Liberia

Malaria Indicator Survey

2016

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2016

National Malaria Control Program
Ministry of Health
Monrovia, Liberia

Liberia Institute of Statistics and
Geo-Information Services
Monrovia, Liberia

The DHS Program
ICF
Rockville, Maryland, USA

September 2017

Recommended citation:

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FOREWORD

Malaria is the leading cause of attendance at outpatient departments and also the number one cause of death among inpatients in Liberia. While malaria maintains its lead in morbidity and mortality, there have been significant investments in prevention and treatment by the Global Fund, the U.S. President's Malaria Initiative, and the Government of Liberia. As a result, Liberia is making significant strides in the fight against malaria. The new data show progress on almost every indicator in the fight against the disease. The Ebola virus disease outbreak of 2014 caused some setbacks in the fight against malaria, as it affected the entire health care system. However, the health system is recovering and is now reaching and progressing beyond the pre-Ebola status. Although curable and preventable, malaria remains a major public health problem, taking its greatest toll on young children and pregnant women. To reduce the malaria burden in Liberia, the Ministry of Health, through the National Malaria Control Program (NMCP), introduced a policy and strategic plan for malaria control and prevention. The NMCP is currently in its fourth plan, the Liberia National Malaria Strategic Plan for 2016-2020. The overarching goal of this plan is to reduce morbidity and mortality caused by malaria by 50%, in line with the Global Malaria Plan and the Global Technical Strategy for Malaria. With funds from the Global Fund to Fight AIDS, Tuberculosis and Malaria, and the U.S. President's Malaria Initiative and other partners, the NMCP and its partners have increased interventions in case management, prevention of malaria during pregnancy, integrated vector management, and advocacy and behavior change. In addition, the plan aims to strengthen the NMCP by improving program management, operational research, and monitoring and evaluation while strengthening health systems overall.

The NMCP relies on the Liberia Malaria Indicator Survey (LMIS) and other national household surveys, which are conducted periodically, to track progress of malaria control interventions in the general population. The first LMIS was conducted in 2005 and provided baseline data for all key malaria control and prevention indicators for Liberia. The 2009 LMIS and 2011 LMIS provided updates for the program, and the 2016 LMIS shows progress over the past 5 years.

The results presented in this report clearly indicate that coverage of malaria control interventions in Liberia is increasing gradually. However, use of these interventions remains low despite improvement over the years.

The information in this report will help the NMCP and other partners in the Roll Back Malaria initiative to assess the current Malaria Control Policy and Strategic Plan and to better plan and implement future malaria control activities in Liberia. We want to urge our partners, both local and international, to strengthen their efforts to roll back malaria in Liberia.

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ACKNOWLEDGEMENTS

READING AND UNDERSTANDING THE 2016 LIBERIA MALARIA INDICATOR SURVEY (LMIS)

The 2016 Liberia Malaria Indicator Survey (LMIS) report is very similar in content to the 2011 LMIS but is presented in a new format. The new style features more figures to highlight trends, subnational patterns, and background characteristics. Large colourful maps display data by the regions in Liberia. The text has been simplified to highlight key points in bullets and to clearly identify indicator definitions in boxes.

Although the text and figures featured in each chapter highlight some of the most important findings, not every finding can be discussed or displayed graphically. For this reason, 2016 LMIS data users should be comfortable reading and interpreting data tables.

The following pages provide an introduction to the organization of the 2016 LMIS tables, the presentation of background characteristics, and a brief summary of sampling procedures used and understanding denominators. In addition, this section provides some exercises for users as they practice their new skills in interpreting 2016 LMIS tables.
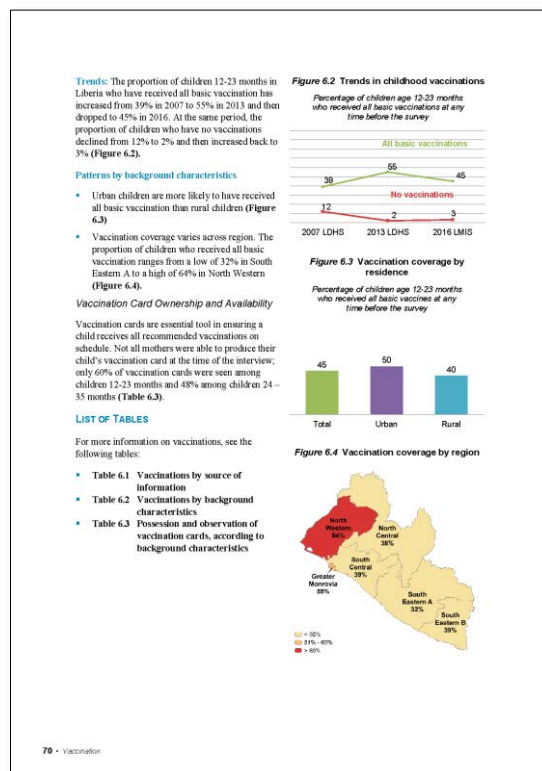
Example 1: Low Haemoglobin

Table 5.7 Haemoglobin <8.0 g/dl in children   **1**

Percentage of children age 6-59 months with haemoglobin lower than 8.0 g/dl, by background characteristics, Liberia MIS 2016

Background characteristic **3**	Haemoglobin <8.0 g/dl **2**	Number of children
Age in months		
6-8	10.1	119
9-11	5.9	165
12-17	10.5	376
18-23	12.6	233
24-35	10.0	610
36-47	6.1	677
48-59	6.6	694
Sex		
Male	8.9	1,476
Female	7.7	1,397
Mother's interview status		
Interviewed	8.3	2,222
Not interviewed[1]	8.3	651
Residence		
Urban	6.7	1,507
Rural	10.1	1,366
Region		
Greater Monrovia	3.2	811
North Western	8.2	245
South Central	10.0	541
South Eastern A	8.6	152
South Eastern B	8.5	176
North Central	11.7	948
Mother's education[2]		
No education	10.0	861
Primary	8.0	594
Secondary or higher	6.6	766
Wealth quintile		
Lowest	12.7	660
Second	11.2	675
Middle	7.4	586
Fourth	6.6	503
Highest	0.7	449
Total	8.3 **4**	2,873

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

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

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

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

Step 4: Look at the row at the bottom of the table highlighted in pink. These percentages represent the totals of children age 6-59 months with low haemoglobin. In this case, 8.3%* of children age 6-59 months had haemoglobin <8.0 g/dl.

Step 5: To find out what percentage of children age 6-59 in rural areas had low haemoglobin, draw two imaginary lines, as shown on the table. This shows that 10.1% of children age 6-59 months in rural areas had haemoglobin <8.0 g/dl.

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

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

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

a) Is low haemoglobin more common among boys or girls?

b) Is there a clear pattern of low haemoglobin by age?

c) What are the lowest and highest percentages (range) of low haemoglobin by region?

d) Is there a clear pattern of low haemoglobin by mother's education level?

e) Is there a clear pattern of low haemoglobin by wealth quintile?

Answers:

a) Low haemoglobin is slightly greater among boys (8.9%) than among girls (7.7%).

b) Low haemoglobin is greatest among children age 18-23 months (12.6%), but there is no clear pattern by age.

c) Low haemoglobin is least common in Greater Monrovia (3.2%) and most common in Northern Central Region (11.7%).

d) Low haemoglobin decreases slightly as mother's level of education increases; 10.0% of children whose mothers have no education have low haemoglobin, compared to 6.6% of children whose mothers have secondary or higher education.

e) Yes, low haemoglobin decreases as household wealth increases; low haemoglobin is most common among children living in households in the lowest wealth quintile (12.7%) and is least common among children in households in the highest wealth quintile (0.7%).

Example 2: Use of Mosquito Nets by Pregnant Women
A Question Asked of a Subgroup of Survey Respondents

Table 4.14 Use of mosquito nets by pregnant women   **1**

Percentages of pregnant women age 15-49 who, the night before the survey, slept under a mosquito net (treated or untreated), under an insecticide-treated net (ITN), under a long-lasting insecticidal net (LLIN), and under an ITN or in a dwelling in which the interior walls have been sprayed against mosquitoes (IRS) in the past 12 months; and among pregnant women age 15-49 in households with at least one ITN, the percentage who slept under an ITN the night before the survey, according to background characteristics, Liberia MIS 2016

Background characteristic	Among pregnant women age 15-49 in all households **2**					Among pregnant women age 15-49 in households with at least one ITN[1]	
	Percentage who slept under any mosquito net last night	Percentage who slept under an ITN[1] last night	Percentage who slept under an LLIN last night	Percentage who slept under an ITN[1] last night or in a dwelling sprayed with IRS[2] in the past 12 months	Number of pregnant women	Percentage who slept under an ITN[1] last night	Number of pregnant women
Residence							
Urban	37.1	35.4	35.4	35.4	177	65.3	96
Rural	50.2	45.3	45.3	45.3	127	75.8	76
Region							
Greater Monrovia	(32.5)	(29.2)	(29.2)	(29.2)	91	*	45
North Western	(68.6)	(60.4) **4**	(60.4)	(60.4)	25	(84.8) **4**	18
South Central	32.3	26.4	26.4	26.4	70	* **4**	23
South Eastern A	33.5	33.5	33.5	33.5	28	(65.2)	14
South Eastern B	(60.1)	(60.1)	(60.1)	(60.1)	15	(69.9)	13
North Central	(55.3)	(55.3)	(55.3)	(55.3)	76	(70.1)	60
Education							
No education	36.0	34.3	34.3	34.3	123	69.5	61
Primary	49.9	44.9	44.9	44.9	83	68.3	54
Secondary or higher	44.5	41.5	41.5	41.5	99	72.0	57
Wealth quintile							
Lowest	35.8	35.8	35.8	35.8	64	72.9	32
Second	57.5	47.2	47.2	47.2	60	(81.4)	35
Middle	48.8	48.8	48.8	48.8	66	(75.7)	43
Fourth	(49.4)	(44.5)	(44.5)	(44.5)	60	(64.3)	42
Highest	(17.9)	(17.9)	(17.9)	(17.9)	53	*	21
Total	42.5	39.5	39.5	39.5	**3** 304	69.9	**3** 172

Note: Table is based on women who stayed in the household the night before the interview. An asterisk indicates that the figure is based on fewer than 25 unweighted cases and has been suppressed and figures in parentheses are based on 25-49 unweighted cases.
[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment (LLIN) or a net that has been soaked with insecticide within the past 12 months.
[2] Indoor residual spraying (IRS) is limited to spraying conducted by a government, private or non-governmental organization.

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

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

Step 3: Look at the number of women included in this table. How many pregnant women age 15-49 in all households were interviewed? It's 304. Now look at the second panel. How many pregnant women age 15-49 in households with at least one ITN were interviewed? It's 172.

Step 4: Only 304 pregnant women age 15-49 in all households and 172 pregnant women in households with at least one ITN were interviewed in the 2016 LMIS. Once these pregnant women are further divided into the background characteristic categories, there may be too few cases for the percentages to be reliable.

- What percentage of pregnant women age 15-49 in all households in North Western region slept under an ITN the night before the survey? 60.4%. This percentage is in parentheses because there are between 25 and 49 pregnant women (unweighted) in this category. Readers should use this number with caution—it may not be reliable. (For more information on weighted and unweighted numbers, see Example 3.)

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

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

Example 3: Understanding Sampling Weights in 2016 LMIS Tables

A sample is a group of people who have been selected for a survey. In the 2016 LMIS, the sample is designed to represent the national population age 15-49. In addition to national data, most countries want to collect and report data on smaller geographical or administrative areas. However, doing so requires a minimum sample size per area. For the 2016 LMIS, the survey sample is representative at the national and regional levels, and for urban and rural areas.

Table 2.8 Background characteristics of respondents

Percent distribution of women and men age 15-49 by selected background characteristics, Liberia MIS 2016

Background characteristic	Number of women		
	Weighted percent	Weighted number	Unweighted number
Region			
Greater Monrovia	39.1	1,679	913
North Western	6.5	279	522
South Central	17.0	729	728
South Eastern A	25.8	1,106	742
South Eastern B	6.2	264	640
North Central	5.4	233	745
	3	**2**	**1**
Total 15-49	100.0	4,290	4,290

To generate statistics that are representative of the country as a whole and the six regions, the number of women surveyed in each region should contribute to the size of the total (national) sample in proportion to size of the region. However, if some regions have small populations, then a sample allocated in proportion to each region's population may not include sufficient women from each region for analysis. To solve this problem, regions with small populations are oversampled. For example, let's say that you have enough money to interview 4,290 women and want to produce results that are representative of Liberia as a whole and its regions (as in Table 2.8). However, the total population of Liberia is not evenly distributed among the regions: some regions, such as Greater Monrovia, are heavily populated while others, such as North Western are not. Thus, North Western must be oversampled.

A sampling statistician determines how many women should be interviewed in each region in order to get reliable statistics. The **blue column (1)** in the table at the right shows the actual number of women interviewed in each region. Within the regions, the number of women interviewed ranges from 522 in North Western to 913 in Greater Monrovia. The number of interviews is sufficient to get reliable results in each region.

With this distribution of interviews, some regions are overrepresented and some regions are underrepresented. For example, the population in Greater Monrovia is about 39% of the population in Liberia, while North Western's population contributes only 6.5%. But as the blue column shows, the number of women interviewed in Greater Monrovia accounts for only about 21% of the total sample of women interviewed (913/4,290, with rounding) and the number of women interviewed in North Western region accounts for 12% of the total sample of women interviewed (522/4,290). This unweighted distribution of women does not accurately represent the population.

In order to get statistics that are representative of Liberia, the distribution of the women in the sample needs to be weighted (or mathematically adjusted) such that it resembles the true distribution in the country. Women from a small region, such as North Western, should only contribute a small amount to the national total. Women from a large region, like Greater Monrovia, should contribute much more. Therefore, DHS statisticians mathematically calculate a "weight" which is used to adjust the number of women from each region so that each region's contribution to the total is proportional to the actual population of the region. The numbers in the **purple column (2)** represent the "weighted" values. The weighted values can be smaller or larger than the unweighted values at regional level. The total national sample size of 4,290 women has not changed after weighting, but the distribution of the women in the regions has been changed to represent their contribution to the total population size.

How do statisticians weight each category? They take into account the probability that a woman was selected in the sample. If you were to compare the **green column (3)** to the actual population distribution of Liberia, you would see that women in each region are contributing to the total sample with the same

weight that they contribute to the population of the country. The weighted number of women in the survey now accurately represents the proportion of women who live in Greater Monrovia and the proportion of women who live in North Western region.

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

LIBERIA

INTRODUCTION AND SURVEY METHODOLOGY $\quad$ **1**

T he 2016 Liberia Malaria Indicator Survey (LMIS) was implemented by the National Malaria Control Programme (NMCP), in close collaboration with the Liberia Institute of Statistics and Geo-Information Services (LISGIS). Data collection took place from 22 September to 26 November 2016. ICF provided technical assistance. Other agencies and organizations that facilitated the successful implementation of the survey through technical or financial support, or both, were the United Nations Population Fund (UNFPA), United Nations Children's Fund (UNICEF), Management Sciences for Health (MSH), President's Malaria Initiative (PMI), University of Liberia-Pacific Institute for Research & Evaluation (UL/PIRE), LISGIS, World Health Organization (WHO), U.S. Centers for Disease Control and Prevention (CDC), Ministry of Health (MOH), Liberia Medical and Dental Council (LMDC), and the Liberia Health and Medical Products Regulatory Authority (LHMRA).

1.1 SURVEY OBJECTIVES

The primary objective of the 2016 Liberia Malaria Indicator Survey (LMIS) was to provide up-to-date estimates of basic demographic and health indicators for malaria. Specifically, the LMIS collected information on vector control interventions such as mosquito nets and indoor residual spraying of insecticides, on intermittent preventive treatment of malaria in pregnant women, and on care seeking and treatment of fever in children. Also, young children were tested for malarial infection and anaemia.

The information collected through the LMIS is intended to assist policy makers and program managers in designing and evaluating programs and strategies for improving the health of the country's population.

1.2 SAMPLE DESIGN

The LMIS followed a two-stage sample design and was intended to allow estimates of key indicators for the following domains:

- At the national level
- For urban and rural areas
- For six geographical regions, consisting of the following groups of counties:

1. Greater Monrovia
2. North Western: Bomi, Grand Cape Mount, and Gbarpolu counties
3. South Central: Montserrado (excluding Greater Monrovia district), Margibi, and Grand Bassa counties
4. North Central: Bong, Nimba, and Lofa counties
5. South Eastern A: River Cess, Sinoe, and Grand Gedeh counties
6. South Eastern B: River Gee, Grand Kru, and Maryland counties

The first stage of sampling involved selecting sample points (clusters) from the sampling frame. Enumeration areas (EAs) delineated from the National Population and Housing Census conducted in March 2008 (NPHC 2008) were used as the sampling frame. A total of 150 clusters with probability proportional to size, were chosen from the EAs covered in the NPHC 2008. Of these clusters, 70 were in urban areas and 80 in rural areas.

The second stage of sampling involved systematic selection of households. A household listing operation was undertaken in all of the selected EAs from July to August, 2016, and households to be included in the

survey were randomly selected from these lists. Thirty households were selected from each EA, for a total sample size of 4,500 households. Because of the approximately equal sample sizes in each region, the sample was not self-weighting at the national level. Results shown in this report have been weighted to account for the complex sample design. See Appendix A for additional details on the sampling procedures.

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

1.3   QUESTIONNAIRES

Four questionnaires—the Household Questionnaire, the Woman's Questionnaire, the Biomarker Questionnaire, and the Fieldworker Questionnaire were used for the LMIS. Core questionnaires available from the Roll Back Malaria Monitoring and Evaluation Reference Group (RBM-MERG) were adapted to reflect the population and health issues relevant to Liberia. The modifications were decided upon at a series of meetings with various stakeholders from the National Malaria Control Programme (NMCP) and other government ministries and agencies, nongovernmental organisations, and international donors. The questionnaires were in English, with some text adapted to Liberian English.

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

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

- Background characteristics (age, residential history, education, literacy, religion, and ethnicity)
- Reproductive history for the last 5 years
- Preventive malaria treatment for the most recent birth
- Pregnancy and postnatal care
- Use of contraception
- Prevalence and treatment of fever among children under age 5
- Child immunizations
- Knowledge about malaria (symptoms, causes, how to prevent, and types of antimalarial medications)

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

Consent statements were developed for each tool (the Household, Woman's, and Biomarker questionnaires). Further consent statements were formulated for malaria testing, anaemia testing, and treatment of children with positive malaria rapid diagnostic tests (RDTs).

For the first time, the Fieldworker Questionnaire was used in the LMIS. This questionnaire was created to serve as a tool in conducting analyses of data quality. The questionnaire was distributed and collected by the NMCP after final selection of fieldworkers was done and before fieldworkers entered the field.

Fieldworkers filled out a 2-page self-administered questionnaire on their general background characteristics.

1.4   Anaemia and Malaria Testing

Blood samples for biomarker testing were collected by finger- or heel-prick from children age 6-59 months. Each field team included one biomarker technician who carried out the anaemia and the malaria testing and provided malaria medications for children who tested positive for malaria, in accord with the approved treatment protocols. The biomarker technicians requested informed consent for each test from the child's parent or guardian before the blood samples were collected, according to the protocols approved by the Liberia Ethics Committee and the Institutional Review Board at ICF (formerly ICF International).

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

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

Children who tested positive for malaria were offered a full course of medicine following the standard procedure for uncomplicated malaria treatment in Liberia. To ascertain the correct dose, biomarker technicians learned to use treatment guidance charts and to ask about any medications the child might already be taking. The biomarker technicians were also trained to identify signs and symptoms of severe malaria. They provided the age-appropriate dose of artemisinin combination therapy (ACT) along with instructions on how to administer the medicine to the child. Children with symptoms of severe malaria were not treated but referred to a health facility.

1.5   PRETEST

The training for the pretest took place from 13 July to 27 July 2016. Overall, 23 people participated—14 interviewers and 9 biomarker specialists. NMCP, MOH, LISGIS, and ICF staff members led the training and served as the supervisory team for the pretest fieldwork. Participants learned to administer paper questionnaires and collect blood samples for anaemia and parasitaemia testing. The pretest training consisted of the survey overview and objectives, techniques of interviewing, field procedures, details of all sections of the Household and the Woman's questionnaires, and 4 days of field practice. At the end of pretest fieldwork, a debriefing session was held, and the questionnaires were modified based on the findings from the field.

1.6   Training of Field Staff

The training, which was coordinated by NMCP, MOH, LISGIS, ICF and other members of the technical working group, took place 5 September to 15 September 2016 at the Rose Garden Plaza in Monrovia. Seventy-three field staff—43 interviewers and 30 biomarker technicians—were trained for 10 days. The training course consisted of instruction regarding interviewing techniques and field procedures, a detailed review of questionnaire content, instruction on how to administer the paper questionnaires, and mock interviews between participants in the classroom. Of the participants in the main survey training, 24 were selected as interviewers, 12 as supervisors, and 24 as biomarker technicians. One participant was assigned as an editor during data processing, and 12 were placed on standby and not assigned to teams.

