1,170**	95.7	19.7	39.5	22.1	14.8	32.4	9.0	8.9	19.9	4.8	5.5	2.3	1.8	2.4	1.5	0.1	0.2	1,121
30-34	96.9	**945**	93.5	17.2	34.2	19.5	12.6	28.8	7.2	7.7	19.9	3.6	4.6	2.2	1.1	1.9	1.3	0.3	0.4	916
35-39	95.7	**828**	96.7	16.0	31.7	19.6	11.3	29.6	9.7	9.7	21.9	4.3	5.3	3.1	1.6	2.0	2.0	0.3	0.4	792
40-44	94.4	**437**	95.1	20.9	43.1	22.1	15.7	31.2	14.2	14.0	25.4	7.3	10.0	5.1	1.6	4.5	1.3	0.3	0.5	413
45-49	94.4	**357**	94.8	18.1	34.4	20.7	14.5	34.0	10.6	12.9	23.7	4.9	5.5	4.1	1.7	2.0	2.3	0.2	0.2	337
Residence																				
Urban	97.4	**2,400**	95.6	21.2	41.7	21.9	19.8	41.2	10.5	10.7	23.2	5.8	7.0	3.9	1.5	3.4	1.6	0.3	0.3	2,338
Rural	93.9	**3,222**	95.8	17.0	34.4	20.3	10.1	25.0	9.2	10.3	22.2	4.8	6.0	2.7	1.3	2.3	1.7	0.1	0.4	3,025
Education																				
No education	94.6	**2,850**	95.7	16.4	33.0	19.4	10.4	26.2	8.9	9.1	19.8	5.2	6.1	3.5	1.3	2.9	1.8	0.1	0.4	2,697
Primary	94.0	**514**	95.9	17.8	37.5	19.9	10.9	30.6	11.3	10.6	25.9	6.1	7.7	3.2	1.7	2.5	2.2	0.1	0.4	483
Secondary	96.6	**2,108**	96.4	21.8	43.2	23.3	19.1	38.4	9.7	11.9	25.0	4.9	6.5	2.9	1.5	2.7	1.4	0.4	0.3	2,035
More than secondary	98.4	**151**	85.9	25.5	44.4	22.4	30.7	54.8	19.2	14.4	31.3	6.2	6.9	1.6	0.8	4.1	0.6	0.0	0.0	148
Wealth quintile																				
Lowest	96.2	**1,169**	96.7	13.1	32.7	19.0	8.7	20.4	7.9	12.2	24.9	4.0	6.2	3.8	1.7	1.9	2.4	0.2	0.5	**1,125**
Second	91.2	**1000**	95.2	15.7	34.2	19.7	7.5	23.8	10.0	8.4	23.5	4.0	5.2	2.9	1.1	2.0	1.3	0.1	0.8	**912**
Middle	94.8	**1,107**	95.5	15.2	33.5	19.1	8.3	29.8	9.5	8.8	21.7	4.6	6.5	3.1	1.3	2.5	1.9	0.1	0.4	**1,049**
Fourth	95.5	**1,150**	97.0	23.4	39.1	24.9	16.4	31.8	11.0	11.3	21.0	3.3	8.0	3.2	1.5	3.8	1.4	0.1	0.1	**1,098**
Highest	98.6	**1,196**	94.2	25.7	47.1	22.1	28.5	51.8	10.3	11.0	22.3	5.1	5.9	3.0	1.3	3.7	1.2	0.6	0.0	**1,179**
Total	95.4	**5,622**	95.7	18.8	37.6	21.0	14.3	32.0	9.7	10.4	22.7	5.2	6.4	3.2	1.4	2.8	1.7	0.2	0.3	**5**,363

Table 5.5.2 Knowledge of ways to avoid malaria

Among women age 15-49 who have ever heard of malaria the percentage of women, who cite specific ways to avoid getting malaria, according to region and district, Sierra Leone MIS 2021

Background Characteristic	Percentage who know of ways to avoid getting malaria	Woman who have seen or heard a malaria message in the past 6 months	Sleep under a treated net	Use mosquito repellent	Avoid mosquito bites	Take prevention medication	Indoor Residual Sprays (IRS)	Use mosquito coils	Cut around house	Eliminate stagnant water	Keep surroundings clean	Burn leaves	Cut the grass	Don't drink dirty water	Don't eat bad food (immature sugarcane / leftover food)	Use mosquito screens on windows	Don't get soaked in rain	Store bought insect killer	Other	Woman who know of ways to avoid getting malaria
Region																				
Eastern	98.3	**1,218**	97.6	10.7	25.4	8.9	5.1	20.6	6.4	14.9	24.7	1.0	4.1	2.2	0.4	1.5	1.0	0.0	0.3	1,197
Northern	90.3	**1,089**	93.0	30.1	42.1	31.1	18.4	36.4	10.9	9.6	25.3	8.6	8.4	2.7	0.7	8.1	3.0	0.2	0.5	983
North Western	94.1	**772**	96.8	12.4	33.4	16.3	7.9	29.1	11.9	4.9	25.0	9.5	9.2	5.9	2.7	2.0	2.7	0.1	0.9	726
Southern	95.5	**1,297**	97.3	16.6	43.9	24.5	13.0	25.3	13.5	11.1	19.9	6.3	8.0	2.7	1.6	1.3	1.4	0.3	0.1	1,239
Western	97.8	**1,246**	93.8	23.8	42.0	24.0	25.3	48.4	7.0	9.4	20.0	2.9	3.7	3.5	1.9	1.8	0.9	0.4	0.2	1,218
District																				
Kailahun	98.5	**366**	96.9	3.0	24.3	2.5	1.7	14.0	2.7	8.1	20.7	0.0	1.1	0.6	0.7	1.3	0.1	0.0	0.0	361
Kenema	97.8	**558**	96.9	14.1	26.5	9.5	3.3	24.3	6.3	9.9	18.6	1.4	3.3	4.3	0.3	0.4	2.2	0.0	0.7	545
Kono	98.6	**303**	100.0	14.0	25.6	15.9	12.8	21.3	10.8	31.9	40.1	1.5	9.1	0.3	0.1	4.2	0.0	0.0	0.0	299
Bombali	97.2	**308**	95.0	68.4	67.9	63.5	42.6	36.1	25.1	23.5	38.6	23.1	23.2	5.2	2.1	23.0	7.9	0.7	0.4	299
Karene	95.5	**170**	99.1	11.7	38.6	0.7	1.6	32.5	4.7	2.8	12.3	0.0	0.0	2.2	1.3	0.0	1.2	0.0	0.4	162
Kambia	94.3	**215**	91.9	13.6	73.2	35.7	6.2	37.8	29.4	13.2	40.0	31.7	31.4	18.2	8.0	6.3	8.6	0.3	2.8	203
Falaba	90.7	**88**	93.4	39.1	37.5	11.1	3.9	19.8	2.6	0.0	25.5	2.0	0.8	2.4	0.0	0.0	3.1	0.0	0.0	80
Koinadugu	86.5	**111**	97.4	24.9	30.9	23.2	19.2	30.0	4.4	2.6	8.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	96
Port Loko	93.4	**387**	98.4	12.0	8.7	12.3	11.6	22.8	5.2	1.1	22.3	1.3	0.9	0.7	0.4	0.4	0.0	0.0	0.0	361
Tonkolili	87.3	**577**	90.9	6.9	29.3	16.5	6.4	40.7	5.0	4.2	20.7	2.6	2.6	1.7	0.2	2.2	0.7	0.0	0.7	504
Bo	96.1	**614**	97.4	6.3	45.6	10.4	6.5	25.5	11.6	3.9	9.7	3.4	3.5	1.2	0.7	0.2	0.3	0.1	0.2	591
Bonthe	95.5	**287**	97.4	18.9	38.1	30.9	16.4	27.1	20.7	27.8	38.8	14.2	17.9	5.2	3.4	0.8	5.3	0.0	0.2	274
Moyamba	97.4	**315**	96.8	35.7	53.1	49.6	22.7	24.5	9.9	10.0	20.4	3.2	7.1	3.1	1.4	2.9	0.3	0.6	0.0	307
Pujehun	82.4	**75**	99.2	9.9	9.5	8.3	11.5	19.8	19.5	13.2	33.7	14.1	13.2	3.8	3.6	4.0	0.0	2.0	0.0	62
Western rural	97.6	**576**	97.9	14.7	17.9	20.3	5.2	23.2	2.9	6.4	23.3	0.0	0.0	2.4	1.5	1.0	0.2	0.0	0.1	563
Western urban	97.9	**669**	90.3	31.6	62.7	27.2	42.6	70.0	10.5	11.9	17.1	5.5	6.9	4.5	2.2	2.5	1.4	0.8	0.3	655
Total	95.4	**5,622**	95.7	18.8	37.6	21.0	14.3	32.0	9.7	10.4	22.7	5.2	6.4	3.2	1.4	2.8	1.7	0.2	0.3	**5**,363

Table 5.6.1 Knowledge of malaria treatment

Among women aged 15-49 who have heard of malaria, the percentage who cite people most at risk to get malaria, and cite specific various drugs to treat malaria, according to background, characteristics, Sierra Leone MIS 2021

	People most at risk at get malaria							Medicines used to treat malaria						
Background Characteristic	Children	Adults	Pregnant women	Older adults	Anyone	Other	Don't know	ACT	Chloroquine	SP/Fansidar	Quinine	Aspirin, Panadol, Paracetamol	Traditional medecines / herbs	Other	Total woman who have heard of malaria
Age															
15-19	77.3	25.3	51.4	15.4	30.0	0.2	0.9	80.3	10.5	24.3	8.2	23.6	13.4	0.8	1,328
20-24	77.0	20.1	54.5	12.7	28.5	0.1	1.0	81.1	10.1	30.1	8.6	20.5	11.5	0.5	1,436
25-29	80.9	23.2	55.7	12.9	26.2	0.2	0.6	84.5	9.5	30.7	8.4	22.1	12.1	0.7	1,660
30-34	79.0	22.6	55.0	10.7	27.1	0.1	0.7	82.5	9.2	29.4	8.1	23.3	11.8	0.4	1,253
35-39	79.8	25.9	56.4	14.8	26.2	0.1	0.3	86.6	8.8	26.6	6.5	20.0	10.9	0.8	1,157
40-44	78.9	25.7	57.5	14.5	30.9	0.1	0.6	82.6	9.1	27.8	8.2	20.0	13.9	0.7	624
45-49	78.9	29.1	54.5	15.4	29.8	0.0	0.7	78.3	8.7	29.7	8.9	24.8	15.5	1.3	515
Residence															
Urban	77.4	21.1	53.2	13.0	29.5	0.1	0.5	86.3	9.8	25.6	9.1	22.4	9.1	1.0	3,407
Rural	79.9	25.9	56.1	13.9	26.8	0.1	0.8	79.9	9.4	30.5	7.3	21.6	14.7	0.4	4,566
Education															
No education	79.1	23.8	55.2	13.9	26.4	0.1	0.9	81.1	8.9	27.4	7.5	22.2	13.2	0.4	4,036
Primary	83.6	28.4	57.5	12.4	23.2	0.3	0.7	82.3	9.8	31.1	7.6	18.0	13.9	0.7	706
Secondary	77.3	23.1	53.4	13.6	30.9	0.1	0.4	84.2	10.5	29.6	8.6	22.9	11.2	1.0	3,042
More than secondary	80.6	20.8	60.7	7.4	30.9	0.0	0.0	91.8	6.7	21.5	14.0	17.4	6.7	2.5	188
Wealth quintile															
Lowest	82.9	26.9	53.0	16.3	22.9	0.3	1.1	78.2	8.2	28.8	6.6	17.8	13.4	1.1	1,544
Second	79.1	28.8	55.4	13.5	30.3	0.1	0.7	83.2	8.1	28.7	6.5	24.3	16.4	0.3	1,466
Middle	76.9	24.8	52.0	12.6	28.2	0.1	0.9	77.7	10.6	29.7	7.0	22.8	13.4	0.4	1,606
Fourth	82.2	21.0	62.0	12.7	23.3	0.0	0.6	84.4	11.3	30.1	11.0	18.5	10.0	0.2	1,600
Highest	73.8	18.8	52.0	12.4	34.5	0.0	0.2	89.0	9.4	25.0	9.0	26.1	9.1	1.4	1,756
Total	78.9	23.9	54.8	13.5	28.0	0.1	0.7	82.6	9.5	28.4	8.1	21.9	12.3	0.7	7,973

Table 5.6.2 Knowledge of malaria treatment

Among women aged 15-49 who have heard of malaria, the percentage who cite people most at risk to get malaria, and cite specific various drugs to treat malaria, according to region and district,, Sierra Leone MIS 2021

	People most at risk at get malaria							Medicines used to treat malaria							
Background Characteristic	Children	Adults	Pregnant women	Older adults	Anyone	Other	Don't know	ACT	Chloroquine	SP/Fansidar	Quinine	Aspirin, Panadol, Paracetamol	Traditional medicines / herbs	Other	Total woman who have heard of malaria
Region															
Eastern	84.9	31.7	57.4	13.4	22.2	0.2	0.5	74.6	4.6	34.3	7.9	21.1	11.1	0.5	1,675
Northern	66.5	14.8	46.2	13.1	34.1	0.2	1.0	69.7	19.7	30.6	14.8	34.6	13.7	0.6	1,565
North Western	84.5	22.8	69.2	12.0	29.2	0.0	0.4	96.1	6.9	34.3	4.3	31.0	17.0	0.4	1,220
Southern	85.2	32.6	58.1	17.2	20.8	0.1	0.9	82.2	10.2	29.9	7.1	5.8	14.3	0.4	1,687
Western	74.3	17.0	47.3	11.5	33.9	0.0	0.7	92.5	6.6	15.8	5.9	20.7	7.4	1.4	1,826
District															
Kailahun	85.5	24.8	44.7	2.4	17.7	0.0	0.3	70.0	0.9	40.1	2.1	18.0	6.4	0.0	581
Kenema	82.8	27.9	58.1	12.5	14.2	0.5	0.7	85.9	2.9	32.1	5.9	14.4	14.8	1.1	623
Kono	87.0	45.2	71.7	27.4	37.9	0.0	0.5	90.0	11.1	30.7	17.0	33.0	12.0	0.2	488
Bombali	69.9	10.5	61.7	18.3	30.9	0.4	1.2	74.3	38.5	72.5	24.7	32.1	16.6	1.5	498
Falaba	79.1	10.1	37.4	3.4	21.8	0.4	0.4	70.4	6.0	8.6	13.7	27.1	3.3	0.6	147
Koinadugu	86.2	24.6	65.1	15.1	23.4	0.0	1.3	91.7	26.2	26.3	23.8	28.4	5.3	0.4	179
Tonkolili	56.6	16.4	32.8	11.0	41.8	0.2	0.8	61.5	8.1	7.7	6.2	39.2	16.0	0.1	736
Kambia	92.4	36.6	82.5	25.7	20.0	0.2	1.1	91.0	13.9	36.8	7.3	53.5	8.4	0.7	301
Karene	81.1	19.6	59.8	14.3	44.3	0.0	0.0	96.9	2.5	44.8	1.5	27.5	22.0	0.9	335
Port Loko	82.4	17.5	67.8	3.6	25.1	0.0	0.3	98.4	5.9	26.9	4.4	21.5	18.4	0.0	582
Bo	85.0	33.5	61.7	8.4	10.2	0.0	0.2	74.1	5.0	40.2	5.1	4.5	2.7	0.0	680
Bonthe	82.9	25.6	45.4	16.7	19.5	0.0	1.1	86.7	1.0	13.2	5.0	5.3	29.2	1.6	388
Moyamba	89.4	40.6	69.0	35.7	42.4	0.4	1.7	94.1	26.0	30.5	8.9	5.9	27.4	0.0	365
Pujehun	83.0	27.7	51.5	15.5	18.7	0.0	1.1	81.1	15.9	25.1	13.8	10.7	3.4	0.0	242
Western rural	79.2	11.6	43.9	12.8	28.4	0.0	1.0	94.4	4.0	8.3	3.1	5.7	2.2	1.9	772
Western urban	70.7	21.0	49.7	10.5	37.9	0.0	0.4	91.2	8.6	21.3	7.9	31.7	11.2	1.1	1,053
Total	78.9	23.9	54.8	13.5	28.0	0.1	0.7	82.6	9.5	28.4	8.1	21.9	12.3	0.7	7,973

Table 5.7 Malaria susceptibility, severity, and self-efficacy

Percentage of women age 15-49 who express specific perceptions about malaria risk, and percentage who perceive that their families and communities are at risk, from malaria; percentage of women who express specific perceptions about the severity of malaria, and percentage who feel that the consequences of malaria are, serious; and percentage of women who express specific perceptions regarding their confidence in their ability to perform specific malaria-related behaviours (self-, efficacy), according to background characteristics, Sierra Leone MIS 2021

	Percentage of women who:									
Background Characteristic	Disagree that people in the community get malaria only during the rainy season	Agree that when a child has a fever, they almost always worry it might be malaria	Perceive that their families and communities are at risk from malaria	Disagree that getting malaria is not a problem because it can be easily treated	Disagree that only weak children can die from malaria	Feel that the consequences of malaria are serious	Agree that they can sleep under a mosquito net for the entire night when there are lots of mosquitoes	Agree that they can sleep under a mosquito net for the entire night when there are few mosquitoes	Are confident in their ability to perform specific malaria-related behaviours	Total women
Age										
15-19	53.6	66.0	83.8	52.8	63.1	74.4	73.4	69.7	77.4	1,412
20-24	52.9	71.5	87.5	56.4	69.7	77.9	75.0	74.2	81.4	1,495
25-29	56.0	75.9	90.5	55.4	67.8	77.2	73.1	71.0	78.9	1,720
30-34	55.1	76.7	90.5	57.4	68.5	78.7	72.9	70.8	77.8	1,293
35-39	53.4	78.5	90.7	53.9	66.9	75.5	72.2	70.3	76.8	1,203
40-44	52.8	76.0	89.8	59.6	68.8	78.4	76.9	74.6	83.0	641
45-49	61.6	75.3	89.7	55.1	67.3	75.0	74.0	71.7	77.5	535
Residence										
Urban	52.3	73.6	88.6	52.7	68.0	75.2	77.4	75.5	82.5	3,513
Rural	56.4	74.1	88.9	57.6	66.9	78.0	71.0	68.7	76.1	4,787
Region										
Eastern	69.6	78.8	91.8	57.0	77.5	84.9	76.7	76.9	83.5	1,715
Northern	46.6	75.2	85.8	52.3	63.0	73.8	69.2	65.2	76.5	1,717
North Western	65.8	69.7	88.5	77.6	74.3	91.2	70.4	66.4	73.9	1,265
Southern	49.4	75.1	90.3	48.7	58.9	67.0	71.5	73.8	76.7	1,720
Western	45.7	69.9	87.5	48.6	65.1	71.3	79.1	73.8	81.9	1,883
District										
Kailahun	77.8	85.3	95.1	46.5	79.9	87.7	83.9	71.9	86.5	591
Kenema	50.8	77.7	86.2	64.3	67.8	75.8	68.8	80.2	82.7	642
Kono	83.0	71.6	94.5	59.3	85.5	92.0	77.8	78.3	80.4	501
Bombali	32.5	71.5	82.9	45.4	59.8	68.2	82.6	80.5	91.4	511
Falaba	22.2	68.3	74.4	29.3	47.8	57.9	75.6	61.1	82.6	192
Koinadugu	21.1	74.1	79.0	46.7	54.8	65.0	57.2	54.1	63.2	194
Tonkolili	67.5	79.5	92.1	63.7	71.0	83.6	62.1	59.0	68.8	814
Kambia	60.4	73.8	92.7	75.8	81.3	92.4	79.7	80.6	87.5	310
Karene	75.9	70.0	95.8	83.3	69.4	91.1	87.7	82.3	91.2	342
Port Loko	63.1	67.5	82.3	75.2	73.5	90.7	56.0	50.5	57.4	612
Bo	49.3	71.8	86.6	43.3	49.4	55.8	69.8	77.9	80.4	683
Bonthe	46.9	73.4	91.4	47.5	71.5	79.1	80.1	76.9	81.1	397
Moyamba	41.1	88.2	96.2	52.4	57.8	68.5	82.2	81.1	84.8	381
Pujehun	65.8	68.4	90.5	59.0	67.9	76.6	46.8	46.3	47.7	245
Western rural	47.3	63.8	83.9	60.0	75.9	83.2	81.0	71.4	82.9	785
Western urban	44.5	74.2	90.0	40.5	57.4	62.8	77.8	75.6	81.2	1,097
Education										
No education	55.6	75.9	89.4	56.9	68.1	77.9	71.4	70.0	77.7	4,242
Primary	51.0	71.4	86.0	52.5	63.8	75.5	70.8	68.1	74.8	743
Secondary	54.1	71.7	88.3	54.6	66.9	75.5	77.2	74.2	81.1	3,122
More than secondary	56.6	73.4	92.2	51.9	73.0	76.8	77.0	76.1	81.4	192
Wealth quintile										
Lowest	55.6	76.9	89.8	53.8	68.3	78.4	76.6	73.2	81.3	1,605
Second	56.9	70.7	89.1	55.8	65.3	75.9	67.8	65.4	73.6	1,561
Middle	57.4	75.1	89.2	59.5	69.7	79.7	73.9	72.1	79.1	1,666
Fourth	54.9	72.1	86.1	63.8	70.3	81.5	68.7	67.6	75.2	1,675
Highest	49.1	74.6	89.7	45.4	63.5	68.9	80.6	78.6	84.3	1,793
Total	54.6	73.9	88.8	55.5	67.4	76.8	73.7	71.6	78.8	8,300

Table 5.8 Attitudes toward malaria-related behaviours and malaria norms

Percentage of women age 15-49 who express specific perceptions regarding malaria-related behaviours, percentage with favourable attitudes toward specific malaria-related behaviours, percentage who express specific perceptions regarding community norms, and percentage who believe the majority of people in their community currently practise specific malaria-related behaviours, according to background characteristics, Sierra Leone MIS 2021

	Percentage of women who:				
Background Characteristic	Disagree that when a child has a fever, it is best to start by giving them any medicine available at home	Agree that at least half of the people in the community take their children to a health provider on the same day or day after they develop a fever	Agree that among those who have nets, at least half of the people in the community sleep under a net every night	Believe the majority of people in their community currently practise specific malaria-related behaviours2	Total women
Age					
15-19	46.0	42.6	31.3	48.4	1,411
20-24	55.4	41.5	32.0	47.3	1,495
25-29	54.3	42.5	31.9	48.6	1,720
30-34	55.3	41.3	32.1	48.0	1,293
35-39	52.8	45.5	36.7	53.3	1,203
40-44	54.8	46.6	33.3	52.0	641
45-49	49.5	48.9	39.6	56.6	535
Residence					
Urban	55.8	39.5	29.9	45.0	3,513
Rural	50.5	46.1	35.5	53.2	4,787
Region					
Eastern	56.3	56.7	42.3	63.8	1,715
Northern	39.7	42.2	38.5	51.6	1,717
North Western	63.5	52.4	31.2	59.7	1,265
Southern	47.3	37.2	31.4	41.8	1,712
Western	59.3	31.6	22.8	35.7	1,883
District					
Kailahun	44.4	68.6	49.5	71.3	591
Kenema	66.5	41.1	30.1	49.6	642
Kono	55.8	61.1	48.4	71.5	501
Bombali	35.8	71.4	70.2	84.4	511
Falaba	31.8	40.4	32.8	53.9	192
Koinadugu	47.1	59.6	49.8	67.9	194
Tonkolili	42.3	20.3	17.5	26.6	814
Kambia	39.0	62.9	39.5	70.9	310
Karene	60.3	29.7	22.8	40.1	342
Port Loko	77.7	59.7	31.6	64.9	612
Bo	50.0	24.2	18.9	29.0	683
Bonthe	43.8	55.0	45.0	60.6	397
Moyamba	41.2	51.0	48.3	56.2	381
Pujehun	56.9	25.0	19.1	26.4	245
Western rural	68.8	35.5	26.9	41.4	785
Western urban	52.4	28.9	20.0	31.6	1,097
Education					
No education	51.8	45.1	35.3	52.5	4,242
Primary	52.9	46.1	38.5	53.4	743
Secondary	53.6	40.8	29.7	45.9	3,122
More than secondary	59.8	33.0	21.0	35.9	192
Wealth quintile					
Lowest	52.6	50.1	37.9	56.6	1,605
Second	50.0	47.1	39.0	55.2	1,561
Middle	47.8	43.6	34.5	51.0	1,666
Fourth	58.7	42.5	29.2	48.5	1,675
Highest	54.5	34.5	26.2	38.7	1,793
Total	52.8	43.3	33.2	49.7	8,300

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SAMPLE DESIGN

Appendix A

A.1 INTRODUCTION

The Sierra Leone Malaria Indicator Survey 2021 (SLMIS 2021) will be the third survey of its kind following the SLMIS 2013 and SLMIS 2016. The survey calls for a nationally representative sample of 8,064 households selected from 336 sample clusters. The survey is expected to result about 9,200 interviews of women 15-49 years, about 8,000 biomarker tests for children 6-59 months, and about 2,000 biomarker tests for children 60-119 months in a subsample consists of 1/3 of the households selected. It is designed to provide up-to-date information on access, coverage and use of the core malaria interventions, including malaria diagnosis and treatment, possession and use of Long-Lasting Insecticidal Net (LLIN); malaria parasite prevalence and anemia prevalence in children aged 6-59 months and children aged 60-119 months; on the knowledge, attitudes, and practices of malaria among women aged 15-49 years, and the intermittent preventive treatment (IPT) for malaria during their last pregnancy.