Biomarker technicians were also taught how to record children's anaemia and malaria results on the respective brochures and how to fill in the referral slip for any child found to have severe anaemia and or malaria. The biomarker technicians carried out a field practice in two communities in Bomi County to enhance their skills. To ensure compliance with personal protective equipment (PPE) procedures in the post-Ebola environment, biomarker technicians wore the reinforced latex gloves in addition to full length plastic aprons. In some households this brought back memories of Ebola and made respondents hesitant to allow their child to be tested for malaria. Biomarker technicians were trained to tell respondents before the start of malaria testing that they would be wearing full length aprons but to not be concerned as these were part of their uniform.

Two days of field practice took place in five urban clusters in Monrovia, with two to three teams working in each cluster. By design, teams were without biomarker technicians during the first day of field practice, and they therefore could focus exclusively on household and individual interviews. Teams were joined by biomarker technician candidates on the second day of field practice. Fieldwork coordinators observed interviews and reviewed edited questionnaires, and where possible, provided feedback to interviewers, biomarker technicians, and supervisors.

1.7   Fieldwork

Twelve teams were organised for field data collection. Each team consisted of one field supervisor, two field interviewers, two biomarker technicians to conduct biomarker testing, and one driver. The field staff also included seven coordinators.

Each team was allocated about 12-13 clusters depending on their regional location. The teams spent an average of 5 days in a cluster. Information on selected clusters and sampled households was provided to each team for easy location of the households. When eligible respondents were absent from their homes, two or more callbacks were made to offer respondents an opportunity to be part of the survey.

Field data collection for the LMIS started on 22 September 2016. For maximum supervision, all 12 teams were visited by national monitors, largely members of the technical working group. Fieldwork was completed on 26 November 2016.

1.8   Data Processing

The processing of the LMIS questionnaire data began 15 October 2016 after the fieldwork commenced. Completed questionnaires were returned periodically from the field to the NMCP office in Monrovia, where they were coded by data processing personnel recruited and trained for this task. The data processing staff consisted of a supervisor and an assistant from NMCP, a questionnaire administrator, five data entry operators, and one secondary data editor, all of whom were trained by an ICF data processing specialist. Data were entered using the CSPro computer package. All data were entered twice (100 percent verification). The concurrent processing of the data was a distinct advantage for data quality, since NMCP was able to advise field teams of errors detected during data entry. The data entry and editing phase of the survey was completed 15 February 2017.

1.9 ETHICAL CONSIDERATION

The protocol for the 2016 LMIS was approved by institutional review boards of both the University of Liberia- Pacific Institute for Research and Evaluation (UL/PIRE) and ICF. All data and other information collected were kept confidential. Respondents' names and identification numbers were removed from the electronic database during analysis. The risks and benefits of participation in the survey were explained to respondents and informed consent for interview or blood collection was sought. Respondents gave consent to be part of the survey.

1.10 RESPONSE RATES

Table 1.1 shows that of the 4,484 households selected for the sample, 4,261 were occupied at the time of fieldwork. Among the occupied households, 4,218 were successfully interviewed, yielding a total household response rate of 99%. In the interviewed households, 4,407 women were identified to be eligible for individual interview and 4,290 were successfully interviewed, yielding a response rate of 97%.

Table 1.1 Results of the household and individual interviews

Number of households, number of interviews, and response rates, according to residence (unweighted), Liberia MIS 2016

	Residence		
Result	Urban	Rural	Total
Household interviews			
Households selected	2,092	2,392	4,484
Households occupied	1,997	2,264	4,261
Households interviewed	1,974	2,244	4,218
Household response rate[1]	98.8	99.1	99.0
Interviews with women age 15-49			
Number of eligible women	2,396	2,011	4,407
Number of eligible women interviewed	2,331	1,959	4,290
Eligible women response rate[2]	97.3	97.4	97.3

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

1.11 HEALTH SYSTEM IMPACTS IN THE CONTEXT OF THE EBOLA EPIDEMIC

In 2013, the Ebola virus disease (EVD) originated in Guinea and subsequently swept through Liberia and Sierra Leone, making it the largest outbreak of the virus in history. Liberia confirmed its first Ebola case in March 2014. Initially the outbreak appeared to be contained in the rural areas but spread exponentially to the capital city of Monrovia in June 2014. By August 2014, President Ellen Johnson Sirleaf had declared a state of emergency and placed restrictions on the movement of the population to minimize the spread of infection.

In late 2014, more than 80% of public and private health facilities, except for facilities located in the two counties most heavily affected by EVD, continued to report routine health information at levels consistent with the pre-EVD period (GoL 2014). Though facilities remained open, the EVD epidemic damaged confidence in the health system, and communities expressed fear and mistrust in health facilities and health workers. Similarly, health care workers feared being exposed to EVD by patients and were unwilling to care for them. This reaction was intensified by a lack of adequate training and personal protective equipment to deliver services safely. As a result of the EVD epidemic, Liberia experienced dramatic declines in public health indicators of the delivery of basic health care. The 2016 LMIS reports on the current status of malaria prevalence and immunization coverage and how these two areas were influenced by the presence of EVD.

Malaria
The initial clinical presentation of EVD is very similar to that of malaria— fever, anorexia, fatigue, headache, and joint pain—posing a problem of differential diagnosis for both patients and health care

workers. During the outbreak, patients who had signs and symptoms of malaria were often too frightened to seek care because they feared either having EVD or being mistakenly referred to an EVD holding centre with suspected EVD. The ability to provide proper case management for malaria during the EVD outbreak was additionally challenged by lack of diagnostic capacity. Though great strides had been made in scaling up diagnosis prior to the EVD epidemic in many health facilities, testing with RDTs or microscopy was temporarily suspended for fear of contracting Ebola, due to lack of personal protective equipment for use by laboratory technicians and personnel performing these tests. Outpatient visits dropped 61% nationwide between August and October 2014. During this time recorded malaria cases plummeted, although experts suspect a likely increase in actual malaria cases among the population as a result of the crisis (PMI 2017).

<u>Maternal Health and Child Immunizations</u>
During the EVD epidemic women who would have normally received antenatal care or delivered in a health facility turned instead to informal health care providers, such as traditional birth attendants. Additionally, routine vaccination campaigns, such as the measles campaign scheduled in 2014, were suspended, leaving children unvaccinated and susceptible to outbreak. As a result of the EVD epidemic, Liberia experienced dramatic declines in other public health indicators such as the prenatal/postnatal care as well as routine vaccination coverage. For example, measles vaccination rates dropped from about 78% in January 2014 to about 45% in January 2015. Similarly, during 2014, health facility deliveries declined from 65% to 28%, deliveries attended by skilled providers dropped from 61% to 31%, and pregnant women having the recommended four or more antenatal care visits declined from 78% to 31% (GoL 2014).

On 14 January 2016 Liberia was declared EVD-free for the final time. There were 3,163 cases confirmed by laboratory analysis and 4,810 deaths (GoL 2014). Since the end of the EVD epidemic, many resources have been targeted towards improving health indicators across all health services. The effects of the EVD epidemic are still present, however. The factors mentioned here likely contributed to trends observed in indicators measured by the 2016 LMIS.

CHARACTERISTICS OF HOUSEHOLDS AND WOMEN

2

| Key Findings |

- **Drinking Water:** More urban households (95%) than rural households (71%) have access to an improved source of drinking water.

- **Sanitation:** Only 17% of households use an improved toilet facility. Among the remaining 83% with unimproved sanitation, 46% have some sanitation, while 37% have none at all.

- **Household wealth:** Almost half of households in the Greater Monrovia region are in the highest wealth quintile (49%), while almost half of households in South Eastern A region are in the lowest wealth quintile (46%).

- **Electricity:** Twenty percent of households in Liberia have electricity, including 34% in urban areas and 1% in rural areas.

- **Literacy:** Urban women are more than twice as likely as rural women to be literate.

- **Contraceptive use:** The contraceptive prevalence rate (CPR) is 31% for all women age 15-49 in Liberia; most women use a modern method.

Information on the socioeconomic characteristics of the household population in Liberia provides a context for interpreting important demographic and health indicators. It can indicate how representative the LMIS survey is. In addition, this information sheds light on the general living conditions of the population.

This chapter presents information on sources of drinking water, sanitation, wealth, ownership of durable goods, and composition of the household population. In addition, characteristics of the survey respondents give a profile of age, education, literacy, and contraceptive usage. Socioeconomic characteristics help us to understand the factors that affect 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, and rainwater. Households using bottled water for drinking are classified as using an improved source only if their water for cooking and handwashing is from an improved source.
Sample: Households

Improved sources of water protect against outside contamination, and therefore water is more likely to be safe to drink. In Liberia, 85% of households have access to an improved source of drinking water (**Table**

2.1). Ninety-five percent of urban households and 71% of rural households have access to improved water sources.

Urban and rural households rely on different sources of drinking water. Only about 2% of urban households have piped water in their dwelling or yard (**Table 2.1**). A majority (62%) of households in rural areas access drinking water from hand pumps, tube wells or boreholes, compared with only 39% of urban households **(Figure 2.1)**. Almost one-third of urban households rely on bottled water for drinking. Eighty percent of those in rural households travel less than 30 minutes to fetch drinking water (**Table 2.1**).

Trends: The proportion of households obtaining water from improved sources increased from 73% in the 2013 LDHS to 85% in the 2016 LMIS. However, the gains are concentrated in rural households; the proportion of urban households with access to improved drinking water sources has increased from 86% to 95%, compared with an increase from 56% to 71% in rural households over the same period.

***Figure 2.1* Household drinking water by residence**

Percent distribution of households by source of drinking water

- Unimproved source
- Bottled water/mineral water in sachet, improved source for cooking/washing
- Protected dug well/Protected spring
- Hand pump/tube well or borehole
- Public tap/standpipe
- Piped water into dwelling/yard plot/Piped to neighbour
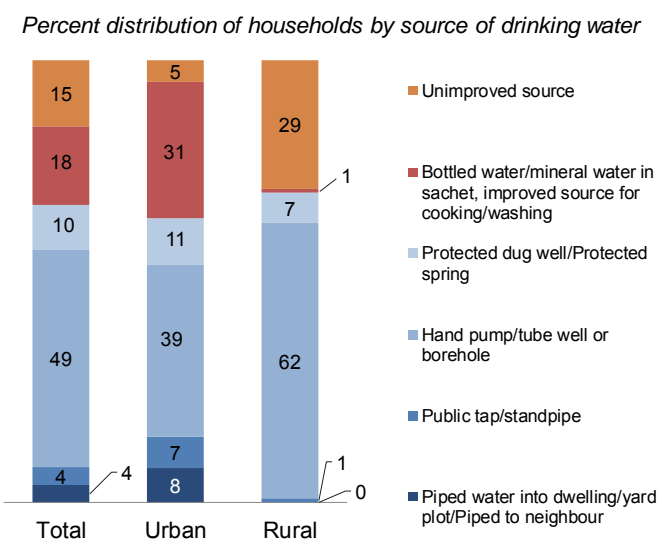
2.2   SANITATION

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

In Liberia, only 17% of households use an improved toilet facility, defined as a non-shared facility constructed to prevent contact with human waste. Such facilities reduce the transmission of cholera, typhoid, and other diseases (**Table 2.2** and **Figure 2.2**). Eighty-four percent of households have unimproved sanitation, with 31% using a toilet facility that would be classified as improved if not shared with other households, 16% using an unimproved toilet facility, and 37% practicing open defecation (**Table 2.2**). Households in urban areas are more likely to have improved sanitation (26%) compared with rural households (4%) (**Figure 2.2**), whereas households in rural areas are more likely to practice open defecation than households in urban areas (62% versus 18%).

***Figure 2.2* Household toilet facilities by residence**

Percent distribution of households by type of toilet facilities

- Open defecation (no facility/bush/field)
- Unimproved facility
- Unimproved sanitation, shared facility
- Improved sanitation
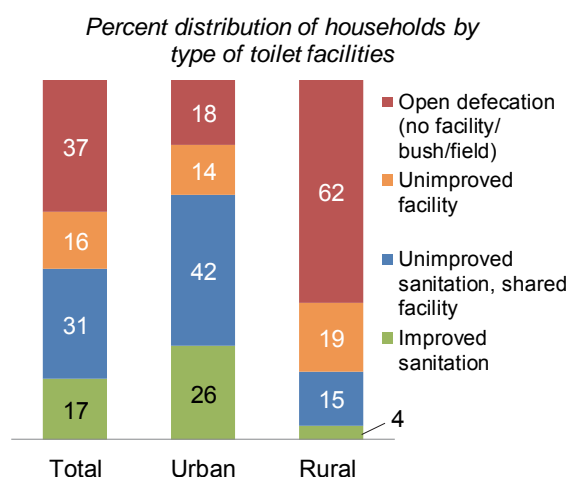
Trends: The proportion of households with improved sanitation has increased since the 2013 LDHS (17% in 2016 but 14% in 2013).

2.3 HOUSING CHARACTERISTICS

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

Overall, 20% of households in Liberia have access to electricity. Thirty–four percent of urban households but only 1% of rural households have access. Households reporting access to electricity rose from 10% in the 2013 LDHS to 20% in the 2016 LMIS **(Table 2.3)**.

Earth/mud/sand and concrete/cement are the most common flooring materials in Liberia, used by 44% and 47% of all households, respectively. Rural households are more likely to have floors made of earth, mud, or sand (78%) than are urban households (18%). Urban households are more likely to have floors made of cement or concrete (67%) than rural households (21%).

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. Twenty-nine percent of households use three or more rooms for sleeping, 26% use two rooms, and 45% use only one room. There are only slight urban-rural differences in the number of rooms used for sleeping (**Table 2.3**).

Exposure to cooking smoke, especially to smoke produced from solid fuels, is potentially harmful to health. Solid fuel for cooking includes fire coal/charcoal and wood. Altogether, 98% of households use solid fuel. Use for cooking is nearly universal in both urban (97%) and rural (98%) households in Liberia, although the preference is for coal/charcoal in urban areas and wood in rural areas (**Table 2.3**).

2.4 HOUSEHOLD WEALTH

Wealth index

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

Sample: Households

By definition, 20% of the total household population is in each wealth quintile. However, population distributions are unequal when stratifying by urban and rural areas. Thirty-three percent of the population in urban areas is in the highest quintile compared with only 1% of the population in rural areas. On the other hand, only 6% of the urban population falls in the lowest wealth quintile, compared with 40% of the rural population (**Figure 2.3**).

Regionally, the South Eastern A region has the highest percentage of the population in the lowest wealth quintile (46%) compared with the Greater Monrovia region that has none of its population in the lowest quintile (**Table 2.5**).

Household Durable Goods

Data from the survey revealed information on ownership of household effects, means of transport, access to agricultural land, and farm animals. Urban households are more likely than rural households to own a radio (59% versus 43%), television (37% versus 3%), mobile telephone (81% versus 39%), and car/truck (8% versus 1%). Rural households are more likely than urban households to farm agricultural land (59% versus 16%), and to own farm animals (55% versus 26%) (**Table 2.4**).

Figure 2.3 Household wealth by residence

Percent distribution of de jure population by wealth quintiles
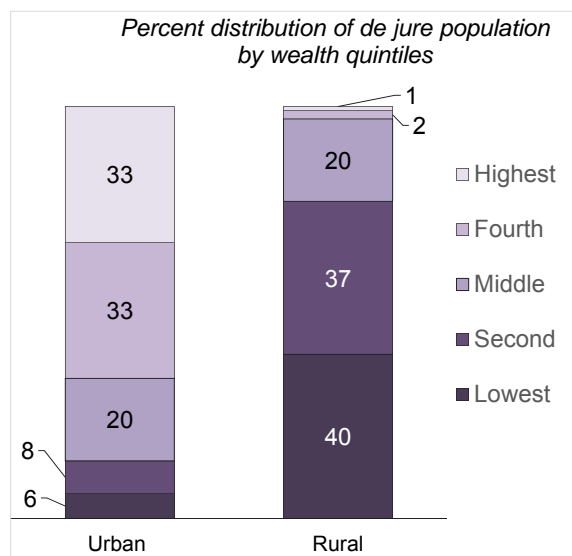
2.5   HOUSEHOLD POPULATION AND COMPOSITION

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

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

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

How indicators are calculated
All tables are based on the de facto population unless specified otherwise.

In the LMIS, 21,141 people stayed overnight in the 4,218 households interviewed.

Age and sex are important demographic variables and are the primary basis of demographic classification. **Table 2.6** shows the distribution of the de facto household population by 5-year age groups, according to sex and residence.

The population pyramid in **Figure 2.4** shows the population distribution by sex and by 5-year age groups. The broad base of the pyramid indicates Liberia's population is young, which is typical of developing countries with a high fertility rate and low life expectancy. Almost half of the population (46%) is under age 15, 51% is age 15-64, and only 3% of the population is age 65 and older (**Table 2.6**).

On average, households in Liberia consist of five persons (**Table 2.7**). Men predominantly head households (67%). The proportion of households headed by women is higher in urban areas than in rural areas (37% versus 28%).

2.6 EDUCATIONAL ATTAINMENT OF WOMEN

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

Figure 2.4 Population pyramid

Percent distribution of the household population

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. About 31% of women age 15-49 have no education. Forty-seven percent of women have completed primary school. Additionally, 44% of women have at least some secondary education, but only 6% of women have more than secondary education. Overall, women have completed a median of only 4 years of education.

Trends: The percentage of interviewed women with no formal education decreased from 36% in the 2011 LMIS to 31% in the 2016 LMIS. The percentage of women with at least some secondary education increased from 24% in 2011 to 34% in 2016.

Patterns by background characteristics

- Women in rural areas are more likely than those in urban areas to have no education (48% vs. 22%, respectively) (**Figure 2.5**).

- The South Central region has the highest proportion of women with no education (47%), followed by 45% in North Western, 40% in South Eastern A, 37% in South Eastern B, 33% in North Central, and 19 percent in Greater Monrovia (**Table 2.9**).

- Women in the lowest household wealth quintile are least likely to be educated; 53% have no education compared with 15% of women in the highest wealth quintile.

Figure 2.5 Education of survey respondents by residence

Percent distribution of women age 15-49 by highest level of schooling attended or completed
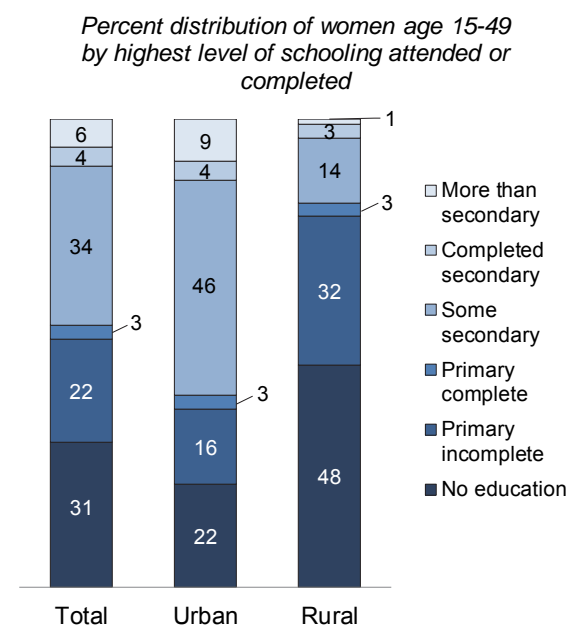
Note: Percentages do not add to 100% due to rounding.

2.7   LITERACY OF WOMEN

> **Literacy**
> Respondents who have attended higher than secondary school are assumed to be literate. All other respondents were given a sentence to read, and they were considered to be literate if they could read all or part of the sentence.
> *Sample:* Women age 15-49

The ability to read and write is an important personal asset that empowers people by increasing opportunities in life. Knowing the level and distribution of literacy among the population is an important factor in the design and delivery of health messages and interventions.

The 2016 LMIS assessed literacy in women age 15-49 by asking respondents to read a simple sentence in English. Respondents were scored on whether they could not read at all or else could read part or all of the sentence shown to them. Respondents who attended school above the secondary level were assumed to be literate. Persons who were blind or visually impaired were excluded. The results show that 6% of women have more than secondary schooling. Among those with secondary education or lower and those with no schooling, 31% can read a whole sentence, 16% can read part of the sentence, and 47% cannot read at all. Overall, 53% of women age 15-49 in Liberia are literate (**Table 2.10**).

2.8   CONTRACEPTIVE USE

> **Contraceptive prevalence rate**
> Percentage of all women who use any contraceptive method
> *Sample:* All women age 15-49

> **Modern methods**
> Include male and female sterilization, injectables, intrauterine devices (IUDs), contraceptive pills, implants, female and male condoms, the standard days method, lactational amenorrhea method, and emergency contraception

The contraceptive prevalence rate is usually shown for currently married women age 15-49; however, the LMIS contraceptive prevalence rate (CPR) is calculated for all women age 15-49. The CPR in Liberia is 31%, and almost all users are using a modern method. The most commonly used methods are injectables (19%), pills (5%), and implants (4%) **(Table 2.11)**.

Patterns by background characteristics

- Urban women are slightly more likely to use modern contraception than rural women (32% versus 29%) **(Table 2.11)**.

- There is a notable difference in contraceptive use by education level. It ranges from a low of 24% among women with no education to a high of 36% among women with secondary or higher education **(Table 2.11)**.

2.9   SOURCE OF MODERN CONTRACEPTIVE METHODS

> **Source of modern contraceptives**
> The place where the modern method currently being used was obtained the last time it was acquired
> *Sample:* Women age 15-49 currently using a modern contraceptive method

Seventy percent of all modern contraceptive users obtain their methods from the public sector, while 23% obtain methods from the private medical sector and 2% from other sources (**Table 2.12**).

LIST OF TABLES

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

Table 2.1 Household drinking water

Percent distribution of households and de jure population by source of drinking water, and by time to obtain drinking water, according to residence, Liberia MIS 2016

Characteristic	Households			Population		
	Urban	Rural	Total	Urban	Rural	Total
Source of drinking water						
Improved source	95.3	70.6	84.5	94.5	71.3	84.9
Piped water into dwelling/yard plot	2.4	0.1	1.4	2.8	0.0	1.7
Piped to neighbour	5.7	0.1	3.2	5.4	0.1	3.2
Public tap/standpipe	6.9	0.8	4.2	6.7	0.8	4.3
Hand pump/tube well or borehole	38.7	62.1	48.9	42.9	62.3	50.9
Protected dug well	10.5	6.2	8.6	12.1	6.7	9.9
Protected spring	0.4	0.5	0.5	0.3	0.9	0.5
Rain water	0.0	0.0	0.0	0.0	0.0	0.0
Bottled water/mineral water in sachet, improved source for cooking/washing [1]	30.8	0.8	17.7	24.2	0.4	14.4
Unimproved source	4.6	29.4	15.4	5.3	28.6	14.9
Unprotected dug well	2.6	1.8	2.2	3.2	2.1	2.7
Unprotected spring	0.1	3.1	1.4	0.1	2.7	1.2
Tanker truck/cart with small tank	0.4	0.0	0.2	0.6	0.0	0.4
Surface water	1.5	24.5	11.5	1.5	23.8	10.7
Other/Missing	0.1	0.1	0.1	0.2	0.1	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Time to obtain drinking water (round trip)						
Water on premises [2]	29.2	11.4	21.5	27.3	10.7	20.5
Less than 30 minutes	60.3	80.4	69.1	61.1	81.4	69.5
30 minutes or longer	9.6	7.3	8.6	10.4	7.2	9.1
Don't know/missing	0.8	0.9	0.8	1.1	0.7	0.9
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number	2,382	1,836	4,218	12,877	9,067	21,944

[1] Because the quality of bottled water is not known, households using bottled water for drinking are classified as using an improved or unimproved source according to their water source for cooking and washing.
[2] Includes water piped to a neighbour

Table 2.2 Household sanitation facilities

Percent distribution of households and de jure population by type of toilet/latrine facilities, according to residence, Liberia MIS 2016

Type of toilet/latrine facility	Households			Population		
	Urban	Rural	Total	Urban	Rural	Total
Improved sanitation	25.9	4.4	16.5	29.9	5.2	19.7
Flush/pour flush to piped sewer system	1.4	0.0	0.8	1.3	0.0	0.8
Flush/pour flush to septic tank	21.1	1.3	12.5	24.1	1.2	14.7
Flush/pour flush to pit latrine	1.7	0.6	1.2	2.2	0.7	1.6
Ventilated improved pit (VIP) latrine	0.5	1.1	0.8	1.0	1.4	1.2
Pit latrine with a slab	1.2	1.2	1.2	1.4	1.5	1.4
Composting toilet	0.0	0.1	0.1	0.0	0.3	0.1
Unimproved sanitation, shared facility[1]	42.3	15.3	30.6	37.5	14.9	28.2
Flush/pour flush to piped sewer system	0.8	0.0	0.5	0.7	0.0	0.4
Flush/pour flush to septic tank	24.5	1.9	14.6	20.2	1.7	12.6
Flush/pour flush to pit latrine	7.3	4.1	5.9	6.8	3.9	5.6
Ventilated improved pit (VIP) latrine	2.7	5.7	4.0	2.8	5.5	3.9
Pit latrine with a slab	6.8	3.6	5.4	6.8	3.7	5.5
Composting toilet	0.2	0.1	0.2	0.2	0.1	0.2
Unimproved facility	14.2	18.7	16.2	14.6	20.1	16.9
Flush/pour flush not to sewer/septic tank/pit latrine	0.2	0.2	0.2	0.2	0.1	0.2
Pit latrine without slab/open pit	8.0	12.7	10.0	8.9	13.7	10.9
Bucket	0.8	0.0	0.4	0.6	0.0	0.4
Hanging toilet/hanging latrine	5.2	5.5	5.3	4.6	6.1	5.2
Other/missing	0.1	0.4	0.2	0.3	0.2	0.2
Open defecation [no facility/bush/ field]	17.6	61.6	36.8	17.9	59.8	35.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number	2,382	1,836	4,218	12,877	9,067	21,944

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

Table 2.3 Household characteristics

Percent distribution of households and de jure population by housing characteristics and percentage using solid fuel for cooking, according to residence, Liberia MIS 2016

Housing characteristic	Households			Population		
	Urban	Rural	Total	Urban	Rural	Total
Electricity						
Yes	34.0	1.3	19.8	32.0	1.2	19.3
No	66.0	98.7	80.2	68.0	98.8	80.7
Total	100.0	100.0	100.0	100.0	100.0	100.0
Flooring material						
Earth/sand/mud	17.9	77.5	43.8	18.4	76.6	42.5
Wood/planks	0.1	0.1	0.1	0.1	0.1	0.1
Parquet or polished wood	0.1	0.0	0.0	0.1	0.0	0.0
Floor mat, linoleum, vinyl	5.2	0.3	3.1	4.3	0.3	2.6
Ceramic tiles/terrazzo	9.2	0.7	5.5	10.2	0.7	6.3
Concrete/cement	66.5	20.9	46.7	66.1	21.8	47.8
Carpet	0.8	0.2	0.5	0.5	0.2	0.4
Other/missing	0.2	0.3	0.3	0.4	0.4	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
Rooms used for sleeping						
One	45.8	42.9	44.6	27.5	27.7	27.6
Two	23.2	29.3	25.9	24.2	31.4	27.2
Three or more	30.8	27.5	29.3	48.1	40.7	45.0
Missing	0.2	0.3	0.2	0.3	0.2	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Cooking fuel						
Electricity	0.2	0.0	0.1	0.2	0.0	0.1
Gas cylinder	0.3	0.0	0.1	0.1	0.0	0.1
Kerosene stove	0.2	0.1	0.2	0.1	0.0	0.1
Fire coal/charcoal	79.4	10.9	49.6	77.1	10.4	49.5
Wood	17.8	87.4	48.1	21.1	88.7	49.0
Other fuel	0.2	0.0	0.1	0.0	0.0	0.0
No food cooked in household	0.9	0.7	0.8	0.2	0.2	0.2
Missing	1.0	0.9	0.9	1.1	0.6	0.9
Total	100.0	100.0	100.0	100.0	100.0	100.0
Percentage using solid fuel for cooking[1]	97.2	98.3	97.7	98.2	99.2	98.6
Number	2,382	1,836	4,218	12,877	9,067	21,944

[1] Includes fire coal/charcoal and wood

Table 2.4 Household possessions

Percentage of households possessing various household effects, means of transportation, agricultural land, and livestock/farm animals by residence, Liberia MIS 2016

	Residence		
Possession	Urban	Rural	Total
Household effects			
Radio	59.4	42.7	52.1
Television	36.6	3.1	22.0
Mobile telephone	80.6	39.2	62.6
Generator	17.8	4.2	11.9
Computer	10.4	0.7	6.2
Icebox	12.7	1.2	7.7
Table	81.7	59.4	72.0
Chairs	80.8	57.5	70.7
Cupboard	36.4	10.2	25.0
Mattress (not made of straw or grass)	95.5	76.8	87.3
Sewing machine	3.9	0.3	2.4
Bench/stool	67.5	79.6	72.8
Watch	39.4	19.8	30.8
Means of transport			
Bicycle	4.6	0.8	3.0
Motorcycle/scooter	7.5	6.0	6.8
Car/truck	8.1	0.9	5.0
Boat or canoe	0.8	2.1	1.3
Farming of agricultural land[1]	16.0	59.3	34.8
Ownership of farm animals[2]	26.4	55.0	38.8
Number	2,382	1,836	4,218

[1] Households were asked if any member of the household farmed agricultural land. Such land need not be owned by the household.
[2] Cattle/bulls, pigs, goats, sheep, or chicken, ducks, or guinea fowl

Table 2.5 Wealth quintiles

Percent distribution of the de jure population by wealth quintiles, and the Gini Coefficient, according to residence and region, Liberia MIS 2016

Residence/region	Wealth quintile					Total	Number of persons	Gini coefficient
	Lowest	Second	Middle	Fourth	Highest			
Residence								
Urban	6.1	7.7	20.3	32.6	33.3	100.0	12,877	0.17
Rural	39.8	37.4	19.5	2.1	1.1	100.0	9,067	0.32
Region								
Greater Monrovia	0.0	0.0	9.5	41.1	49.4	100.0	7,265	0.17
North Western	26.4	24.6	38.3	7.4	3.3	100.0	1,792	0.32
South Central	28.5	22.9	25.8	12.4	10.4	100.0	3,833	0.36
South Eastern A	45.8	19.7	25.6	6.1	2.7	100.0	1,476	0.40
South Eastern B	31.7	26.4	29.2	8.0	4.7	100.0	1,336	0.26
North Central	27.7	38.8	20.1	9.6	3.8	100.0	6,242	0.22
Total	20.0	20.0	20.0	20.0	20.0	100.0	21,944	0.24

Table 2.6 Household population by age, sex, and residence

Percent distribution of the de facto household population by various age groups and percentage of the de facto household population age 10-19, according to sex and residence, Liberia MIS 2016

| | Urban | | | Rural | | | | | |
Age	Male	Female	Total	Male	Female	Total	Male	Female	Total
<5	15.4	12.7	14.0	18.4	18.1	18.2	16.6	14.8	15.7
5-9	14.4	14.7	14.5	18.5	16.5	17.5	16.1	15.4	15.7
10-14	14.0	15.6	14.8	14.9	11.7	13.3	14.4	14.0	14.2
15-19	12.1	10.5	11.3	7.9	7.0	7.4	10.3	9.1	9.7
20-24	9.0	10.3	9.6	5.2	7.9	6.6	7.4	9.3	8.4
25-29	7.0	7.9	7.5	5.7	6.1	5.9	6.4	7.2	6.8
30-34	6.0	6.9	6.5	4.8	6.3	5.6	5.5	6.7	6.1
35-39	6.3	5.3	5.8	5.1	5.4	5.2	5.8	5.3	5.6
40-44	4.2	3.4	3.8	4.5	3.9	4.2	4.3	3.6	4.0
45-49	3.7	2.6	3.1	4.4	3.0	3.7	4.0	2.7	3.4
50-54	2.2	3.8	3.0	2.5	4.3	3.4	2.3	4.0	3.2
55-59	1.9	1.8	1.9	2.2	2.6	2.4	2.1	2.2	2.1
60-64	1.4	1.2	1.3	2.0	2.6	2.3	1.6	1.8	1.7
65-69	0.9	1.1	1.0	0.8	1.8	1.3	0.9	1.4	1.1
70-74	0.6	0.8	0.7	1.6	0.9	1.2	1.0	0.8	0.9
75-79	0.2	0.7	0.5	0.8	1.1	0.9	0.4	0.9	0.7
80 +	0.5	0.5	0.5	0.8	0.9	0.9	0.6	0.7	0.7
Don't know/missing	0.3	0.1	0.2	0.1	0.0	0.1	0.2	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Dependency age groups									
0-14	43.7	43.0	43.4	51.7	46.2	49.0	47.1	44.3	45.7
15-64	53.8	53.8	53.8	44.2	49.0	46.6	49.8	51.9	50.8
65+	2.2	3.2	2.7	4.0	4.7	4.4	2.9	3.8	3.4
Don't know/missing	0.3	0.1	0.2	0.1	0.0	0.1	0.2	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Child and adult populations									
0-17	51.8	49.5	50.6	57.1	50.1	53.6	54.0	49.7	51.8
18+	47.9	50.5	49.2	42.8	49.8	46.3	45.8	50.2	48.1
Don't know/missing	0.3	0.1	0.2	0.1	0.0	0.1	0.2	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Adolescents 10-19	26.1	26.1	26.1	22.8	18.7	20.7	24.7	23.1	23.9
Number of persons	5,984	6,499	12,483	4,324	4,334	8,658	10,308	10,833	21,141

Table 2.7 Household composition

Percent distribution of households by sex of head of household and by household size and mean size of households, according to residence, Liberia MIS 2016

| | Residence | | |
Characteristic	Urban	Rural	Total
Household headship			
Male	62.6	72.4	66.9
Female	37.4	27.6	33.1
Total	100.0	100.0	100.0
Number of usual members			
1	8.9	8.6	8.8
2	9.5	11.7	10.4
3	14.8	11.4	13.3
4	12.6	14.9	13.6
5	12.4	14.8	13.5
6	11.2	13.8	12.3
7	7.3	9.4	8.2
8	7.5	5.9	6.8
9+	15.8	9.6	13.1
Total	100.0	100.0	100.0
Mean size of households	5.4	4.9	5.2
Number of households	2,382	1,836	4,218

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

Table 2.8 Background characteristics of women

Percent distribution of women age 15-49 by selected background characteristics, Liberia MIS 2016

Background characteristic	Weighted percent	Number of women	
		Weighted number	Unweighted number
Age			
15-19	21.0	902	895
20-24	19.9	855	799
25-29	16.4	706	679
30-34	15.8	680	678
35-39	11.9	510	537
40-44	8.2	352	405
45-49	6.7	286	297
Religion			
Christian	87.9	3,770	3,770
Muslim	10.9	468	447
Traditional religion	0.3	13	16
No religion	0.9	40	57
Language[1]			
Bassa	11.9	512	531
Gbandi	3.3	142	95
Belle	0.6	26	37
Dey	0.3	14	28
Gio	7.6	325	246
Gola	2.7	115	156
Grebo	6.6	283	619
Kissi	4.1	175	130
Kpelle	23.8	1,022	826
Krahn	2.2	94	188
Kru	5.4	232	355
Lorma	4.9	212	132
Mandingo	3.3	142	107
Mano	6.0	257	150
Mende	1.1	48	51
Sapro	0.7	31	70
Vai	3.8	162	149
None/English only	10.2	436	367
Other	1.5	63	53
Residence			
Urban	64.1	2,749	2,331
Rural	35.9	1,541	1,959
Region			
Greater Monrovia	39.1	1,679	913
North Western	6.5	279	522
South Central	17.0	729	728
South Eastern A	6.2	264	640
South Eastern B	5.4	233	745
North Central	25.8	1,106	742
Education			
No education	31.2	1,339	1,523
Elementary	24.9	1,067	1,184
Junior High	19.6	840	765
Senior High	18.4	790	642
Higher	6.0	256	176
Wealth quintile			
Lowest	16.0	688	1,007
Second	17.6	755	804
Middle	19.1	819	969
Fourth	22.6	970	783
Highest	24.7	1,058	727
Total 15-49	100.0	4,290	4,290

Note: Education categories refer to the highest level of education attended, whether or not that level was completed.
[1] Respondents were asked the main language they spoke other than English.

Table 2.9 Educational attainment

Percent distribution of women age 15-49 by highest level of schooling attended or completed, and median years completed, according to background characteristics, Liberia MIS 2016

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	13.7	29.2	4.5	44.2	5.8	2.6	100.0	11.2	1,757
15-19	8.9	36.5	5.8	40.4	7.6	0.8	100.0	5.7	902
20-24	18.7	21.5	3.2	48.2	4.0	4.4	100.0	12.0	855
25-29	28.6	17.6	1.5	41.7	3.5	7.0	100.0	5.2	706
30-34	41.2	15.1	2.6	29.0	2.1	10.0	100.0	1.4	680
35-39	51.6	18.1	2.1	16.6	1.7	10.0	100.0	a	510
40-44	52.8	17.8	1.1	18.0	1.7	8.7	100.0	a	352
45-49	58.4	14.3	2.9	18.0	2.0	4.3	100.0	a	286
Residence									
Urban	21.7	16.1	3.3	45.7	4.1	9.0	100.0	12.0	2,749
Rural	48.1	32.0	2.7	13.6	3.1	0.5	100.0	a	1,541
Region									
Greater Monrovia	19.0	11.8	3.0	49.9	4.2	12.1	100.0	12.9	1,679
North Western	44.8	24.0	2.6	25.6	2.4	0.4	100.0	1.7	279
South Central	46.9	24.2	2.0	20.7	2.9	3.3	100.0	a	729
South Eastern A	39.6	34.5	2.9	18.5	3.2	1.4	100.0	1.7	264
South Eastern B	37.4	28.7	3.2	26.4	3.6	0.7	100.0	2.6	233
North Central	32.6	30.3	3.9	26.8	4.3	2.0	100.0	3.4	1,106
Wealth quintile									
Lowest	52.6	31.4	2.0	11.2	2.7	0.0	100.0	a	688
Second	41.9	31.0	3.9	19.6	3.6	0.1	100.0	1.8	755
Middle	34.1	25.6	3.4	31.3	4.0	1.6	100.0	3.8	819
Fourth	23.0	18.4	2.6	47.2	4.5	4.3	100.0	11.9	970
Highest	15.0	9.2	3.3	49.8	3.8	18.9	100.0	13.4	1,058
Total	31.2	21.8	3.1	34.2	3.8	6.0	100.0	4.2	4,290

[1] Completed grade 6 at the primary level
[2] Completed grade 12 at the secondary level
a = Omitted because less than 50% of the respondents have completed one year of school

Table 2.10 Literacy

Percent distribution of women age 15-49 by level of schooling attended and level of literacy, and percentage literate, according to background characteristics, Liberia MIS 2016

Background characteristic	More than secondary schooling	No schooling or elementary or junior high or senior high						Total	Percentage literate[1]	Number of women
		Can read a whole sentence	Can read part of a sentence	Cannot read at all	No card with required language	Blind/visually impaired	Missing			
Age										
15-24	2.6	44.4	21.0	31.5	0.3	0.2	0.0	100.0	68.0	1,757
15-19	0.8	45.8	23.2	29.7	0.4	0.0	0.1	100.0	69.8	902
20-24	4.4	42.9	18.7	33.4	0.2	0.3	0.0	100.0	66.0	855
25-29	7.0	33.1	12.0	47.4	0.2	0.0	0.2	100.0	52.2	706
30-34	10.0	22.6	12.1	55.1	0.0	0.0	0.2	100.0	44.6	680
35-39	10.0	13.8	11.0	64.9	0.1	0.0	0.2	100.0	34.8	510
40-44	8.7	12.4	12.7	65.8	0.1	0.5	0.0	100.0	33.7	352
45-49	4.3	19.1	12.0	64.6	0.0	0.0	0.0	100.0	35.4	286
Residence										
Urban	9.0	40.6	16.7	33.2	0.1	0.2	0.1	100.0	66.4	2,749
Rural	0.5	14.1	13.8	71.2	0.3	0.0	0.2	100.0	28.3	1,541
Region										
Greater Monrovia	12.1	44.5	12.9	30.0	0.2	0.3	0.1	100.0	69.5	1,679
North Western	0.4	18.4	12.3	68.8	0.1	0.0	0.0	100.0	31.1	279
South Central	3.3	25.3	10.8	60.4	0.0	0.0	0.2	100.0	39.4	729
South Eastern A	1.4	15.3	16.5	66.5	0.0	0.0	0.2	100.0	33.2	264
South Eastern B	0.7	19.4	19.5	60.3	0.0	0.1	0.0	100.0	39.6	233
North Central	2.0	24.1	23.0	50.4	0.4	0.0	0.1	100.0	49.0	1,106
Wealth quintile										
Lowest	0.0	10.9	14.8	74.2	0.0	0.0	0.0	100.0	25.8	688
Second	0.1	17.9	19.0	62.7	0.4	0.0	0.0	100.0	37.0	755
Middle	1.6	28.3	17.1	52.4	0.2	0.0	0.4	100.0	47.0	819
Fourth	4.3	42.0	16.0	37.5	0.1	0.0	0.0	100.0	62.4	970
Highest	18.9	45.9	12.4	22.1	0.2	0.4	0.2	100.0	77.1	1,058
Total	6.0	31.1	15.7	46.9	0.2	0.1	0.1	100.0	52.7	4,290

[1] Refers to women who attended more than senior high schooling and women who can read a whole sentence or part of a sentence

Table 2.11 Current use of contraception by background characteristics

Percent distribution of women 15-49 by contraceptive method currently being used according to background characteristics, Liberia MIS 2016