The survey is designed to produce representative results for the main MIS indictors for the country together, for the urban and rural areas separately, for each of the five regions, and for each of the sixteen districts.

A.2 SAMPLING FRAME

The sampling frame used for SLMIS 2021 is the last General Population and Housing Census conducted in Sierra Leone in 2015(GPHC 2015), provided by the Statistics of Sierra Leone (SSL). The sampling frame is a complete list of enumeration areas (EAs) covering the whole country, created for the purpose of the GPHC 2015. An EA is a geographic area consisting of a convenient number of households which served as counting unit for the census, with an average size of about 550 residents per EA which is equivalent to about 100 households per EA. The sampling frame contains information about the location, the administrative attribution, the type of residence, and the number of residents for each EA. A sketch map is also available for each EA which delimitates the geographic boundaries of the EA.

Administratively, Sierra Leone is divided into five regions, each region is subdivided into a number of districts, with a total number of sixteen districts. Each district is subdivided into Chiefdom and Chiefdom to Sections, and Sections are subdivided into EAs. An EA is either a village, or a group of small villages, or a part of a large village. **Table A 1** gives the distribution of population by district and according to type of residence. In Sierra Leone, 41 percent of the population lives in urban areas. The largest district is Western Area Urban which represent 14.9 percent of the total population. The smallest district is Bonthe district, which represents only 2.8 percent of the total population. **Table A 2** below shows the distribution of EAs and their average size in number residents. There are in total 12856 EAs, 5296 in urban areas, and 7,560 in rural areas. The average EA size is homogeneous by residence type, about 550 residents per EA or equivalently about 100 households per EA.

Table A 1. Distribution of population by region, district and residence

Region	District	Residence type		Total	% Urban	% District
		Urban	Rural			
Eastern	Kailahun	153,286	373,093	526,379	29.1	7.4
	Kenema	271,699	338,192	609,891	44.5	8.6
	Kono	124,662	381,438	506,100	24.6	7.1
Northern	Bombali	158,096	264,864	422,960	37.4	6.0
	Falaba	14,132	191,221	205,353	6.9	2.9
	Koinadugu	59,393	144,626	204,019	29.1	2.9
	Tonkolili	107,330	406,654	513,984	20.9	7.2
North Western	Kambia	101,455	244,019	345,474	29.4	4.9
	Karene	18,874	266,672	285,546	6.6	4.0
	Port Loko	157,075	373,790	530,865	29.6	7.5
Southern	Bo	195,081	380,397	575,478	33.9	8.1
	Bonthe	37,985	162,796	200,781	18.9	2.8
	Moyamba	22,697	295,891	318,588	7.1	4.5
	Pujehun	28,117	318,344	346,461	8.1	4.9
Western	Western Area Rural	400,632	43,638	444,270	90.2	6.3
	Western Area Urban	1,055,964		1,055,964	100.0	14.9
Sierra Leone		2,906,478	4,185,635	7,092,113	41.0	100.0

*Source: Sierra Leone 2015 general population and housing census

Table A 2. Distribution of EAs and their average size in number of residents by district and by residence

Region	District	Residence type		Total	Average EA size		
		Urban	Rural		Urban	Rural	Total
Eastern	Kailahun	276	615	891	555	607	591
	Kenema	441	678	1,119	616	499	545
	Kono	201	586	787	620	651	643
Northern	Bombali	266	464	730	594	571	579
	Falaba	24	330	354	589	579	580
	Koinadugu	123	271	394	483	534	518
	Tonkolili	207	834	1,041	519	488	494
North Western	Kambia	200	376	576	507	649	600
	Karene	26	409	435	726	652	656
	Port Loko	294	706	1,000	534	529	531
Southern	Bo	323	708	1,031	604	537	558
	Bonthe	71	390	461	535	417	436
	Moyamba	37	579	616	613	511	517
	Pujehun	33	549	582	852	580	595
Western	Western Area Rural	635	65	700	631	671	635
	Western Area Urban	2,139		2,139	494		494
Sierra Leone		5,296	7,560	12,856	549	554	552

*Source: Sierra Leone 2015 general population and housing census

A.3 Sampling Procedure and Sample Allocation

The sample for SLMIS 2021 is a stratified sample selected in two stages from the sampling frame. Stratification is achieved by separating each district into urban and rural areas. In total, 31 sampling strata have been created since Western Area Urban district has only urban areas. Samples will be selected independently in each stratum, by a two stages selection procedure according to the sample allocation given in table 3 below. Implicit stratification and proportional allocation will be achieved at each of the lower administrative levels by sorting the sampling frame within each sampling stratum before sample selection, according to administrative units, and by using a probability proportional to size selection procedure at the first stage's sampling.

In the first stage, 336 EAs will be selected with probability proportional to the EA size and with independent selection in each sampling stratum with the sample allocation given in **Table 3**. The EA size is the number of residents residing in the EA during the population census in 2015. After the selection of the EAs in the first stage and before the main survey, a household listing operation will be carried out in all the selected EAs, and the resulting lists of households will serve as sampling frame for the selection of households in the second stage. Some of the selected EAs may be of large size. In order to reduce the task of household listing, for the selected EAs which have more than 200 households could be segmented. Only one segment would be selected for the survey with probability proportional to the segment size. Household listing will be conducted only in the selected segment (see detailed instructions for segmentation in the Manual for Household Listing). So a SLMIS 2021 cluster is either an EA or a segment of an EA.

In the second stage of selection, a fixed number of 24 households per cluster in both urban and rural areas will be selected with an equal probability systematic selection from the newly created household listing. The survey interviewer must interview only the pre-selected households. No replacements and no changes of the pre-selected households will be allowed in the implementing stages in order to prevent bias. All women aged 15-49 who are usual members of the selected households or who spent the night in the selected households the day before the survey are eligible for the female individual survey.

Table A 3 below shows the sample allocation of clusters and households by district and by type of residence; **Table A 4** below shows the sample allocation of expected number of completed women interviews and the expected number of biomarker testing for children aged 6-59 months by district and by type of residence. In order that the survey precisions are comparable across districts, the sample allocation features a power allocation with small adjustment. This allocation oversamples the small districts and undersamples the large districts. This allocation will enhance the representativity of the survey sample compared to an equal size allocation adopted in previous MIS surveys in Sierra Leone. The sample calculations are based on the survey results of Sierra Leone MIS 2016.

Table A 3. Sample allocation of EAs and households by district and by residence type

Region	District	Allocation of EA			Household selected		
		Urban	Rural	Total	Urban	Rural	Total
Eastern	Kailahun	7	16	23	168	384	552
	Kenema	9	15	24	216	360	576
	Kono	6	17	23	144	408	552
Northern	Bombali	7	13	20	168	312	480
	Falaba	2	14	16	48	336	384
	Koinadugu	4	12	16	96	288	384
	Tonkolili	5	18	23	120	432	552
North Western	Kambia	5	13	18	120	312	432
	Karene	2	16	18	48	384	432
	Port Loko	7	16	23	168	384	552
Southern	Bo	8	16	24	192	384	576
	Bonthe	3	13	16	72	312	384
	Moyamba	2	17	19	48	408	456
	Pujehun	2	17	19	48	408	456
Western	Western Area Rural	15	4	19	360	96	456
	Western Area Urban	35		35	840		840
Sierra Leone		119	217	336	2,856	5,208	8,064

Table A 4. Expected number of women 15-49 interviewed and children under 6-69 months tested for biomarker by district and by residence type

Region	District	Women 15-49			Children 6-59 months		
		Urban	Rural	Total	Urban	Rural	Total
Eastern	Kailahun	225	396	621	142	410	552
	Kenema	291	373	664	184	385	569
	Kono	194	422	616	122	436	558
Northern	Bombali	225	322	547	142	334	476
	Falaba	64	347	411	41	359	400
	Koinadugu	130	298	428	81	307	388
	Tonkolili	161	447	608	101	462	563
North Western	Kambia	161	322	483	101	334	435
	Karene	64	396	460	41	410	451
	Port Loko	225	396	621	142	410	552
Southern	Bo	258	396	654	163	410	573
	Bonthe	97	322	419	61	334	395
	Moyamba	64	422	486	41	436	477
	Pujehun	64	422	486	41	436	477
Western	Western Area Rural	485	100	585	305	102	407
	Western Area Urban	1,129		1,129	712		712
Sierra Leone		3,837	5,381	9,218	2,420	5,565	7,985

A.4 SAMPLING WEIGHT FOR HOUSEHOLD AND INDIVIDUAL SURVEY

Because of the non-proportional allocation of the sample to the different districts and to their urban and rural areas, sampling weights will be required for any analysis using SLMIS 2021 data to ensure the actual representativity of the sample. Since the SLMIS 2021 sample is a two-stage stratified cluster sample, sampling weights will be calculated based on sampling probabilities which will be calculated separately for each sampling stage and for each cluster. We use the following notations:

P_{1hi}: sampling probability of the i^{th} cluster in stratum h
P_{2hi}: sampling probability for all households in the i^{th} cluster in stratum h
P_{hi}: overall sampling probability for all households in the i^{th} cluster in stratum h

Let a_h be the number of clusters selected in stratum h for the SLMIS, M_{hi} the number of residents according to the sampling frame in the i^{th} cluster, and $\sum M_{hi}$ the total number of residents in the stratum h. The probability of selecting the i^{th} cluster in stratum h for the SLMIS 2021 is calculated as follows:

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

Let L_{hi} and g_{hi} be the number of households listed and selected in the i^{th} cluster in stratum h. The probability for selecting a household in the i^{th} cluster is calculated as follows:

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

The overall selection probability of each household in cluster i of stratum h is therefore the production of the selection probabilities:

$$P_{hi} = P_{1hi} \times P_{2hi} = \frac{a_h g_{hi} M_{hi}}{L_{hi} \sum M_{hi}}$$

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

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

A spreadsheet containing all sampling parameters and selection probabilities will be prepared to facilitate the calculation of sampling weights. Design weight will be adjusted for household non-response and as well as for individual non-response to get the sampling weights for households and for women individuals, respectively. The differences of the household sampling weights and the women individual sampling weights are introduced by individual non-response. Sampling weights for malaria testing for children are obtained by adjusting the household sampling weight for non-response to test for children. All the sampling weights will be further normalized at national level to produce un-weighted cases equal to weighted cases for interviewed households, for interviewed women 15-49 and for children participated in the malaria test, respectively. It is important to note that the normalized weights are relative weights which are valid for estimating proportions, means, ratios and rates, but not valid for estimating population totals and not valid for pooled data from different surveys.

Table A.5 Sample implementation: Women

Percent distribution of households and eligible women age 15-49 by results of the household and individual interviews, and household, eligible women and overall women response rates, according to residence and province (unweighted), Sierra Leone 2021

	Residence		Region					
Result	Urban	Rural	Eastern	Northern	North Western	Southern	Western	Total
Selected households								
Completed (C)	99.3	98.9	99.6	99.4	98.0	99.0	99.4	99.1
Household present but no competent respondent at home (HP)	0.2	0.2	0.1	0.2	0.4	0.2	0.3	0.2
Refused (R)	0.1	0.5	0.1	0.1	1.6	0.2	0.2	0.4
Dwelling not found (DNF)	0.1	0.1	0.0	0.1	0.1	0.5	0.0	0.1
Household absent (HA)	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1
Dwelling vacant/address not a dwelling (DV)	0.0	0.1	0.1	0.2	0.0	0.1	0.0	0.1
Other (O)	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of sampled households	2,832	5,232	1,680	1,800	1,416	1,872	1,296	8,064
Household response rate (HRR)[1]	99.5	99.1	99.9	99.7	98.0	99.1	99.5	99.3
Eligible women								
Completed (EWC)	99.8	99.9	99.9	99.7	99.6	100.0	99.9	99.8
Not at home (EWNH)	0.2	0.0	0.1	0.3	0.0	0.0	0.1	0.1
Refused (EWR)	0.0	0.1	0.0	0.0	0.3	0.0	0.1	0.1
Incapacitated (EWI)	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of women	3,090	5,223	1,746	1,960	1,357	1,870	1,380	8,313
Eligible women response rate (EWRR)[2]	99.8	99.9	99.9	99.7	99.6	100.0	99.9	99.8
Overall women response rate (ORR)[3]	99.3	99.0	99.8	99.4	97.6	99.1	99.3	99.1

[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 2021 Sierra Leone Malaria Indicator Survey (SLMIS) to minimize this type of error, non-sampling errors are impossible to avoid and difficult to evaluate statistically. Sampling errors, on the other hand, can be evaluated statistically.

The sample of respondents selected in the 2021 SLMIS is only one of many samples that could have been selected from the same population, using the same design and expected size. Each of these samples would yield results that differ somewhat from the results of the actual sample selected. Sampling errors are a measure of the variability between all possible samples. Although the degree of variability is not known exactly, it can be estimated from the survey results.

Sampling error is usually measured in terms of the standard error for a particular statistic (mean. percentage. etc.), which is the square root of the variance. The standard error can be used to calculate confidence intervals within which the true value for the population can reasonably be assumed to fall. For example, for any given statistic calculated from a sample survey, the value of that statistic will fall within a range of plus or minus two times the standard error of that statistic in 95% 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 2021 SLMIS 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 SPSS. These programs use the Taylor linearization method of variance estimation for survey estimates that are means, proportions, or ratios.

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

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

in which

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

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

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

Sampling errors for the 2021 SLMIS 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, for each of the country regions (Eastern.

Northern. Southern, and Western), and for each of the country's 16 districts. 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.25** present the value of the statistic (R), its standard error (SE), the number of unweighted (N) and weighted (WN) cases, the design effect (DEFT), the relative standard error (SE/R), and the 95% confidence limits (R ± 2SE) for each variable. The DEFT is considered undefined when the standard error considering a simple random sample is zero (when the estimate is close to 0 or 1).

The confidence interval (e.g. as calculated for children slept under an ITN last night) can be interpreted as follows: the overall average from the national sample is 0.496, and its standard error is 0.014. Therefore, to obtain the 95% confidence limits, one adds and subtracts twice the standard error to the sample estimate, that is, $0.496 \pm 2 \times 0.014$. There is a high probability (95%) that the true proportion of children with slept under an ITN last night is between 0.468 and 0.524. For the total sample, the value of the DEFT, averaged over all variables, is 1.77. This means that, due to multi-stage clustering of the sample, the average standard error is increased by a factor of 1.77 over that in an equivalent simple random sample.

Table B.1 List of selected variables for sampling errors. Sierra Leone MIS 2021

Variable	Estimate	Base population
HOUSEHOLDS		
Ownership of at least night one ITN	Proportion	Households
Average number of ITNs per household	Mean	Households
Ownership of at least one ITN for every two persons	Proportion	Households
WOMEN		
No education	Proportion	All women 15-49
Secondary education or higher	Proportion	All women 15-49
Literacy	Proportion	All women 15-49
CHILDREN		
Child slept under an ITN last night	Proportion	Children under 5
Child slept under an ITN last night in households with at least one ITN	Proportion	Children under 5 in households with at least one ITN
Child had fever in last 2 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 (age 6-59 months) has anaemia (haemoglobin <8.0 g/dl)	Proportion	Child 6-59 months tested for anaemia
Child (age 6-59 months) has malaria (based on rapid test)	Proportion	Children 6-59 months tested (rapid test) for malaria
Child (age 6-59 months) has malaria (based on microscopy test)	Proportion	Children 6-59 months tested (microscopy) for malaria
PREGNANT WOMEN		
Slept under an ITN last night	Proportion	All pregnant women 15-49
Received 2+ doses of SP/Fansidar	Proportion	Last birth of women 15-49 with live births in last 2 years

Tableau B.2 Sampling errors: Total sample. Sierra Leone MIS 2021

Variable	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.608	0.011	7,990	7,990	2.015	0.018	0.586	0.630
Average number of ITNs per household	1.218	0.031	7,990	7,990	2.132	0.025	1.156	1.280
Ownership of at least one ITN for every two persons	0.246	0.009	7,990	7,990	1.897	0.037	0.228	0.264
No education	0.511	0.011	8,300	8,300	1.943	0.022	0.489	0.533
Secondary education or higher	0.399	0.010	8,300	8,300	1.878	0.025	0.379	0.419
Literacy	0.403	0.010	8,300	8,300	1.857	0.025	0.383	0.423
Child slept under an ITN last night	0.496	0.014	5,863	5,800	2.157	0.028	0.468	0.524
Child had fever in last 2 weeks	0.172	0.009	4,383	4,387	1.534	0.052	0.154	0.190
Child sought care/treatment from a health facility	0.751	0.022	786	756	1.416	0.029	0.707	0.795
Child took ACT	0.911	0.017	730	714	1.602	0.019	0.877	0.945
Child (6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.026	0.003	5,015	5,013	1.551	0.115	0.020	0.032
Child (6-59 months) has malaria (based on microscopy test)	0.216	0.010	4,874	4,884	1.731	0.046	0.196	0.236
Child (6-59 months) has malaria (based on rapid test)	0.393	0.012	5,053	5,048	1.803	0.031	0.369	0.417
Pregnant women slept under an ITN last night	0.522	0.033	598	584	1.640	0.063	0.456	0.588
Received 2+ doses of SP/Fansidar during antenatal visit	0.805	0.014	1,543	1,577	1.433	0.017	0.777	0.833

Table B.3 Sampling errors: Urban sample. Sierra Leone MIS 2021

ariables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.526	0.015	2,813	3,230	1.708	0.029	0.496	0.556
Average number of ITNs per household	0.972	0.038	2,813	3,230	1.840	0.039	0.896	1.048
Ownership of at least one ITN for every two persons	0.199	0.013	2,813	3,230	1.883	0.065	0.173	0.225
No education	0.357	0.018	3,084	3,513	2.247	0.050	0.321	0.393
Secondary education or higher	0.583	0.016	3,084	3,513	1.925	0.027	0.551	0.615
Literacy	0.582	0.017	3,084	3,513	2.027	0.029	0.548	0.616
Child slept under an ITN last night	0.433	0.019	1,793	2,021	1.708	0.044	0.395	0.471
Child had fever in last 2 weeks	0.167	0.015	1,370	1,565	1.558	0.090	0.137	0.197
Child sought care/treatment from a health facility	0.724	0.044	244	261	1.617	0.061	0.636	0.812
Child took ACT	0.927	0.022	231	251	1.338	0.024	0.883	0.971
Child (age 6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.007	0.004	1,552	1,751	1.926	0.500	0.000	0.016
Child (age 6-59 months) has malaria (based on microscopy test)	0.142	0.015	1,502	1,706	1.787	0.106	0.112	0.172
Child (age 6-59 months) has malaria (based on rapid test)	0.261	0.016	1,575	1,781	1.543	0.061	0.229	0.293
Pregnant women slept under an ITN last night	0.482	0.054	161	186	1.557	0.112	0.374	0.590
Received 2+ doses of SP/Fansidar during antenatal visit	0.827	0.020	494	568	1.230	0.024	0.787	0.867

Table B.4 Sampling errors: Rural sample. Sierra Leone MIS 2021

Variables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.663	0.015	5,177	4,760	2.242	0.023	0.633	0.693
Average number of ITNs per household	1.386	0.044	5,177	4,760	2.268	0.032	1.298	1.474
Ownership of at least one ITN for every two persons	0.278	0.013	5,177	4,760	1.938	0.047	0.252	0.304
No education	0.625	0.013	5,216	4,787	1.873	0.021	0.599	0.651
Secondary education or higher	0.264	0.012	5,216	4,787	1.947	0.045	0.240	0.288
Literacy	0.272	0.012	5,216	4,787	1.901	0.044	0.248	0.296
Child slept under an ITN last night	0.528	0.019	4,070	3,780	2.350	0.036	0.490	0.566
Child had fever in last 2 weeks	0.175	0.011	3,013	2,821	1.521	0.063	0.153	0.197
Child sought care/treatment from a health facility	0.765	0.024	542	495	1.288	0.031	0.717	0.813
Child took ACT	0.902	0.023	499	463	1.708	0.025	0.856	0.948
Child (age 6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.036	0.004	3,463	3,261	1.481	0.111	0.028	0.044
Child (age 6-59 months) has malaria (based on microscopy test)	0.256	0.013	3,372	3,178	1.731	0.051	0.230	0.282
Child (age 6-59 months) has malaria (based on rapid test)	0.465	0.016	3,478	3,268	1.898	0.034	0.433	0.497
Pregnant women slept under an ITN last night	0.541	0.042	437	398	1.695	0.078	0.457	0.625
Received 2+ doses of SP/Fansidar during antenatal visit	0.792	0.020	1,049	1,009	1.555	0.025	0.752	0.832

Table B.5 Sampling errors: Eastern Region sample. Sierra Leone MIS 2016

Variables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.735	0.019	1,673	1,642	1.707	0.026	0.697	0.773
Average number of ITNs per household	1.372	0.054	1,673	1,642	1.813	0.039	1.264	1.480
Ownership of at least one ITN for every two persons	0.275	0.019	1,673	1,642	1.693	0.069	0.237	0.313
No education	0.532	0.026	1,745	1,715	2.186	0.049	0.480	0.584
Secondary education or higher	0.372	0.024	1,745	1,715	2.061	0.065	0.324	0.420
Literacy	0.366	0.024	1,745	1,715	2.049	0.066	0.318	0.414
Child slept under an ITN last night	0.604	0.028	1,260	1,248	2.045	0.046	0.548	0.660
Child had fever in last 2 weeks	0.127	0.016	989	963	1.466	0.126	0.095	0.159
Child sought care/treatment from a health facility	0.746	0.047	137	123	1.200	0.063	0.652	0.840
Child took ACT	0.836	0.041	133	119	1.255	0.049	0.754	0.918
Child (6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.030	0.006	1,149	1,146	1.244	0.200	0.018	0.042
Child (6-59 months) has malaria (based on microscopy test)	0.245	0.02	1,116	1,110	1.541	0.082	0.205	0.285
Child (age 6-59 months) has malaria (based on rapid test)	0.461	0.023	1,139	1,136	1.584	0.050	0.415	0.507
Pregnant women slept under an ITN last night	0.605	0.070	115	121	1.612	0.116	0.465	0.745
Received 2+ doses of SP/Fansidar during antenatal visit	0.860	0.021	350	349	1.117	0.024	0.818	0.902

Table B.6 Sampling errors: Northern Region sample. Sierra Leone MIS 2021

Variables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.605	0.027	1,789	1,581	2.234	0.045	0.551	0.659
Average number of ITNs per household	1.219	0.066	1,789	1,581	2.017	0.054	1.087	1.351
Ownership of at least one ITN for every two persons	0.234	0.014	1,789	1,581	1.317	0.060	0.206	0.262
No education	0.586	0.019	1,955	1,717	1.599	0.032	0.548	0.624
Secondary education or higher	0.337	0.019	1,955	1,717	1.682	0.056	0.299	0.375
Literacy	0.352	0.018	1,955	1,717	1.527	0.051	0.316	0.388
Child slept under an ITN last night	0.464	0.024	1,448	1,288	1.702	0.052	0.416	0.512
Child had fever in last 2 weeks	0.173	0.012	1,055	974	1.011	0.069	0.149	0.197
Child sought care/treatment from a health facility	0.716	0.041	187	168	1.199	0.057	0.634	0.798
Child took ACT	0.912	0.027	149	140	1.073	0.030	0.858	0.966
Child (6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.024	0.006	1,166	1,059	1.413	0.250	0.012	0.036
Child (6-59 months) has malaria (based on microscopy test)	0.244	0.024	1,089	1,001	1.800	0.098	0.196	0.292
Child (age 6-59 months) has malaria (based on rapid test)	0.483	0.028	1,154	1,048	1.808	0.058	0.427	0.539
Pregnant women slept under an ITN last night	0.568	0.074	171	146	1.882	0.130	0.420	0.716
Received 2+ doses of SP/Fansidar during antenatal visit	0.717	0.042	402	401	1.847	0.059	0.633	0.801

Table B.7 Sampling errors: North Western Region sample. Sierra Leone MIS 2021

Variables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.597	0.032	1,387	1,308	2.325	0.054	0.533	0.661
Average number of ITNs per household	1.224	0.076	1,387	1,308	2.101	0.062	1.072	1.376
Ownership of at least one ITN for every two persons	0.270	0.027	1,387	1,308	2.239	0.100	0.216	0.324
No education	0.664	0.025	1,352	1,265	1.865	0.038	0.614	0.714
Secondary education or higher	0.252	0.021	1,352	1,265	1.697	0.083	0.210	0.294
Literacy	0.269	0.021	1,352	1,265	1.692	0.078	0.227	0.311
Child slept under an ITN last night	0.441	0.035	988	908	2.112	0.079	0.371	0.511
Child had fever in last 2 weeks	0.150	0.015	783	731	1.154	0.100	0.120	0.180
Child sought care/treatment from a health facility	0.575	0.070	129	109	1.520	0.122	0.435	0.715
Child took ACT	0.957	0.024	122	104	1.222	0.025	0.909	1.000
Child (6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.032	0.009	808	752	1.459	0.281	0.014	0.050
Child (6-59 months) has malaria (based on microscopy test)	0.220	0.028	788	731	1.812	0.127	0.164	0.276
Child (age 6-59 months) has malaria (based on rapid test)	0.478	0.027	824	763	1.508	0.056	0.424	0.532
Pregnant women slept under an ITN last night	0.516	0.070	125	122	1.497	0.136	0.376	0.656
Received 2+ doses of SP/Fansidar during antenatal visit	0.865	0.025	223	209	1.065	0.029	0.815	0.915

Table B.8 Sampling errors: Southern Region sample. Sierra Leone MIS 2021

Variables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.692	0.023	1,853	1,695	2.014	0.033	0.646	0.738
Average number of ITNs per household	1.593	0.081	1,853	1,695	2.336	0.051	1.431	1.755
Ownership of at least one ITN for every two persons	0.305	0.024	1,853	1,695	2.110	0.079	0.257	0.353
No education	0.523	0.022	1,870	1,720	1.793	0.042	0.479	0.567
Secondary education or higher	0.340	0.022	1,870	1,720	1.896	0.065	0.296	0.384
Literacy	0.351	0.023	1,870	1,720	1.987	0.066	0.305	0.397
Child slept under an ITN last night	0.581	0.036	1,491	1,406	2.714	0.062	0.509	0.653
Child had fever in last 2 weeks	0.247	0.025	1,023	975	1.798	0.101	0.197	0.297
Child sought care/treatment from a health facility	0.856	0.025	250	241	1.113	0.029	0.806	0.906
Child took ACT	0.910	0.038	244	237	2.131	0.042	0.834	0.986
Child (6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.033	0.009	1,303	1,228	1.722	0.273	0.015	0.051
Child (6-59 months) has malaria (based on microscopy test)	0.238	0.020	1,306	1,232	1.691	0.084	0.198	0.278
Child (age 6-59 months) has malaria (based on rapid test)	0.360	0.027	1,344	1,265	2.002	0.075	0.306	0.414
Pregnant women slept under an ITN last night	0.541	0.061	138	124	1.381	0.113	0.419	0.663
Received 2+ doses of SP/Fansidar during antenatal visit	0.804	0.026	382	363	1.217	0.032	0.752	0.856

Table B.9 Sampling errors: Western Region sample. Sierra Leone MIS 2021

Variable	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)		
Ownership of at least one ITN	0.418	0.020	1,288	1,764	1.733	0.048	0.378	0.458
Average number of ITNs per household	0.711	0.051	1,288	1,764	2.075	0.072	0.609	0.813
Ownership of at least one ITN for every two persons	0.153	0.016	1,288	1,764	1.856	0.105	0.121	0.185
No education	0.310	0.025	1,378	1,883	2.364	0.081	0.260	0.360
Secondary education or higher	0.633	0.022	1,378	1,883	1.997	0.035	0.589	0.677
Literacy	0.621	0.026	1,378	1,883	2.337	0.042	0.569	0.673
Child slept under an ITN last night	0.325	0.025	676	951	1.656	0.077	0.275	0.375
Child had fever in last 2 weeks	0.155	0.024	533	744	1.844	0.155	0.107	0.203
Child sought care/treatment from a health facility	0.755	0.074	83	115	1.882	0.098	0.607	0.903
Child took ACT	0.945	0.032	82	113	1.544	0.034	0.881	1.000
Child (6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.009	0.007	589	828	2.278	0.778	0.001	0.023
Child (6-59 months) has malaria (based on microscopy test)	0.104	0.022	575	810	2.093	0.212	0.060	0.148
Child (age 6-59 months) has malaria (based on rapid test)	0.162	0.023	592	837	1.818	0.142	0.116	0.208
Pregnant women slept under an ITN last night	0.264	0.094	49	71	1.680	0.356	0.076	0.452
Received 2+ doses of SP/Fansidar during antenatal visit	0.818	0.028	186	254	1.151	0.034	0.762	0.874

Table B.10 Sampling errors: Kailahun sample. Sierra Leone MIS 2021

Variables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.788	0.043	591	545	2.445	0.055	0.702	0.874
Average number of ITNs per household	1.438	0.122	591	545	2.439	0.085	1.194	1.682
Ownership of at least one ITN for every two persons	0.255	0.041	591	545	2.209	0.161	0.173	0.337
No education	0.504	0.043	649	590	2.107	0.085	0.418	0.590
Secondary education or higher	0.391	0.040	649	590	1.967	0.102	0.311	0.471
Literacy	0.379	0.040	649	590	2.016	0.106	0.299	0.459
Child slept under an ITN last night	0.668	0.068	451	425	2.989	0.102	0.532	0.804
Child had fever in last 2 weeks	0.127	0.027	337	306	1.424	0.213	0.073	0.181
Child sought care/treatment from a health facility	0.847	0.088	47	39	1.456	0.104	0.671	1.000
Child took ACT	0.734	0.098	42	37	1.356	0.134	0.538	0.930
Child (6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.013	0.006	406	388	1.088	0.462	0.001	0.025
Child (6-59 months) has malaria (based on microscopy test)	0.230	0.044	395	374	2.039	0.191	0.142	0.318
Child (age 6-59 months) has malaria (based on rapid test)	0.478	0.057	405	385	2.265	0.119	0.364	0.592
Pregnant women slept under an ITN last night	0.601	0.148	43	42	2.002	0.246	0.305	0.897
Received 2+ doses of SP/Fansidar during antenatal visit	0.831	0.038	116	106	1.028	0.046	0.755	0.907

Table B.11 Sampling errors: Kenema sample. Sierra Leone MIS 2021

Variables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.685	0.022	576	630	1.165	0.032	0.641	0.729
Average number of ITNs per household	1.287	0.076	576	630	1.519	0.059	1.135	1.439
Ownership of at least one ITN for every two persons	0.231	0.026	576	630	1.529	0.113	0.179	0.283
No education	0.550	0.036	573	643	1.860	0.065	0.478	0.622
Secondary education or higher	0.339	0.038	573	643	2.052	0.112	0.263	0.415
Literacy	0.340	0.035	573	643	1.853	0.103	0.270	0.410
Child slept under an ITN last night	0.539	0.024	483	543	1.143	0.045	0.491	0.587
Child had fever in last 2 weeks	0.140	0.029	368	415	1.698	0.207	0.082	0.198
Child sought care/treatment from a health facility	0.626	0.065	58	58	1.004	0.104	0.496	0.756
Child took ACT	0.914	0.038	55	55	1.064	0.042	0.838	0.990
Child (6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.038	0.009	453	514	1.271	0.237	0.020	0.056
Child (6-59 months) has malaria (based on microscopy test)	0.248	0.022	440	499	1.148	0.089	0.204	0.292
Child (age 6-59 months) has malaria (based on rapid test)	0.496	0.021	449	509	0.968	0.042	0.454	0.538
Pregnant women slept under an ITN last night	0.554	0.095	47	57	1.416	0.171	0.364	0.744
Received 2+ doses of SP/Fansidar during antenatal visit	0.857	0.034	143	164	1.240	0.040	0.789	0.925

Table B.12 Sampling errors: Kono sample. Sierra Leone MIS 2021

Variables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.726	0.032	552	483	1.584	0.044	0.662	0.790
Average number of ITNs per household	1.385	0.079	552	483	1.492	0.057	1.227	1.543
Ownership of at least one ITN for every two persons	0.350	0.024	552	483	1.126	0.069	0.302	0.398
No education	0.541	0.059	574	501	2.636	0.109	0.423	0.659
Secondary education or higher	0.392	0.046	574	501	2.125	0.117	0.300	0.484
Literacy	0.385	0.048	574	501	2.226	0.125	0.289	0.481
Child slept under an ITN last night	0.617	0.045	358	290	1.589	0.073	0.527	0.707
Child had fever in last 2 weeks	0.116	0.021	309	251	0.992	0.181	0.074	0.158
Child sought care/treatment from a health facility	0.877	0.051	39	29	0.899	0.058	0.775	0.979
Child took ACT	0.799	0.089	39	29	1.274	0.111	0.621	0.977
Child (6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.040	0.015	315	252	1.219	0.375	0.010	0.070
Child (6-59 months) has malaria (based on microscopy test)	0.247	0.036	306	245	1.303	0.146	0.175	0.319
Child (6-59 months) has malaria (based on rapid test)	0.356	0.037	311	250	1.241	0.104	0.282	0.430
Pregnant women slept under an ITN last night	0.731	0.124	26	22	1.457	0.170	0.483	0.979
Received 2+ doses of SP/Fansidar during antenatal visit	0.895	0.033	95	81	0.954	0.037	0.829	0.961

Table B.13 Sampling errors: Bombali sample. Sierra Leone MIS 2021

Variables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.626	0.032	476	438	1.367	0.051	0.562	0.69
Average number of ITNs per household	1.247	0.079	476	438	1.252	0.063	1.089	1.405
Ownership of at least one ITN for every two persons	0.230	0.022	476	438	1.102	0.096	0.186	0.274
No education	0.454	0.027	548	512	1.24	0.059	0.400	0.508
Secondary education or higher	0.450	0.027	548	512	1.217	0.06	0.396	0.504
Literacy	0.495	0.027	548	512	1.211	0.055	0.441	0.549
Child slept under an ITN last night	0.491	0.048	384	352	1.792	0.098	0.395	0.587
Child had fever in last 2 weeks	0.172	0.024	303	279	1.078	0.14	0.124	0.220
Child sought care/treatment from a health facility	0.823	0.064	52	48	1.224	0.078	0.695	0.951
Child took ACT	0.872	0.047	46	43	0.938	0.054	0.778	0.966
Child (6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.025	0.009	330	305	1.193	0.36	0.007	0.043
Child (6-59 months) has malaria (based on microscopy test)	0.128	0.025	295	281	1.253	0.195	0.078	0.178
Child (age 6-59 months) has malaria (based on rapid test)	0.308	0.027	327	303	1.036	0.088	0.254	0.362
Pregnant women slept under an ITN last night	na	na	18	16	na	na	na	na
Received 2+ doses of SP/Fansidar during antenatal visit	0.858	0.048	111	102	1.384	0.056	0.762	0.954

Table B.14 Sampling errors: Falaba sample. Sierra Leone MIS 2021

Variables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.517	0.076	355	185	2.077	0.147	0.365	0.669
Average number of ITNs per household	1.123	0.192	355	185	1.915	0.171	0.739	1.507
Ownership of at least one ITN for every two persons	0.206	0.041	355	185	1.386	0.199	0.124	0.288
No education	0.705	0.061	373	192	1.861	0.087	0.583	0.827
Secondary education or higher	0.219	0.055	373	192	1.843	0.251	0.109	0.329
Literacy	0.228	0.05	373	192	1.654	0.219	0.128	0.328
Child slept under an ITN last night	0.432	0.06	254	130	1.377	0.139	0.312	0.552
Child had fever in last 2 weeks	0.228	0.049	37	92	1.118	0.215	0.13	0.326
Child sought care/treatment from a health facility	0.772	0.076	38	21	0.823	0.098	0.62	0.924
Child took ACT	na	na	18	10	na	na	na	na
Child (6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.037	0.019	190	98	1	0.514	0.001	0.075
Child (6-59 months) has malaria (based on microscopy test)	0.273	0.069	164	83	1.436	0.253	0.135	0.411
Child (age 6-59 months) has malaria (based on rapid test)	0.568	0.073	187	96	1.460	0.129	0.422	0.714
Pregnant women slept under an ITN last night	0.806	0.104	41	22	0.968	0.129	0.598	1.000
Received 2+ doses of SP/Fansidar during antenatal visit	0.753	0.106	48	24	1.194	0.141	0.541	0.965

Table B.15 Sampling errors: Koinadugu sample. Sierra Leone MIS 2021

Variables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.731	0.045	384	173	1.345	0.062	0.641	0.821
Average number of ITNs per household	1.884	0.119	384	173	0.978	0.063	1.646	2.122
Ownership of at least one ITN for every two persons	0.414	0.043	384	173	1.146	0.104	0.328	0.500
No education	0.655	0.039	416	193	1.130	0.06	0.577	0.733
Secondary education or higher	0.283	0.039	416	193	1.212	0.138	0.205	0.361
Literacy	0.313	0.047	416	193	1.412	0.15	0.219	0.407
Child slept under an ITN last night	0.546	0.065	314	143	1.526	0.119	0.416	0.676
Child had fever in last 2 weeks	0.172	0.024	33	101	0.609	0.14	0.124	0.220
Child sought care/treatment from a health facility	0.950	0.032	34	17	0.647	0.034	0.886	1.000
Child took ACT	1.000	0.000	32	17	0.000	0.000	1.000	1.000
Child (6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.033	0.018	249	111	0.975	0.545	0.003	0.069
Child (6-59 months) has malaria (based on microscopy test)	0.351	0.041	243	108	0.918	0.117	0.269	0.433
Child (age 6-59 months) has malaria (based on rapid test)	0.527	0.086	244	108	1.825	0.163	0.355	0.699
Pregnant women slept under an ITN last night	0.499	0.133	41	20	1.250	0.267	0.233	0.765
Received 2+ doses of SP/Fansidar during antenatal visit	0.847	0.040	82	38	0.686	0.047	0.767	0.927

Table B.16 Sampling errors: Tonkolili sample. Sierra Leone MIS 2021

Variables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.587	0.048	552	781	2.723	0.082	0.491	0.683
Average number of ITNs per household	1.076	0.111	552	781	2.691	0.103	0.854	1.298
Ownership of at least one ITN for every two persons	0.202	0.021	552	781	1.453	0.104	0.160	0.244
No education	0.623	0.032	594	816	1.866	0.051	0.559	0.687
Secondary education or higher	0.307	0.033	594	816	2.034	0.107	0.241	0.373
Literacy	0.303	0.029	594	816	1.820	0.096	0.245	0.361
Child slept under an ITN last night	0.436	0.035	476	658	1.787	0.080	0.366	0.506
Child had fever in last 2 weeks	0.162	0.016	348	498	0.988	0.099	0.130	0.194
Child sought care/treatment from a health facility	0.584	0.068	61	81	1.254	0.116	0.448	0.720
Child took ACT	0.910	0.044	53	71	1.196	0.048	0.822	0.998
Child (6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.018	0.009	382	541	1.899	0.500	0.000	0.036
Child (6-59 months) has malaria (based on microscopy test)	0.286	0.040	371	526	2.040	0.140	0.206	0.366
Child (age 6-59 months) has malaria (based on rapid test)	0.557	0.041	380	538	1.951	0.074	0.475	0.639
Pregnant women slept under an ITN last night	0.502	0.110	71	89	2.227	0.219	0.282	0.722
Received 2+ doses of SP/Fansidar during antenatal visit	0.632	0.066	159	235	2.069	0.104	0.500	0.764

Table B.17 Sampling errors: Kambia sample. Sierra Leone MIS 2021

Variables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.428	0.036	428	327	1.298	0.084	0.356	0.500
Average number of ITNs per household	0.933	0.106	428	327	1.399	0.114	0.721	1.145
Ownership of at least one ITN for every two persons	0.144	0.019	428	327	0.978	0.132	0.106	0.182
No education	0.745	0.042	399	310	1.678	0.056	0.661	0.829
Secondary education or higher	0.167	0.038	399	310	1.814	0.228	0.091	0.243
Literacy	0.179	0.034	399	310	1.576	0.190	0.111	0.247
Child slept under an ITN last night	0.338	0.041	282	217	1.273	0.121	0.256	0.420
Child had fever in last 2 weeks	0.198	0.037	237	183	1.237	0.187	0.124	0.272
Child sought care/treatment from a health facility	0.603	0.097	55	36	1.226	0.161	0.409	0.797
Child took ACT	0.874	0.073	53	35	1.312	0.084	0.728	1.000
Child (6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.033	0.007	198	152	0.869	0.212	0.019	0.047
Child (6-59 months) has malaria (based on microscopy test)	0.246	0.054	213	162	1.593	0.220	0.138	0.354
Child (age 6-59 months) has malaria (based on rapid test)	0.536	0.050	216	165	1.280	0.093	0.436	0.636
Pregnant women slept under an ITN last night	0.249	0.138	30	26	1.349	0.554	0.027	0.525
Received 2+ doses of SP/Fansidar during antenatal visit	0.923	0.024	76	60	0.677	0.026	0.875	0.971

Table B.18 Sampling errors: Karene sample. Sierra Leone MIS 2021

Variables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.811	0.058	407	319	2.669	0.072	0.695	0.927
Average number of ITNs per household	1.789	0.158	407	319	2.123	0.088	1.473	2.105
Ownership of at least one ITN for every two persons	0.385	0.059	407	319	2.166	0.153	0.267	0.503
No education	0.687	0.039	438	340	1.565	0.057	0.609	0.765
Secondary education or higher	0.241	0.037	438	340	1.613	0.154	0.167	0.315
Literacy	0.267	0.040	438	340	1.671	0.150	0.187	0.347
Child slept under an ITN last night	0.523	0.062	305	230	1.898	0.119	0.399	0.647
Child had fever in last 2 weeks	0.130	0.027	229	175	1.038	0.208	0.076	0.184
Child sought care/treatment from a health facility	0.614	0.100	35	23	1.012	0.163	0.414	0.814
Child took ACT	1.000	0.000	34	22	0.000	0.000	1.000	1.000
Child (6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.043	0.025	260	196	1.489	0.581	0.007	0.093
Child (6-59 months) has malaria (based on microscopy test)	0.175	0.044	239	182	1.566	0.251	0.087	0.263
Child (age 6-59 months) has malaria (based on rapid test)	0.501	0.043	260	197	1.219	0.086	0.415	0.587
Pregnant women slept under an ITN last night	0.770	0.090	39	34	1.125	0.117	0.590	0.950
Received 2+ doses of SP/Fansidar during antenatal visit	0.689	0.063	53	39	0.841	0.091	0.563	0.815

Table B.19 Sampling errors: Port Loko sample. Sierra Leone MIS 2021

Variables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.576	0.049	552	662	2.568	0.085	0.478	0.674
Average number of ITNs per household	1.095	0.102	552	662	2.234	0.093	0.891	1.299
Ownership of at least one ITN for every two persons	0.277	0.042	552	662	2.396	0.152	0.193	0.361
No education	0.611	0.040	515	615	2.034	0.065	0.531	0.691
Secondary education or higher	0.302	0.029	515	615	1.566	0.096	0.244	0.360
Literacy	0.316	0.032	515	615	1.700	0.101	0.252	0.380
Child slept under an ITN last night	0.449	0.056	401	461	2.415	0.125	0.337	0.561
Child had fever in last 2 weeks	0.134	0.022	317	373	1.256	0.164	0.090	0.178
Child sought care/treatment from a health facility	0.538	0.125	39	50	1.800	0.232	0.288	0.788
Child took ACT	1.000	0.000	35	47	0.000	0.000	1.000	1.000
Child (6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.025	0.009	350	403	1.410	0.360	0.007	0.043
Child (6-59 months) has malaria (based on microscopy test)	0.229	0.042	336	386	1.950	0.183	0.145	0.313
Child (age 6-59 months) has malaria (based on rapid test)	0.443	0.042	348	401	1.700	0.095	0.359	0.527
Pregnant women slept under an ITN last night	0.490	0.110	56	63	1.777	0.224	0.270	0.710
Received 2+ doses of SP/Fansidar during antenatal visit	0.896	0.038	94	110	1.272	0.042	0.820	0.972

Table B.20 Sampling errors: Bo sample. Sierra Leone MIS 2021

Variables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.769	0.032	549	628	1.908	0.042	0.705	0.833
Average number of ITNs per household	1.767	0.127	549	628	2.318	0.072	1.513	2.021
Ownership of at least one ITN for every two persons	0.323	0.044	549	628	2.369	0.136	0.235	0.411
No education	0.495	0.037	606	682	1.929	0.075	0.421	0.569
Secondary education or higher	0.386	0.039	606	682	2.065	0.101	0.308	0.464
Literacy	0.398	0.043	606	682	2.272	0.108	0.312	0.484
Child slept under an ITN last night	0.626	0.046	507	576	2.268	0.073	0.534	0.718
Child had fever in last 2 weeks	0.295	0.044	389	445	2.038	0.149	0.207	0.383
Child sought care/treatment from a health facility	0.920	0.027	111	131	1.175	0.029	0.866	0.974
Child took ACT	0.869	0.071	110	130	2.423	0.082	0.727	1.000
Child (6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.027	0.015	460	523	2.089	0.556	0.003	0.057
Child (6-59 months) has malaria (based on microscopy test)	0.251	0.035	456	520	1.878	0.139	0.181	0.321
Child (6-59 months) has malaria (based on rapid test)	0.337	0.041	457	520	2.000	0.122	0.255	0.419
Pregnant women slept under an ITN last night	0.502	0.101	38	38	1.318	0.201	0.300	0.704
Received 2+ doses of SP/Fansidar during antenatal visit	0.879	0.034	144	160	1.302	0.039	0.811	0.947

Table B.21 Sampling errors: Bonthe sample. Sierra Leone MIS 2021

Variables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.706	0.059	383	346	2.406	0.084	0.588	0.824
Average number of ITNs per household	1.638	0.226	383	346	2.864	0.138	1.186	2.090
Ownership of at least one ITN for every two persons	0.243	0.049	383	346	2.137	0.202	0.145	0.341
No education	0.504	0.057	442	399	2.278	0.113	0.390	0.618
Secondary education or higher	0.349	0.055	442	399	2.291	0.158	0.239	0.459
Literacy	0.350	0.055	442	399	2.284	0.157	0.240	0.460
Child slept under an ITN last night	0.578	0.091	374	335	3.365	0.157	0.396	0.760
Child had fever in last 2 weeks	0.257	0.041	257	230	1.400	0.160	0.175	0.339
Child sought care/treatment from a health facility	0.729	0.073	70	59	1.316	0.100	0.583	0.875
Child took ACT	0.948	0.033	69	58	1.198	0.035	0.882	1.000
Child (age 6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.040	0.020	296	265	1.841	0.500	0.000	0.080
Child (age 6-59 months) has malaria (based on microscopy test)	0.190	0.027	307	274	1.152	0.142	0.136	0.244
Child (age 6-59 months) has malaria (based on rapid test)	0.342	0.060	337	301	2.226	0.175	0.222	0.462
Pregnant women slept under an ITN last night	0.488	0.078	46	42	0.954	0.160	0.332	0.644
Received 2+ doses of SP/Fansidar during antenatal visit	0.667	0.049	105	96	1.011	0.073	0.569	0.765

Table B.22 Sampling errors: Moyamba sample. Sierra Leone MIS 2021

Variables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.797	0.054	449	352	2.525	0.068	0.689	0.905
Average number of ITNs per household	1.914	0.191	449	352	2.553	0.100	1.532	2.296
Ownership of at least one ITN for every two persons	0.398	0.058	449	352	2.241	0.146	0.282	0.514
No education	0.560	0.033	484	380	1.286	0.059	0.494	0.626
Secondary education or higher	0.274	0.033	484	380	1.439	0.120	0.208	0.340
Literacy	0.278	0.031	484	380	1.346	0.112	0.216	0.340
Child slept under an ITN last night	0.636	0.098	338	292	3.456	0.154	0.440	0.832
Child had fever in last 2 weeks	0.161	0.038	235	199	1.458	0.236	0.085	0.237
Child sought care/treatment from a health facility	0.856	0.039	42	32	0.639	0.046	0.778	0.934
Child took ACT	1.000	0.000	40	31	0.000	0.000	1.000	1.000
Child (age 6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.054	0.016	299	254	1.153	0.296	0.022	0.086
Child (age 6-59 months) has malaria (based on microscopy test)	0.247	0.046	302	256	1.707	0.186	0.155	0.339
Child (age 6-59 months) has malaria (based on rapid test)	0.420	0.064	305	259	2.095	0.152	0.292	0.548
Pregnant women slept under an ITN last night	0.678	0.126	37	32	1.776	0.186	0.426	0.930
Received 2+ doses of SP/Fansidar during antenatal visit	0.863	0.056	81	68	1.327	0.065	0.751	0.975

Table B.23 Sampling errors: Pujehun sample. Sierra Leone MIS 2021

Variables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.457	0.038	448	358	1.444	0.083	0.381	0.533
Average number of ITNs per household	0.969	0.107	448	358	1.549	0.110	0.755	1.183
Ownership of at least one ITN for every two persons	0.250	0.024	448	358	1.060	0.096	0.202	0.298
No education	0.580	0.036	311	246	1.149	0.062	0.508	0.652
Secondary education or higher	0.297	0.032	311	246	1.111	0.108	0.233	0.361
Literacy	0.325	0.037	311	246	1.243	0.114	0.251	0.399
Child slept under an ITN last night	0.388	0.048	260	198	1.379	0.124	0.292	0.484
Child had fever in last 2 weeks	0.170	0.041	132	97	1.032	0.241	0.088	0.252
Child sought care/treatment from a health facility	na	na	22	16	na	na	na	na
Child took ACT	na	na	22	15	na	na	na	na
Child (age 6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.011	0.006	238	181	1.068	0.545	0.001	0.023
Child (age 6-59 months) has malaria (based on microscopy test)	0.258	0.054	232	177	1.632	0.209	0.15	0.366
Child (age 6-59 months) has malaria (based on rapid test)	0.379	0.045	235	180	1.257	0.119	0.289	0.469
Pregnant women slept under an ITN last night	na	na	16	12	na	Na	na	na
Received 2+ doses of SP/Fansidar during antenatal visit	0.738	0.079	50	38	1.094	0.107	0.580	0.896