Background characteristic	Any method	Modern method											Traditional method				Not currently using	Total	Number of women
		Any modern method	Female sterilization	IUD	Inject-able/DEPO	Implants	Pill	Male condom	Emergency contraception	Cycle beads/SDM	LAM	Other modern method	Any traditional method	Rhythm	With-drawal	Other traditional method			
Age																			
15-19	25.1	25.0	0.7	0.0	17.1	2.2	3.3	0.9	0.0	0.5	0.2	0.0	0.1	0.0	0.0	0.1	74.9	100.0	902
20-24	39.9	39.5	0.7	1.1	26.0	5.0	4.3	1.8	0.0	0.3	0.1	0.2	0.4	0.0	0.0	0.4	60.1	100.0	855
25-29	39.8	39.5	1.0	0.3	24.7	4.5	6.0	1.9	0.0	1.2	0.0	0.0	0.2	0.0	0.0	0.2	60.2	100.0	706
30-34	35.6	35.0	0.8	0.3	20.5	3.7	6.1	2.2	0.4	0.9	0.2	0.0	0.6	0.1	0.3	0.1	64.4	100.0	680
35-39	29.4	29.4	2.1	0.1	14.2	3.7	8.0	0.3	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	70.6	100.0	510
40-44	18.0	18.0	0.6	0.0	9.8	1.1	4.7	0.3	0.0	1.4	0.0	0.2	0.0	0.0	0.0	0.0	82.0	100.0	352
45-49	9.2	8.7	0.1	0.0	4.4	2.1	0.3	0.0	0.0	0.0	0.0	1.7	0.5	0.1	0.0	0.4	90.8	100.0	286
Residence																			
Urban	31.9	31.6	1.3	0.5	19.0	4.0	3.8	1.7	0.1	1.0	0.0	0.2	0.3	0.0	0.1	0.2	68.1	100.0	2,749
Rural	29.4	29.1	0.1	0.0	18.7	2.4	6.7	0.6	0.0	0.2	0.3	0.1	0.2	0.1	0.0	0.2	70.6	100.0	1,541
Region																			
Greater Monrovia	29.6	29.3	0.3	0.6	17.9	4.0	2.6	2.0	0.2	1.4	0.0	0.4	0.2	0.0	0.1	0.1	70.4	100.0	1,679
North Western	34.0	34.0	0.0	0.9	23.3	2.5	4.4	0.5	0.0	0.3	1.7	0.4	0.1	0.1	0.0	0.0	66.0	100.0	279
South Central	29.9	29.5	0.2	0.1	17.1	5.2	5.8	0.7	0.0	0.4	0.0	0.0	0.4	0.0	0.0	0.4	70.1	100.0	729
South Eastern A	34.4	33.3	0.1	0.0	23.9	3.8	4.4	0.5	0.0	0.5	0.0	0.1	1.1	0.6	0.0	0.5	65.6	100.0	264
South Eastern B	40.1	40.1	0.1	0.0	29.3	5.1	4.7	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59.9	100.0	233
North Central	30.4	30.2	2.8	0.0	17.0	1.3	8.0	0.9	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.2	69.6	100.0	1,106
Education																			
No education	24.1	23.8	0.4	0.3	13.5	2.9	5.8	0.5	0.0	0.2	0.1	0.2	0.3	0.0	0.1	0.2	75.9	100.0	1,339
Primary	31.3	31.2	0.5	0.0	20.4	2.9	6.2	0.8	0.0	0.3	0.1	0.0	0.1	0.0	0.0	0.1	68.7	100.0	1,067
Secondary or higher	36.3	36.0	1.5	0.4	22.9	4.2	3.7	2.1	0.0	1.0	0.1	0.2	0.3	0.1	0.0	0.2	63.7	100.0	1,629
Wealth quintile																			
Lowest	24.8	24.4	1.2	0.1	15.5	2.2	4.9	0.3	0.0	0.0	0.0	0.1	0.4	0.0	0.0	0.4	75.2	100.0	688
Second	32.2	32.0	1.8	0.0	19.7	2.0	7.8	0.4	0.0	0.3	0.1	0.0	0.2	0.0	0.0	0.2	67.8	100.0	755
Middle	35.1	34.7	1.1	0.2	22.2	4.4	5.1	1.1	0.0	0.1	0.4	0.1	0.3	0.1	0.0	0.2	64.9	100.0	819
Fourth	32.7	32.4	0.6	0.4	19.8	3.5	4.5	2.2	0.0	1.2	0.0	0.2	0.4	0.0	0.1	0.2	67.3	100.0	970
Highest	29.4	29.3	0.1	0.7	17.0	4.5	2.8	1.8	0.3	1.5	0.1	0.4	0.1	0.0	0.1	0.0	70.6	100.0	1,058
Total	31.0	30.7	0.9	0.3	18.9	3.5	4.9	1.3	0.1	0.7	0.1	0.2	0.3	0.0	0.1	0.2	69.0	100.0	4,290

Note: If more than one method is used, only the most effective method is considered in this tabulation.
SDM =Standard days method; LAM = Lactational amenorrhea method

Table 2.12 Source of modern contraception methods

Percent distribution of users of modern contraceptive methods age 15-49 by most recent source of method, according to method, Liberia MIS 2016

Source	Injectables/ DEPO	Implants	Pills	Male condom	Total
Public sector	72.1	85.2	71.2	(51.1)	70.2
Government hospital	18.7	25.4	14.1	(25.9)	18.5
Government health centre	18.2	28.5	14.4	(8.0)	17.5
Health clinic	30.1	23.5	35.3	(11.9)	28.4
Mobile clinic	1.1	1.7	1.1	(0.0)	1.1
Community health worker/ outreach	3.6	4.8	5.0	(5.3)	4.1
Other public sector	0.4	1.3	1.4	(0.0)	0.7
Private medical sector	24.5	11.9	21.5	(41.8)	23.3
Private hospital/clinic	8.4	8.2	1.8	(1.9)	7.3
Pharmacy/med. store	11.9	2.2	14.6	(39.9)	12.1
Private doctor	0.6	0.2	2.0	(0.0)	0.7
Planned Parenthood Association of Liberia	2.6	0.8	1.6	(0.0)	2.2
Other private medical sector	1.0	0.5	1.5	(0.0)	1.0
Other source	2.2	1.0	2.9	(2.8)	2.3
Shop	0.1	0.3	2.2	(2.8)	0.6
Church	0.0	0.0	0.0	(0.0)	0.0
Friends relatives	2.1	0.7	0.7	(0.0)	1.7
Other	0.8	0.7	3.2	(4.2)	1.3
Missing	0.4	1.2	1.1	(0.0)	0.6
Total	100.0	100.0	100.0	100.0	100.0
Number of women	810	148	208	55	1,275

Note: Total includes users of IUDs, emergency contraception, standard days method, and other modern methods but excludes lactational amenorrhea method (LAM).
Figures in parentheses are based on 25-49 unweighted cases.

PREGNANCY AND POSTNATAL CARE

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Key Findings

- **Antenatal care coverage:** Almost all women (98%) who gave birth in the 5 years preceding the survey received antenatal care from a skilled provider for their most recent birth; 79% of all women had the recommended four or more antenatal visits.

- **Delivery:** About 76% of last births in the 5 years preceding the survey took place in a health facility.

- **Postnatal checks:** About 77% of women received the recommended postnatal health check within 2 days of delivery.

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Health care services before, during, and after pregnancy are important for the survival and wellbeing of both mother and infant. The 2016 LMIS obtained information on the extent to which women in Liberia receive care during each of these stages. Utilization of antenatal, delivery, and postnatal care services can contribute to policies and programs that improve maternal and infant health care.

3.1 ANTENATAL CARE COVERAGE

Skilled Providers

Antenatal care (ANC) from a skilled provider
Pregnancy care received from skilled providers, such as doctors and nurses/midwives
Sample: Women age 15-49 who had a live birth in the 5 years before the survey

Ninety-eight percent of women age 15-49 received ANC from a skilled provider during the pregnancy of their most recent birth. The majority of women received ANC from a nurse/midwife (83%), while 14% received ANC from a doctor, and 1% from a physician assistant **(Table 3.1)**.

Trends: The proportion of women age 15-49 in Liberia who received ANC from a skilled provider increased slightly from 96% in 2013 to 98% in 2016.

Timing and Number of ANC Visits

Seventy-nine percent of women had four or more ANC visits, and only 2% did not receive any ANC. Overall, 72% of women were in their first trimester of pregnancy at the time of their first ANC visit, as recommended **(Table 3.2)**.

Trends: The proportion of women who received the recommended four or more ANC visits has increased slightly from 78% in 2013 to 79% in 2016.

Patterns by background characteristics

▪ ANC coverage is high in both rural and urban areas, in all regions, and for women of all education and wealth levels **(Table 3.1)**.

▪ Urban women are around four times more likely than rural women to receive ANC from a doctor (21% versus 5%).

3.2   DELIVERY SERVICES

Institutional Deliveries

> **Institutional deliveries**
> Deliveries that occur in a health facility
> *Sample:* Most recent live births in the 5 years before the survey

Seventy-six percent of last live births in the 5 years before the survey took place in a health facility, while 23% were delivered at home. Most institutional deliveries took place in public sector facilities (61%) **(Table 3.3)**.

Trends: Institutional deliveries in Liberia increased from 56% in 2013 to 76% in 2016, with public sector health facility deliveries increasing from 43% in 2013 to 61% in 2016.

Patterns by background characteristics

▪ By region, institutional deliveries range from a low of 64% in South Central to a high of 84% in North Central **(Figure 3.1)**.

▪ Institutional deliveries are most common among mothers with secondary school education (83%) and among women in the highest wealth quintile (82%) **(Table 3.3)**.

3.3   POSTNATAL CARE

Postnatal Health Check for Mothers

Safe motherhood programs recommend that women receive a postnatal health check within 2 days after delivery. In Liberia, 77% of mothers had a check in the first 2 days after birth, while 16% of mothers did not **(Table 3.5)**. Nine percent of mothers received a postnatal health check from a doctor, 61% from a nurse or midwife, 2% from a physician assistant, and 6% from a traditional birth attendant **(Table 3.4)**.

Figure 3.1 **Institutional deliveries by region**

Percentage of births delivered in a facility

North Western 65%
North Central 84%
South Central 64%
Greater Monrovia 77%
South Eastern A 82%
South Eastern B 79%

< 70%
71% - 80%
> 80%
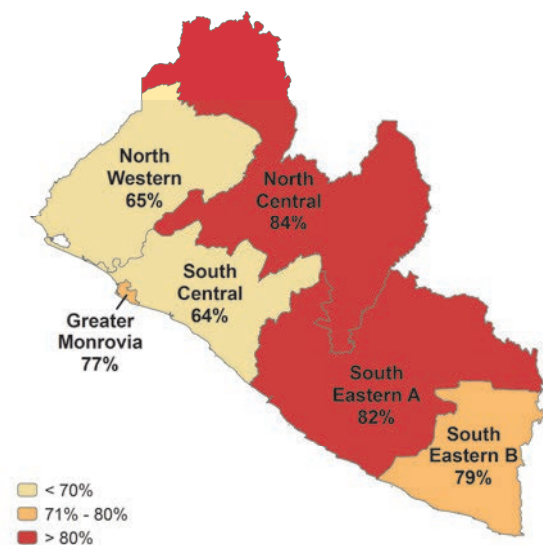
Patterns by background characteristics

- Women who delivered in a health facility are much more likely to receive a postnatal health check within 2 days of delivery than those who delivered elsewhere (82% versus 63%) **(Figure 3.2)**.

- There are some differences in postnatal care for mothers by region. Mothers are most likely to have a timely postnatal health check in North Western (84%) and least likely in South Central (71%) **(Table 3.5)**.

LIST OF TABLES

For more information on maternal health care, see the following tables:

- **Table 3.1   Antenatal care**
- **Table 3.2   Number of antenatal care visits and timing of first visit**
- **Table 3.3   Place of delivery**
- **Table 3.4   Type of provider of first postnatal check for the mother**
- **Table 3.5   Timing of first postnatal check for the mother**

Figure 3.2 **Postnatal care by place of delivery**

Percentage of last births in the 2 years before the survey for which women received a postnatal check during the first 2 days after birth
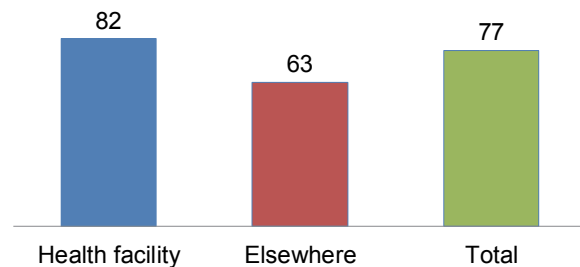
Table 3.1 Antenatal care

Percent distribution of women age 15-49 who had a live birth in the 5 years preceding the survey, by type of 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, Liberia MIS 2016

| Background characteristic | Antenatal care provider | | | | | | No ANC | Total | Percent-age receiving antenatal care from a skilled provider[1] | Number of women |
	Doctor	Nurse/ midwife	Physician assistant	Traditional birth attendant	Commu-nity health worker/ outreach	Other/ missing				
Mother's age at birth										
<20	11.8	86.0	1.0	0.3	0.0	0.1	0.9	100.0	98.7	495
20-34	14.4	82.5	0.8	0.1	0.2	0.2	1.8	100.0	97.8	1,398
35-49	13.5	82.2	1.3	0.5	0.0	0.0	2.5	100.0	97.0	299
Residence										
Urban	20.6	77.5	0.7	0.1	0.2	0.2	0.7	100.0	98.8	1,242
Rural	4.7	90.7	1.2	0.3	0.0	0.0	3.0	100.0	96.6	950
Region										
Greater Monrovia	26.7	71.5	0.9	0.2	0.3	0.4	0.0	100.0	99.1	718
North Western	3.3	94.7	0.0	0.7	0.0	0.0	1.3	100.0	98.0	168
South Central	8.7	85.8	0.4	0.0	0.0	0.0	5.1	100.0	94.9	400
South Eastern A	1.4	88.2	6.7	1.3	0.2	0.2	2.0	100.0	96.3	141
South Eastern B	10.4	86.1	1.4	0.0	0.0	0.0	2.1	100.0	97.9	124
North Central	8.3	90.1	0.3	0.0	0.0	0.0	1.3	100.0	98.7	642
Education										
No education	6.9	88.2	0.8	0.3	0.3	0.0	3.5	100.0	95.9	744
Primary	10.9	86.5	1.5	0.4	0.0	0.0	0.6	100.0	98.9	576
Secondary or higher	21.3	76.8	0.7	0.0	0.0	0.3	0.8	100.0	98.9	873
Wealth quintile										
Lowest	3.5	89.0	1.3	0.7	0.1	0.1	5.4	100.0	93.8	446
Second	7.8	90.4	0.7	0.0	0.0	0.0	1.1	100.0	98.9	464
Middle	11.8	85.8	1.1	0.0	0.0	0.0	1.2	100.0	98.8	431
Fourth	17.9	79.1	1.1	0.3	0.5	0.6	0.5	100.0	98.0	451
Highest	29.3	70.4	0.4	0.0	0.0	0.0	0.0	100.0	100.0	399
Total	13.7	83.2	0.9	0.2	0.1	0.1	1.7	100.0	97.9	2,192

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, and physician assistant.

Table 3.2 Number of antenatal care visits and timing of first visit

Percent distribution of women age 15-49 who had a live birth in the 5 years preceding the survey, by number of antenatal care (ANC) visits for the most recent live birth, and by the timing of the first visit, and among women with ANC, median months pregnant at first visit, according to residence, Liberia MIS 2016

| Number of ANC visits and timing of first visit | Residence | | Total |
	Urban	Rural	
Number of ANC visits			
None	0.7	3.0	1.7
1	1.5	3.6	2.4
2-3	11.8	15.2	13.3
4+	83.4	73.7	79.2
Don't know/missing	2.6	4.5	3.5
Total	100.0	100.0	100.0
Number of months pregnant at time of first ANC visit			
No antenatal care	0.7	3.0	1.7
<4	72.3	72.4	72.4
4-5	20.1	17.2	18.9
6-7	4.4	4.4	4.4
8+	0.2	1.8	0.9
Don't know/missing	2.3	1.2	1.8
Total	100.0	100.0	100.0
Number of women	1,242	950	2,192
Median months pregnant at first visit (for those with ANC)	3.1	3.1	3.1
Number of women with ANC	1,233	922	2,155

Table 3.3 Place of delivery

Percent distribution of women 15-49 who had a live birth in the 5 years preceding the survey, by place of the most recent birth, according to background characteristics, Liberia MIS 2016

Background characteristic	Health facility		Home	Other	Total	Percentage delivered in a health facility	Number of births
	Public sector	Private sector					
Mother's age at birth							
<20	66.9	12.0	20.6	0.4	100.0	78.9	495
20-34	58.9	17.7	23.0	0.5	100.0	76.5	1,398
35-49	58.5	11.9	29.2	0.3	100.0	70.4	299
Antenatal care visits[1]							
None	(18.3)	(3.8)	(77.8)	0.0	100.0	(22.2)	37
1-3	52.9	11.9	34.5	0.7	100.0	64.8	344
4+	62.2	17.0	20.4	0.4	100.0	79.2	1,736
Don't know/missing	80.7	6.3	12.8	0.3	100.0	87.0	76
Residence							
Urban	56.7	23.4	19.7	0.2	100.0	80.1	1,242
Rural	65.8	5.5	28.0	0.8	100.0	71.2	950
Region							
Greater Monrovia	43.1	34.3	22.2	0.4	100.0	77.4	718
North Western	59.0	5.9	33.4	1.7	100.0	64.9	168
South Central	51.2	12.9	35.5	0.4	100.0	64.2	400
South Eastern A	76.8	5.0	16.9	1.3	100.0	81.8	141
South Eastern B	72.6	6.3	20.1	1.0	100.0	78.9	124
North Central	80.7	3.0	16.3	0.0	100.0	83.7	642
Education							
No education	58.5	10.0	31.3	0.3	100.0	68.4	744
Primary	67.3	9.0	22.8	0.9	100.0	76.3	576
Secondary or higher	58.1	24.7	16.8	0.3	100.0	82.9	873
Wealth quintile							
Lowest	60.5	2.7	35.6	1.2	100.0	63.2	446
Second	74.1	6.5	19.2	0.2	100.0	80.6	464
Middle	67.5	9.3	22.9	0.2	100.0	76.9	431
Fourth	52.4	26.3	21.2	0.1	100.0	78.7	451
Highest	47.0	35.3	17.0	0.7	100.0	82.4	399
Total	60.6	15.6	23.3	0.5	100.0	76.2	2,192

Note: Figures in parentheses are based on 25-49 unweighted cases.
[1] Includes only the most recent birth in the 5 years preceding the survey

Table 3.4 Type of provider of first postnatal check for the mother

Among women age 15-49 giving birth in the 2 years preceding the survey, percent distribution by type of provider of the mother's first postnatal health check during the 2 days after the most recent live birth, according to background characteristics, Liberia MIS 2016

Background characteristic	Type of health provider of mother's first postnatal checkup					No postnatal checkup in the first 2 days after birth	Total	Number of women
	Doctor	Nurse/ midwife	Physician assistant	Traditional birth atten- dant	Community health worker/ outreach			
Age at birth								
<20	6.6	62.0	2.3	3.7	0.3	25.0	100.0	277
20-34	10.0	60.4	1.6	6.2	0.0	21.7	100.0	719
35-49	10.3	58.2	1.6	6.2	0.0	23.8	100.0	150
Place of delivery								
Health facility	11.5	67.7	2.3	0.0	0.0	18.4	100.0	870
Elsewhere	2.2	37.8	0.0	23.1	0.4	36.6	100.0	276
Residence								
Urban	13.6	58.9	1.4	2.8	0.1	23.2	100.0	639
Rural	3.8	62.7	2.3	9.0	0.0	22.3	100.0	507
Region								
Greater Monrovia	14.8	55.7	1.9	2.5	0.0	25.2	100.0	368
North Western	4.0	65.5	0.7	14.1	0.0	15.7	100.0	98
South Central	5.7	50.8	2.6	12.3	0.0	28.6	100.0	208
South Eastern A	5.9	59.4	4.0	6.4	0.0	24.3	100.0	86
South Eastern B	13.2	55.5	0.9	7.2	0.2	23.0	100.0	64
North Central	6.9	72.2	1.1	1.6	0.3	18.0	100.0	322
Education								
No education	7.6	56.8	1.0	8.9	0.0	25.8	100.0	364
Primary	5.9	61.3	2.6	6.2	0.0	23.9	100.0	336
Secondary or higher	13.1	63.1	1.8	2.4	0.2	19.4	100.0	446
Wealth quintile								
Lowest	5.2	57.7	1.8	12.7	0.0	22.6	100.0	256
Second	6.4	63.5	2.5	4.6	0.4	22.7	100.0	242
Middle	4.5	67.2	1.7	5.0	0.0	21.5	100.0	220
Fourth	11.3	57.3	1.9	3.3	0.0	26.2	100.0	246
Highest	21.8	56.7	0.8	0.6	0.0	20.1	100.0	181
Total	9.3	60.5	1.8	5.6	0.1	22.8	100.0	1,146

Table 3.5 Timing of first postnatal check for the mother

Among women age 15-49 giving birth in the 2 years preceding the survey, percent distribution of the mother's first postnatal check for the most recent live birth by time after delivery, and percentage of women with a live birth during the 2 years preceding the survey who received a postnatal check in the first 2 days after giving birth, according to background characteristics, Liberia MIS 2016

| Background characteristic | Time after delivery of mother's first postnatal checkup[1] | | | | | | | | Percentage of women with a postnatal checkup in the first 2 days after birth[2] | Number of women |
	Less than 4 hours	4-23 hours	1-2 days	3-6 days	7-41 days	Don't know/missing	No postnatal checkup[1]	Total		
Age at birth										
<20	64.8	2.9	7.3	2.0	1.9	2.0	19.1	100.0	75.0	277
20-34	69.1	4.3	4.9	1.0	2.4	3.3	15.0	100.0	78.3	719
35-49	65.7	4.0	6.6	3.4	3.3	0.7	16.4	100.0	76.2	150
Place of delivery										
Health facility	71.8	4.0	5.8	1.2	2.5	2.8	11.9	100.0	81.6	870
Elsewhere	54.5	3.4	5.5	2.8	2.1	2.2	29.5	100.0	63.4	276
Residence										
Urban	67.1	4.4	5.3	1.7	2.8	2.8	15.9	100.0	76.8	639
Rural	68.2	3.3	6.3	1.4	1.9	2.5	16.5	100.0	77.7	507
Region										
Greater Monrovia	66.4	3.9	4.5	1.9	0.6	4.0	18.7	100.0	74.8	368
North Western	79.4	1.8	3.1	1.3	1.9	1.4	11.1	100.0	84.3	98
South Central	58.5	5.9	6.9	1.5	3.5	1.9	21.6	100.0	71.4	208
South Eastern A	68.3	3.3	4.2	0.6	4.5	4.7	14.5	100.0	75.7	86
South Eastern B	71.3	1.9	3.8	1.6	1.7	1.2	18.5	100.0	77.0	64
North Central	70.3	3.8	8.0	1.5	3.5	1.7	11.2	100.0	82.0	322
Education										
No education	69.0	2.9	2.4	1.4	2.2	3.8	18.4	100.0	74.2	364
Primary	64.4	4.4	7.2	1.1	1.8	1.4	19.7	100.0	76.1	336
Secondary or higher	68.9	4.4	7.3	2.0	3.1	2.7	11.6	100.0	80.6	446
Wealth quintile										
Lowest	67.8	2.7	7.0	1.6	2.7	1.6	16.7	100.0	77.4	256
Second	65.4	5.7	6.2	1.4	3.5	2.5	15.3	100.0	77.3	242
Middle	68.8	4.1	5.6	2.8	1.6	1.8	15.3	100.0	78.5	220
Fourth	64.3	3.8	5.7	1.1	2.6	2.7	19.8	100.0	73.8	246
Highest	73.2	3.1	3.5	0.9	1.3	5.2	12.6	100.0	79.9	181
Total	67.6	3.9	5.7	1.6	2.4	2.7	16.1	100.0	77.2	1,146

[1] Includes women who received a check after 41 days
[2] Includes women who received a check from a doctor, nurse/midwife, physician assistant, community health worker/outreach, or traditional birth attendant

MALARIA PREVENTION

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4

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Key Findings

- ***Ownership of insecticide-treated nets (ITNs):*** More than half (62%) of the households in Liberia own at least one ITN. One quarter (25%) of the households in Liberia have at least one ITN for every two people.