Table B.24 Sampling errors: Western Area Rural sample. Sierra Leone MIS 2021

Variables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.494	0.032	452	632	1.588	0.065	0.43	0.558
Average number of ITNs per household	0.857	0.082	452	632	1.902	0.096	0.693	1.021
Ownership of at least one ITN for every two persons	0.174	0.025	452	632	1.676	0.144	0.124	0.224
No education	0.399	0.042	552	781	2.369	0.105	0.315	0.483
Secondary education or higher	0.548	0.037	552	781	2.060	0.068	0.474	0.622
Literacy	0.491	0.036	552	781	2.029	0.073	0.419	0.563
Child slept under an ITN last night	0.351	0.038	311	459	1.713	0.108	0.275	0.427
Child had fever in last 2 weeks	0.201	0.037	262	374	1.779	0.184	0.127	0.275
Child sought care/treatment from a health facility	0.855	0.059	49	75	1.538	0.069	0.737	0.973
Child took ACT	0.981	0.015	49	75	0.956	0.015	0.951	1.011
Child (6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.019	0.014	257	385	2.292	0.737	0.009	0.047
Child (6-59 months) has malaria (based on microscopy test)	0.142	0.025	249	367	1.390	0.176	0.092	0.192
Child (age 6-59 months) has malaria (based on rapid test)	0.259	0.035	258	386	1.551	0.135	0.189	0.329
Pregnant women slept under an ITN last night	na	na	19	28	na	na	na	na
Received 2+ doses of SP/Fansidar during antenatal visit	0.807	0.038	92	127	1.082	0.047	0.731	0.883

Table B.25 Sampling errors: Western Area Urban sample. Sierra Leone MIS 2021

Variables	Value (R)	Standard error (SE)	Unweighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	R-2SE	R+2SE
Ownership of at least one ITN	0.376	0.024	836	1132	1.668	0.064	0.328	0.424
Average number of ITNs per household	0.630	0.063	836	1132	2.108	0.100	0.504	0.756
Ownership of at least one ITN for every two persons	0.142	0.020	836	1132	1.954	0.141	0.102	0.182
No education	0.247	0.025	826	1102	1.912	0.101	0.197	0.297
Secondary education or higher	0.694	0.021	826	1102	1.496	0.030	0.652	0.736
Literacy	0.713	0.025	826	1102	1.827	0.035	0.663	0.763
Child slept under an ITN last night	0.308	0.034	365	492	1.638	0.110	0.240	0.376
Child had fever in last 2 weeks	0.107	0.025	271	370	1.587	0.234	0.057	0.157
Child sought care/treatment from a health facility	0.565	0.125	34	38	1.585	0.221	0.315	0.815
Child took ACT	0.874	0.084	34	38	1.594	0.096	0.706	1.042
Child (6-59 months) has anaemia (haemoglobin <8.0 g/dl)	0.000	0.000	332	443	0.000	na	0.000	0.000
Child (6-59 months) has malaria (based on microscopy test)	0.075	0.036	326	443	2.887	0.480	0.003	0.147
Child (age 6-59 months) has malaria (based on rapid test)	0.080	0.021	334	451	1.676	0.263	0.038	0.122
Pregnant women slept under an ITN last night	0.207	0.136	30	42	1.976	0.657	0.065	0.479
Received 2+ doses of SP/Fansidar during antenatal visit	0.828	0.041	94	127	1.208	0.050	0.746	0.910

DATA QUALITY TABLES

Appendix C

Table C.1 Household age distribution

Single-year age distribution of the de facto household population by sex (weighted), Sierra Leone MIS 2021

	Women		Men			Women		Men	
Age	Number	Percent	Number	Percent	Age	Number	Percent	Number	Percent
0	356	1.7	409	2.0	37	163	0.8	153	0.8
1	472	2.3	503	2.5	38	218	1.1	170	0.9
2	586	2.9	566	2.8	39	161	0.8	146	0.7
3	721	3.5	699	3.5	40	296	1.4	494	2.5
4	707	3.4	742	3.7	41	69	0.3	97	0.5
5	509	2.5	542	2.7	42	116	0.6	207	1.0
6	577	2.8	576	2.9	43	110	0.5	118	0.6
7	546	2.7	588	2.9	44	53	0.3	94	0.5
8	497	2.4	511	2.6	45	235	1.1	512	2.6
9	458	2.2	402	2.0	46	77	0.4	110	0.6
10	783	3.8	808	4.0	47	77	0.4	143	0.7
11	499	2.4	525	2.6	48	89	0.4	177	0.9
12	705	3.4	623	3.1	49	51	0.2	140	0.7
13	738	3.6	439	2.2	50	660	3.2	303	1.5
14	731	3.6	411	2.1	51	170	0.8	83	0.4
15	273	1.3	590	3.0	52	244	1.2	105	0.5
16	259	1.3	330	1.7	53	141	0.7	78	0.4
17	267	1.3	382	1.9	54	137	0.7	104	0.5
18	320	1.6	403	2.0	55	216	1.1	216	1.1
19	291	1.4	301	1.5	56	108	0.5	128	0.6
20	486	2.4	415	2.1	57	77	0.4	60	0.3
21	247	1.2	247	1.2	58	78	0.4	93	0.5
22	310	1.5	271	1.4	59	59	0.3	50	0.3
23	259	1.3	247	1.2	60	271	1.3	236	1.2
24	205	1.0	183	0.9	61	33	0.2	40	0.2
25	538	2.6	462	2.3	62	82	0.4	67	0.3
26	222	1.1	192	1.0	63	46	0.2	53	0.3
27	304	1.5	238	1.2	64	51	0.2	46	0.2
28	364	1.8	285	1.4	65	174	0.8	151	0.8
29	293	1.4	186	0.9	66	45	0.2	27	0.1
30	620	3.0	499	2.5	67	41	0.2	56	0.3
31	125	0.6	108	0.5	68	51	0.2	51	0.3
32	249	1.2	235	1.2	69	39	0.2	33	0.2
33	178	0.9	143	0.7	70+	515	2.5	509	2.6
34	142	0.7	158	0.8	Don't Know/ Missing	49	0.2	21	0.1
35	500	2.4	518	2.6					
36	169	0.8	153	0.8	Total	20,508	100.0	19,962	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, number and percent distribution of interviewed women age 15-49, and percentage of eligible women who were interviewed (weighted), by 5-year age groups, Sierra Leone MIS 2021

Age group	Household population of women age 10-54	Interviewed women age 15-49		Percentage of eligible women interviewed
		Number	Percentage	
10-14	3,455	-	-	-
15-19	1,410	1,407	16.9	99.7
20-24	1,507	1,505	18.1	99.9
25-29	1,721	1,719	20.7	99.9
30-34	1,314	1,309	15.7	99.6
35-39	1,211	1,209	14.5	99.9
40-44	645	644	7.7	99.9
45-49	530	530	6.4	100.0
50-54	1,352	-	-	-
15-49	8,338	8,323	100.0	99.8

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.

Table C.3 Completeness of reporting

Percentage of observations missing information for selected demographic and health questions (weighted), Sierra Leone MIS 2021

Subject	Percentage with information missing	Number of cases
Month Only (Births in the 5 years preceding the survey)	0.29	4,447
Month and Year (Births in the 5 years preceding the survey)	0.00	4,447
Age at Death (Deceased children born in the 5 years preceding the survey)	1.41	38
Respondent's education (All women age 15-49)	0.00	8,300
Fever in last 2 weeks (Living children 0-59 months)	1.05	4,537

Table C.4 Births by calendar years

Number of births, percentage with complete birth date, sex ratio at birth, and calendar year ratio by calendar year, according to living, dead, and total children (weighted), Sierra Leone 2021

Calendar year	Number of births			Percentage with complete birth date[1]			Sex ratio at birth[2]			Calendar year ratio[3]		
	L	D	T	L	D	T	L	D	T	L	D	T
2021	365	10	375	100.0	100.0	100.0	107.5	118.5	107.8	-	-	-
2020	912	7	919	100.0	100.0	100.0	113.8	331.2	114.6	-	-	-
2019	908	6	913	99.7	100.0	99.7	94.3	267.3	94.8	92.9	77.7	92.8
2018	1,041	8	1,048	99.7	100.0	99.7	86.5	94.5	86.6	116.4	170.8	116.7
2017	880	4	884	99.4	100.0	99.4	111.7	-	112.6	106.2	57.7	105.8
2016	618	4	622	99.6	100.0	99.6	107.9	179.2	108.3	140.4	245.5	140.8
2017- 2021	4,106	34	4,139	99.7	100.0	99.7	100.9	189.0	101.4	-	-	-
All	4,724	134	4,857	99.7	28.6	97.8	101.8	152.3	102.9	-	-	-

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

ADDITIONAL TABLE

Appendix D

Table D.1 In-door 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, Sierra Leone MIS 2021

Background Characteristic	Percentage of households with IRS1 in the past 12 months[1]	Percentage of households with at least one ITN and/or IRS in the past 12 months	Percentage of households with at least one ITN for every two persons and/or IRS in the past 12 months	Number of households
Residence				
Urban	5.2	54.5	24.0	3,230
Rural	11.7	68.7	35.4	4,760
Region				
Eastern	0.2	73.5	27.6	1,642
Northern	13.1	65.1	33.3	1,581
North Western	0.3	59.7	27.3	1,308
Southern	25.2	73.1	46.5	1,695
Western	4.9	43.9	19.2	1,764
District				
Kailahun	0.0	78.8	25.6	545
Kenema	0.0	68.5	23.1	630
Kono	0.6	72.8	35.4	483
Bombali	45.8	78.4	58.0	438
Falaba	0.6	52.3	21.3	185
Koinadugu	1.5	73.6	42.1	173
Tonkolili	0.3	58.8	20.4	781
Kambia	0.0	42.8	14.4	327
Karene	0.0	81.1	38.5	319
Port Loko	0.6	57.6	28.2	662
Bo	68.0	87.3	75.5	628
Bonthe	0.0	70.6	24.3	346
Moyamba	0.0	79.7	39.8	352
Pujehun	0.0	45.7	25.0	358
Western Area Rural	2.2	50.4	19.2	632
Western Area Urban	6.4	40.3	19.2	1,132
Wealth quintile				
Lowest	13.4	77.4	37.1	1,429
Second	9.2	68.5	35.0	1,514
Middle	9.9	68.0	33.9	1,555
Fourth	6.8	53.0	24.2	1,719
Highest	7.1	51.8	26.0	1,773
Total	9.1	63.0	30.8	7,990

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

SURVEY PERSONNEL

Appendix E

MIS TECHNICAL WORKING GROUP (TWG)

Professor Foday Sahr, University of Sierra Leone Principal Investigator

Professor Mohamed Samai, University of Sierra Leone Co-Principal Investigator

Anitta. RY Kamara, Case Management & Research Team Lead, NMCP, TWG Member, National Coordinator

Sr. Wani Lahai, IEC/SBCC & MIP Team Lead, NMCP Member, SBCC Coordinator

Dr. Francis Smart, Director, Directorate of Planning and Policy Information MoHS Member

Dr. Edward Magbity, M&E Specialist, DPPI, MOHS Member

Mr. Francis Tommy, Principal Statistician, Stat SL Member, Household mapping lead

Mrs. Miriam Jalloh, Statistician/Census Manager, Stat SL Member, Household mapping lead

Mr. Ebrima Jarjou, GF NFM2 Project Director, CRS Member, Project Director

Dr. Regena J. Kain, GF NFM2 Health Program Manager, CRS Member, Deputy Project Director

Suehiro Yuki - UNICEF Member

Dr. Louisa Ganda, National Programme Officer, WHO Member,Technical adviser

Madam Doris Harding, Program Manager Public Health Laboratory, MoHS Member

Mr. Silleh Bah-Statistician – Stat SL Member, Data Analyst

Mr. Alpha S. Swaray, Medical Microbiologist, MoHS Member, Laboratory Manager

Dr. David Schnabel – US President Malaria Initiative (PMI) Resident Advisor Sierra Leone Member, Technical Advisor

Dr. Ramlat Jose – US President Malaria Initiative (PMI) Resident Advisor Sierra Leone Member, Technical Advisor

Mr. Harold Thomas – Program Manager Health Education Department, MOHS Member, Technical SBCC adviser

MIS TECHNICAL LABORATORY SUPERVISORS

Doris Harding Alpha S. Swaray Alusine Fofanah Salieu Kamara

MIS TECHNICAL LABORATORY MICROSCOPIST

Abdulai Jalloh	Santigie Kanu	Elvera D. Mansaray	Salieu M. Timbo
Janet Marvah	Juliana B. Bendu	Samuel Tarawallie	Donald Bangura
Sorie I O Bangura	Samuel Jusu	Alhaji Tommy	Anthony S.M Domawah
Mark Samba	Foday Bears Musa	Alhaji Bundu Sankoh	Momoh Siafa
Vandi Momoh	Christian A. Davies		

DATA PROCESSING MANAGER

Mohamed Sillah-Kanu – Catholic Relief Services

DATA MANAGERS

Mr. Musa Sillah-Kanu, Senior M&E Officer, National Malaria Control Programme

Thomas K. Ansumana - National Malaria Control Programme
Clementina Akran, - Statistics Sierra Leone
Silleh Bah – Statistics Sierra Leone

SLIDE MANAGERS

Brenda Stafford Samuel Tommy Hawa Christiana Swarray
Rosaline Enid Sheriff Esther S. Momoh

LOGISTICS OFFICERS

Foday Sankoh Amara Lahai

BIOMARKER SUPERVISORS

Edwina Florence Conteh Jerikatu Bangura Philip G. Pessima

SBCC COORDINATORS

Wani Kumba Lahai Kottor Kay Kamara Nancy Martha Mansaray

SBCC COMMUNITY MOBILISERS

Ignatius G. Margai
Rosaline Kain Saidu
Fatmata G. Alpha
Dauda Bonapha
Katumu Mansaray
Baindu Susan Brima
Micheal M. Tommy
Momoh Kallon
Ivan Murad
Umar Madina Bah
Alimamy Kamara
Isaac Foday

Andrew Amara
Lucy Macauley
Osman Bundu
Henry A.N. Akran
Sarah Yamson
Sylvester B. Rogers
Kingsley Ensah
William Pessima
Osman Samura
Ibrahim Sahid Kamara
Jasona Pratt
Sylvester Kpulum

Hannah A. Rogers
Victoria Oshoba-Williams
Janet A Kamara
Memunatu Kargbo
Ngaila Charlie
Umaru Sorie Kamara
Mohamed Sima Dumbuya
Emeralda Kabba Kamara
Mustapha Koroma
Isata John
Rugiatu Jimmy

Kailahun Team 1 Field Staff

John Seppeh	Coordinator
Abdul Waheed Kallon	Supervisor
Erica King	Nurse
Sam Johnny	Interviewer
Hajaratu Sorsor	Biomarker
Abdul M Garner	Runner

Kailahun Team 2 Field Staff

John Seppeh	Coordinator
Idrissa J.S. Kalloh	Supervisor
Magdalene Sabina Dakowa	Nurse
Sahr M Musa	Interviewer
Regina Johnson	Biomarker
Abdul M Garner	Runner

Kenema Team 3 Field Staff

Sia Jammie Sellu	Coordinator
Ansumana Sandy	Supervisor
Isatu Bangura	Nurse
Ishmail Conteh	Interviewer
Soukhainatu Tunis	Biomarker
Gassimu Turay	Runner

Kenema Team 4 Field Staff

Sia Jammie Sellu	Coordinator
Mawonday Marah	Supervisor
Marion F.R. Sesay	Nurse
Patrick Kamara	Interviewer
Augusta Samm-Boma	Biomarker
Gassimu Turay	Runner

Kono Team 5 Field Staff

Frederick Yamba	Coordinator
Reuben T. Ansumana	Supervisor
Moiyatu M. Momoh	Nurse
Patrick F.S. Korjie	Interviewer
Sam Saffa	Biomarker
Joseph Kallie Mansaray	Runner

Kono Team 6 Field Staff

Frederick Yamba	Coordinator
Francis G. Kalokoh	Supervisor
Mahawa Kabba	Nurse
Lansana B. Kuyateh	Interviewer
Mariama Tucker	Biomarker
Joseph Kallie Mansaray	Runner

Bombali Team 7 Field Staff

Lamin Kamara	Coordinator
Amarina Adama Koroma	Supervisor
Kadiatu Keister-Kabba	Nurse
Alex Dumbuya	Interviewer
Sobie Kanu	Biomarker
Priscilla Bangura	Runner

Bombali Team 8 Field Staff

Lamin Kamara	Coordinator
Micheal Wisdom Richards	Supervisor
Samuel Henry Coker	Nurse
Ibrahim White Koroma	Interviewer
Alfreda Conteh	Biomarker
Priscilla Bangura	Runner

Falaba Team 9 Field Staff

Samuel E. Grovesnor	Coordinator
Augusta Murray	Supervisor
AbuBakarr Sinneh Kanu	Nurse
Abubakarr Kabba	Interviewer
Karifa D. Marah	Biomarker
Abdul Abibu Kemoh	Runner

Falaba Team 10 Field Staff

Samuel E. Grovesnor	Coordinator
Mohamed Bangura	Supervisor
Princess George	Nurse
Ulamatu Victoria Kargbo	Interviewer
Kumba Tarawallie	Biomarker
Abdul Abibu Kemoh	Runner

Koinadugu Team 11 Field Staff

Dallow Kpaka	Coordinator
Alie Bantama	Supervisor
Aisha B. Musa	Nurse
Wilson Frazer	Interviewer
Franklyn A.F. Marah	Biomarker
Daniel K. Morris	Runner

Koinadugu Team 12 Field Staff

Dallow Kpaka	Coordinator
Saysay Goba Koker	Supervisor
Geodrica Williams-Kamara	Nurse
Jecinta H Gamanga	Interviewer
Aminata S. Kamara	Biomarker
Daniel K. Morris	Runner

Tonkolili Team 13 Field Staff

Pity Florence Kanu	Coordinator
Margaret T. Sesay	Supervisor
Elenor Ngegbai	Nurse
Christiana K Sesay	Interviewer
Josephine Jokojeh Decker	Biomarker
Thomas George	Runner

TonkoliliTeam 14 Field Staff

Pity Florence Kanu	Coordinator
Henrietta Kargbo	Supervisor
Zainab Bangura	Nurse
Kadiatu Fofana	Interviewer
Laurel M. Kargbo	Biomarker
Thomas George	Runner

Kambia Team 15 Field Staff

Musa Salieu Kamara	Coordinator
Alfred Dumbuya	Supervisor
Hannah Tucker	Nurse
Caroline Spaine	Interviewer
Hawanatu S. Kamara	Biomarker
Mohamed Sankoh	Runner

Kambia Team 16 Field Staff

Musa Salieu Kamara	Coordinator
Mariama M. Mansaray	Supervisor
Moses Gbouma Allieu	Nurse
Ibrahim Conteh	Interviewer
Rugiatu Bangura	Biomarker
Mohamed Sankoh	Runner

Karene Team 17 Field Staff

Alimamy Kamara	Coordinator
Saidu Bangura	Supervisor
Linda Harding	Nurse
Andrew Lahai	Interviewer
Ann Marie Sesay	Biomarker
Alhaji Abubakarr Fawundu	Runner

Karene Team 18 Field Staff

Alimamy Kamara	Coordinator
Mariatu H. Kamara	Supervisor
Fatmata Y. Kargbo	Nurse
Gifty Grant	Interviewer
Gloria Kpaka	Biomarker
Alhaji Abubakarr Fawundu	Runner

Port Loko Team 19 Field Staff

Roseline F. Kamara	Coordinator
Solnet Brima	Supervisor
Ramatu Bangura	Nurse
Osman Momoh Kamara	Interviewer
Betty Fatoma	Biomarker
Princess Jamie Tommy	Runner

Port Loko Team 20 Field Staff

Roseline F. Kamara	Coordinator
Mabinty Christiana Thompson	Supervisor
Kadiatu Kamara	Nurse
Aisha Kumbasaryon Kargbo	Interviewer
Rachel Y Conteh	Biomarker
Princess Jamie Tommy	Runner

Bo Team 21 Field Staff

Ngadi G. Lombi	Coordinator
Ozaru Seppeh	Supervisor
Mariama Kamara	Nurse
Tamba Thomas	Interviewer
Mary Digba Yamba	Biomarker
Mustapha Appiah Kingsfore	Runner

Bo Team 22 Field Staff

Ngadi G. Lombi	Coordinator
Mangu Juana Smith	Supervisor
Musu E Sombai	Nurse
Kadija Keila	Interviewer
Vinniatu F.Tia	Biomarker
Mustapha Appiah Kingsfore	Runner

Bonthe Team 23 Field Staff

Doris M.S. Ganda	Coordinator
Ishmeal Hassan	Supervisor
Ramatu T. Bangura	Nurse
Musa Brima	Interviewer
Christiana J. Caulker	Biomarker
Francis Kombay	Runner

Bonthe Team 24 Field Staff

Doris M.S. Ganda	Coordinator
Dantes Musa	Supervisor
Fatmata Kamara	Nurse
Jessy Wilfred Humper	Interviewer
Lamin Kanu	Biomarker
Francis Kombay	Runner

Moyamba Team 25 Field Staff

Philip Brewah	Coordinator
Joseph Lansana	Supervisor
Philicia George	Nurse
James Junisa	Interviewer
Abdulai Samba	Biomarker
Kandeh Bangura	Runner

MoyambaTeam 26 Field Staff

Philip Brewah	Coordinator
Christopher Marovia	Supervisor
Edith Momoh	Nurse
Joseph A Gegbe	Interviewer
Fatmata S. Koroma	Biomarker
Kandeh Bangura	Runner

Pujehun Team 27 Field Staff

Zainab Juheh Bah	Coordinator
Mohamed Swarray	Supervisor
Mariama Kaingbanja	Nurse
Lucy Konie	Interviewer
Lillian Kanu	Biomarker
Mohamed Seppeh	Runner

Pujehun Team 28 Field Staff

Zainab Juheh Bah	Coordinator
Esther Foday	Supervisor
Prince Kwesi Evans	Nurse
Alberta M. Foday	Interviewer
Yatta Sonnie	Biomarker
Mohamed Seppeh	Runner

Western Area Rural Team 29 Field Staff

Mohamed S. Jalloh	Coordinator
Victoria Dixon Luke	Supervisor
Gwendolyn A. Macauley	Nurse
Joseph Koroma	Interviewer
Isatu Mansaray	Biomarker
Umaru Barrie	Runner

Western Area Rural Team 30 Field Staff

Mohamed S. Jalloh	Coordinator
Mariama Blackie	Supervisor
Bridgette Wright	Nurse
Mary Kumba Ansumana	Interviewer
Rose P. Stevens	Biomarker
Umaru Barrie	Runner

Western Area Urban Team 31 Field Staff

Ramata Kanneh	Coordinator
Augusta Foday	Supervisor
Tenneh Gilo M. Sombie	Nurse
Amy Pabai	Interviewer
Nini Jalloh	Biomarker
Edwina Roberts	Runner

Western Area Urban Team 32 Field Staff

Ramata Kanneh	Coordinator
Henrietta Emmanuel	Supervisor
Hannah Crosby	Nurse
John Thullah	Interviewer
Lorraine Marion Feury	Biomarker
Edwina Roberts	Runner

CATHOLIC RELIEF SERVICES (CRS) PROGRAMMING STAFF

Isabelle Tissandie	Head of Operations
Glynnis Cummings-John	Head of Programs
Ebrima Jarjou	Program Director
Regena Juliana Kain	Program Manager
Afrina Karim	MIS Coordinator
Janet Jajua	Junior Professional
Dominic Lumeh	Senior Project Officer
Momoud Kabba	MEAL Manager
Memunatu K. Kamara	MEAL Officer
Yusifu Kargbo	Grant Manager
Vera Harmond	Grant Accountant
Arima Kamara	Grant Accountant
James Nyakeh Lahai	Zonal Coordinator, East
Yayah Mansaray	Zonal Coordinator, South
Abel Calovini Janneh	Zonal Coordinator, North
Sheku Keita	Zonal Coordinator, Northwest
Alhaji Kamara	IT Manager
Muelda Smith	Project Admin Officer

Utica International STAFF

Mohamed Ayad	Project Coordinator
Momodou Kalleh	Survey Manager
Alfredo Aliaga	Sampling Statistician
Papa Mabèye Diop	Sampling Statistician
Michel Toukam	Biomarker Specialist
Abdou Sarr	Data Processing Specialist
Han raggers	Data Processing Specialist
Carole Steere	Senior Editor
Kylee Breedlove	Report Production Specialist

QUESTIONNAIRES

Appendix **F**

QUESTIONNAIRES

2021 SIERRA LEONE MALARIA INDICATOR SURVEY
HOUSEHOLD QUESTIONNAIRE

SIERRA LEONE
MINISTRY OF HEALTH AND SANITATION, NATIONAL MALARIA CONTROL PROGRAMME
STATISTICS SIERRA LEONE
CATHOLIC RELIEF SERVICES

IDENTIFICATION

LOCALITY NAME _____

NAME OF HOUSEHOLD HEAD _____

CLUSTER NUMBER .....

HOUSEHOLD NUMBER .....

PROVINCE .....

DISTRICT .....

CHIEFDOM .....

SECTION .....

ENUMERATION AREA .....

HOUSEHOLD SELECTED FOR CHILDREN TESTING AGE 5-9 YEARS/60-119 MONTHS? (1=YES,

URBAN-RURAL (RURAL=1 , URBAN=2 .....

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE				DAY / MONTH / YEAR 2021
INTERVIEWER'S NAME				INT. NO.
RESULT*				RESULT*
NEXT VISIT DATE				TOTAL NUMBER OF VISITS
TIME				

*RESULT CODES:

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

TOTAL PERSONS IN HOUSEHOLD

TOTAL ELIGIBLE WOMEN

LINE NO. OF RESPONDENT TO HOUSEHOLD QUESTIONNAIRE

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

LANGUAGE OF QUESTIONNAIRE** ENGLISH

**LANGUAGE CODES:

01 ENGLISH	04 TEMNE	07 SHERBRO	10 KONO	13 YALUNKA
02 KRIO	05 MADINGO	08 LIMBA	11 SUSU	14 KORANKO
03 MENDE	06 LOKO	09 KISSI	12 FULLAH	96 OTHER

TEAM NUMBER	TEAM SUPERVISOR NAME	TEAM SUPERVISOR NUMBER

INTRODUCTION AND CONSENT

(3)

Hello. My name is _____. I am working with the Ministry of Health and Sanitation (MoHS). We are conducting a survey about malaria all over Sierra Leone. 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 any of the people listed on this card.

GIVE CARD WITH CONTACT INFORMATION

2021 SLMIS Principle Investigator: Dr. Foday Sahr; +232 76 480288; Email: fsahr65@gmail.com
Chairman of Ethics Committee: Professor Hector G. Morgan; +232 76 629251; Email: hmorg2007@yahoo.com
Director of Policy, Planning, & Information: Dr. Francis Smart; +232 78 300933; Email:
Deputy Chief Medical Officer-Public Health; Dr. Sartie Kenneh; Ministry of Health and Sanitation;+23276644009; Email: sartiekenneh@gmail.com
National Malaria Control Programme (NMCP): Sr. Anitta R.Y. Kamara; +232 76 481960; Email: anittakav@gmail.com
Catholic Relief Services: Mr. Ebrima Jarjou; +232 79 250636; Email: ebrima.jarjou@crs.org

As part of the survey we would first like to ask some questions about your household. All of the answers you give will be confidential. As part of this survey, we are asking that children all over the country take an Anemia test. Anemia is a serious health problem that usually results from poor nutrition, infection, or disease. This survey will help the government to develop programs to prevent and treat Anemia. 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. If the malaria test is positive, treatment will be offered. This survey will help the government to develop programs to prevent malaria. Participation in the survey is completely voluntary. If we should come to any question you don't want to answer, just let me know and I will

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

IGNATURE OF INTERVIEWER _____ DATE _____

RESPONDENT AGREES TO BE INTERVIEWED . . 1

RESPONDENT DOES NOT AGREE TO BE INTERVIEWED . . 2 → END

100	RECORD THE TIME.	HOURS . . . . . MINUTES . . . . .

HOUSEHOLD SCHEDULE

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	ELIGIBILITY		
1	2	3	4	5	6	7	8	9	10
	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 ASKING QUESTIONS 2-7 FOR EACH PERSON ASK QUESTIONS 2A-2C TO BE SURE THAT THE LISTING IS COMPLETE.	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 YEAR	CIRCLE LINE NUMBER OF ALL CHILDREN AGE 0-4 Yrs/ 0-59 MONTHS	CIRCLE LINE NUMBER OF ALL CHILDREN AGE 5-9 YEARS/ 60-119 MONTHS
01			M F 1 2	Y N 1 2	Y N 1 2	IN YEARS COMPLETE	01	01	01
02			1 2	1 2	1 2		02	02	02
03			1 2	1 2	1 2		03	03	03
04			1 2	1 2	1 2		04	04	04
05			1 2	1 2	1 2		05	05	05
06			1 2	1 2	1 2		06	06	06
07			1 2	1 2	1 2		07	07	07
08			1 2	1 2	1 2		08	08	08
09			1 2	1 2	1 2		09	09	09
10			1 2	1 2	1 2		10	10	10

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

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

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

CODES FOR Q. 3: RELATIONSHIP TO HEAD OF HOUSEHOLD

01 = HEAD
02 = WIFE OR HUSBAND
03 = SON OR DAUGHTER
04 = SON-IN-LAW OR DAUGHTER-IN-LAW
05 = GRANDCHILD
06 = PARENT
07 = PARENT-IN-LAW
08 = BROTHER OR SISTER
09 = NIECE/NEPHEW BY BLOOD
10 = NIECE/NEPHEW BY MARRIAGE
11 = OTHER RELATIVES
12 = ADOPTED/FOSTER/ STEPCHILD
13 = NOT RELATED
14 = COWIFE
98 = DON'T KNOW

HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
101 (4)	What is the main source of drinking water for members of your household?	**PIPED WATER** PIPED INTO DWELLING . . . . . 11 PIPED TO YARD/PLOT . . . . . 12 PIPED TO NEIGHBOR . . . . . 13 PUBLIC TAP/STANDPIP . . . . . 14 TUBE WELL OR BOREHOL . . . . . 21 **DUG WELL** PROTECTED WELL . . . . . 31 UNPROTECTED WELL . . . . . 32 **WATER FROM SPRING** PROTECTED SPRING . . . . . 41 UNPROTECTED SPRIN . . . . . 42 RAINWATER . . . . . 51 TANKER TRUCK . . . . . 61 CART WITH SMALL TANK . . . . . 71 SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/ IRRIGATION CHANNEL . . . . . 81 BOTTLED WATEF . . . . . 91 WATER SACHET! . . . . . 92 OTHER _____ 96 (SPECIFY)	→ 105 → 103 → 103
102	What is the main source of water used by your household for other purposes such as cooking and handwashing?	**PIPED WATER** PIPED INTO DWELLING . . . . . 11 PIPED TO YARD/PLOT . . . . . 12 PIPED TO NEIGHBOI . . . . . 13 PUBLIC TAP/STANDPIP . . . . . 14 TUBE WELL OR BOREHOL . . . . . 21 **DUG WELL** PROTECTED WELL . . . . . 31 UNPROTECTED WELL . . . . . 32 **WATER FROM SPRING** PROTECTED SPRING . . . . . 41 UNPROTECTED SPRIN . . . . . 42 RAINWATER . . . . . 51 TANKER TRUCK . . . . . 61 CART WITH SMALL TANK . . . . . 71 SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/ IRRIGATION CHANNEL . . . . . 81 OTHER _____ 96 (SPECIFY)	→ 105
103	Where is that water source located?	IN OWN DWELLING . . . . . 1 IN OWN YARD/PLOT . . . . . 2 ELSEWHERE 3	→ 105
104	How long does it take to go there, get water, and come back?	MINUTES . . . . . ☐☐☐ DON'T KNOW 998	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
105 (5)	What kind of toilet facility do members of your household usually use? IF NOT POSSIBLE TO DETERMINE, ASK PERMISSION TO OBSERVE THE FACILITY.	**FLUSH OR POUR FLUSH TOILET** FLUSH TO PIPED SEWER SYSTEM ..... 11 FLUSH TO SEPTIC TANK ..... 12 FLUSH TO PIT LATRINE ..... 13 FLUSH TO SOMEWHERE ELS ..... 14 FLUSH, DON'T KNOW WHER ..... 15 **PIT LATRINE** VENTILATED IMPROVED PIT LATRINE .. 21 PIT LATRINE WITH SLAB ..... 22 PIT LATRINE WITHOUT SLAB/OPEN PI .. 23 COMPOSTING TOILET ..... 31 BUCKET TOILET ..... 41 HANGING TOILET/HANGING LATRI ..... 51 NO FACILITY/BUSH/FIELD ..... 61 OTHER _____ 96 (SPECIFY)	→ 109
106	Do you share this toilet facility with other households?	YES ..... 1 NO 2	→ 108
107	Including your own household, how many households use this toilet facility?	NO. OF HOUSEHOLDS IF LESS THAN 10 ..... 0 _ 10 OR MORE HOUSEHOLDS ..... 95 DON'T KNOW 98	
108	Where is this toilet facility located?	IN OWN DWELLING ..... 1 IN OWN YARD/PLOT ..... 2 ELSEWHERE 3	
109	In your household, what type of cookstove is mainly used for cooking?	ELECTRIC STOVE ..... 01 SOLAR COOKER ..... 02 LIQUIFIED PETROLEUM GAS (LPG)/ COOKING GAS STOVE ..... 03 PIPED NATURAL GAS STOVE ..... 04 BIOGAS STOVE ..... 05 LIQUID FUEL STOVE ..... 06 MANUFACTURED SOLID FUEL STOVE ..... 07 TRADITIONAL SOLID FUEL STOVE ..... 08 THREE STONE STOVE/OPEN FIRE ..... 09 NO FOOD COOKED IN HOUSEHOL ..... 95 OTHER _____ 96 (SPECIFY)	→ 111 → 111

HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
110	What type of fuel or energy source is used in this cookstove?	ALCOHOL/ETHANOL . . . . . 01 GASOLINE/DIESEL . . . . . 02 KEROSENE/PARAFFIN . . . . . 03 COAL/LIGNITE . . . . . 04 CHARCOAL . . . . . 05 WOOD . . . . . 06 STRAW/SHRUBS/GRASS . . . . . 07 AGRICULTURAL CROP . . . . . 08 ANIMAL DUNG/WASTE . . . . . 09 PROCESSED BIOMASS (PELLETS) OR WOODCHIPS . . . . . 10 GARBAGE/PLASTIC . . . . . 11 SAWDUST . . . . . 12 OTHER _____ 96 (SPECIFY)	
111	How many rooms in this household are used for sleeping?	ROOMS	
111A	How many sleeping facilities are currently in use in this household, including any beds, mattresses, mats, or rugs? ASK FOR BOTH INSIDE AND OUTSIDE OF DWELLING. IF THE NUMBER IS MORE THAN 25, RECORD 95.	NUMBER OF SLEEPING FACILITIES	
112	Does this household own any livestock, herds, other farm animals, or poultry?	YES . . . . . 1 NO 2	→ 114
113 (6)	How many of the following animals does this household own? IF NONE, RECORD '00'. IF 95 OR MORE, RECORD '95'. IF UNKNOWN, RECORD '98'.		
	a) Milk cows or bulls?	a) COWS/BULLS	
	b) Other cattle? Please specify	b) OTHER CATTLE	
	c) Horses, donkeys, or mules?	c) HORSES/DONKEYS/MULE	
	d) Goats?	d) GOATS	
	e) Sheep?	e) SHEEP	
	f) Chickens or other poultry?	f) CHICKENS/POULTR	
114	Does any member of this household own any agricultural land?	YES . . . . . 1 NO 2	→ 116

HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
115	How many hectares or acres or plots of agricultural land do members of this household own? IF 95 OR MORE, CIRCLE '950'. IF 95 OR ACRES, RECORD IN HECTARES. IF 95 OR PLOTS, RECORD IN ACRES.	HECTARES ..... 1 ☐☐.☐ ACRES ..... 2 ☐☐.☐ PLOT ..... 3 ☐☐.☐ 95 OR MORE HECTARES ..... 950 DON'T KNOW 998	
116 (7)	Does your household have: a) Electricity? b) A radio? c) A television? d) A non-mobile telephone? e) A computer? f) A refrigerator?	YES NO a) ELECTRICITY ..... 1 2 b) RADIO ..... 1 2 c) TELEVISION ..... 1 2 d) NON-MOBILE TELEPHONE .. 1 2 e) COMPUTER ..... 1 2 f) REFRIGERATOR 1 2	
117	Does any member of this household own: a) A watch? b) A mobile phone? c) A bicycle? d) A motorcycle or motor scooter? e) An animal-drawn cart? f) A car or truck? g) A boat with a motor? h) A boat without a motor?	YES NO a) WATCH ..... 1 2 b) MOBILE PHONE ..... 1 2 c) BICYCLE ..... 1 2 d) MOTORCYCLE/SCOOTER .. 1 2 e) ANIMAL-DRAWN CART ..... 1 2 f) CAR/TRUCK ..... 1 2 g) BOAT WITH MOTOR ..... 1 2 h) BOAT WITHOUT MOTOR 1 2	
118	Does any member of this household have a bank account or Village Savings or Osusu ?	YES ..... 1 NO 2	
119	Does any member of this household use a mobile phone to make financial transactions such as sending or receiving money, paying bills, purchasing goods or services, or receiving wages?	YES ..... 1 NO 2	
119A	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	→ 119C
119B	Who sprayed the dwelling?	GOVERNMENT WORKER/PROGRA ..... A PRIVATE COMPANY ..... B NONGOVERNMENTAL ORGANIZATION (I .. C OTHER _____ X (SPECIFY) DON'T KNOW ..... Z	
119C	Now I would like to talk to you about mosquito nets. What shape of mosquito nets do you prefer, conical or rectangular? SHOW PHOTO OF NETS	CONICAL ..... 1 RECTANGULAR ..... 2 EITHER ..... 3 DON'T KNOW 8	
119D	If you have a choice, what color of mosquito net do you prefer?	WHITE ..... 1 BLUE ..... 2 GREEN ..... 3 OTHER _____ 6 (SPECIFY)	

HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
119E	Do you prefer a mosquito net where the material is soft (nade of polyester) or hard (made of polyethylene)? SHOW SAMPLES PIECES	SOFT(POLYESTER) ..... 1 HARD (POLYETHYLENE ..... 2 DON'T KNOW 8	
120	Does your household have any mosquito nets?	YES ..... 1 NO 2	→ 132
121	How many mosquito nets does your household have?	NUMBER OF NETS ..... [ ][ ]	

MOSQUITO NETS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
	ASK THE RESPONDENT TO SHOW YOU ALL THE NETS IN THE HOUSEHOLD. OBSERVE AND ANSWER THE QUESTIONS FOR EACH NET, ONE BY ONE.		
122	ASSIGN EACH NET A SEQUENTIAL NUMBER AND RECORD THE NUMBER HERE.	NET NUMBER ..... [ ][ ]	
123	WAS THIS NET OBSERVED?	OBSERVED ..... 1 NOT OBSERVED 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 AG ..... 95 NOT SURE 98	
125	OBSERVE OR ASK BRAND/TYPE OF MOSQUITO NET. IF BRAND IS UNKNOWN AND YOU CANNOT OBSERVE THE NET, SHOW PICTURES OF TYPICAL NET TYPES/BRANDS TO RESPONDENT.	**LONG-LASTING INSECTICIDE-TREATED NET (LLIN)** PermaNET ..... 11 PermaNET 3.0 ..... 12 OLYSET ..... 13 OLYSET PLUS ..... 14 DURANET ..... 15 OTHER/DON'T KNOW BRAND (LLIN ..... 16 OTHER TYPE (NOT LLIN ..... 96 DON'T KNOW TYPE 98	
126 (8)	Did you get the net through a [MOSQUITO NET CAMPAIGN], during an antenatal care visit, or during an immunization visit?	YES, [MOSQUITO NET CAMPAIGN] ..... 1 YES, ANC ..... 2 YES, IMMUNIZATION VISIT ..... 3 NO 4	→ 128

MOSQUITO NETS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
127	Where did you get the net?	GOVERNMENT HOSPITAL /HEAL . . . . . 01 GOVERNMENT MOBILE CLINICS . . . . . 02 PRIVATE MOBILE CLINICS . . . . . 03 PRIVATE HEALTH FACILIT` . . . . . 04 PHARMACY . . . . . 05 SHOP/MARKE` . . . . . 06 CHW . . . . . 07 MISSION/FAITH BASED HOSPITA . . . . . 08 MISSION/FAITH BASED CLINI(. . . . . 09 NGO . . . . . 10 SCHOOL . . . . . 11 OTHER Please specif\ . . . . . 96 DON'T KNOW 98	
128	Did anyone sleep under this mosquito net last night?	YES . . . . . 1 NO . . . . . 2 NOT SURE 8	→ 130 → 131
129	Who slept under this mosquito net last night? RECORD THE PERSON'S NAME AND LINE NUMBER FROM HOUSEHOLD SCHEDULE.	NAME _____ LINE NUMBER . . . . . ☐☐ NAME _____ LINE NUMBER . . . . . ☐☐ NAME _____ LINE NUMBER . . . . . ☐☐ NAME _____ LINE NUMBER . . . . . ☐☐	→ 131
130 (9)	What was the main reason this net was not used last night?	TOO HOT . . . . . 01 DON'T LIKE NET SHAPE/COLOR/SIZ . . . . . 02 DON'T LIKE SMELL . . . . . 03 UNABLE TO HANG NET . . . . . 04 SLEPT OUTDOORS . . . . . 05 USUAL USER DIDN'T SLEEP HERE LAST NIGHT . . . . . 06 NO MOSQUITOES/NO MALARIA . . . . . 07 EXTRA NET/SAVING FOR LATER . . . . . 08 OTHER _____ 96 (SPECIFY)	
131	GO BACK TO 122 FOR NEXT NET; OR, IF NO MORE NETS, GO TO 132.		

ADDITIONAL HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
132 (5)	OBSERVE MAIN MATERIAL OF THE FLOOR OF THE DWELLING. RECORD OBSERVATION.	**NATURAL FLOOR** EARTH/SAND ..... 11 DUNG ..... 12 **RUDIMENTARY FLOOR** WOOD PLANKS ..... 21 PALM/BAMBOO ..... 22 **FINISHED FLOOR** PARQUET OR POLISHED WOOD ..... 31 VINYL OR ASPHALT STRIPS ..... 32 CERAMIC TILES ..... 33 CEMENT ..... 34 CARPET ..... 35 OTHER _____ 96 (SPECIFY)	
133 (5)	OBSERVE MAIN MATERIAL OF THE ROOF OF THE DWELLING. RECORD OBSERVATION.	**NATURAL ROOFING** NO ROOF ..... 11 THATCH/PALM LEAF ..... 12 SOD ..... 13 **RUDIMENTARY ROOFING** RUSTIC MAT ..... 21 PALM/BAMBOO ..... 22 WOOD PLANKS ..... 23 CARDBOARD ..... 24 **FINISHED ROOFING** ZINC/ALUMINIUM ..... 31 WOOD ..... 32 CALAMINE/CEMENT FIBER ..... 33 CERAMIC TILES ..... 34 CEMENT ..... 35 ROOFING SHINGLES ..... 36 OTHER _____ 96 (SPECIFY)	
134 (5)	OBSERVE MAIN MATERIAL OF THE EXTERIOR WALLS OF THE DWELLING. RECORD OBSERVATION.	**NATURAL WALLS** NO WALLS ..... 11 CANE/PALM/TRUNK ..... 12 DIRT ..... 13 **RUDIMENTARY WALLS** BAMBOO WITH MUD ..... 21 STONE WITH MUD ..... 22 UNCOVERED ADOBE ..... 23 PLYWOOD ..... 24 CARDBOARD ..... 25 REUSED WOOD ..... 26 **FINISHED WALLS** CEMENT ..... 31 STONE WITH LIME/CEMENT ..... 32 BRICKS ..... 33 CEMENT BLOCKS ..... 34 COVERED ADOBE ..... 35 WOOD PLANKS/SHINGLES ..... 36 ZINC ..... 37 OTHER _____ 96 (SPECIFY)	
135	RECORD THE TIME.	HOURS ..... [ ][ ] MINUTES ..... [ ][ ]	

INTERVIEWER'S OBSERVATIONS

TO BE FILLED IN AFTER COMPLETING INTERVIEW

COMMENTS ABOUT INTERVIEW:

COMMENTS ON SPECIFIC QUESTIONS:

ANY OTHER COMMENTS:

SUPERVISOR'S OBSERVATIONS

2021 SIERRA LEONE MALARIA INDICATOR SURVEY
WOMAN'S QUESTIONNAIRE

MINISTRY OF HEALTH AND SANITATION, NATIONAL MALARIA CONTROL PROGRAMME
STATISTICS SIERRA LEONE
CATHOLIC RELIEF SERVICES

IDENTIFICATION

LOCALITY NAME _____ | | |

NAME OF HOUSEHOLD HEAD _____ | | |

CLUSTER NUMBI . . . . . | | |

HOUSEHOLD NUMBER . . . . . | | |

NAME AND LINE NUMBER OF WOMAN _____ | |

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE				DAY | | MONTH | | YEAR 2021
INTERVIEWER'S NAME				INT. NO. | | | |
RESULT*				RESULT* |
NEXT VISITDATE				
TIME				TOTAL NUMBER OF VISITS |

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

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

**LANGUAGE CODES:

LANGUAGE OF QUESTIONNAIRE** **ENGLISH**

01 ENGLISH 04 TEMNE 07 SHERBRO 10 KONO 13 YALUNKA
02 KRIO 05 MADINGO 08 LIMBA 11 SUSU 14 KORANKO
03 MENDE 06 LOKO 09 KISSI 12 FULLAH 96 OTHER

TEAM	TEAM SUPERVISOR	
| | NUMBER	_____ NAME | | | | NUMBER	

INTRODUCTION AND CONSENT

Hello. My name is _____. I am working with the Ministry of Health and Sanitation (MoHS). We are conducting a survey about malaria all over Sierra Leone. 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 to 20 minutes. All of the answers you give will be confidential and will not be shared with anyone other than members of our survey team. You don't have to be in the survey, but we hope you will agree to answer the questions since your views are important. If I ask you any question you don't want to answer, just let me know and I will go on to the next question or you can stop the interview at any time.

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

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

GIVE CARD WITH CONTACT INFORMATION

2021 SLMIS Principle Investigator: Dr. Foday Sahr; +232 76 480288; Email: fsahr65@gmail.com
Chairman of Ethics Committee: Professor Hector G. Morgan; +232 76 629251; Email: hmorg2007@yahoo.com
Director of Policy, Planning, & Information: Dr. Francis Smart; +232 78 300933; Email: drfsmart@gmail.com
Deputy Chief Medical Officer-Public Health; Dr. Sartie Kenneh; Ministry of Health and Sanitation;+23276644009; Email: sartiekenneh@gmail.com
National Malaria Control Programme (NMCP): Sr. Anitta R.Y. Kamara; +232 76 481960; Email: anittakav@gmail.com
Catholic Relief Services: Mr. Ebrima Jarjou; +232 79 250636; Email: ebrima.jarjou@crs.org

As part of the survey we would first like to ask some questions about your household. All of the answers you give will be confidential. As part of this survey, we are asking that children all over the country take an anemia test. Anemia is a serious health problem that usually results from poor nutrition, infection, or disease. This survey will help the government to develop programs to prevent and treat anemia. 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. If the malaria test is positive, treatment will be offered. This survey will help the government to develop programs to prevent malaria. Participation in the survey is completely voluntary. If we should come to any question you don't want to answer, just let me know and I

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

GNATURE OF INTERVIEWER _____ DATE _____

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

SECTION 1. RESPONDENT'S BACKGROUND

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
101	RECORD THE TIME.	HOURS ..... [ ][ ] MINUTE ..... [ ][ ]	
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, junior secondary, senior secondary ,vocational , technical or higher?	PRIMARY ..... 1 JUNIOR SECONDARY 2 SENIOR SECONDARY ..... 3 VOCATIONAL/TECHNICAL ..... 4 HIGHER 5	
106	What is the highest [GRADE/FORM/YEAR] you completed at that level? IF COMPLETED LESS THAN ONE YEAR AT THAT LEVEL, RECORD '00'.	[GRADE/FORM/YEAR ..... [ ][ ]	
107	CHECK 105: PRIMARY OR SECONDARY ☐ ↓ HIGHER ☐ → 110		
108 (3)	Now I would like you to read this sentence to me. SHOW CARD TO RESPONDENT. IF RESPONDENT CANNOT READ WHOLE SENTENCE, PROBE: Can you read any part of the sentence to me?	CANNOT READ AT ALL ..... 1 ABLE TO READ ONLY PART OF THE SENTENCE ..... 2 ABLE TO READ WHOLE SENTENCE ..... 3 NO CARD WITH REQUIRED LANGUAGE _____ 4 (SPECIFY LANGUAGE) BLIND/VISUALLY IMPAIRED 5	
109	CHECK 108: CODE '2', '3' OR '4' CIRCLED ☐ ↓ CODE '1' OR '5' CIRCLED ☐ → 111		
110	Do you read a newspaper or magazine at least once a week, less than once a week or not at all?	AT LEAST ONCE A WEEK ..... 1 LESS THAN ONCE A WEEK ..... 2 NOT AT ALL 3	

SECTION 1. RESPONDENT'S BACKGROUND

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
111	Do you listen to the radio at least once a week, less than once a week or not at all?	AT LEAST ONCE A WEE . . . . . 1 LESS THAN ONCE A WEEK . . . . . 2 NOT AT ALL 3	
112	Do you watch television at least once a week, less than once a week or not at all?	AT LEAST ONCE A WEE . . . . . 1 LESS THAN ONCE A WEEK . . . . . 2 NOT AT ALL 3	
113	Do you own a mobile phone?	YES . . . . . 1 NO 2	→ 115
114	Is your mobile phone a smart phone?	YES . . . . . 1 NO 2	
115	Have you ever used the Internet from any location on any device?	YES . . . . . 1 NO 2	→ 118
116	In the last 12 months, have you used the Internet? IF NECESSARY, PROBE FOR USE FROM ANY LOCATION, WITH ANY DEVICE.	YES . . . . . 1 NO 2	→ 118
117	During the last one month, how often did you use the Internet: almost every day, at least once a week, less than once a week, or not at all?	ALMOST EVERY DAY . . . . . 1 AT LEAST ONCE A WEE . . . . . 2 LESS THAN ONCE A WEEK . . . . . 3 NOT AT ALL 4	
118	What is your religion?	CHRISTIAN . . . . . 1 MUSLIM . . . . . 2 NONE . . . . . 3 OTHER _____ 96 (SPECIFY)	
119	What is your ethnic group? (Tribe)	CREOLE . . . . . 01 MENDE . . . . . 02 TEMNE . . . . . 03 MADINGO . . . . . 04 LOKO . . . . . 05 SHERBRO . . . . . 06 LIMBA . . . . . 07 KISSI . . . . . 08 KONO . . . . . 09 SUSU . . . . . 10 FULLAH . . . . . 11 KRIM . . . . . 12 YALUNKA . . . . . 13 KORANKO . . . . . 14 VAI . . . . . 15 OTHER _____ 96 (SPECIFY)	

(1) Increase the time reported to the respondent if modules are added to the questionnaire.