- ***Sources of ITNs:*** Over 80% of ITNs owned by households were distributed during mass campaigns, and another 4% came from antenatal care visits.

- ***Access to ITNs:*** Over 4 in 10 people (42%) have access to an ITN, meaning that they could sleep under an ITN if every ITN in a household were used by two people.

- ***Use of ITNs:*** Thirty-nine percent of the household population, 44% of children under 5, and 40% of pregnant women slept under an ITN the night before the survey.

- ***Intermittent preventive therapy (IPTp):*** To prevent malaria during pregnancy, 55% of pregnant women received at least two doses of SP/Fansidar, and 22% received at least three doses.

his chapter describes the population coverage rates of some of the key malaria control interventions in Liberia, including the ownership and use of insecticide-treated nets (ITNs) and intermittent preventive treatment in pregnancy (IPTp). Malaria control efforts focus on scaling-up these interventions.

To reduce the prevalence of malaria, the Liberia Malaria Control Strategic Plan 2016-2020 envisions universal coverage of the population with ITNs through routine distribution and periodic mass campaigns.

4.1   OWNERSHIP OF INSECTICIDE-TREATED NETS

Ownership of insecticide-treated nets
Households that have at least one insecticide-treated net (ITN). An ITN is defined as (1) a factory-treated net that does not require any further treatment (long-lasting insecticidal net, or LLIN) or (2) a net that has been soaked with insecticide within the past 12 months.
Sample: Households

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

When properly used, ITNs protect households and communities from malaria. Their distribution and use are one of the central interventions for preventing malaria infection in Liberia.

The national strategy is to distribute nets across the country and to provide enough for all household residents. This indicator is operationalised as one ITN for every two household members.

The 2016 LMIS revealed that 62% of households in Liberia own at least one insecticide-treated net (ITN). Only 25% of households have one net for every two people sleeping in the household the night prior to the survey. Thus, to meet strategic goals, the scope of distribution needs to expand to reach the households who do not own any ITNs. In addition, the quantity of ITNs distributed to each household needs to increase until there is a sufficient number to protect each household resident (**Table 4.1**). The main reasons given to explain why households do not have enough mosquito nets are that the household did not receive any nets (42%) and that the nets were damaged (33%) **(Table 4.2).**

Additionally, 34% of households had disposed of at least one net in the 12 months preceding the survey **(Table 4.5).** Eighty-one percent of households who recently discarded mosquito nets had used them fewer than 2 years; 61% of these were hard nets **(Table 4.6).** Tearing was the main reason for disposal of nets (89%) **(Table 4.7).**

Trends: The proportion of households with at least one ITN increased from 47%, reported in the 2009 LMIS, to 62% in the 2016 LMIS **(Figure 4.1)**.

Patterns by background characteristics

- Households in the second to lowest wealth quintile are more likely to own at least one ITN than households in the highest wealth quintile **(Figure 4.2).**

- Households in South Central region are more likely than those in any other region to have at least one ITN **(Figure 4.3).**

- Rural households are more likely than urban households to own at least one ITN **(Table 4.1)**

Source of nets

Ninety percent of mosquito nets owned by households were free, while 10% were purchased. The mean cost was 330 Liberian dollars (equivalent to about US$3.50 at current exchange rates) **(Table 4.3)**. Eighty-one percent of households obtained an ITN through a mass distribution campaign **(Figure 4.4).**

***Figure 4.1* Trends in ITN Ownership**

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

LMIS 2009   LDHS 2011   LMIS 2013   LMIS 2016
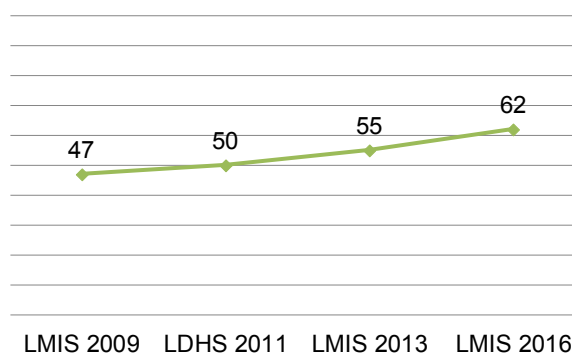
***Figure 4.2* ITN ownership by household wealth**

Percentage of households with at least one ITN

Lowest   Second   Middle   Fourth   Highest

Poorest ⟶ *Wealthiest*
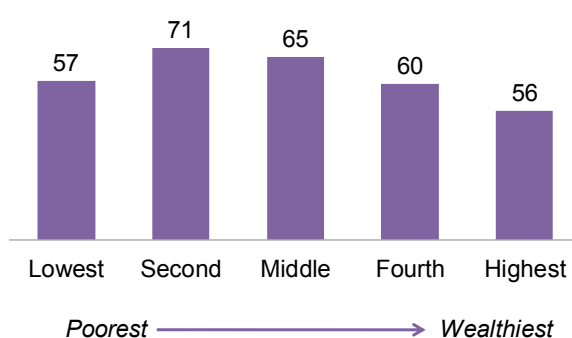
Figure 4.3 ITN ownership by region

Percentage of households with at least one ITN

North Western 63%

North Central 77%

South Central 45%

Greater Monrovia 56%

South Eastern A 64%

South Eastern B 70%

- ☐ < 55%
- ☐ 56% - 65%
- ■ > 66%
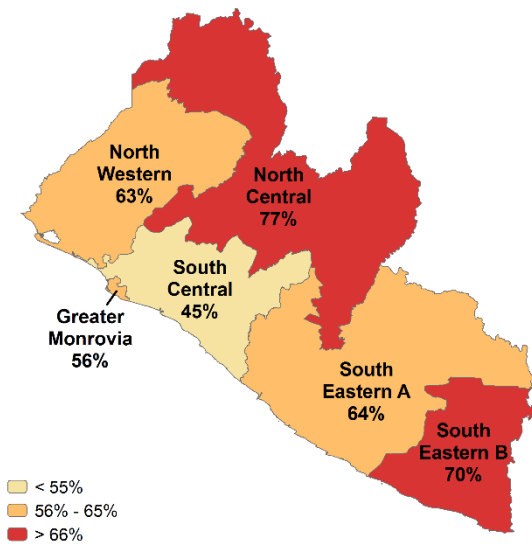
Figure 4.4 Source of ITNs

Percent distribution of ITNs in interviewed households

Mass campaigns	81
ANC distribution	4
Neighbour/Friend/Relative	3
Street Corner	2
Other	3
Shops/Market	7
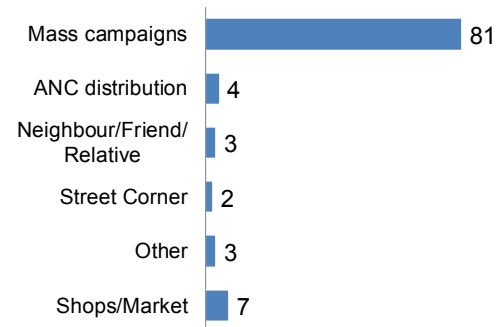
4.2   INDOOR RESIDUAL SPRAYING

Vector control interventions: Indoor residual spraying (IRS) in the past 12 months and/or ownership of insecticide-treated nets (ITNs)

Percentage of households in which someone has come into the dwelling to spray the interior walls against mosquitoes (IRS) in the past 12 months

Percentage of households with at least one ITN and/or IRS in the past 12 months

Sample: Households

In Liberia, indoor residual spraying (IRS), a component of integrated vector management strategy, is central to malaria prevention. The goal of IRS is to kill mosquitoes when they rest on an interior wall that has been sprayed with insecticide. The IRS program in Liberia began in 2009 with funding from the President's Malaria Initiative (PMI). The programme was implemented in 14 districts in 5 counties (Margibi, Bong, Grand Bassa, Montserrado, and Nimba) across two regions (North Central and South Central). The use of IRS can significantly reduce the mosquito population, thereby leading to rapid reductions in malaria transmission and subsequent morbidity and mortality. Given the limited coverage of the IRS programme, only 1% of all households in the country had IRS in the 12 months before the survey **(Table 4.9).**

Patterns by background characteristics

- Rural households are more likely than urban households to have had IRS in the 12 months preceding the survey **(Table 4.9).**

- South Central region had the highest percentage of households with IRS in the 12 months preceding the survey (4 %) **(Table 4.9).**

4.3 HOUSEHOLD ACCESS AND USE OF ITNS

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

Use of ITNs
Percentage of population that slept under an ITN the night before the survey.
Sample: De facto household population

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

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

Overall, only 42% of Liberians have access to an ITN (they could sleep under an ITN if each ITN in the household were used by up to two people) (**Table 4.10**). Thirty-nine percent of the population reported using an ITN the night before the survey (**Table 4.11**). Comparing these two population-level indicators, it is evident that the proportion of the population using ITNs is similar to the proportion with access to an ITN (39% and 42%, respectively). Thus, there is no major gap between ITN access and ITN use at the population level (**Figure 4.5**). Seventy-one percent of existing ITNs were used the night preceding the survey (**Table 4.12**). The major reason why mosquito nets were not used the night before the survey was that the net was not hung up or was stored away (49%) (**Table 4.8**).

Figure 4.5 Access to and use of ITNs

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

■ Access to an ITN ■ Slept under an ITN
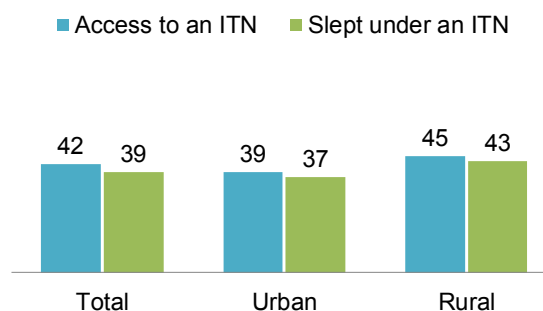
Patterns by background characteristics

- ITN utilisation is higher among household populations in rural areas than in urban areas (43% and 37% respectively). ITN use is highest in household populations in North Central (54%) and lowest in South Central (29%) (**Table 4.11**).

- In households owning at least one ITN, populations were most likely to use an ITN in North Western (69%) and North Central (70%) and least likely to use an ITN in South Eastern A (49%) (**Table 4.11**).

4.4 USE OF ITNS BY CHILDREN AND PREGNANT WOMEN

Malaria is endemic in Liberia with transmission occurring year-round. Natural immunity to the disease is acquired over time for those living in high transmission areas (Doolan et al. 2009). Children under 5 are prone to severe infection due to a lack of acquired immunity. For about 6 months following birth, antibodies acquired from the mother during pregnancy protect the child. This maternal immunity is

gradually lost when children start to develop their own immunity to malaria. Age is an important factor in determining levels of acquired immunity. Acquired immunity does not prevent infection but rather protects against severe disease and death. The pace at which immunity develops depends on the exposure to malarial infection, and in high malaria-endemic areas, children are thought to attain a high level of immunity by their fifth birthday. Such children may experience episodes of illness but usually do not suffer from severe, life-threatening conditions.

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

As stated in the Liberia National Strategic Plan 2016-2020, all children under age 5 and all pregnant women should sleep under an ITN or LLIN every night to prevent complications of malaria.

Overall, 44% of children under age 5 slept under an ITN the final night before the survey; so did 40% of pregnant women (**Table 4.13** and **Table 4.14**). In households with at least one ITN, the corresponding numbers were 66% of children under age 5 and 70% of pregnant women (**Table 4.13** and **Table 4.14**).

Trends:

ITN use increased from 26% to 44% among children under age 5 and from 33% to 40% among pregnant women between the 2009 LMIS and the 2016 LMIS (**Figure 4.8**).

Patterns by background characteristics

- The proportions of female and male children under age 5 who slept under an ITN the night preceding the survey were identical (44%) **(Table 4.13).**

- ITN use among children under age 5 is highest in North Western and North Central regions (56% each) and lowest in South Central (31%) **(Table 4.13).**

Figure 4.8 **ITN use by children and pregnant women**

Percentage of children and pregnant women using an ITN the night before the survey

- In households with at least one ITN, use by children under age 5 is highest for children younger than 12 months (72%) and lowest for children age 36-47 months (62%).

- Pregnant women in rural areas are more likely than pregnant women in urban areas to use ITNs (45% and 35%, respectively) **(Table 4.14).**

4.5   MALARIA IN PREGNANCY

Intermittent preventive treatment (IPTp) during pregnancy (IPTp2+)
Percentage of women who took at least two doses of SP/Fansidar during their last pregnancy with at least one dose received during an antenatal care visit.
Sample: Women age 15-49 with a live birth in the 2 years before the survey

Intermittent preventive treatment (IPTp) during pregnancy (IPTp3+)
Percentage of women who took at least three doses of SP/Fansidar during their last pregnancy with at least one dose received during an antenatal care visit.
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 Liberia, with substantial risks for the mother, her foetus, and the neonate. Intermittent preventive treatment of malaria in pregnancy (IPTp) is a full therapeutic course of antimalarial medicine given to pregnant women at routine antenatal care visits to prevent malaria. IPTp helps prevent maternal malaria episodes, maternal and foetal anaemia, placental parasitaemia, low birth weight, and neonatal mortality.

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

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

Eighty-two percent of women with a live birth in the 2 years preceding the survey received one or more doses of SP/Fansidar with at least one dose received during an ANC visit. Fifty-five percent received two or more doses of SP/Fansidar with at least one dose received during an ANC visit, and 22% received three or more doses of SP/Fansidar with at least one dose received during an ANC visit (**Table 4.15**).

Trends: The percentage of women receiving IPTp1+ increased from 55% in the 2009 LMIS to 82% in the 2016 LMIS. The proportion of women receiving two or more doses of SP/Fansidar for IPTp has increased from 45% in the 2009 LMIS to 55% in the 2016 LMIS. IPTp3+ has doubled from 10% in the 2009 LMIS to 22% in the 2016 LMIS (**Figure 4.9**).

Figure 4.9 **Trends in IPTp use by pregnant women**

Percentage of women with a live birth in the 2 years before the survey who received at least 1, 2, or 3 doses of SP/Fansidar with at least one during an ANC visit
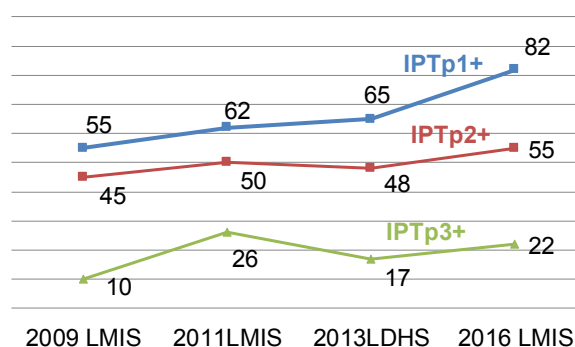
Patterns by background characteristics

- The use of IPTp3+ was slightly higher among rural woman (25%) than urban women (20%) **(Table 4.15)**

- IPTp3+ ranged from 14% in Greater Monrovia to 35% in South Eastern B region. **(Table 4.15)**

LIST OF TABLES

For detailed information on malaria, see the following tables:

Table 4.1 Household possession of mosquito nets

Percentage of households with at least one mosquito net (treated or untreated), insecticide-treated net (ITN), and long-lasting insecticidal net (LLIN); average number of nets, ITNs, and LLINs per household; and percentage of households with at least one net, ITN, and LLIN per two persons who stayed in the household last night, according to background characteristics, Liberia MIS 2016

Background characteristic	Percentage of households with at least one mosquito net			Average number of nets per household			Number of households	Percentage of households with at least one net for every two persons who stayed in the household last night[1]			Number of households with at least one person who stayed in the household last night
	Any mosquito net	Insecticide-treated mosquito net (ITN)[2]	Long-lasting insecticidal net (LLIN)	Any mosquito net	Insecticide-treated mosquito net (ITN)[2]	Long-lasting insecticidal net (LLIN)		Any mosquito net	Insecticide-treated mosquito net (ITN)[2]	Long-lasting insecticidal net (LLIN)	
Residence											
Urban	59.9	58.9	58.4	1.2	1.2	1.2	2,382	23.1	22.8	22.6	2,376
Rural	66.0	65.0	64.7	1.2	1.2	1.2	1,836	29.0	28.3	28.3	1,823
Region											
Greater Monrovia	56.9	55.5	54.8	1.2	1.1	1.1	1,392	22.7	22.4	22.0	1,390
North Western	64.6	63.3	63.2	1.1	1.1	1.1	424	31.1	30.5	30.4	419
South Central	46.8	45.4	44.8	0.9	0.9	0.9	761	19.2	17.7	17.7	757
South Eastern A	64.5	63.9	63.9	1.3	1.2	1.2	291	28.9	28.5	28.5	290
South Eastern B	71.5	70.3	70.3	1.7	1.6	1.6	231	30.8	30.5	30.5	228
North Central	77.0	76.9	76.8	1.5	1.5	1.5	1,119	29.9	29.8	29.8	1,115
Wealth quintile											
Lowest	57.0	56.7	56.6	1.0	1.0	1.0	911	25.3	25.1	25.1	905
Second	71.8	70.8	70.3	1.4	1.4	1.4	812	27.8	26.6	26.6	809
Middle	66.1	65.3	65.2	1.3	1.3	1.3	827	25.7	25.2	25.2	823
Fourth	60.8	59.7	59.2	1.2	1.1	1.1	860	23.6	23.4	23.0	859
Highest	57.6	55.7	55.0	1.3	1.3	1.2	808	26.1	25.7	25.5	804
Total	62.5	61.5	61.1	1.2	1.2	1.2	4,218	25.7	25.2	25.1	4,200

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

Table 4.2 Reasons for not having mosquito nets

Among households without mosquito nets, percentage reporting various reasons for not having a mosquito net, according to background characteristics, Liberia MIS 2016

Background characteristic	No mosquitos	Not Available	Don't like to use nets	Too expensive	Did not receive	Spoiled	Have window screens	Other	Number of households without mosquito nets
Residence									
Urban	1.5	22.2	11.6	6.2	38.8	29.7	2.1	4.2	956
Rural	1.3	13.0	1.8	2.2	47.8	38.0	0.0	1.2	625
Region									
Greater Monrovia	2.2	23.9	17.0	6.6	32.5	24.9	2.7	5.8	599
North Western	0.6	7.4	1.0	1.2	67.5	24.2	0.0	0.0	150
South Central	1.0	9.6	2.3	1.9	48.9	38.3	0.3	0.9	404
South Eastern A	2.5	30.8	3.6	1.6	32.4	29.6	0.4	1.5	104
South Eastern B	3.3	21.2	2.4	0.8	46.0	36.9	0.0	2.3	66
North Central	0.0	21.2	2.0	8.2	43.6	48.9	1.0	2.3	257
Wealth quintile									
Lowest	1.3	15.4	1.5	5.0	49.8	40.7	0.0	1.2	391
Second	0.7	14.5	0.6	2.8	49.7	39.2	0.0	1.1	229
Middle	0.7	16.1	3.9	5.7	45.9	31.7	1.0	0.9	280
Fourth	0.8	22.8	9.4	3.5	38.6	28.9	1.5	5.0	337
Highest	3.3	22.7	21.4	5.6	29.8	25.0	3.5	6.1	343
Total	1.4	18.6	7.8	4.6	42.4	33.0	1.3	3.0	1,580

Note: Percentages may sum to more than 100.0 because more than one reason can be given.

Table 4.3 Cost of mosquito nets

Percent distribution of mosquito nets by whether obtained free or bought, and among nets that were bought, the mean cost, according to background characteristics, Liberia MIS 2016

Background characteristic	For all nets reported by household					For nets that were bought	
	Bought	Obtained free	Don't know	Total	Number of nets	Mean cost in Liberian dollars	Number of nets
Residence							
Urban	15.0	84.8	0.2	100.0	2,952	347	425
Rural	3.1	96.9	0.0	100.0	2,277	218	67
Region							
Greater Monrovia	20.3	79.4	0.3	100.0	1,639	357	322
North Western	3.9	96.1	0.0	100.0	469	(253)	18
South Central	10.9	89.1	0.0	100.0	682	281	63
South Eastern A	3.2	96.7	0.1	100.0	365	*	12
South Eastern B	1.8	98.0	0.0	100.0	385	(317)	7
North Central	4.2	95.8	0.0	100.0	1,689	(251)	70
Wealth quintile							
Lowest	5.2	94.7	0.0	100.0	953	(205)	46
Second	3.7	96.2	0.0	100.0	1,141	(200)	39
Middle	6.0	94.0	0.0	100.0	1,086	303	64
Fourth	15.0	84.5	0.5	100.0	1,009	322	151
Highest	19.8	80.2	0.0	100.0	1,040	401	192
Total	9.8	90.1	0.1	100.0	5,229	330	492

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

Table 4.4 Source of mosquito nets

Percent distribution of mosquito nets by where mosquito net was obtained, according to background characteristics, Liberia MIS 2016

Background characteristic	Mass distribution	ANC visit	During a delivery at a health facility	Government health facility	Private health facility	Shop/ market	Community health worker	Religious institution	Street corner	Neighbour/ friend/ relative	Other	Don't know/ missing	Total	Number of nets
Type of net														
ITN[1]	81.6	3.7	1.2	0.9	0.2	6.8	0.1	0.1	2.2	3.0	0.1	0.1	100.0	5,134
Other[2]	39.6	15.2	2.9	3.0	0.0	28.3	0.0	0.0	1.8	7.4	0.0	1.8	100.0	96
Residence														
Urban	75.8	3.0	0.9	1.2	0.3	11.0	0.1	0.2	3.6	3.5	0.3	0.1	100.0	2,952
Rural	87.3	5.1	1.7	0.6	0.1	2.1	0.0	0.0	0.4	2.6	0.0	0.0	100.0	2,277
Region														
Greater Monrovia	70.6	3.0	0.4	0.4	0.1	14.9	0.1	0.2	5.4	4.5	0.2	0.2	100.0	1,639
North Western	87.0	3.8	0.9	1.0	0.1	1.9	0.0	0.0	1.5	3.5	0.0	0.0	100.0	469
South Central	75.6	8.7	1.7	1.4	0.0	8.2	0.2	0.4	1.1	2.2	0.3	0.1	100.0	682
South Eastern A	83.0	4.2	2.9	1.4	0.2	2.7	0.0	0.0	0.4	5.1	0.1	0.0	100.0	365
South Eastern B	86.9	6.3	2.1	0.8	0.1	0.9	0.0	0.0	0.6	1.9	0.2	0.0	100.0	385
North Central	89.3	2.3	1.4	1.1	0.4	3.1	0.0	0.0	0.6	1.9	0.0	0.0	100.0	1,689
Wealth quintile														
Lowest	87.2	4.4	1.0	0.1	0.3	4.0	0.0	0.0	0.8	2.2	0.0	0.0	100.0	953
Second	85.9	4.7	2.2	1.5	0.3	2.3	0.0	0.0	0.4	2.7	0.0	0.0	100.0	1,141
Middle	84.8	4.5	1.4	1.0	0.0	4.4	0.0	0.2	1.4	2.1	0.0	0.0	100.0	1,086
Fourth	74.2	3.1	1.0	0.7	0.1	9.6	0.0	0.4	4.3	5.7	0.5	0.5	100.0	1,009
Highest	71.8	2.8	0.3	1.1	0.2	15.8	0.3	0.0	4.3	3.1	0.2	0.0	100.0	1,040
Total	80.8	3.9	1.2	0.9	0.2	7.2	0.1	0.1	2.2	3.1	0.1	0.1	100.0	5,229

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

Table 4.5 Disposal of mosquito nets

Percentage of households that disposed of at least one net in the past 12 months, according to background characteristics, Liberia MIS 2016

Background characteristic	Percentage of households that disposed of at least one net	Number of households
Residence		
Urban	32.2	2,382
Rural	35.7	1,836
Region		
Greater Monrovia	31.9	1,392
North Western	36.1	424
South Central	31.7	761
South Eastern A	24.8	291
South Eastern B	44.7	231
North Central	36.4	1,119
Wealth quintile		
Lowest	30.8	911
Second	39.2	812
Middle	36.4	827
Fourth	29.5	860
Highest	33.1	808
Total	33.7	4,218

Table 4.6 Use and type of disposed mosquito nets

Among households that disposed of at least one mosquito net in the past 12 months, percent distribution by duration of use prior to disposal of the most recently disposed net, and percentage of nets disposed by type of net, according to background characteristics, Liberia MIS 2016

Background characteristic	Duration of use of mosquito net prior to disposal					Number of mosquito nets disposed	Type of mosquito net disposed				Number of mosquito nets disposed
	Less than 2 years	2-4 years	More than 4 years	Don't know	Total		Soft	Hard	Don't know	Total	
Residence											
Urban	85.2	9.0	1.0	4.7	100.0	766	53.1	44.7	2.2	100.0	766
Rural	76.7	19.9	2.5	0.9	100.0	655	71.2	28.7	0.1	100.0	655
Region											
Greater Monrovia	86.2	7.2	0.2	6.3	100.0	444	49.7	47.9	2.4	100.0	444
North Western	85.5	14.2	0.0	0.3	100.0	153	76.7	23.3	0.0	100.0	153
South Central	82.8	12.7	3.1	1.4	100.0	241	52.2	47.3	0.5	100.0	241
South Eastern A	69.8	24.0	5.4	0.9	100.0	72	48.0	50.8	1.2	100.0	72
South Eastern B	55.3	31.6	11.1	2.0	100.0	103	62.8	36.6	0.6	100.0	103
North Central	82.2	16.0	0.0	1.8	100.0	407	75.9	23.1	1.1	100.0	407
Wealth quintile											
Lowest	76.5	19.2	3.8	0.5	100.0	281	64.4	35.5	0.0	100.0	281
Second	82.2	15.4	1.4	1.0	100.0	318	71.0	27.9	1.1	100.0	318
Middle	79.3	17.4	2.1	1.2	100.0	301	66.4	33.6	0.0	100.0	301
Fourth	84.6	9.8	1.0	4.6	100.0	253	54.3	44.8	1.0	100.0	253
Highest	84.4	7.3	0.0	8.3	100.0	268	48.1	47.6	4.3	100.0	268
Total	81.3	14.1	1.7	3.0	100.0	1,421	61.4	37.3	1.2	100.0	1,421

Table 4.7 Main reason for disposing of mosquito nets

Among households that disposed of at least one mosquito net in the past 12 months, percent distribution by the main reason for disposal of the most recent net, according to background characteristics, Liberia MIS 2016

Background characteristic	Torn	No longer repelled mosqui-tos	Got a new one	Put in storage/ end of rainy season	Installed screens	Itching/ Skin irritation/ health problems	Can't breathe/ too hot	Toxic chemi-cals	Other	Missing	Total	Number of mosquito nets disposed
Residence												
Urban	84.2	1.6	6.8	0.7	0.2	0.6	1.6	0.2	3.7	0.3	100.0	766
Rural	94.9	0.9	1.0	0.3	0.1	0.0	0.3	0.2	2.2	0.0	100.0	655
Region												
Greater Monrovia	77.8	1.3	10.1	1.1	0.3	0.9	2.5	0.4	5.7	0.0	100.0	444
North Western	96.5	0.0	1.8	1.1	0.0	0.0	0.0	0.6	0.0	0.0	100.0	153
South Central	91.0	0.5	1.7	0.0	0.1	0.3	1.0	0.0	5.3	0.0	100.0	241
South Eastern A	92.9	1.2	2.2	0.3	1.4	0.0	0.7	0.6	0.6	0.0	100.0	72
South Eastern B	87.9	3.2	3.9	0.5	0.0	0.0	0.3	0.0	4.2	0.0	100.0	103
North Central	97.3	1.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.6	100.0	407
Wealth quintile												
Lowest	95.8	1.4	0.8	0.2	0.0	0.0	0.3	0.3	1.1	0.0	100.0	281
Second	94.9	0.3	1.2	0.0	0.0	0.0	0.0	0.1	3.5	0.0	100.0	318
Middle	93.8	1.4	2.6	0.3	0.3	0.0	0.0	0.0	1.6	0.0	100.0	301
Fourth	79.7	2.2	8.8	1.3	0.5	0.8	3.7	0.0	2.9	0.0	100.0	253
Highest	79.1	1.3	8.4	0.8	0.1	1.1	1.5	0.6	6.3	0.9	100.0	268
Total	89.2	1.3	4.1	0.5	0.2	0.3	1.0	0.2	3.0	0.2	100.0	1,421

Table 4.8 Reasons for not using mosquito nets

Percentage of mosquito nets not used the night before the survey, and among those nets, reasons given for not using the net, according to background characteristics, Liberia MIS 2016

Background characteristic	Too hot/ difficult to breathe	Size of the bed	Not hung up/stored away	Net not in good condition	Material too hard/rough	Child does not like	Itching/ skin irritation	Bad for health	Super-stition/ witchcraft	Too weak to hang	Chemical smell/toxic	Saving for later	No mosquitos	Usual user(s) did not sleep in household	Other	Don't know	Number of nets not used the night before the survey
Residence																	
Urban	19.8	3.8	51.5	3.7	3.2	1.7	4.2	0.2	0.4	2.4	2.4	11.1	3.4	6.6	6.5	0.4	884
Rural	6.6	0.9	44.6	9.2	0.5	0.9	0.1	0.1	0.5	1.0	0.0	22.4	6.6	8.2	7.2	0.2	606
Region																	
Greater Monrovia	24.4	4.7	48.7	3.4	4.0	2.4	6.1	0.3	0.0	2.2	2.9	7.9	3.8	4.4	7.4	0.6	598
North Western	13.0	1.0	51.0	3.0	0.2	1.3	0.0	0.3	0.0	0.4	0.0	34.0	10.1	9.2	5.0	0.0	133
South Central	9.8	1.1	56.2	8.7	0.5	0.0	0.0	0.0	0.0	0.9	1.8	9.5	6.5	5.7	5.3	0.0	200
South Eastern A	5.6	1.0	45.4	10.5	2.5	0.4	0.2	0.3	1.8	3.2	0.0	17.2	5.5	8.1	4.3	0.0	153
South Eastern B	4.9	1.7	54.4	5.8	0.5	0.8	0.5	0.0	0.2	1.8	0.0	13.5	4.6	9.8	5.6	0.6	153
North Central	6.2	1.4	40.3	8.7	0.8	1.1	0.0	0.0	1.3	1.7	0.0	30.0	2.3	12.3	9.6	0.0	255
Wealth quintile																	
Lowest	3.7	0.4	46.5	9.1	1.4	1.3	0.1	0.0	1.1	1.2	0.0	19.0	5.9	10.7	9.4	0.0	254
Second	4.5	0.2	42.5	7.5	0.2	0.0	0.2	0.3	0.0	1.6	0.0	23.7	3.5	11.0	6.4	0.4	250
Middle	9.4	2.9	48.2	7.1	0.3	0.5	0.7	0.0	0.1	1.9	1.0	22.9	6.1	6.9	6.1	0.0	249
Fourth	24.7	2.8	50.1	5.0	4.4	1.7	0.5	0.5	0.0	0.0	3.6	14.5	4.9	2.2	4.9	0.0	315
Highest	21.9	5.1	53.0	3.2	3.0	2.5	7.8	0.0	0.8	3.7	1.7	5.8	3.8	7.0	7.2	0.8	424
Total	14.4	2.6	48.7	6.0	2.1	1.4	2.5	0.2	0.4	1.8	1.4	15.7	4.7	7.3	6.8	0.3	1,490

[1] Percentage may sum to more than 100 because more than one reason could be given.

Table 4.9 Indoor residual spraying against mosquitoes

Percentage of households in which someone has come into the dwelling to spray the interior walls against mosquitoes (IRS) in the past 12 months, the percentage of households with at least one ITN and/or IRS in the past 12 months, and the percentage of households with at least one ITN for every two persons and/or IRS in the past 12 months, according to background characteristics, Liberia MIS 2016

Background characteristic	Percentage of households with IRS[1] in the past 12 months	Percentage of households with at least one ITN[2] and/or IRS in the past 12 months	Percentage of households with at least one ITN[2] for every two persons and/or IRS in the past 12 months	Number of households
Residence				
Urban	0.9	59.2	23.4	2,382
Rural	1.6	65.8	29.2	1,836
Region				
Greater Monrovia	0.4	55.7	22.6	1,392
North Western	0.0	63.3	30.1	424
South Central	4.2	47.8	20.5	761
South Eastern A	1.0	64.0	28.8	291
South Eastern B	0.0	70.3	30.2	231
North Central	0.9	77.2	30.6	1,119
Wealth quintile				
Lowest	0.3	56.8	25.2	911
Second	3.0	72.1	28.5	812
Middle	1.2	66.0	26.1	827
Fourth	1.0	60.3	24.2	860
Highest	0.6	55.9	25.8	808
Total	1.2	62.1	25.9	4,218

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

Table 4.10 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, Liberia MIS 2016

Number of ITNs	Number of persons who stayed in the household the night before the survey								Total
	1	2	3	4	5	6	7	8+	
0	49.4	44.5	45.4	35.3	36.9	28.5	36.7	33.3	35.6
1	39.6	35.1	29.9	34.3	27.3	20.4	18.2	14.9	22.3
2	6.8	14.3	16.0	19.6	17.8	27.3	19.6	14.4	17.7
3	4.0	5.5	6.7	9.3	13.8	19.1	20.2	24.7	17.6
4	0.2	0.1	0.4	1.3	0.5	3.4	3.0	4.7	2.8
5	0.0	0.5	0.6	0.0	1.6	0.3	1.3	4.1	2.0
6	0.0	0.1	1.0	0.2	0.9	0.6	0.9	2.2	1.2
7	0.0	0.0	0.0	0.1	1.2	0.4	0.1	1.7	0.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number	426	957	1,739	2,150	2,901	2,871	2,370	7,727	21,141
Percent with access to an ITN[1,2]	50.6	55.5	44.6	47.6	43.1	48.8	39.0	34.2	41.5

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

Table 4.11 Use of mosquito nets by persons in the household

Percentage of the de facto household population who slept the night before the survey under a mosquito net (treated or untreated), under an insecticide-treated net (ITN), under a long-lasting insecticidal net (LLIN), and under an ITN or in a dwelling in which the interior walls have been sprayed against mosquitoes (IRS) in the past 12 months; and among the de facto household population in households with at least one ITN, the percentage who slept under an ITN the night before the survey, according to background characteristics, Liberia MIS 2016

Background characteristic	Household population					Household population in households with at least one ITN[1]	
	Percentage who slept under any mosquito net last night	Percentage who slept under an ITN[1] last night	Percentage who slept under an LLIN last night	Percentage who slept under an ITN[1] last night or in a dwelling sprayed with IRS[2] in the past 12 months	Number of persons	Percentage who slept under an ITN[1] last night	Number of persons
Age							
<5	44.8	43.7	43.5	44.2	3,315	65.7	2,206
5-14	35.6	34.9	34.8	35.4	6,338	53.7	4,128
15-34	36.4	35.7	35.6	36.5	6,538	57.2	4,085
35-49	46.5	45.7	45.6	46.7	2,738	73.2	1,709
50+	48.5	47.6	47.6	48.4	2,187	70.4	1,479
Sex							
Male	38.6	37.9	37.8	38.6	10,308	59.0	6,622
Female	41.3	40.6	40.4	41.2	10,833	62.7	7,002
Residence							
Urban	37.7	36.8	36.7	37.4	12,483	58.5	7,857
Rural	43.4	42.8	42.6	43.5	8,658	64.2	5,767
Region							
Greater Monrovia	33.3	32.0	31.8	32.1	7,072	53.6	4,218
North Western	46.7	46.0	45.9	46.0	1,672	69.1	1,112
South Central	30.1	28.9	28.7	31.2	3,689	59.3	1,800
South Eastern A	32.1	32.1	32.1	32.4	1,434	49.2	935
South Eastern B	40.3	39.9	39.8	39.9	1,258	55.3	907
North Central	53.9	53.8	53.8	54.6	6,017	69.6	4,652
Wealth quintile							
Lowest	37.1	36.9	36.8	37.1	4,197	62.9	2,462
Second	49.4	48.8	48.6	49.8	4,201	67.8	3,026
Middle	44.5	44.0	44.0	44.9	4,220	63.3	2,938
Fourth	38.3	36.8	36.6	37.9	4,238	58.2	2,684
Highest	30.9	29.8	29.7	30.1	4,286	50.8	2,514
Total	40.0	39.3	39.1	39.9	21,141	60.9	13,625

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

Table 4.12 Use of existing ITNs

Percentage of insecticide-treated nets (ITNs) that were used by anyone the night before the survey, according to background characteristics, Liberia MIS 2016

Background characteristic	Percentage of existing ITNs[1] used last night	Number of ITNs[1]
Residence		
Urban	69.5	2,895
Rural	73.5	2,239
Region		
Greater Monrovia	62.3	1,593
North Western	72.0	461
South Central	70.4	655
South Eastern A	58.2	363
South Eastern B	60.7	378
North Central	85.0	1,684
Wealth quintile		
Lowest	73.5	947
Second	78.3	1,120
Middle	76.9	1,072
Fourth	68.4	983
Highest	57.9	1,011
Total	71.2	5,134

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

Table 4.13 Use of mosquito nets by children

Percentage of children under age 5 who, the night before the survey, slept under a mosquito net (treated or untreated), under an insecticide-treated net (ITN), under a long-lasting insecticidal net (LLIN), and under an ITN or in a dwelling in which the interior walls have been sprayed against mosquitoes (IRS) in the past 12 months; and among children under 5 years of age in households with at least one ITN, the percentage who slept under an ITN the night before the survey, according to background characteristics, Liberia MIS 2016

Background characteristic	Children under age 5 in all households					Children under age 5 in households with at least one ITN[1]	
	Percentage who slept under any mosquito net last night	Percentage who slept under an ITN[1] last night	Percentage who slept under an LLIN last night	Percentage who slept under an ITN[1] last night or in a dwelling sprayed with IRS[2] in the past 12 months	Number of children	Percentage who slept under an ITN[1] last night	Number of children
Age in months							
<12	50.1	48.5	47.9	48.7	645	72.4	432
12-23	44.5	43.7	43.5	45.0	632	64.1	431
24-35	44.2	42.9	42.9	43.1	620	65.7	405
36-47	42.0	40.8	40.8	40.8	697	61.8	460
48-59	43.7	42.9	42.8	43.7	722	64.7	478
Sex							
Male	45.2	43.7	43.6	44.4	1,702	66.1	1,125
Female	44.4	43.7	43.4	44.1	1,613	65.2	1,081
Residence							
Urban	43.2	42.0	41.9	42.3	1,740	65.5	1,116
Rural	46.6	45.6	45.2	46.4	1,575	65.9	1,090
Region							
Greater Monrovia	38.6	36.7	36.7	36.9	942	61.2	566
North Western	56.7	55.9	55.6	55.9	283	77.0	205
South Central	33.6	31.2	30.5	33.5	620	61.8	313
South Eastern A	33.2	33.1	33.1	33.1	197	50.0	130
South Eastern B	44.7	43.9	43.7	43.9	201	62.2	142
North Central	55.8	55.8	55.7	55.9	1,073	70.4	850
Wealth quintile							
Lowest	39.6	39.0	38.9	39.0	766	64.4	464
Second	53.1	52.2	51.7	52.7	771	69.7	577
Middle	48.8	48.2	48.1	49.7	674	67.1	484
Fourth	42.5	40.1	40.1	40.4	597	65.6	365
Highest	37.6	36.1	36.1	36.4	508	58.0	316
Total	44.8	43.7	43.5	44.2	3,315	65.7	2,206

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

Table 4.14 Use of mosquito nets by pregnant women

Percentage of pregnant women age 15-49 who, the night before the survey, slept under a mosquito net (treated or untreated), under an insecticide-treated net (ITN), under a long-lasting insecticidal net (LLIN), and under an ITN or in a dwelling in which the interior walls have been sprayed against mosquitoes (IRS) in the past 12 months; and among pregnant women age 15-49 in households with at least one ITN, the percentage who slept under an ITN the night before the survey, according to background characteristics, Liberia MIS 2016

Background characteristic	Among pregnant women age 15-49 in all households					Among pregnant women age 15-49 in households with at least one ITN[1]	
	Percentage who slept under any mosquito net last night	Percentage who slept under an ITN[1] last night	Percentage who slept under an LLIN last night	Percentage who slept under an ITN[1] last night or in a dwelling sprayed with IRS[2] in the past 12 months	Number of pregnant women	Percentage who slept under an ITN[1] last night	Number of pregnant women
Residence							
Urban	37.1	35.4	35.4	35.4	177	65.3	96
Rural	50.2	45.3	45.3	45.3	127	75.8	76
Region							
Greater Monrovia	(32.5)	(29.2)	(29.2)	(29.2)	91	*	45
North Western	(68.6)	(60.4)	(60.4)	(60.4)	25	(84.8)	18
South Central	32.3	26.4	26.4	26.4	70	*	23
South Eastern A	33.5	33.5	33.5	33.5	28	(65.2)	14
South Eastern B	(60.1)	(60.1)	(60.1)	(60.1)	15	(69.9)	13
North Central	(55.3)	(55.3)	(55.3)	(55.3)	76	(70.1)	60
Education							
No education	36.0	34.3	34.3	34.3	123	69.5	61
Primary	49.9	44.9	44.9	44.9	83	68.3	54
Secondary or higher	44.5	41.5	41.5	41.5	99	72.0	57
Wealth quintile							
Lowest	35.8	35.8	35.8	35.8	64	72.9	32
Second	57.5	47.2	47.2	47.2	60	(81.4)	35
Middle	48.8	48.8	48.8	48.8	66	(75.7)	43
Fourth	(49.4)	(44.5)	(44.5)	(44.5)	60	(64.3)	42
Highest	(17.9)	(17.9)	(17.9)	(17.9)	53	*	21
Total	42.5	39.5	39.5	39.5	304	69.9	172

Note: Table is based on women who stayed in the household the night before the interview. An asterisk indicates that the figure is based on fewer than 25 unweighted cases and has been suppressed. Figures in parentheses are based on 25-49 unweighted cases.
[1] An insecticide-treated net (ITN) is a factory-treated net that does not require any further treatment (LLIN) or a net that has been soaked with insecticide within the past 12 months.
[2] Indoor residual spraying (IRS) is limited to spraying conducted by a government, private, or non-governmental organization.