(2) Revise according to the local education system.

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

SECTION 2. REPRODUCTION

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
201	Now I would like to ask about all the births you have had during your life. Have you ever given birth?	YES ..... 1 NO 2	→206
202	Do you have any sons or daughters to whom you have given birth who are now living with you?	YES ..... 1 NO 2	→204
203	a) How many sons live with you? b) And how many daughters live with you? IF NONE, RECORD '00'.	a) SONS AT HOM ..... [ ][ ] b) DAUGHTERS AT HOME ..... [ ][ ]	
204	Do you have any sons or daughters to whom you have given birth who are alive but do not live with	YES ..... 1 NO 2	→206
205	a) How many sons are alive but do not live with you? b) And how many daughters are alive but do not live with you? IF NONE, RECORD '00'.	a) SONS ELSEWHERE ..... [ ][ ] b) DAUGHTERS ELSEWHERE ..... [ ][ ]	
206	Have you ever given birth to a boy or girl who was born alive but later died? IF NO, PROBE: Any baby who cried, who made any movement, sound, or effort to breathe, or who showed any other signs of life even if for a very	YES ..... 1 NO 2	→208
207	a) How many boys have died? b) And how many girls have died? IF NONE, RECORD '00'.	a) BOYS DEAD ..... [ ][ ] b) GIRLS DEAD ..... [ ][ ]	
208	SUM ANSWERS TO 203, 205, AND 207, AND ENTER TOTAL. IF NONE, RECORD '00'.	TOTAL LIVE BIRTHS ..... [ ][ ]	
209	CHECK 208: Just to make sure that I have this right: you have had in TOTAL _____ births during your life. Is that correct? YES ↓ NO → PROBE AND CORRECT 201-208 AS		
210	CHECK 208: ONE OR MORE BIRTHS ↓ NO BIRTHS →		→224
211	Now I'd like to ask you about your more recent births. How many births have you had in 2016-2021? RECORD NUMBER OF LIVE BIRTHS IN 2016-	TOTAL IN 2016-2021 ..... [ ][ ] NONE 00	→224

SECTION 2. REPRODUCTION

212 Now I would like to record the names of all your births, whether still alive or not, starting with the most recent one you had.
RECORD IN 213 THE NAMES OF ALL THE BIRTHS BORN IN 2016-2021. RECORD TWINS AND TRIPLETS ON SEPARATE ROWS. IF THERE ARE MORE THAN 5 BIRTHS, USE AN ADDITIONAL QUESTIONNAIRE STARTING WITH THE SECOND ROW.

213 What name was given to your (most recent/ previous) baby? RECORD NAME. BIRTH HISTORY NUMBER.	214 Is (NAME) a boy or a girl?	215 Was that a single or multiple pregnancy?	216 On what day, month, and year was (NAME) born?	217 Is (NAME) still alive?	218 IF ALIVE: How old was (NAME) at (NAME)'s last birthday? RECORD AGE IN COMP-LETED 401A	219 IF ALIVE: Is (NAME) living with you?	220 IF ALIVE: RECORD HOUSEHOLD LINE NUMBER OF CHILD. RECORD '00' IF CHILD NOT LISTED IN HOUSEHOLD.	221 Were there any other live births between (NAME) and (NAME OF PREVIOUS BIRTH), including any children who died after birth?
01	BOY 1 GIRL 2	SING 1 MULT 2	DAY MONTH YEAR	YES 1 NO 2 → (NEXT BIRTH)	AGE IN YEARS	YES 1 NO 2	HOUSEHOLD LINE NUMBER → (NEXT BIRTH)	
02	BOY 1 GIRL 2	SING 1 MULT 2	DAY MONTH YEAR	YES 1 NO 2 → (SKIP TO 221)	AGE IN YEARS	YES 1 NO 2	HOUSEHOLD LINE NUMBER	YES 1 → (ADD BIRTH) NO 2 → (NEXT BIRTH)
03	BOY 1 GIRL 2	SING 1 MULT 2	DAY MONTH YEAR	YES 1 NO 2 → (SKIP TO 221)	AGE IN YEARS	YES 1 NO 2	HOUSEHOLD LINE NUMBER	YES 1 → (ADD BIRTH) NO 2 → (NEXT BIRTH)
04	BOY 1 GIRL 2	SING 1 MULT 2	DAY MONTH YEAR	YES 1 NO 2 → (SKIP TO 221)	AGE IN YEARS	YES 1 NO 2	HOUSEHOLD LINE NUMBER	YES 1 → (ADD BIRTH) NO .... 2 → (NEXT BIRTH)
05	BOY 1 GIRL 2	SING 1 MULT 2	DAY MONTH YEAR	YES 1 NO 2 → (SKIP TO 221)	AGE IN YEARS	YES 1 NO 2	HOUSEHOLD LINE NUMBER	YES 1 → (ADD BIRTH) NO .... 2 → (NEXT BIRTH)

SECTION 2. REPRODUCTION

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
222	Have you had any live births since the birth of (NAME OF MOST RECENT BIRTH)?"	YES ..... 1 (RECORD BIRTH(S) IN TABLE) NO 2	
223	COMPARE 211 WITH NUMBER OF BIRTHS IN BIRTH HISTORY NUMBERS ARE THE SAME ☐ NUMBERS ARE DIFFERENT ☐ (PROBE AND RECONCILE)		
224	Are you pregnant now?	YES ..... 1 NO ..... 2 UNSURE 8	→301
225	How many weeks or months pregnant are you? RECORD NUMBER OF COMPLETED WEEKS OR MONTHS.	WEEKS ..... 1 ☐☐ MONTHS ..... 2 ☐☐	

SECTION 3. PREGNANCY AND INTERMITTENT PREVENTIVE TREATMENT

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
301	CHECK 216 AND 218: ONE OR MORE BIRTHS 0-35 MONTHS BEFORE THE SURVEY NO BIRTHS 0-35 MONTHS BEFORE THE SURVEY		→ 401
302	RECORD THE NAME OF THE MOST RECENT BIRTH FROM 213, LINE 01:	MOST RECENT BIRTH NAME _____	
303	Now I would like to ask you some questions about your last pregnancy that resulted in a live birth. While you were pregnant with (NAME), did you see anyone for antenatal care for this pregnancy?	YES ..... 1 NO 2	→ 308
304 (1)	Whom did you see? Anyone else? PROBE TO IDENTIFY EACH TYPE OF PERSON AND RECORD ALL MENTIONED.	**HEALTH PERSONNEL** DOCTOR ..... A NURSE/MIDWIFE ..... B MCH AIDE ..... C COMMUNITY HEALTH OFFIC ..... D COMMUNITY HEALTH ASSIS ..... E **OTHER PERSON** TRADITIONAL BIRTH ATTENDAN ..... F COMMUNITY HEALTH WORKER/ FIELD WORKER ..... G OTHER _____ X (SPECIFY)	401A
305 (1)	Where did you receive antenatal care for this pregnancy? Anywhere else? PROBE TO IDENTIFY THE TYPE OF SOURCE. IF UNABLE TO DETERMINE IF PUBLIC, PRIVATE, OR NGO SECTOR, RECORD 'X' AND WRITE THE NAME OF THE PLACE(S).	**HOME** HER HOME ..... A OTHER HOME ..... B **PUBLIC SECTOR** GOVERNMENT HOSPITAL ..... C GOVERNMENT HEALTH CENTER (..... D MOBILE CLINIC ..... E COMMUNITY HEALTH WORKER F OTHER PUBLIC SECTOR _____ G (SPECIFY) **PRIVATE MEDICAL SECTOR** PRIVATE HOSPITAL ..... H PRIVATE CLINIC ..... I MISSION FAITH-BASED HOSPITAL J MISSION FAITH-BASED CLINIC K PHARMACY L MOBILE CLINIC M OTHER PRIVATE MEDICAL SECTOR _____ N (SPECIFY) **NGO MEDICAL SECTOR** NGO HOSPITA ..... O NGO CLINI ..... P OTHER NGO MEDICAL SECTOR _____ Q (SPECIFY) OTHER _____ X (SPECIFY)	

SECTION 3. PREGNANCY AND INTERMITTENT PREVENTIVE TREATMENT

NO.	NAME OF CHILD _____	BIRTH HISTORY NUMBER	
306	How many weeks or months pregnant were you when you first received antenatal care for this pregnancy?	WEEKS ..... 1 MONTHS ..... 2 DON'T KNOW 998	
307	How many times did you receive antenatal care during this pregnancy?	NUMBER OF TIMES ..... DON'T KNOW 98	
308 (2)	During this pregnancy, did you take SP/Fansidar to keep you from getting malaria?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→ 401
309 (2)	How many times did you take SP/Fansidar during this pregnancy?	TIMES	
310 (2)	Did you get the SP/Fansidar during any antenatal care visit, during another visit to a health facility or from another source? IF MORE THAN ONE SOURCE, RECORD THE HIGHEST SOURCE ON THE LIST.	ANTENATAL VISIT ..... 1 ANOTHER FACILITY VIS ..... 2 TRADITIONAL BIRTH ATTENDAN ..... 3 COMMUNITY HEALTH WORKER ..... 4 OTHER SOURCE 6	

(1) Coding categories to be developed locally; however, the broad categories must be maintained.
(2) Fansidar is a brand name for the malaria medicine SP. There are also many other brand names for SP. If Fansidar is not a commonly known brand in the country, change "Fansidar" to the most commonly known brand name for SP, like this "SP/[NEW BRAND NAME]". Or you can simply delete "/Fansidar" and leave "SP" on its own.

SECTION 4. FEVER IN CHILDREN

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
401	CHECK 216, 217, AND 218 IN THE BIRTH HISTORY: ANY SURVIVING CHILDREN BORN 0-59 MONTHS BEFORE THE SURVEY? ONE OR MORE SURVIVING CHILDREN BORN 0-59 MONTHS BEFORE THE SURVEY ☐ ↓ NO SURVIVING CHILDREN BORN 0-59 MONTHS BEFORE THE SURVEY ☐ → 501		
402	Now I would like to ask some questions about the health of your children born in the last 5 years. (We will talk about each separately, starting with the youngest.)		
403	RECORD THE NAME AND BIRTH HISTORY NUMBER FROM 213 OF THE SURVIVING CHILDREN BORN 0-59 MONTHS BEFORE THE SURVEY, STARTING WITH THE LAST ONE. NAME OF CHILD _____ BIRTH HISTORY NUMBER . . . . . ☐☐		
404	Has (NAME) been ill with a fever at any time in the last 2 weeks?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	☐ → 401A
405	At any time during the illness, did (NAME) have blood taken from (NAME)'s finger or heel for testing?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
406	Were you told by a healthcare provider that (NAME) had malaria?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
407	Did you seek advice or treatment for the illness from any source?	YES . . . . . 1 NO 2	→ 412

SECTION 4. FEVER IN CHILDREN

NO.	NAME OF CHILD _____	BIRTH HISTORY NUMBER	

408 (1)	Where did you seek advice or treatment? Anywhere else? PROBE TO IDENTIFY THE TYPE OF SOURCE. IF UNABLE TO DETERMINE IF PUBLIC, PRIVATE, OR NGO SECTOR, RECORD 'X' AND WRITE THE NAME OF THE PLACE(S).	**PUBLIC SECTOR** GOVERNMENT HOSPITAL ..... A GOVERNMENT HEALTH CENTER (F ..... B MOBILE CLINIC ..... C COMMUNITY HEALTH WORKER D OTHER PUBLIC SECTOR _____ E (SPECIFY) **PRIVATE MEDICAL SECTOR** PRIVATE HOSPITAL ..... F PRIVATE CLINIC ..... G MISSION FAITH-BASED HOSPITAL H MISSION FAITH-BASED CLINIC I PHARMACY J MOBILE CLINIC K OTHER PRIVATE MEDICAL SECTOR _____ L (SPECIFY) **NGO MEDICAL SECTOR** NGO HOSPITA ..... M NGO CLINI(..... N OTHER NGO MEDICAL SECTOR _____ O (SPECIFY) **OTHER SOURCE** SHOF ..... P TRADITIONAL PRACTITIONEI ..... Q MARKET ..... R ITINERANT DRUG SELLER ..... S OTHER _____ X (SPECIFY)	
409	CHECK 408: TWO OR MORE CODES CIRCLED ☐ ↓	ONLY ONE CODE CIRCLED ☐ → 411	
410	Where did you first seek advice or treatment? USE LETTER CODE FROM 408.	FIRST PLACE ..... ☐	
411	How many days after the illness began did you first seek advice or treatment for (NAME)? IF THE SAME DAY RECORD '00'.	DAYS ..... ☐☐	
412	At any time during the illness, did (NAME) take any medicine for the illness?	YES ..... 1 NO ..... 2 → 416 DON'T KNOW 8	

SECTION 4. FEVER IN CHILDREN

NO.	NAME OF CHILD _____ BIRTH HISTORY NUMBER	
413 (2)	What medicine did (NAME) take? Any other medicine? RECORD ALL MENTIONED. IF MEDICINE NOT KNOWN, ASK TO SEE THE PACKAGE OR PRESCRIPTION.	**ANTIMALARIAL MEDICINE** ARTEMISININ COMBINATION THERAPY (ACT) ..... A SP/FANSIDAR ..... B CHLOROQUIN ..... C AMODIAQUINE ..... D QUININE PILLS ..... E INJECTION/IV ..... F ARTESUNATE RECTAL ..... G INJECTION/IV ..... H OTHER ANTIMALARIAL _____ (SPECIFY) I **ANTIBIOTIC MEDICINE** AMOXICILLIN ..... J COTRIMOXAZOLE ..... K OTHER PILL/SYRUP ..... L OTHER INJECTION/I ..... M **OTHER MEDICINE** ASPIRIN ..... N PARACETAMOL/PANADOL/ ACETAMINOPHEN ..... O IBUPROFEN ..... P OTHER _____ (SPECIFY) X DON'T KNOW ..... Z
414	CHECK 413: ARTEMISININ COMBINATION THERAPY ('A') GIVEN CODE 'A' CIRCLED ☐ ↓ CODE 'A' NOT CIRCLED ☐ → 416	
415	How long after the fever started did (NAME) first take an artemisinin combination therapy?	SAME DAY ..... 0 NEXT DAY ..... 1 TWO DAYS AFTER FEVER ..... 2 THREE OR MORE DAYS AFTER FEVER ..... 3 DON'T KNOW 8
416	CHECK 216 AND 217 IN BIRTH HISTORY: ANY MORE SURVIVING CHILDREN BORN 0-59 MONTHS BEFORE THE SURVEY? NO MORE SURVIVING CHILDREN BORN 0-59 MONTHS BEFORE THE ☐ ↓ MORE SURVIVING CHILDREN BORN 0-59 MONTHS BEFORE ☐ → 403	

(1) Coding categories to be developed locally; however, the broad categories must be maintained.
(2) Coding categories to be developed locally and revised based on the pretest. All antimalarials commonly used in the country should be included in the response categories. Common brand names of medicine, such as Bayer or Tylenol, should be added to the response categories for aspirin, acetaminophen, or ibuprofen as appropriate.

SECTION 4A. CHILD IMMUNIZATION AND IPTi

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
401A	CHECK 216, 217, AND 218 IN THE BIRTH HISTORY: ANY SURVIVING CHILDREN BORN 0-35 MONTHS BEFORE THE SURVEY? ONE OR MORE SURVIVING CHILDREN BORN 0-35 MONTHS BEFORE THE ☐ NO SURVIVING CHILDREN BORN 0-35 MONTHS BEFORE THE ☐		→ 501
402A	RECORD THE NAME AND BIRTH HISTORY NUMBER FROM 213 OF THE SURVIVING CHILDREN BORN 0-35 MONTHS BEFORE THE SURVEY, STARTING WITH THE LAST ONE NAME OF LAST BIRT _____ BIRTH HISTORY NUMB . . . . . ☐☐		
403A	CHECK 217 FOR CHILD: LIVING ☐ DEAD ☐		→ 414A
404A	Do you have a card or other document where (NAME)'s vaccinations are written down?	YES, HAS ONLY A CARI . . . . . 1 YES, HAS ONLY AN OTHER DOCUMEI . . . . . 2 YES, HAS CARD AND OTHER DOCUM . . . . . 3 NO, NO CARD AND NO OTHER DOCUME . . 4	→ 407A → 407A
405A	Did you ever have a vaccination card for (NAME)?	YES . . . . . 1 NO 2	
406A	CHECK 404A: CODE '2' CIRCLED ☐ CODE '4' CIRCLED ☐		→ 408AC
407A	May I see the card or other document where (NAME)'s vaccinations are written down?	YES, ONLY CARD SEEN . . . . . 1 YES, ONLY OTHER DOCUMENT SE . . . . . 2 YES, CARD AND OTHER DOCUMENT SE . . 3 NO CARD AND NO OTHER DOCUMENT SEE 4	 → 408AC

SECTION 4A. CHILD IMMUNIZATION AND IPTi

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
	NAME OF LAST BIRT _____	BIRTH HISTORY NUMB.....	
408A	COPY DATES FROM THE CARD. WRITE '44' IN 'DAY' COLUMN IF CARD SHOWS THAT A DOSE WAS GIVEN, BUT NO DATE IS	DAY MONTH YEAR DPT-HEP.B-HIB (PENTAVALENT) 2 IPTI 1 DPT-HEP.B-HIB (PENTAVALENT) 3 IPTI 2 MEASLES 1 IPTI 3	
408AA	CHECK 408A: ''DPT-HEP.B-HIB (PENTAVALENT) 2" TO "IPTI3" ALL RECORDED?	NO ☐ YES ☐	414A
408AB	In addition to what is recorded on (this document/these documents), did (NAME) receive any other vaccinations, including vaccinations received in campaigns or immunization days or child health days? RECORD 'YES' ONLY IF THE RESPONDENT MENTIONS AT LEAST ONE OF THE VACCINATIONS IN 408A THAT ARE NOT RECORDED AS HAVING BEEN GIVEN.	YES ..... 1 (PROBE FOR VACCINATIONS AND WRITE '66' IN THE CORRESPONDING DAY COLUMN IN 408A THEN WRITE '00' IN THE CORRESPONDING DAY COLUMN FOR ALL VACCINATIONS NOT GIVEN) (THEN SKIP TO 414A) NO ..... 2 DON'T KNOW ..... 8 (WRITE '00' IN THE CORRESPONDING DAY COLUMN FOR ALL VACCINATIONS NOT (THEN SKIP TO 414A)	
408AC	Did (NAME) ever receive any vaccinations to prevent (NAME) from getting diseases, including vaccinations received in campaigns or immunization days or child health days?	YES ..... 1 NO ..... 2 DON'T KNOW 8	414A
408AD	Has (NAME) ever received a pentavalent vaccination, that is, an injection given in the thigh sometimes at the same time as polio drops?	YES ..... 1 NO ..... 2 DON'T KNOW 8	410A
409A	How many times did (NAME) receive the pentavalent vaccine?	NUMBER OF TIMES	
410A	Has (NAME) ever received Intermittent Preventive Treatment in infants (IPTi) , that is, SP/Fansidar tablet given in the mouth at the same time as	YES ..... 1 NO ..... 2 DON'T KNOW 8	412A
411A	How many times did (NAME) receive the Intermittent Preventive Treatment in infants (IPTi)?	NUMBER OF TIMES	
412A	Has (NAME) ever received a measles vaccination, that is, an injection in the arm to prevent measles?	YES ..... 1 NO ..... 2 DON'T KNOW 8	414A
413A	How many times did (NAME) receive the measles vaccine?	NUMBER OF TIMES	
414A	CHECK 216 AND 217 IN BIRTH HISTORY: ANY MORE SURVIVING CHILDREN BORN 0-35 MONTHS BEFORE THE SURVEY?	NO MORE SURVIVING CHILDREN BORN 0-35 MONTHS BEFORE THE ☐ MORE SURVIVING CHILDREN BORN 0-35 MONTHS ☐	402A

SECTION 5. KNOWLEDGE OF MALARIA

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
501	Have you ever heard of an illness called malaria? USE LOCAL NAME FOR MALARIA.	YES . . . . . 1 NO 2	→ 510
502	In your opinion, what causes malaria? CIRCLE ALL MENTIONED. PROBE: Anything else?	MOSQUITO BITE . . . . . A EATING IMMATURE SUGARC . . . B EATING COLD FOC . . . . . C EATING DIRTY FO(. . . . . D DRINKING BEER/PALM W . . . . . E DRINKING DIRTY WATI . . . . . F GETTING SOAKED WITH R/ . . . . . G COLD OR CHANGING WEATH- . . . H WITCHCRAI . . . . . I INJECTIONS/DRUC . . . . . J EATING ORANGES OR MANG . . . K EATING PLENTY OI . . . . . L SHARING RAZORS/BLADI . . . . . M BED BUGS . . . . . N DIRTY SURROUNDIN . . . . . O OTHER _____ X (SPECIFY) DON'T KNO\ . . . . . Z	
503	Can you tell me any symptoms of malaria? CIRCLE ALL MENTIONED. PROBE: Anything else?	FEVER . . . . . 401A401A A EXCESSIVE SWEATIN . . . . . B FEELING COLI . . . . . C HEADACH . . . . . D NAUSEA AND VOMITIN . . . . . E DIARRHE/ . . . . . F DIZZINESS . . . . . G LOSS OF APPETITE . . . . . H BODY ACHE OR JOINT P/ . . . . . I PALE EYES . . . . . J BODY WEAKNES . . . . . K REFUSING TO EAT OR DRI . . . . . L JAUNDICE . . . . . M DARK URINE . . . . . N LOW BLOOD (ANEMI/ . . . . . O OTHER _____ X (SPECIFY) DON'T KNO\ . . . . . Z	
504	Can you tell me any danger symptoms for severe malaria? CIRCLE ALL MENTIONED. PROBE: Anything else?	SHIVERING/SHAKING/CONVULSIC A VOMITING EVERYTH . . . . . B CONFUSION . . . . . C LOW BLOOD (ANAEM . . . . . D DIFFICULTY BREATHIN . . . . . E DIZZINESS . . . . . F JAUNDICE . . . . . G OTHER _____ X (SPECIFY) DON'T KNO\ . . . . . Z	

SECTION 5. KNOWLEDGE OF MALARIA

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
505A	Is it better to sleep under an untreated or treated net?	UNTREATEI . . . . . 1 TREATED . . . . . 2 DON'T KNO\ 8	
506	In your opinion, which people are most at risk of getting malaria? CIRCLE ALL MENTIONED. PROBE: Anything else?	CHILDREI . . . . . A ADULTS . . . . . B PREGNANT WOMI . . . . . C OLDER ADULT . . . . . D ANYONI . . . . . E OTHER _____ X (SPECIFY) OTHER _____ Y (SPECIFY) DON'T KNO\ . . . . . Z	
507	What medicines are used to treat malaria ? CIRCLE ALL MENTIONED. PROBE: Anything else?	ACT . . . . . A CHLOROQUIN . . . . . B SP/FANSIDA . . . . . C QUININI . . . . . D ASPIRIN, PANADOL, PARACETAM(E TRADITIONAL MEDICINE/HI . . . . . F OTHER _____ X (SPECIFY) DON'T KNO\ . . . . . Z	
507A	Do you have a mosquito net?	YES 1 NO 2	
508	Did you sleep under a mosquito net last night?	YES 1 NO 2	→ 510
509	What are the reasons you did not sleep under a mosquito net last night? Any other reason?	DO NOT LIKE SMELL OF N . . . . . A DO NOT LIKE SHAPE/SI . . . . . B PREFER A DIFFERENT C . . . . . C NET IS ITCHY/IRRITATI . . . . . D NET IS NOT LARGE ENOUGH/ FEEL CLOSTROPHOI . . . . . E IT IS HOT SLEEPING UNDER N . . . F OTHER _____ X (SPECIFY) DON'T KNO\ . . . . . Z	
510	In the past six months, have you seen or heard any messages about	YES . . . . . 1 NO 2	→ 512