Table 4.15 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, at least one of which was received during an ANC visit, received two or more doses of SP/Fansidar, at least one of which was received during an ANC visit, and received three or more doses of SP/Fansidar, at least one of which was received during an ANC visit, according to background characteristics, Liberia MIS 2016

Background characteristic	Percentage who received one or more doses of SP/Fansidar[1]	Percentage who received two or more doses of SP/Fansidar[1]	Percentage who received three or more doses of SP/Fansidar[1]	Number of women with a live birth in the 2 years preceding the survey
Residence				
Urban	81.8	51.6	20.1	639
Rural	82.9	58.2	24.8	507
Region				
Greater Monrovia	76.8	47.1	13.5	368
North Western	90.3	67.8	25.9	98
South Central	72.4	38.6	16.6	208
South Eastern A	86.8	60.6	29.1	86
South Eastern B	86.4	68.4	35.4	64
North Central	90.5	64.9	30.1	322
Education				
No education	76.1	47.4	21.3	364
Primary	88.4	65.1	26.4	336
Secondary or higher	82.8	52.3	19.7	446
Wealth quintile				
Lowest	76.8	48.7	19.2	256
Second	88.0	65.5	28.8	242
Middle	88.2	60.9	28.7	220
Fourth	79.2	51.9	20.3	246
Highest	79.6	43.8	12.1	181
Total	82.3	54.5	22.2	1,146

[1] Received the specified number of doses of SP/Fansidar, at least one of which was received during an ANC visit

MANAGEMENT OF FEVER, ANAEMIA, AND MALARIA IN CHILDREN

5

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Key Findings

- **Fever prevalence:** Thirty-eight 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 78% of children with fever in the 2 weeks before the survey.

- **Source of advice or treatment:** Among children with recent fever for whom care was sought, 59% received advice or treatment from the public sector, 34% from the private sector, and only 8% elsewhere.

- **Testing:** Fifty percent of children with a recent fever received a finger or heel prick for testing.

- **Type of antimalarial drug used:** Among children under age 5 with a recent fever who received an antimalarial, 81% received artemisinin combination therapy.

- **Severe anaemia:** Eight percent of children age 6-59 months have a haemoglobin level less than 8 g/dl.

- **Malaria:** Forty-five percent of children age 6-59 months tested positive with a rapid diagnostic test for malaria.

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

Fever management strategies are useful when assessing a child who may have malaria. A key case management objectives of the National Malaria Control Programme (NMCP) is to ensure that all suspected cases of malaria have access to confirmatory diagnosis and receive effective treatment. Fever is a key symptom of malaria and other acute infections. Prompt and effective diagnosis and treatment will prevent malaria morbidity and mortality.

5.1 PREVALENCE OF FEVER AMONG THE HOUSEHOLD POPULATION AND COST OF TREATMENT

Malaria is a leading cause of death in Liberia. It not only presents Liberian families with a burden of illness and disease but also presents them with a financial challenge. The cost of treatment can be considerable, with payments demanded for medicine and transport to a hospital or clinic. The 2016 LMIS provides basic information about the health care costs for household members. The survey's Household Questionnaire asked six questions of every household member. Had he or she been sick with fever at any time in the past 4 weeks? If so, had any treatment been received? Where did the treatment take place, and how much did it cost? Interviewers also asked if the person had been tested for malaria and, if the answer was 'yes,' did they receive the results.

When interpreting these results, it is important to remember that responses to questions asked in the Household Questionnaire may lack the perspective of the individual with fever, who may or may not have been consulted during the survey interview. Inaccuracies can occur.

In the 4 weeks preceding the survey, 29% of the household population reported having been sick with fever. Among those with fever, 76% sought treatment. Of those who sought treatment, only 63% were tested for malaria. Of those tested, however, 96% received results (**Table 5.1**).

Patterns by background characteristics

- Urban residents are less likely to have had a fever in the 4 weeks preceding the survey than rural residents (25% vs. 35%). However, those living in urban areas are more likely to seek treatment when they have fever; 80% of the urban population sought treatment compared with 73% of the rural population (**Table 5.1**).

- Thirty-five percent of those with fever who sought treatment went to a government health clinic, 15% went to a private hospital or clinic, and 14% went to a medicine store (**Table 5.2**).

- Overall, half of people with fever who sought treatment received free treatment. Higher percentages of people received free treatment from government-supported facilities, such as government hospitals (82%), health centres (88%), and health clinics (90%) (**Table 5.2**).

- Among those who paid for treatment of the fever, the mean cost was 885 Liberian dollars (approximately US$9.50).

5.2 CARE SEEKING FOR CHILDREN WITH FEVER

> **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 2 weeks before the survey, as reported by the child's mother

Thirty-eight percent of children under age 5 had fever in the 2 weeks preceding the survey. Among children under age 5 with fever, advice or treatment was sought for 78% and timely care seeking (the same or next day following fever onset) occurred for 32% of the febrile children (**Table 5.3**).

Among children with recent fever, most received advice or treatment from the public health sector (46%), with 32% seeking care from a government health clinic, and 8% from a government hospital. Only 27% of children with fever sought advice or treatment from a private sector source (**Table 5.4**).

Trends: There has been an increase in the proportion of children under 5 with fever for whom advice or treatment is sought, up from 71% in 2013 to 78% in 2016. Care seeking from a public (government) source has increased, while seeking health care from private and other sources has decreased. (**Figure 5.1**).

Patterns by background characteristics

- The percentage of children with fever in the 2 weeks preceding the survey was higher in rural areas (43%) than urban areas (34%) (**Table 5.3**).

- The prevalence of fever among children is highest in North Western region (53%) and lowest in Greater Monrovia (31%) (**Table 5.3**).

- Monrovia has the highest percentage of children for whom advice or treatment was sought (87%), while South Eastern A has the lowest (72%) (**Table 5.3**).

Figure 5.1 Trends in care seeking for fever in children by source of care

Percent of children under age 5 with fever in the 2 weeks preceding the survey for whom advice or treatment was sought

- The percentage of children under age 5 for whom advice or treatment was sought the same or next day increases with the mother's level of education (**Table 5.3**).
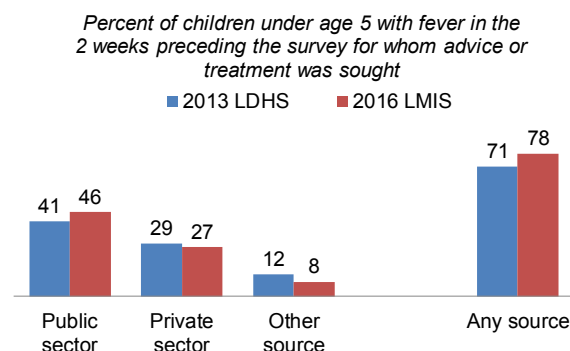
5.3 DIAGNOSTIC TESTING OF CHILDREN WITH FEVER

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

The National Malaria Control Programme 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 2016 LMIS asked interviewed women with children under 5 who had a fever in the 2 weeks before the survey if the child had blood taken from a finger or heel for testing during the illness. This information is used as a proxy measure for adherence to the NMCP policy of conducting diagnostic testing for all suspected malaria cases.

In the 2016 LMIS, only 50% 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 5.3**).

Trends: The percentage of children who had blood taken from a finger or heel for testing increased from 33% in the 2011 LMIS to 42% in the 2013 LDHS and to 50% in the 2016 LMIS. This shows improved adherence to the malaria treatment policy of testing before treatment.

Patterns by background characteristics

- Urban children under 5 with fever are more likely than rural children to have blood taken from a finger or heel for testing (55% versus 45%) (**Table 5.3**).

- Sixty-one percent of children under 5 with recent fever in North Western region had blood taken from a finger or heel for testing, compared with only 43% in North Central region (**Figure 5.2**).

Figure 5.2 Diagnostic testing of children with fever by region

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

- The percentage of children under 5 with recent fever who had blood taken from a finger or heel for testing was similar for girls and boys **(Table 5.3).**

5.4 USE OF RECOMMENDED ANTIMALARIALS

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

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

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

Artemisinin-based combination therapy (ACT) is the recommended first-line antimalarial drug for the treatment of uncomplicated malaria in Liberia.

According to the results shown in **Table 5.5**, most children under age 5 with recent fever who received an antimalarial took an ACT (81%). Less than 1% of children with fever who received an antimalarial took SP/Fansidar, 2% took chloroquine, 3% took amodiaquine, 8% took quinine pills, 3% quinine injection/IV, 2% artesunate rectal, and 2% took artesunate injection/IV **(Table 5.5)**.

Trends: Among children under age 5 with fever who took any antimalarial, the percentage who took ACT ranges from 70% in the 2011 LMIS, to 43% in the 2013 LDHS, to 81% in the 2016 LMIS. One cause for the apparent drastic decrease in ACT use in 2013 is that colloquial referral to ACTs as amodiaquine made it difficult to distinguish use of the single drug and the combination therapy. The 2016 LMIS made interviewers aware of this distinction and required them to probe when respondents mentioned amodiaquine. **(Figure 5.3).**

Figure 5.3 Trends in ACT use by children under age 5

Among children under 5 with recent fever who took an antimalarial, percentage who received ACT

| 2011 LMIS | 2013 LDHS | 2016 LMIS |
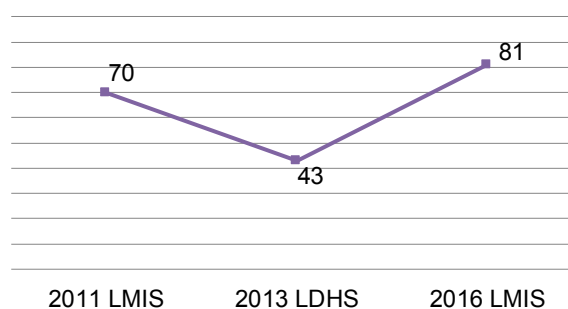
Patterns by background characteristics

- Among children under age 5 with recent fever who took an antimalarial drug, 88 percent of those in rural areas took any ACT, compared with 74% of those in urban areas **(Table 5.5).**

- Ninety-three percent of children under 5 with recent fever in the South Eastern A region took any ACT, compared with only 70% in the Monrovia region **(Table 5.5)**.

- Among children under age 5 with recent fever who took any antimalarial, the proportion who took any ACT decreases as mother's education increases **(Table 5.5).**

5.5 PREVALENCE OF LOW HAEMOGLOBIN IN CHILDREN

Prevalence of low haemoglobin in children

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

Sample: Children age 6-59 months

Anaemia, defined as a reduced level of haemoglobin in blood, decreases the amount of oxygen reaching the tissues and organs of the body and reduces their capacity to function. Anaemia is associated with impaired motor and cognitive development in children. The main causes of anaemia in children are malaria

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

Among eligible children age 6-59 months from interviewed households, almost all (86%) consented and were tested for anaemia (**Table 5.6**).

Eight percent of children age 6-59 months have low haemoglobin levels (**Table 5.7**).

Trends: The national prevalence of haemoglobin <8g/dl among children age 6-59 months has increased from 5% in 2009 to 8% in 2011 and 2016.

Patterns by background characteristics

- The prevalence of low haemoglobin in children age 6-59 months is higher in rural than urban areas (10% and 7%, respectively) **(Table 5.7).**

- North Central region has the highest percentage of children age 6-59 months with low haemoglobin (12%) and Monrovia region has the lowest (3%) (**Figure 5.4**).

- The prevalence of low haemoglobin in children age 6-59 months decreases with increasing wealth quintile, from 13% among children in the lowest wealth quintile to 1% among children in the highest (**Figure 5.5**).

Figure 5.4 Prevalence of low haemoglobin in children by region

Percentage of children age 6-59 months with haemoglobin <8g/dl

North Western 8%
North Central 12%
South Central 10%
Greater Monrovia 3%
South Eastern A 9%
South Eastern B 9%

- < 5%
- 6% - 10%
- < 10%
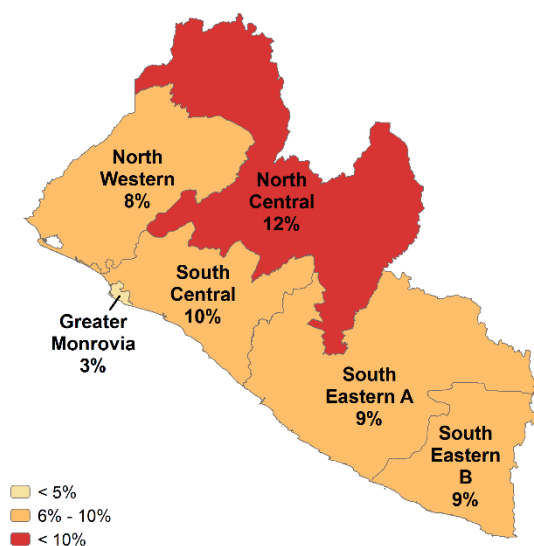
Figure 5.5 Low haemoglobin in children by household wealth

Percentage of children age 6-59 months with haemogloblin lower than 8.0 g/dl

Lowest	Second	Middle	Fourth	Highest
13	11	7	7	1

Poorest → *Wealthiest*

5.6   PREVALENCE OF MALARIA IN CHILDREN

Malaria prevalence in children
Percentage of children age 6-59 months classified as infected with malaria according to rapid diagnostic test results.
Sample: Children age 6-59 months

As is the case in many other countries in sub-Saharan Africa, malaria is one of the leading causes of death in Liberia among children under age 5. Malaria transmission is high throughout the year, contributing to development of partial immunity within the first 2 years of life. However, many people, including children, may have malaria parasites in their blood without showing any signs of infection. Such asymptomatic infection not only contributes to further transmission of malaria but also increases the risk of anaemia and other associated morbidity among the infected individuals.

In the 2016 LMIS, rapid diagnostic tests (RDTs) were used by survey teams in the field to facilitate treatment of infected children during the survey fieldwork.

Just under half of children age 6-59 months (45%) were positive for malaria antigens, according to RDT results. (**Table 5.8**).

Trends: National malaria prevalence has not changed between the 2011 LMIS and the 2016 LMIS However, there was a sharp increase from the 2009 LMIS to the 2011 LMIS (**Figure 5.6**).

Patterns by background characteristics

- Malaria prevalence ranges from 24% among children age 9-11 months to 53% among children age 48-59 months **(Table 5.8).**

- Malaria prevalence is five times higher among children in the lowest wealth quintile (68%) compared with children in the highest wealth quintile (14%) (**Figure 5.7**).

- Malaria prevalence is more than twice as high in rural areas (62%) as in urban areas (30%) **(Table 5.8).**

- By region, malaria prevalence according to RDT is highest in the South Eastern B region (69%) and the lowest in the Greater Monrovia region (12%) (**Figure 5.8**).

Figure 5.6 **Trends in malaria prevalence in children**

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

Figure 5.7 **Prevalence of malaria in children by household wealth**

Percentage of children age 6-59 months who tested positive for malaria by RDT
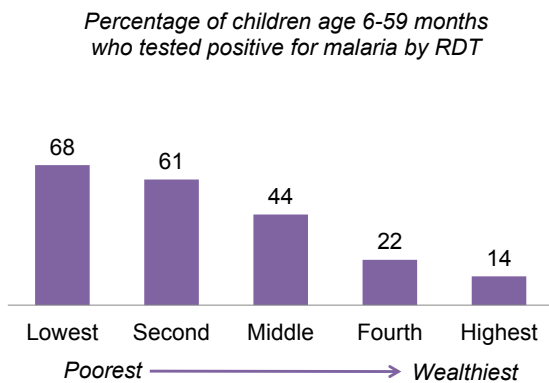
Figure 5.8 **Prevalence of malaria in children by region**

Percentage of children age 6-59 months who tested positive for malaria by RDT
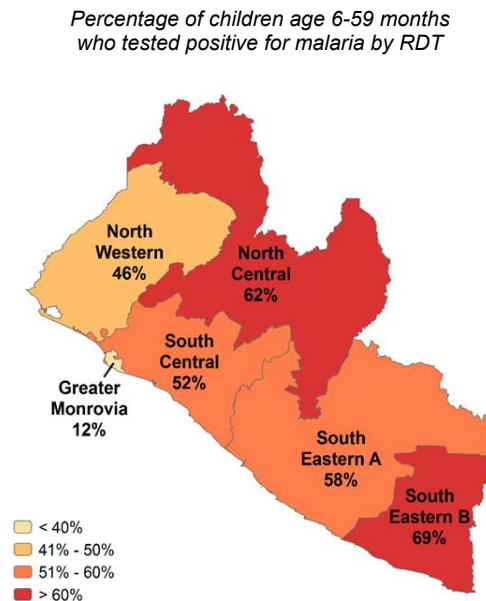
LIST OF TABLES

For detailed information on malaria, see the following tables:

Table 5.1 Prevalence of fever and treatment among household population

Percent distribution of de facto household population by whether they were reported as having fever in the 4 weeks before the survey, percent distribution of those reported to have had fever by whether they sought treatment for the fever, percent distribution of those who had fever and sought treatment by whether they reported getting tested for malaria, and percent distribution of those who had fever, sought treatment, and got tested for malaria, by whether they were told the results of the test, according to selected background characteristics, Liberia MIS 2016