SECTION 5. KNOWLEDGE OF MALARIA

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
511	Have you seen or heard these messages from :	YES NO	
	a) Government clinic/hospital?	GOVT CLINIC/HOSPI 1 2	
	b) Community health worker?	COMMUINTY HEALTH WORK 1 2	
	c) Community health club?	COMMUNITY HEALTH CLUB 1 2	
	d) School health club	SCHOOL HEALTH CLUB 1 2	
	e) In your home?	AT HOME 1 2	
	f) Drama groups?	DRAMA GROUP 1 2	
	g) Peer educators?	PEER EDUCATOR 1 2	
	h) Community meeting?	COMMUNITY MEETI 1 2	
	i) Town crier?	TOWN CRIE 1 2	
	j) Posters or billboards?	POSTERS/BILLBOAR 1 2	
	k) On tv?	TV 1 2	
	l) On the radio?	RADI 1 2	
	m) In the newspapar?	NEWSPAPE 1 2	
	n) Faith/religious leader?	FAITH/RELIGIOUS LEADE . . . 1 2	
	o) Friends or family?	FRIENDS/FAMILY 1 2	
	p) Anywhere else?	OTHER _____ . . . 1 2 (SPECIFY)	
511AB	Are there ways to avoid getting malaria?	YES . . . . . 1 NO . . . . . 2 → 512	
511AC	How can someone protect themselves against malaria? CIRCLE ALL MENTIONED. PROBE: Anything else?	SLEEP UNDER A TREATED NI . . . A USE MOSQUITO REPELLEN . . . . . B AVOID MOSQUITO BITE . . . . . C TAKE PREVENTIVE MEDICAT . . . D INDOOR RESIDUAL SPRAY (I . . . E USE MOSQUITO COI . . . . . F CUT GRASS AROUND HOU . . . . . G ELIMINATE STAGNANT WA . . . . . H KEEP SURROUNDINGS CL . . . . . I BURN LEAVES . . . . . J CUT THE GRASS . . . . . K DON'T DRINK DIRTY WA . . . . . L DON'T EAT BAD FOOD (IMMATURE SUGARCANE/LEFTOVER FOC . M USE MOSQUITO SCREENS ON WINDOW . . . . . N DON'T GET SOAKED IN R . . . . . O STORE BOUGHT INSECT KILL . . . P OTHER _____ X (SPECIFY) DON'T KNO . . . . . Z	
512	People in this community only get malaria during the rainy season	AGRE . . . . . 1 DISAGREE . . . . . 2 DON'T KNO 3	
513	When a child has a fever, you almost always worry it might be malaria	AGRE . . . . . 1 DISAGREE . . . . . 2 DON'T KNO 3	

SECTION 5. KNOWLEDGE OF MALARIA

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
514	You don't worry about malaria because it can be easily treated	AGRE . . . . . 1 DISAGREE . . . . . 2 DON'T KNO\ 3	
515	Only weak children can die from malaria	AGRE . . . . . 1 DISAGREE . . . . . 2 DON'T KNO\ 3	
516	You can sleep under a mosquito net for the entire night when there are lots of mosquitoes	AGRE . . . . . 1 DISAGREE . . . . . 2 DON'T KNO\ 3	
517	You can sleep under a mosquito net for the entire night when there are few mosquitoes	AGRE . . . . . 1 DISAGREE . . . . . 2 DON'T KNO\ 3	
517A (5)	You do not like sleeping under a mosquito net when the weather is too warm. Do you agree or disagree?	AGRE . . . . . 1 DISAGR . . . . . 2 DON'T KNOW/UNC 8	
518	When a child has a fever, it is best to start by giving them any medicine available at home.	AGRE . . . . . 1 DISAGREE . . . . . 2 DON'T KNO\ 3	
519	At least half of the people in your community take their children to a health provider on the same day or day after they develop a fever	AGRE . . . . . 1 DISAGREE . . . . . 2 DON'T KNO\ 3	
520	Among those who have nets, at least half of the people in your community sleep under a net every night	AGRE . . . . . 1 DISAGREE . . . . . 2 DON'T KNO\ 3	
521	RECORD THE TIME.	HOUR . . . . . [ ][ ] MINUTE . . . . . [ ][ ]	

INTERVIEWER'S OBSERVATIONS

TO BE FILLED IN AFTER COMPLETING INTERVIEW

COMMENTS ABOUT INTERVIEW:

COMMENTS ON SPECIFIC QUESTIONS:

ANY OTHER COMMENTS:

SUPERVISOR'S OBSERVATIONS

2021 SIERRA LEONE MALARIA INDICATOR SURVEY
BIOMARKER QUESTIONNAIRE

MINISTRY OF HEALTH AND SANITATION, NATIONAL MALARIA CONTROL PROGRAMME
STATISTICS SIERRA LEONE
CATHOLIC RELIEF SERVICES

IDENTIFICATION

LOCALITY NAME _____

NAME OF HOUSEHOLD HEAD _____

CLUSTER NUMBER ..... | | | |

HOUSEHOLD NUMBER ..... | | | |

HOUSEHOLD SELECTED FOR CHILDREN TESTING AGE 5-9 YEARS/60-119 MONTHS? (1=YES, ___) | | |

NAME AND LINE NUMBER OF WOMAN

[FIELDWORKER] VISITS

	1	2	3	FINAL VISIT
DATE				DAY
				MONTH
[FIELDWORKER'S] NAME				YEAR 2021
NEXT VISIT DATE				TOTAL NUMBER OF VISITS
TIME				

NOTES:

TOTAL ELIGIBLE CHILDREN 0-9 YEARS

TOTAL ELIGIBLE CHILDREN 0-4 YEARS

TOTAL ELIGIBLE CHILDREN 5-9 YEARS

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

**LANGUAGE CODES:

LANGUAGE OF QUESTIONNAIRE** **ENGLISH**

01 ENGLISH	04 TEMNE	07 SHERBRO	10 KONO	13 YALUNKA
02 KRIO	05 MADINGO	08 LIMBA	11 SUSU	14 KORANKO
03 MENDE	06 LOKO	09 KISSI	12 FULLAH	96 OTHER

TEAM NUMBER | |

TEAM SUPERVISOR

NAME _____ NUMBER | | | |

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 6 MONTHS TO 4 YEARS

101	CHECK WITH INTERVIEWER/ CAPI OUTPUT FOR "LIST ELIGIBLE INDIVIDUALS/BIOMARKERS" [COLUMN 9 IN HOUSEHOLD QUESTIONNAIRE]. RECORD THE LINE NUMBER FOR ELIGIBLE CHILD 1 AGE 0-5 YEARS IN QUESTION 102 ON THIS PAGE .		
	CHILD 1		SKIP
102	CHECK WITH INTERVIEWER/ CAPI OUTPUT AND RECORD NAME AND LINE NUMBER OF CHILD 1. [RECORD NAME FROM COLUMN 2 IN HOUSEHOLD QUESTIONNAIRE; RECORD LINE NUMBER FROM COLUMN 9 IN HOUSEHOLD	NAME _____ LINE NUMBER	
103	IF MOTHER INTERVIEWED: COPY CHILD'S DATE OF BIRTH (DAY, MONTH, AND YEAR) FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: What is (NAME)'s date of birth?	DAY . . . . . . MONTH . . . . . . YEAR	
104	IF MOTHER INTERVIEWED: COPY CHILD'S AGE FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: How old was (NAME) at (NAME)'s last birthday? COMPARE AND CORRECT 103 AND/OR 104 IF INCONSISTENT.	AGE IN COMPLETED YEARS	
105	CHECK 104: CHILD AGE 0-4 YEARS? YES ☐ NO ☐		→ 129
106	CHECK 103: IS THE CHILD AGE 0-5 MONTHS OR IS THE CHILD OLDER? OLDER ☐ AGE 0-5 MONTHS ☐		→ 129
107	RECORD NAME OF PARENT/RESPONSIBLE ADULT FOR THE CHILD.	NAME _____ LINE NUMBER	
108	ASK CONSENT FOR MALARIA AND ANEMIA TESTS FROM PARENT/RESPONSIBLE ADULT: As part of this survey, we are asking children all over the country to take a test to see if they have malaria and a test to see if they have anemia. Malaria is a serious illness caused by a parasite transmitted by a mosquito bite. Anemia is a serious health problem that usually results from poor nutrition, malaria and other infections, or chronic disease. This survey will assist the government to develop programs to prevent and treat malaria and anemia. We ask that all children age 6 months through 4 years take part in malaria and anemia testing. The tests require 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 malaria and anemia immediately, and the results will be told to you right away. [A few blood drops will be collected on slide(s) and taken to a laboratory for testing. You will not be told the results of the laboratory testing.] All results will be kept strictly confidential and will not be shared with anyone other than members of our survey team. Do you have any questions? You can say yes or no. It is up to you to decide.		
109	CIRCLE THE CODE.	GRANTED . . . . . 1 REFUSED . . . . . 2 NOT PRESENT/OTHER 3	→ 112
110	SIGN NAME AND ENTER [FIELDWORKER] NUMBER.	_____ (SIGN) [FIELDWORKER]	

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 6 MONTHS TO 4 YEARS

	CHILD 1		SKIP
111	IF CONSENT GRANTED, PREPARE EQUIPMENT AND SUPPLIES FOR THE TESTS AND PROCEED WITH		
112	PLACE 1ST BAR CODE LABEL FOR MALARIA LAB TEST IN SPACE TO THE RIGHT. 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	
113	RECORD HEMOGLOBIN LEVEL HERE AND IN THE [ANEMIA AND MALARIA PAMPHLET].	G/DL ..... ☐☐.☐ NOT PRESENT .....994 REFUSED .....995 OTHER 996	
114	RECORD THE RESULT OF THE MALARIA RDT HERE AND IN THE ANEMIA AND MALARIA PAMPHLET.	POSITIVE ..... 1 NEGATIVE ..... 2 → 126 NOT PRESENT ..... 4 → 128 REFUSED ..... 5 OTHER ..... 6 → 126	
115	Does (NAME) suffer from any of the following illnesses or symptoms: a) Extreme weakness? b) Heart problems? c) Loss of consciousness? d) Rapid or difficult breathing? e) Seizures? f) Abnormal bleeding? g) Jaundice or yellow skin? h) Dark urine?	YES NO a) EXTREME WEAKNE 1 2 b) HEART PROBLEM . 1 2 c) LOSS OF CONSCIOI 1 2 d) RAPID BREATHIN . 1 2 e) SEIZURES ..... 1 2 f) BLEEDING ..... 1 2 g) JAUNDICE ..... 1 2 h) DARK URINI 1 2	
116	CHECK 115: ANY 'YES' CIRCLED? NO ☐ YES ☐		→ 118
117	CHECK 113: HEMOGLOBIN RESULT	BELOW [8.0 G/DL], SEVERE ANEMIA ..... 1 [8.0 G/DL] OR ABOVE ..... 2 OTHER 6	→ 119
118	**SEVERE MALARIA REFERRAL** 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. RECORD THE RESULT OF THE MALARIA RDT ON THE REFERRAL FORM.		→ 126
119	In the past 2 weeks has (NAME) taken or is (NAME) taking artemether–lumefantrine (AL) given by a doctor or health center to treat the malaria? VERIFY BY ASKING TO SEE TREATMENT.	YES ..... 1 NO 2	→ 121

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 6 MONTHS TO 4 YEARS

	CHILD 1		SKIP
120	**ALREADY TAKING ARTEMETHER - LUMEFANTRINE (AL) REFERRAL STATEMENT** You have told me that (NAME OF CHILD) had already received artemether–lumefantrine (AL) for malaria. Therefore, I cannot give you additional artemether–lumefantrine (AL). However, the test shows that he/she has malaria. If your child has a fever for 2 days after the last dose of artemether–lumefantrine (AL), you should take the child to the nearest health facility for further examination.		→ 128
121	ASK CONSENT FOR MALARIA TREATMENT FROM PARENT/RESPONSIBLE ADULT: The malaria test shows that your child has malaria. We can give you free medicine. The medicine is called artemether–lumefantrine (AL). artemether–lumefantrine (AL) 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.		
122	CIRCLE THE APPROPRIATE CODE.	ACCEPTED MEDICINE . . . . . 1 REFUSED MEDICINE . . . . . 2 OTHER 6	→ 128
123	SIGN NAME AND ENTER [FIELDWORKER] NUMBER.	_____ (SIGN) [FIELDWORKER]	
124	CHECK 122: ACCEPTED MEDICINE? YES ☐ NO ☐		→ 128
125	PROVIDE DOSAGE INSTRUCTIONS TO PARENT/RESPONSIBLE ADULT. [INSERT INSTRUCTIONS HERE:] TELL THE PARENT/RESPONSIBLE ADULT: If [NAME] has a high fever, fast or difficult breathing, is not able to drink or breastfeed, gets sicker or does not get better in 2 days, you should take him/her to a health professional for treatment		→ 128
126	CHECK 113: HEMOGLOBIN RESULT	BELOW [8.0 G/DL], SEVERE ANEMIA . . . . . 1 [8.0 G/DL] OR ABOVE . . . . . 2 OTHER 6	→ 128
127	**SEVERE ANEMIA REFERRAL** 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. RECORD THE RESULT OF THE ANEMIA TEST ON THE REFERRAL FORM.		
128	TODAY'S DATE:	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR . . . . . ☐☐☐☐	
129	IF ANOTHER CHILD, GO TO 102 ON THE NEXT PAGE; IF NO MORE CHILDREN 6-59 MONTHS, GO TO 100A.		

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 6 MONTHS TO 4 YEARS

101			
	CHILD 2		SKIP
102	CHECK WITH INTERVIEWER/ CAPI OUTPUT AND RECORD NAME AND LINE NUMBER OF CHILD 2. [RECORD NAME FROM COLUMN 2 IN HOUSEHOLD QUESTIONNAIRE; RECORD LINE NUMBER FROM COLUMN 9 IN HOUSEHOLD	NAME _____ LINE NUMBER . . . . . ☐☐	
103	IF MOTHER INTERVIEWED: COPY CHILD'S DATE OF BIRTH (DAY, MONTH, AND YEAR) FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: What is (NAME)'s date of birth?	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR . . . . . ☐☐☐☐	
104	IF MOTHER INTERVIEWED: COPY CHILD'S AGE FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: How old was (NAME) at (NAME)'s last birthday? COMPARE AND CORRECT 103 AND/OR 104 IF INCONSISTENT.	AGE IN COMPLETED YEARS ☐☐	
105	CHECK 104: CHILD AGE 0-4 YEARS? YES ☐ NO ☐		→ 129
106	CHECK 103: IS THE CHILD AGE 0-5 MONTHS OR IS THE CHILD OLDER? OLDER ☐ AGE 0-5 MONTHS ☐		→ 129
107	RECORD NAME OF PARENT/RESPONSIBLE ADULT FOR THE CHILD.	NAME _____ LINE NUMBER . . . . . ☐☐	
108	ASK CONSENT FOR MALARIA AND ANEMIA TESTS FROM PARENT/RESPONSIBLE ADULT: As part of this survey, we are asking children all over the country to take a test to see if they have malaria and a test to see if they have anemia. Malaria is a serious illness caused by a parasite transmitted by a mosquito bite. Anemia is a serious health problem that usually results from poor nutrition, malaria and other infections, or chronic disease. This survey will assist the government to develop programs to prevent and treat malaria and anemia. We ask that all children age 6 months through 4 years take part in malaria and anemia testing. The tests require 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 malaria and anemia immediately, and the results will be told to you right away. [A few blood drops will be collected on slide(s) and taken to a laboratory for testing. You will not be told the results of the laboratory testing.] All results will be kept strictly confidential and will not be shared with anyone other than members of our survey team. Do you have any questions? You can say yes or no. It is up to you to decide.		
109 (4)	CIRCLE THE CODE.	GRANTED . . . . . 1 REFUSED . . . . . 2 NOT PRESENT/OTHER 3	→ 112
110	SIGN NAME AND ENTER [FIELDWORKER] NUMBER.	_____ (SIGN) ☐☐☐☐ [FIELDWORKER]	

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 6 MONTHS TO 4 YEARS

	CHILD 2		SKIP
111	IF CONSENT GRANTED, PREPARE EQUIPMENT AND SUPPLIES FOR THE TESTS AND PROCEED WITH		
112 (4)	PLACE 1ST BAR CODE LABEL FOR MALARIA LAB TEST IN SPACE TO THE RIGHT. 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	
113	RECORD HEMOGLOBIN LEVEL HERE AND IN THE [ANEMIA AND MALARIA PAMPHLET].	G/DL ..... ☐☐.☐ NOT PRESENT ..... 994 REFUSED ..... 995 OTHER 996	
114	RECORD THE RESULT OF THE MALARIA RDT HERE AND IN THE ANEMIA AND MALARIA PAMPHLET.	POSITIVE ..... 1 → 126 NEGATIVE ..... 2 NOT PRESENT ..... 4 → 128 REFUSED ..... 5 → 126 OTHER 6	
115	Does (NAME) suffer from any of the following illnesses or symptoms: a) Extreme weakness? b) Heart problems? c) Loss of consciousness? d) Rapid or difficult breathing? e) Seizures? f) Abnormal bleeding? g) Jaundice or yellow skin? h) Dark urine?	YES NO a) EXTREME WEAKNE 1 2 b) HEART PROBLEM . 1 2 c) LOSS OF CONSCIOI 1 2 d) RAPID BREATHIN . 1 2 e) SEIZURES ..... 1 2 f) BLEEDING ..... 1 2 g) JAUNDICE ..... 1 2 h) DARK URINI 1 2	
116	CHECK 115: ANY 'YES' CIRCLED? NO ↓ YES ☐ →		118
117 (5)	CHECK 113: HEMOGLOBIN RESULT	BELOW [8.0 G/DL], SEVERE ANEMIA ..... 1 [8.0 G/DL] OR ABOVE ..... 2 → 119 OTHER 6	
118	**SEVERE MALARIA REFERRAL** 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. RECORD THE RESULT OF THE MALARIA RDT ON THE REFERRAL FORM.		→ 126
119	In the past 2 weeks has (NAME) taken or is (NAME) taking artemether–lumefantrine (AL) given by a doctor or health center to treat the malaria? VERIFY BY ASKING TO SEE TREATMENT.	YES ..... 1 NO ..... 2 →	121

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 6 MONTHS TO 4 YEARS

	CHILD 2		SKIP
120	**ALREADY TAKING ARTEMETHER - LUMEFANTRINE (AL) REFERRAL STATEMENT** You have told me that (NAME OF CHILD) had already received artemether–lumefantrine (AL) for malaria. Therefore, I cannot give you additional artemether–lumefantrine (AL). However, the test shows that he/she has malaria. If your child has a fever for 2 days after the last dose of artemether–lumefantrine (AL), you should take the child to the nearest health facility for further examination.		→ 128
121	ASK CONSENT FOR MALARIA TREATMENT FROM PARENT/RESPONSIBLE ADULT: The malaria test shows that your child has malaria. We can give you free medicine. The medicine is called artemether–lumefantrine (AL). artemether–lumefantrine (AL) 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.		
122	CIRCLE THE APPROPRIATE CODE.	ACCEPTED MEDICIN . . . . . 1 REFUSED MEDICIN . . . . . 2 OTHER 6	→ 128
123	SIGN NAME AND ENTER [FIELDWORKER] NUMBER.	_____ (SIGN) [FIELDWORKER]	
124	CHECK 122: ACCEPTED MEDICINE? YES ☐ NO ☐		→ 128
125	PROVIDE DOSAGE INSTRUCTIONS TO PARENT/RESPONSIBLE ADULT. [INSERT INSTRUCTIONS HERE:] TELL THE PARENT/RESPONSIBLE ADULT: If [NAME] has a high fever, fast or difficult breathing, is not able to drink or breastfeed, gets sicker or does not get better in 2 days, you should take him/her to a health professional for treatment		→ 128
126	CHECK 113: HEMOGLOBIN RESULT	BELOW [8.0 G/DL], SEVERE ANEMIA . . . . . 1 [8.0 G/DL] OR ABOVE . . . . . 2 OTHER 6	→ 128
127	**SEVERE ANEMIA REFERRAL** 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. RECORD THE RESULT OF THE ANEMIA TEST ON THE REFERRAL FORM.		
128	TODAY'S DATE:	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR . . . . . ☐☐☐☐	
129	IF ANOTHER CHILD, GO TO 102 ON THE NEXT PAGE; IF NO MORE CHILDREN 6-59 MONTHS, GO TO 100A.		

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 6 MONTHS TO 4 YEARS

101			
	CHILD 3		SKIP
102	CHECK WITH INTERVIEWER/ CAPI OUTPUT AND RECORD NAME AND LINE NUMBER OF CHILD 3. [RECORD NAME FROM COLUMN 2 IN HOUSEHOLD QUESTIONNAIRE; RECORD LINE NUMBER FROM COLUMN 9 IN HOUSEHOLD	NAME _____ LINE NUMBER . . . . . ☐☐	
103	IF MOTHER INTERVIEWED: COPY CHILD'S DATE OF BIRTH (DAY, MONTH, AND YEAR) FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: What is (NAME)'s date of birth?	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR . . . . . ☐☐☐☐	
104	IF MOTHER INTERVIEWED: COPY CHILD'S AGE FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: How old was (NAME) at (NAME)'s last birthday? COMPARE AND CORRECT 103 AND/OR 104 IF INCONSISTENT.	AGE IN COMPLETED YEARS ☐☐	
105	CHECK 104: CHILD AGE 0-4 YEARS? YES ☐ NO ☐		→ 129
106	CHECK 103: IS THE CHILD AGE 0-5 MONTHS OR IS THE CHILD OLDER? OLDER ☐ AGE 0-5 MONTHS ☐		→ 129
107	RECORD NAME OF PARENT/RESPONSIBLE ADULT FOR THE CHILD.	NAME _____ LINE NUMBER . . . . . ☐☐	
108	ASK CONSENT FOR MALARIA AND ANEMIA TESTS FROM PARENT/RESPONSIBLE ADULT: As part of this survey, we are asking children all over the country to take a test to see if they have malaria and a test to see if they have anemia. Malaria is a serious illness caused by a parasite transmitted by a mosquito bite. Anemia is a serious health problem that usually results from poor nutrition, malaria and other infections, or chronic disease. This survey will assist the government to develop programs to prevent and treat malaria and anemia. We ask that all children age 6 months through 4 years take part in malaria and anemia testing. The tests require 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 malaria and anemia immediately, and the results will be told to you right away. [A few blood drops will be collected on slide(s) and taken to a laboratory for testing. You will not be told the results of the laboratory testing.] All results will be kept strictly confidential and will not be shared with anyone other than members of our survey team. Do you have any questions? You can say yes or no. It is up to you to decide.		
109 (4)	CIRCLE THE CODE.	GRANTED . . . . . 1 REFUSED . . . . . 2 NOT PRESENT/OTHER 3	→ 112
110	SIGN NAME AND ENTER [FIELDWORKER] NUMBER.	_____ (SIGN) ☐☐☐☐ [FIELDWORKER]	

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 6 MONTHS TO 4 YEARS

	CHILD 3		SKIP
111	IF CONSENT GRANTED, PREPARE EQUIPMENT AND SUPPLIES FOR THE TESTS AND PROCEED WITH		
112	PLACE 1ST BAR CODE LABEL FOR MALARIA LAB TEST IN SPACE TO THE RIGHT. 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	
113	RECORD HEMOGLOBIN LEVEL HERE AND IN THE [ANEMIA AND MALARIA PAMPHLET].	G/DL ..... ☐☐.☐ NOT PRESENT .....994 REFUSED .....995 OTHER 996	
114	RECORD THE RESULT OF THE MALARIA RDT HERE AND IN THE ANEMIA AND MALARIA PAMPHLET.	POSITIVE ..... 1 NEGATIVE ..... 2 NOT PRESENT ..... 4 REFUSED ..... 5 OTHER 6	→ 126 → 128 → 126
115	Does (NAME) suffer from any of the following illnesses or symptoms: a) Extreme weakness? b) Heart problems? c) Loss of consciousness? d) Rapid or difficult breathing? e) Seizures? f) Abnormal bleeding? g) Jaundice or yellow skin? h) Dark urine?	YES NO a) EXTREME WEAKNE 1 2 b) HEART PROBLEM . 1 2 c) LOSS OF CONSCIOI 1 2 d) RAPID BREATHIN . 1 2 e) SEIZURES ..... 1 2 f) BLEEDING ..... 1 2 g) JAUNDICE ..... 1 2 h) DARK URINI 1 2	
116	CHECK 115: ANY 'YES' CIRCLED? NO ☐ YES ☐		→ 118
117 (5)	CHECK 113: HEMOGLOBIN RESULT	BELOW [8.0 G/DL], SEVERE ANEMIA ..... 1 [8.0 G/DL] OR ABOVE ..... 2 OTHER 6	→ 119
118	**SEVERE MALARIA REFERRAL** 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. RECORD THE RESULT OF THE MALARIA RDT ON THE REFERRAL FORM.		→ 126
119	In the past 2 weeks has (NAME) taken or is (NAME) taking artemether–lumefantrine (AL) given by a doctor or health center to treat the malaria? VERIFY BY ASKING TO SEE TREATMENT.	YES ..... 1 NO 2	→ 121

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 6 MONTHS TO 4 YEARS

	CHILD 3		SKIP
120	**ALREADY TAKING ARTEMETHER - LUMEFANTRINE (AL) REFERRAL STATEMENT** You have told me that (NAME OF CHILD) had already received artemether–lumefantrine (AL) for malaria. Therefore, I cannot give you additional artemether–lumefantrine (AL). However, the test shows that he/she has malaria. If your child has a fever for 2 days after the last dose of artemether–lumefantrine (AL), you should take the child to the nearest health facility for further examination.		→ 128
121	ASK CONSENT FOR MALARIA TREATMENT FROM PARENT/RESPONSIBLE ADULT: The malaria test shows that your child has malaria. We can give you free medicine. The medicine is called artemether–lumefantrine (AL). artemether–lumefantrine (AL) 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.		
122	CIRCLE THE APPROPRIATE CODE.	ACCEPTED MEDICINE . . . . . 1 REFUSED MEDICINE . . . . . 2 OTHER 6	→ 128
123	SIGN NAME AND ENTER [FIELDWORKER] NUMBER.	_____ (SIGN) [ ][ ][ ][ ] [FIELDWORKER]	
124	CHECK 122: ACCEPTED MEDICINE? YES ☐ NO ☐		→ 128
125	PROVIDE DOSAGE INSTRUCTIONS TO PARENT/RESPONSIBLE ADULT. [INSERT INSTRUCTIONS HERE:] TELL THE PARENT/RESPONSIBLE ADULT: If [NAME] has a high fever, fast or difficult breathing, is not able to drink or breastfeed, gets sicker or does not get better in 2 days, you should take him/her to a health professional for treatment		→ 128
126 (5)	CHECK 113: HEMOGLOBIN RESULT	BELOW [8.0 G/DL], SEVERE ANEMIA . . . . . 1 [8.0 G/DL] OR ABOVE . . . . . 2 OTHER 6	→ 128
127	**SEVERE ANEMIA REFERRAL** 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. RECORD THE RESULT OF THE ANEMIA TEST ON THE REFERRAL FORM.		
128	TODAY'S DATE:	DAY . . . . . [ ][ ] MONTH . . . . . [ ][ ] YEAR . . . . . [ ][ ][ ][ ]	
129	IF MORE THAN 3 CHILDREN 6-59 MONTHS, GO TO NEW QUESTIONNAIRE; IF NO MORE CHILDREN 6-59 MONTHS,		

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 5 TO 9 YEARS

100A	CHECK COVER HOUSEHOLD SELECTED TO CHILDREN 5-9 YEARS ☐ ↓ HOUSEHOLD NOT SELECTED TO TEST ☐ → END OF INTERVIEW		
101A (3)	CHECK WITH INTERVIEWER/ CAPI OUTPUT FOR "LIST ELIGIBLE INDIVIDUALS/BIOMARKERS" [COLUMN 10 IN HOUSEHOLD QUESTIONNAIRE]. RECORD THE LINE NUMBER AND NAME FOR ALL ELIGIBLE CHILDREN AGE 5-9 YEARS IN QUESTION 102A ON THIS PAGE AND SUBSEQUENT PAGES STARTING WITH THE FIRST ONE LISTED. IF MORE THAN THREE CHILDREN, USE ADDITIONAL QUESTIONNAIRE(S).		
	CHILD 1		SKIP
102A (3)	CHECK WITH INTERVIEWER/ CAPI OUTPUT AND RECORD NAME AND LINE NUMBER OF CHILD. [RECORD NAME FROM COLUMN 2 IN HOUSEHOLD QUESTIONNAIRE; RECORD LINE NUMBER FROM COLUMN 10 IN HOUSEHOLD	NAME _____ LINE NUMBER . . . . . ☐☐	
103A	IF MOTHER INTERVIEWED: COPY CHILD'S DATE OF BIRTH (DAY, MONTH, AND YEAR) FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: What is (NAME)'s date of birth?	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR . . . . . ☐☐☐☐	
104A	IF MOTHER INTERVIEWED: COPY CHILD'S AGE FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: How old was (NAME) at (NAME)'s last birthday? COMPARE AND CORRECT 103A AND/OR 104A IF INCONSISTENT.	AGE IN COMPLETED YEARS ☐☐	
105A	CHECK 104A: CHILD AGE 5-9 YES ☐ ↓ NO ☐ →		129A
107A	RECORD NAME OF PARENT/RESPONSIBLE ADULT FOR THE CHILD.	NAME _____ LINE NUMBER . . . . . ☐☐	
108A	ASK CONSENT FOR MALARIA AND ANEMIA TESTS FROM PARENT/RESPONSIBLE ADULT: As part of this survey, we are asking children all over the country to take a test to see if they have malaria and a test to see if they have anemia. Malaria is a serious illness caused by a parasite transmitted by a mosquito bite. Anemia is a serious health problem that usually results from poor nutrition, malaria and other infections, or chronic disease. This survey will assist the government to develop programs to prevent and treat malaria and anemia. We ask that all children age 6 months through 4 years take part in malaria and anemia testing. The tests require 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 malaria and anemia immediately, and the results will be told to you right away. [A few blood drops will be collected on slide(s) and taken to a laboratory for testing. You will not be told the results of the laboratory testing.] All results will be kept strictly confidential and will not be shared with anyone other than members of our survey team. Do you have any questions? You can say yes or no. It is up to you to decide.		
109A (4)	CIRCLE THE CODE.	GRANTED . . . . . 1 REFUSED . . . . . 2 NOT PRESENT/OTHER . . . . 3 →	112A
110A	SIGN NAME AND ENTER [FIELDWORKER] NUMBER.	_____ (SIGN) ☐☐☐☐ [FIELDWORKER]	

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 5 TO 9 YEARS

	CHILD 1		SKIP
111A	IF CONSENT GRANTED, PREPARE EQUIPMENT AND SUPPLIES FOR THE TESTS AND PROCEED WITH		
112A (4)	PLACE 1ST BAR CODE LABEL FOR MALARIA LAB TEST IN SPACE TO THE RIGHT. 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	
113A	RECORD HEMOGLOBIN LEVEL HERE AND IN THE [ANEMIA AND MALARIA PAMPHLET].	G/DL . . . . . ☐☐.☐ NOT PRESENT . . . . . 994 REFUSED . . . . . 995 OTHER 996	
114A	RECORD THE RESULT OF THE MALARIA RDT HERE AND IN THE ANEMIA AND MALARIA PAMPHLET.	POSITIVE . . . . . 1 NEGATIVE . . . . . 2 NOT PRESENT . . . . . 4 REFUSED . . . . . 5 OTHER 6	→ 126A → 128A → 126A
115A	Does (NAME) suffer from any of the following illnesses or symptoms: a) Extreme weakness? b) Heart problems? c) Loss of consciousness? d) Rapid or difficult breathing? e) Seizures? f) Abnormal bleeding? g) Jaundice or yellow skin? h) Dark urine?	YES NO a) EXTREME WEAKNE 1 2 b) HEART PROBLEM . 1 2 c) LOSS OF CONSCIO 1 2 d) RAPID BREATHIN . 1 2 e) SEIZURES . . . . . 1 2 f) BLEEDING . . . . . 1 2 g) JAUNDICE . . . . . 1 2 h) DARK URINI 1 2	
116A	CHECK 115A: ANY 'YES' CIRCLED? NO ☐ YES ☐		→ 118A
117A (5)	CHECK 113A: HEMOGLOBIN RESULT	BELOW [8.0 G/DL], SEVERE ANEMIA . . . . . 1 [8.0 G/DL] OR ABOVE . . . . . 2 OTHER 6	→ 119A
118A	**SEVERE MALARIA REFERRAL** 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. RECORD THE RESULT OF THE MALARIA RDT ON THE REFERRAL FORM.		→ 126
119A	In the past 2 weeks has (NAME) taken or is (NAME) taking artemether–lumefantrine (AL) given by a doctor or health center to treat the malaria? VERIFY BY ASKING TO SEE TREATMENT.	YES . . . . . 1 NO 2	→ 121A

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 5 TO 9 YEARS

	CHILD 1		SKIP
120A	**ALREADY TAKING ARTEMETER- LUMEFANTRINE (AL) REFERRAL STATEMENT** You have told me that (NAME OF CHILD) had already received artemether–lumefantrine (AL) for malaria. Therefore, I cannot give you additional artemether–lumefantrine (AL). However, the test shows that he/she has malaria. If your child has a fever for 2 days after the last dose of artemether–lumefantrine (AL), you should take the child to the nearest health facility for further examination.		→ 128
121A	ASK CONSENT FOR MALARIA TREATMENT FROM PARENT/RESPONSIBLE ADULT: The malaria test shows that your child has malaria. We can give you free medicine. The medicine is called artemether–lumefantrine (AL). artemether–lumefantrine (AL) 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.		
122A	CIRCLE THE APPROPRIATE CODE.	ACCEPTED MEDICIN . . . . . 1 REFUSED MEDICINI . . . . . 2 OTHER 6	→ 128A
123A	SIGN NAME AND ENTER [FIELDWORKER] NUMBER.	_____ (SIGN) ☐☐☐☐ [FIELDWORKER]	
124A	CHECK 122A: ACCEPTED YES ☐ NO ☐		→ 128A
125A	PROVIDE DOSAGE INSTRUCTIONS TO PARENT/RESPONSIBLE ADULT. [INSERT INSTRUCTIONS HERE:] TELL THE PARENT/RESPONSIBLE ADULT: If [NAME] has a high fever, fast or difficult breathing, is not able to drink or breastfeed, gets sicker or does not get better in 2 days, you should take him/her to a health professional for treatment		→ 128
126A (5)	CHECK 113A: HEMOGLOBIN RESULT	BELOW [8.0 G/DL], SEVERE ANEMIA . . . . . 1 [8.0 G/DL] OR ABOVE . . . . . 2 OTHER 6	→ 128A
127A	**SEVERE ANEMIA REFERRAL** 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. RECORD THE RESULT OF THE ANEMIA TEST ON THE REFERRAL FORM.		
128A	TODAY'S DATE:	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR . . . . . ☐☐☐☐	
129A	IF ANOTHER CHILD, GO TO 102A ON THE NEXT PAGE; IF NO MORE CHILDREN, END INTERVIEW.		

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 5 TO 9 YEARS

101A (3)			
	CHILD 2		SKIP
102A (3)	CHECK WITH INTERVIEWER/ CAPI OUTPUT AND RECORD NAME AND LINE NUMBER OF CHILD. [RECORD NAME FROM COLUMN 2 IN HOUSEHOLD QUESTIONNAIRE; RECORD LINE NUMBER FROM COLUMN 10 IN HOUSEHOLD	NAME _____ LINE NUMBER . . . . . ☐☐	
103A	IF MOTHER INTERVIEWED: COPY CHILD'S DATE OF BIRTH (DAY, MONTH, AND YEAR) FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: What is (NAME)'s date of birth?	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR . . . . . ☐☐☐☐	
104A	IF MOTHER INTERVIEWED: COPY CHILD'S AGE FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: How old was (NAME) at (NAME)'s last birthday? COMPARE AND CORRECT 103A AND/OR 104A IF INCONSISTENT.	AGE IN COMPLETED YEARS ☐	
105	CHECK 104A: CHILD AGE 5-9 YES ☐ NO ☐		→ 129A
107A	RECORD NAME OF PARENT/RESPONSIBLE ADULT FOR THE CHILD.	NAME _____ LINE NUMBER . . . . . ☐☐	
108A	ASK CONSENT FOR MALARIA AND ANEMIA TESTS FROM PARENT/RESPONSIBLE ADULT: As part of this survey, we are asking children all over the country to take a test to see if they have malaria and a test to see if they have anemia. Malaria is a serious illness caused by a parasite transmitted by a mosquito bite. Anemia is a serious health problem that usually results from poor nutrition, malaria and other infections, or chronic disease. This survey will assist the government to develop programs to prevent and treat malaria and anemia. We ask that all children age 6 months through 4 years take part in malaria and anemia testing. The tests require 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 malaria and anemia immediately, and the results will be told to you right away. [A few blood drops will be collected on slide(s) and taken to a laboratory for testing. You will not be told the results of the laboratory testing.] All results will be kept strictly confidential and will not be shared with anyone other than members of our survey team. Do you have any questions? You can say yes or no. It is up to you to decide.		
109A (4)	CIRCLE THE CODE.	GRANTED . . . . . 1 REFUSED . . . . . 2 NOT PRESENT/OTHER 3	→ 112A
110A	SIGN NAME AND ENTER [FIELDWORKER] NUMBER.	_____ (SIGN) ☐☐☐☐ [FIELDWORKER]	

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 5 TO 9 YEARS

	CHILD 2		SKIP
111A	IF CONSENT GRANTED, PREPARE EQUIPMENT AND SUPPLIES FOR THE TESTS AND PROCEED WITH		
112A (4)	PLACE 1ST BAR CODE LABEL FOR MALARIA LAB TEST IN SPACE TO THE RIGHT. 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	
113A	RECORD HEMOGLOBIN LEVEL HERE AND IN THE [ANEMIA AND MALARIA PAMPHLET].	G/DL ..... ☐☐.☐ NOT PRESENT ..... 994 REFUSED ..... 995 OTHER 996	
114A	RECORD THE RESULT OF THE MALARIA RDT HERE AND IN THE ANEMIA AND MALARIA PAMPHLET.	POSITIVE ..... 1 NEGATIVE ..... 2 NOT PRESENT ..... 4 REFUSED ..... 5 OTHER 6	→ 126A → 128A → 126A
115A	Does (NAME) suffer from any of the following illnesses or symptoms: a) Extreme weakness? b) Heart problems? c) Loss of consciousness? d) Rapid or difficult breathing? e) Seizures? f) Abnormal bleeding? g) Jaundice or yellow skin? h) Dark urine?	YES NO a) EXTREME WEAKNE 1 2 b) HEART PROBLEM . 1 2 c) LOSS OF CONSCIO 1 2 d) RAPID BREATHIN . 1 2 e) SEIZURES ..... 1 2 f) BLEEDING ..... 1 2 g) JAUNDICE ..... 1 2 h) DARK URINI 1 2	
116A	CHECK 115A: ANY 'YES' CIRCLED? NO ☐ YES ☐		→ 118A
117A (5)	CHECK 113A: HEMOGLOBIN RESULT	BELOW [8.0 G/DL], SEVERE ANEMIA ..... 1 [8.0 G/DL] OR ABOVE ..... 2 OTHER 6	→ 119A
118A	**SEVERE MALARIA REFERRAL** 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. RECORD THE RESULT OF THE MALARIA RDT ON THE REFERRAL FORM.		→ 126
119A	In the past 2 weeks has (NAME) taken or is (NAME) taking artemether–lumefantrine (AL) given by a doctor or health center to treat the malaria? VERIFY BY ASKING TO SEE TREATMENT.	YES ..... 1 NO 2	→ 121A

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 5 TO 9 YEARS

	CHILD 2		SKIP
120A	**ALREADY TAKING ARTEMETER- LUMEFANTRINE (AL) REFERRAL STATEMENT** You have told me that (NAME OF CHILD) had already received artemether–lumefantrine (AL) for malaria. Therefore, I cannot give you additional artemether–lumefantrine (AL). However, the test shows that he/she has malaria. If your child has a fever for 2 days after the last dose of artemether–lumefantrine (AL), you should take the child to the nearest health facility for further examination.		→ 128
121A	ASK CONSENT FOR MALARIA TREATMENT FROM PARENT/RESPONSIBLE ADULT: The malaria test shows that your child has malaria. We can give you free medicine. The medicine is called artemether–lumefantrine (AL). artemether–lumefantrine (AL) 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.		
122A	CIRCLE THE APPROPRIATE CODE.	ACCEPTED MEDICIN . . . . . 1 REFUSED MEDICINI . . . . . 2 OTHER 6	→ 128A
123A	SIGN NAME AND ENTER [FIELDWORKER] NUMBER.	_____ (SIGN) ☐☐☐☐ [FIELDWORKER]	
124A	CHECK 122A: ACCEPTED YES ☐ NO ☐		→ 128A
125A	PROVIDE DOSAGE INSTRUCTIONS TO PARENT/RESPONSIBLE ADULT. [INSERT INSTRUCTIONS HERE:] TELL THE PARENT/RESPONSIBLE ADULT: If [NAME] has a high fever, fast or difficult breathing, is not able to drink or breastfeed, gets sicker or does not get better in 2 days, you should take him/her to a health professional for treatment		→ 128
126A (5)	CHECK 113A: HEMOGLOBIN RESULT	BELOW [8.0 G/DL], SEVERE ANEMIA . . . . . 1 [8.0 G/DL] OR ABOVE . . . . . 2 OTHER 6	→ 128A
127A	**SEVERE ANEMIA REFERRAL** 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. RECORD THE RESULT OF THE ANEMIA TEST ON THE REFERRAL FORM.		
128A	TODAY'S DATE:	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR . . . . . ☐☐☐☐	
129A	IF ANOTHER CHILD, GO TO 102A ON THE NEXT PAGE; IF NO MORE CHILDREN, END INTERVIEW.		

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 5 TO 9 YEARS

101A			
	CHILD 3		SKIP
102A	CHECK WITH INTERVIEWER/ CAPI OUTPUT AND RECORD NAME AND LINE NUMBER OF CHILD. [RECORD NAME FROM COLUMN 2 IN HOUSEHOLD QUESTIONNAIRE; RECORD LINE NUMBER FROM COLUMN 10 IN HOUSEHOLD	NAME _____ LINE NUMBER	
103A	IF MOTHER INTERVIEWED: COPY CHILD'S DATE OF BIRTH (DAY, MONTH, AND YEAR) FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: What is (NAME)'s date of birth?	DAY . . . . . . MONTH . . . . . . YEAR	
104A	IF MOTHER INTERVIEWED: COPY CHILD'S AGE FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: How old was (NAME) at (NAME)'s last birthday? COMPARE AND CORRECT 103A AND/OR 104A IF INCONSISTENT.	AGE IN COMPLETED YEARS	
105A	CHECK 104A: CHILD AGE 5-9 YES ☐ NO ☐		→ 129A
107A	RECORD NAME OF PARENT/RESPONSIBLE ADULT FOR THE CHILD.	NAME _____ LINE NUMBER	
108A	ASK CONSENT FOR MALARIA AND ANEMIA TESTS FROM PARENT/RESPONSIBLE ADULT: As part of this survey, we are asking children all over the country to take a test to see if they have malaria and a test to see if they have anemia. Malaria is a serious illness caused by a parasite transmitted by a mosquito bite. Anemia is a serious health problem that usually results from poor nutrition, malaria and other infections, or chronic disease. This survey will assist the government to develop programs to prevent and treat malaria and anemia. We ask that all children age 6 months through 4 years take part in malaria and anemia testing. The tests require 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 malaria and anemia immediately, and the results will be told to you right away. [A few blood drops will be collected on slide(s) and taken to a laboratory for testing. You will not be told the results of the laboratory testing.] All results will be kept strictly confidential and will not be shared with anyone other than members of our survey team. Do you have any questions? You can say yes or no. It is up to you to decide.		
109A (4)	CIRCLE THE CODE.	GRANTED . . . . . 1 REFUSED . . . . . 2 NOT PRESENT/OTHER 3	→ 112A
110A	SIGN NAME AND ENTER [FIELDWORKER] NUMBER.	_____ (SIGN) [FIELDWORKER]	

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 5 TO 9 YEARS

	CHILD 3		SKIP
111A	IF CONSENT GRANTED, PREPARE EQUIPMENT AND SUPPLIES FOR THE TESTS AND PROCEED WITH		
112A	PLACE 1ST BAR CODE LABEL FOR MALARIA LAB TEST IN SPACE TO THE RIGHT. 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	
113A	RECORD HEMOGLOBIN LEVEL HERE AND IN THE [ANEMIA AND MALARIA PAMPHLET].	G/DL . . . . . ☐☐.☐ NOT PRESENT . . . . . .994 REFUSED . . . . . 995 OTHER 996	
114A	RECORD THE RESULT OF THE MALARIA RDT HERE AND IN THE ANEMIA AND MALARIA PAMPHLET.	POSITIVE . . . . . 1 NEGATIVE . . . . . 2 NOT PRESENT . . . . . 4 REFUSED . . . . . 5 OTHER 6	→ 126A → 128A → 126A
115A	Does (NAME) suffer from any of the following illnesses or symptoms: a) Extreme weakness? b) Heart problems? c) Loss of consciousness? d) Rapid or difficult breathing? e) Seizures? f) Abnormal bleeding? g) Jaundice or yellow skin? h) Dark urine?	YES NO a) EXTREME WEAKNE 1 2 b) HEART PROBLEM . 1 2 c) LOSS OF CONSCIO 1 2 d) RAPID BREATHIN . 1 2 e) SEIZURES . . . . . 1 2 f) BLEEDING . . . . . 1 2 g) JAUNDICE . . . . . 1 2 h) DARK URINI 1 2	
116A	CHECK 115A: ANY 'YES' CIRCLED? NO ☐ YES ☐		→ 118A
117A (5)	CHECK 113A: HEMOGLOBIN RESULT	BELOW [8.0 G/DL], SEVERE ANEMIA . . . . . 1 [8.0 G/DL] OR ABOVE . . . . . 2 OTHER 6	→ 119A
118A	**SEVERE MALARIA REFERRAL** 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. RECORD THE RESULT OF THE MALARIA RDT ON THE REFERRAL FORM.		→ 126
119A	In the past 2 weeks has (NAME) taken or is (NAME) taking artemether–lumefantrine (AL) given by a doctor or health center to treat the malaria? VERIFY BY ASKING TO SEE TREATMENT.	YES . . . . . 1 NO 2	→ 121A

HEMOGLOBIN MEASUREMENT AND MALARIA TESTING FOR CHILDREN AGE 5 TO 9 YEARS

	CHILD 3		SKIP
120A	**ALREADY TAKING ARTEMETER- LUMEFANTRINE (AL) REFERRAL STATEMENT** You have told me that (NAME OF CHILD) had already received artemether–lumefantrine (AL) for malaria. Therefore, I cannot give you additional artemether–lumefantrine (AL). However, the test shows that he/she has malaria. If your child has a fever for 2 days after the last dose of artemether–lumefantrine (AL), you should take the child to the nearest health facility for further examination.		→ 128
121A	ASK CONSENT FOR MALARIA TREATMENT FROM PARENT/RESPONSIBLE ADULT: The malaria test shows that your child has malaria. We can give you free medicine. The medicine is called artemether–lumefantrine (AL). artemether–lumefantrine (AL) 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.		
122A	CIRCLE THE APPROPRIATE CODE.	ACCEPTED MEDICIN . . . . . 1 REFUSED MEDICINI . . . . . 2 OTHER 6	→ 128A
123A	SIGN NAME AND ENTER [FIELDWORKER] NUMBER.	_____ (SIGN) ☐☐☐☐ [FIELDWORKER]	
124A	CHECK 122A: ACCEPTED YES ☐ NO ☐		→ 128A
125A	PROVIDE DOSAGE INSTRUCTIONS TO PARENT/RESPONSIBLE ADULT. [INSERT INSTRUCTIONS HERE:] TELL THE PARENT/RESPONSIBLE ADULT: If [NAME] has a high fever, fast or difficult breathing, is not able to drink or breastfeed, gets sicker or does not get better in 2 days, you should take him/her to a health professional for treatment		→ 128
126A (5)	CHECK 113A: HEMOGLOBIN RESULT	BELOW [8.0 G/DL], SEVERE ANEMIA . . . . . 1 [8.0 G/DL] OR ABOVE . . . . . 2 OTHER 6	→ 128A
127A	**SEVERE ANEMIA REFERRAL** 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. RECORD THE RESULT OF THE ANEMIA TEST ON THE REFERRAL FORM.		
128A	TODAY'S DATE:	DAY . . . . . ☐☐ MONTH . . . . . ☐☐ YEAR . . . . . ☐☐☐☐	
129A	IF ANOTHER CHILD, GO TO 102A ON THE NEW QUESTIONNAIRE; IF NO MORE CHILDREN, END INTERVIEW.		

[FIELDWORKER'S] OBSERVATIONS

TO BE FILLED IN AFTER COMPLETING BIOMARKERS

SUPERVISOR'S OBSERVATIONS