Background characteristic	Household population with fever in past 4 weeks					Household population with fever who sought treatment					Household population with fever tested for malaria					Household population with fever tested for malaria and told results				
	Yes	No	Don't know/ missing	Total	Number of people	Yes	No	Don't know/ missing	Total	Number of people with fever	Yes	No	Don't know/ missing	Total	Number of people with fever	Yes	No	Don't know/ missing	Total	Number of people with fever
Age																				
0-4	43.0	56.3	0.7	100.0	3,324	77.5	22.2	0.2	100.0	1,430	70.4	28.6	1.1	100.0	1,109	96.1	3.9	0.0	100.0	780
5-9	30.0	69.6	0.4	100.0	3,327	78.9	21.1	0.0	100.0	997	62.6	36.5	0.9	100.0	786	97.5	2.5	0.0	100.0	492
10-14	20.0	79.6	0.4	100.0	3,002	75.7	24.3	0.0	100.0	600	59.4	39.3	1.3	100.0	454	96.8	3.2	0.0	100.0	270
15-19	20.0	79.7	0.2	100.0	2,049	75.0	24.4	0.6	100.0	410	61.8	36.0	2.2	100.0	308	94.4	4.5	1.1	100.0	190
20-29	22.8	76.2	1.0	100.0	3,215	74.0	25.1	0.8	100.0	734	58.5	40.5	1.0	100.0	544	95.7	3.5	0.8	100.0	318
30-39	27.3	72.3	0.4	100.0	2,464	77.5	22.2	0.3	100.0	673	66.1	31.8	2.1	100.0	521	98.0	1.9	0.1	100.0	345
40-49	32.5	66.4	1.1	100.0	1,547	73.3	26.4	0.4	100.0	502	59.8	39.1	1.2	100.0	368	94.1	4.2	1.7	100.0	220
50-59	36.8	62.6	0.5	100.0	1,114	78.3	21.4	0.4	100.0	410	64.7	33.0	2.3	100.0	321	97.2	2.6	0.2	100.0	208
60+	38.0	61.2	0.7	100.0	1,073	73.7	26.3	0.0	100.0	408	55.9	42.5	1.6	100.0	301	96.6	1.9	1.5	100.0	168
Sex																				
Male	27.5	71.7	0.8	100.0	10,308	76.0	23.7	0.3	100.0	2,839	61.5	37.0	1.5	100.0	2,157	96.6	2.9	0.5	100.0	1,326
Female	30.7	68.9	0.4	100.0	10,833	76.8	22.9	0.2	100.0	3,328	65.1	33.6	1.3	100.0	2,557	96.2	3.5	0.3	100.0	1,665
Residence																				
Urban	25.2	74.3	0.5	100.0	12,483	79.8	19.7	0.5	100.0	3,142	64.2	34.6	1.2	100.0	2,507	97.4	2.0	0.5	100.0	1,609
Rural	34.9	64.4	0.7	100.0	8,658	72.9	27.0	0.1	100.0	3,026	62.6	35.8	1.6	100.0	2,207	95.2	4.6	0.2	100.0	1,381
Region																				
Greater Monrovia	22.8	76.6	0.6	100.0	7,072	81.4	17.9	0.6	100.0	1,612	59.2	39.0	1.8	100.0	1,313	96.8	2.2	1.0	100.0	778
North Western	36.9	62.9	0.3	100.0	1,672	83.8	16.2	0.0	100.0	617	70.2	28.6	1.2	100.0	517	97.8	2.2	0.0	100.0	363
South Central	32.2	66.9	0.9	100.0	3,689	62.7	37.0	0.3	100.0	1,188	54.2	43.8	2.0	100.0	745	92.7	7.2	0.1	100.0	403
South Eastern A	29.7	69.9	0.4	100.0	1,434	72.4	27.5	0.1	100.0	426	67.1	31.3	1.6	100.0	309	94.5	5.3	0.1	100.0	207
South Eastern B	33.1	66.7	0.3	100.0	1,258	82.8	16.9	0.3	100.0	416	80.1	18.0	1.9	100.0	345	94.6	5.0	0.4	100.0	276
North Central	31.7	67.7	0.6	100.0	6,017	77.9	22.0	0.1	100.0	1,909	64.8	34.5	0.6	100.0	1,487	98.0	1.8	0.2	100.0	964
Wealth quintile																				
Lowest	33.5	66.2	0.3	100.0	4,197	68.2	31.7	0.1	100.0	1,404	61.8	37.5	0.7	100.0	957	96.1	3.5	0.4	100.0	591
Second	33.6	65.7	0.8	100.0	4,201	74.9	25.1	0.0	100.0	1,410	65.0	33.1	1.9	100.0	1,055	97.2	2.8	0.0	100.0	686
Middle	32.3	67.3	0.5	100.0	4,220	77.4	22.2	0.4	100.0	1,362	62.5	36.5	1.0	100.0	1,054	94.8	5.0	0.1	100.0	659
Fourth	24.2	75.4	0.4	100.0	4,238	81.1	17.8	1.0	100.0	1,025	62.8	36.6	0.6	100.0	832	96.8	2.6	0.6	100.0	522
Highest	22.6	76.4	1.0	100.0	4,286	84.3	15.7	0.0	100.0	967	65.3	32.0	2.7	100.0	816	97.3	1.8	0.9	100.0	533
Total	29.2	70.2	0.6	100.0	21,141	76.4	23.3	0.3	100.0	6,167	63.4	35.2	1.4	100.0	4,714	96.4	3.2	0.4	100.0	2,991

Note: Data are based on reports from the respondent to the Household Questionnaire and not necessarily the household member with fever. Total includes a small number of cases with age missing.

Table 5.2 Cost of treatment for fever

Among those who sought treatment for fever, percent distribution by place of treatment; mean cost of treatment (including free treatment), percentage receiving free treatment, and mean cost (excluding free treatment), Liberia MIS 2016

Place of treatment	Percent distribution by place of treatment	Mean cost (including those with free treatment)	Percentage receiving free treatment	Number of people receiving treatment, by source	Mean cost (excluding those with free treatment)	Number of people paying for treatment, by source
Government hospital	8.3	286.3	82.0	392	2,312.0	45
Government health centre	7.8	150.3	88.1	368	1,408.5	39
Government health clinic	34.8	58.7	90.3	1,641	684.2	139
Private hospital/clinic	15.3	1,554.7	11.5	722	1,787.5	555
Pharmacy	7.6	577.8	2.2	359	592.8	310
Private doctor	2.3	884.2	18.5	107	1,104.9	79
Mobile clinic	(0.6)	483.9	(6.0)	28	517.4	24
Medicine store	14.3	394.1	1.4	674	399.8	634
Traditional practitioner	0.8	312.1	61.9	39	1,062.3	10
Black bagger/drug peddler	6.2	218.6	0.9	292	220.7	282
Other	1.4	598.1	54.0	64	1,470.7	24
Don't know	*	1,229.8	*	28	1,229.8	9
Total	100.0	426.4	49.0	4,714	884.5	2,150
Number	4,714.0	426.4	49.0	4,714	884.5	2,150

Notes: Data are based on reports from the respondent to the Household Questionnaire and not necessarily the household member with fever Costs are in Liberian dollars. Mean costs are based only on respondents who provided a cost. An asterisk indicates that the figure is based on fewer than 25 unweighted cases and has been suppressed. Figures in parentheses are based on 25-49 unweighted cases.

Table 5.3 Prevalence, diagnosis, and prompt treatment of children with fever

Percentage of children under age 5 with fever in the 2 weeks preceding the survey; and among children under age 5 with fever, the percentage for whom advice or treatment was sought, percentage for whom advice or treatment was sought the same or next day following the onset of fever, and percentage who had blood taken from a finger or heel for testing, according to background characteristics, Liberia MIS 2016

Background characteristic	Children under age 5		Children under age 5 with fever			
	Percentage with fever in the 2 weeks preceding the survey	Number of children	Percentage for whom advice or treatment was sought[1]	Percentage for whom advice or treatment was sought the same or next day[1]	Percentage who had blood taken from a finger or heel for testing	Number of children
Age in months						
<12	40.0	590	83.7	34.5	49.4	236
12-23	43.3	543	85.0	27.4	59.6	235
24-35	39.8	512	73.4	31.1	46.7	203
36-47	39.0	529	72.6	31.8	49.3	207
48-59	29.7	531	72.9	36.5	40.6	158
Sex						
Male	39.9	1,367	76.7	31.5	49.0	545
Female	36.9	1,339	79.7	32.5	50.7	494
Residence						
Urban	34.1	1,447	84.8	37.5	54.8	494
Rural	43.3	1,259	72.1	27.0	45.2	545
Region						
Greater Monrovia	31.0	815	87.0	37.0	57.5	253
North Western	53.2	226	80.7	31.1	61.1	120
South Central	33.6	506	78.7	24.7	44.0	170
South Eastern A	37.9	172	72.4	35.2	49.1	65
South Eastern B	44.3	157	74.6	40.7	51.1	70
North Central	43.6	829	72.6	29.9	43.3	361
Mother's education[2]						
No education	38.6	997	69.9	28.5	41.0	384
Primary	42.3	717	77.8	30.3	51.0	303
Secondary or higher	35.4	992	87.5	37.3	58.5	351
Wealth quintile						
Lowest	41.2	624	72.3	24.6	42.9	257
Second	41.9	597	72.5	32.7	44.7	250
Middle	45.3	520	78.3	34.1	52.0	236
Fourth	30.5	520	88.0	28.1	58.3	158
Highest	30.9	444	87.7	45.4	58.5	137
Total	38.4	2,705	78.2	32.0	49.8	1,039

Note: This table is based on children under 5 born to women age 15-49 interviewed in the survey and is not comparable with results in Table 5.1 which is based on the household population and refers to fever in the previous 4 weeks.
[1] Excludes advice or treatment from a traditional practitioner/black bagger

Table 5.4 Source of advice or treatment for children with fever

Percentage of children under age 5 with fever in the 2 weeks preceding the survey for whom advice or treatment was sought from specific sources; and among children under age 5 with fever in the 2 weeks preceding the survey for whom advice or treatment was sought, the percentage for whom advice or treatment was sought from specific sources, by background characteristics, Liberia MIS 2016

| Source | Percentage for whom advice or treatment was sought from each source: | |
	Among children with fever	Among children with fever for whom advice or treatment was sought
Any public sector source	46.4	59.1
Government hospital	7.5	9.5
Government health centre	6.4	8.1
Government health clinic	31.5	40.1
Mobile clinic	0.5	0.6
CHW/outreach	0.5	0.7
Other public sector	0.1	0.1
Private sector	26.5	33.8
Private hospital/clinic	10.9	13.9
Pharmacy/medicine store	13.9	17.8
Private doctor	1.9	2.5
Any other source	6.5	8.3
Traditional practitioner	0.4	0.4
Market	1.3	1.7
Black bagger/drug peddler	5.1	6.5
Other	1.4	1.8
Number of children	1,039	815

CHW = Community health worker

Table 5.5 Type of antimalarial drugs used

Among children under age 5 with fever in the 2 weeks preceding the survey who took any antimalarial medication, percentage who took specific antimalarial drugs, according to background characteristics, Liberia MIS 2016

Background characteristic	Any ACT	SP/Fansidar	Chloroquine	Amodiaquine	Quinine pills	Quinine injection/IV	Artesunate rectal	Artesunate injection/IV	Other anti-malarial	Number of children with fever who took any antimalarial drug
Age in months										
<6	80.4	0.9	1.3	2.3	8.3	4.0	0.0	0.0	6.9	46
6-11	67.5	0.0	6.6	2.8	10.7	0.0	4.8	2.5	7.0	87
12-23	82.5	0.0	1.4	5.4	8.8	3.5	0.0	1.2	1.9	165
24-35	88.2	0.0	2.1	1.6	2.4	5.4	2.0	1.9	0.5	132
36-47	83.2	0.3	0.9	1.1	5.6	2.8	1.2	0.3	7.7	139
48-59	78.7	0.0	1.6	6.4	11.3	3.8	2.3	6.0	2.3	112
Sex										
Male	83.6	0.0	1.4	3.0	7.9	3.4	0.8	2.8	2.0	362
Female	78.1	0.2	3.0	3.8	7.0	3.3	2.5	1.1	6.0	318
Residence										
Urban	74.0	0.0	2.6	4.1	12.6	5.8	2.3	1.4	5.6	337
Rural	88.0	0.2	1.7	2.8	2.5	0.9	1.0	2.7	2.1	343
Region										
Greater Monrovia	70.0	0.0	3.7	0.4	16.6	7.3	3.5	2.3	6.2	183
North Western	87.1	1.0	0.0	2.1	5.0	0.0	0.7	1.4	3.8	80
South Central	73.9	0.0	1.4	11.0	3.8	1.9	3.3	1.6	5.2	108
South Eastern A	92.8	0.0	0.7	0.0	2.9	0.0	1.7	4.9	0.0	39
South Eastern B	90.8	0.0	2.1	1.1	1.3	1.6	0.0	1.4	3.0	39
North Central	87.5	0.0	2.2	3.7	4.8	2.9	0.0	1.9	2.2	230
Mother's education[2]										
No education	87.4	0.0	2.3	2.1	3.9	0.7	0.5	1.9	3.6	219
Primary	85.3	0.4	1.1	4.2	5.5	1.2	1.1	1.0	1.5	211
Secondary or higher	72.0	0.0	2.8	3.9	12.4	7.5	3.1	3.1	6.1	251
Wealth quintile										
Lowest	86.5	0.5	3.6	2.5	4.7	1.6	0.8	1.2	2.3	157
Second	88.1	0.0	0.0	2.3	2.3	1.6	1.9	2.7	2.1	155
Middle	82.7	0.0	1.3	6.4	4.0	3.9	0.4	2.4	4.1	153
Fourth	70.1	0.0	3.5	4.7	15.7	3.4	3.7	3.7	5.5	115
Highest	71.8	0.0	2.7	0.3	15.9	7.9	2.1	0.0	6.5	101
Total	81.1	0.1	2.1	3.4	7.5	3.3	1.6	2.0	3.9	680

ACT = Artemisinin-based combination therapy

Table 5.6 Coverage of testing for anaemia and malaria in children

Percentage of eligible children age 6-59 months who were tested for anaemia and for malaria, according to background characteristics (unweighted), Liberia MIS 2016

Background characteristic	Anaemia	Malaria with RDT	Number of children eligible
Age in months			
6-8	81.3	81.3	155
9-11	98.2	98.2	167
12-17	96.6	96.6	355
18-23	96.5	96.1	259
24-35	97.2	97.2	597
36-47	97.8	98.0	687
48-59	63.8	63.6	1,030
Sex			
Male	85.5	85.5	1,628
Female	86.3	86.2	1,622
Mother's interview status			
Interviewed	84.2	84.1	2,587
Not interviewed[1]	92.8	92.6	663
Residence			
Urban	85.7	85.6	1,409
Rural	86.1	86.0	1,841
Region			
Greater Monrovia	83.9	83.9	484
North Western	87.6	87.6	482
South Central	87.2	87.2	540
South Eastern A	79.0	78.8	480
South Eastern B	88.0	88.0	599
North Central	88.3	88.1	665
Mother's education[2]			
No education	84.6	84.6	1,114
Primary	84.6	84.6	748
Secondary or higher	82.9	82.9	725
Wealth quintile			
Lowest	86.1	85.9	1,019
Second	88.0	88.0	714
Middle	85.5	85.5	743
Fourth	83.7	83.7	447
Highest	85.0	85.0	327
Total	85.9	85.8	3,250

RDT = Rapid diagnostic test
[1] Includes children whose mothers are deceased
[2] Excludes children whose mothers are not listed in the Household Questionnaire

Table 5.7 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, Liberia MIS 2016

Background characteristic	Haemoglobin <8.0 g/dl	Number of children
Age in months		
6-8	10.1	119
9-11	5.9	165
12-17	10.5	376
18-23	12.6	233
24-35	10.0	610
36-47	6.1	677
48-59	6.6	694
Sex		
Male	8.9	1,476
Female	7.7	1,397
Mother's interview status		
Interviewed	8.3	2,222
Not interviewed[1]	8.3	651
Residence		
Urban	6.7	1,507
Rural	10.1	1,366
Region		
Greater Monrovia	3.2	811
North Western	8.2	245
South Central	10.0	541
South Eastern A	8.6	152
South Eastern B	8.5	176
North Central	11.7	948
Mother's education[2]		
No education	10.0	861
Primary	8.0	594
Secondary or higher	6.6	766
Wealth quintile		
Lowest	12.7	660
Second	11.2	675
Middle	7.4	586
Fourth	6.6	503
Highest	0.7	449
Total	8.3	2,873

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

Table 5.8 Prevalence of malaria in children

Percentage of children age 6-59 months classified as having malaria, by rapid diagnostic test (RDT), according to background characteristics, Liberia MIS 2016

Background characteristic	Malaria prevalence according to RDT	
	RDT positive	Number of children tested
Age in months		
6-8	29.9	119
9-11	24.1	165
12-17	30.7	376
18-23	40.6	233
24-35	48.2	610
36-47	50.8	680
48-59	52.9	690
Sex		
Male	43.8	1,476
Female	46.0	1,396
Mother's interview status		
Interviewed	43.2	2,222
Not interviewed[1]	50.6	650
Residence		
Urban	29.5	1,506
Rural	61.9	1,366
Region		
Greater Monrovia	12.4	811
North Western	46.1	245
South Central	52.1	541
South Eastern A	58.4	152
South Eastern B	68.8	176
North Central	61.7	947
Wealth quintile		
Lowest	68.0	659
Second	61.1	675
Middle	44.1	586
Fourth	21.8	503
Highest	13.6	449
Total	44.9	2,872

[1] Includes children whose mothers are deceased

VACCINATIONS

6

Key Findings

- *Vaccination:* Forty-five percent of children age 12-23 months had received all basic vaccinations at the time of the survey,

- Vaccination coverage has decreased from 55% in 2013 to 45% in 2016.

Information on the vaccination status of young children can help policymakers and programme managers assess the efficacy of current strategies and formulate interventions to improve the health of children. The chapter looks first at current vaccination status, then at trends over time, coverage by residence and region, and finally card ownership and availability.

6.1 VACCINATION OF CHILDREN

All basic vaccinations coverage

Percentage of children age 12-23 months who received specific vaccines at any time before the survey (according to a vaccination card or the mother's report). To have received all basic vaccinations, a child must receive at least:
- one dose of BCG vaccine, which protects against tuberculosis
- three doses of DPT-HepB-Hib, which protects against diphtheria, pertussis (whooping cough), and tetanus
- three doses of polio vaccine
- one dose of measles vaccine

Sample: Living children age 12-23 months

Table 6.1 shows vaccination coverage by source of information (card or report) for each vaccination given by the time the child reaches 23 months and 35 months. The totals for each column indicate the percentage of children receiving vaccines on time. Thirty-nine percent of all basic vaccination information for children age 12-23 months was obtained from their vaccination card. Less information, 29% of all basic vaccination information, was obtained for children age 24-35 from their vaccination cards.

Figure 6.1 Childhood vaccinations
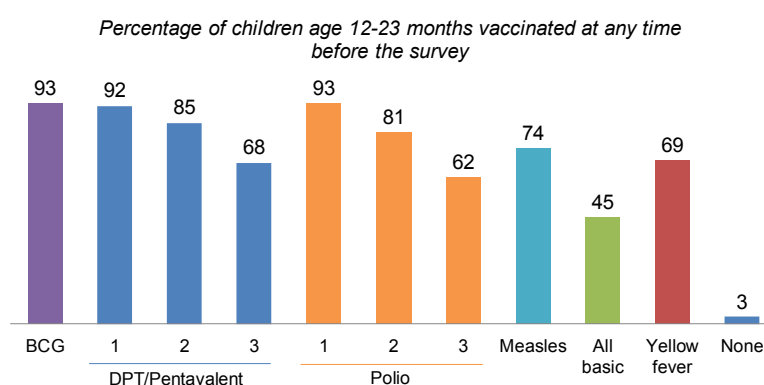
Percentage of children age 12-23 months vaccinated at any time before the survey

Forty-five percent of children age 12-23 months had received all basic vaccinations at the time of the survey **(Table 6.2).** Coverage for children 12-23 months was highest for the first doses of DPT (92%), and polio (93%) as well as BCG vaccine (93%), which requires only one dose. Seventy-four percent received measles vaccine, while 69% received the yellow fever vaccine **(Figure 6.1).** The difference between the

percentages of children receiving the first and third doses is 24 percentage points for DPT and 31 percentage points for polio for children 12-23 months.

Trends: The proportion of children 12-23 months in Liberia who have received all basic vaccination increased from 39% in 2007 to 55% in 2013 and then dropped to 45% in 2016. During the same period, the proportion of children who have had no vaccinations declined from 12% to 2% and then increased back to 3% **(Figure 6.2)**.

Patterns by background characteristics

- Urban children are more likely to have received all basic vaccinations than rural children **(Figure 6.3)**

- Vaccination coverage varies across regions. The proportion of children who received all basic vaccinations ranges from a low of 32% in South Eastern A to a high of 64% in North Western **(Figure 6.4)**.

Figure 6.2 **Trends in childhood vaccinations**

Percentage of children age 12-23 months who received all basic vaccinations at any time before the survey
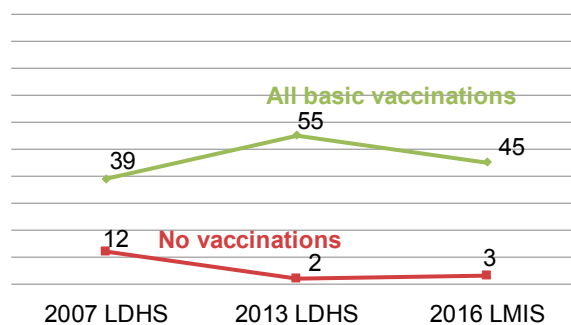
Figure 6.3 **Vaccination coverage by residence**

Percentage of children age 12-23 months who received all basic vaccines at any time before the survey
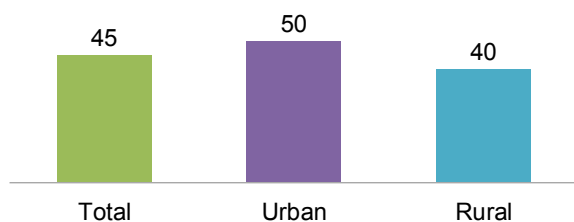
Figure 6.4 **Vaccination coverage by region**

Percentage of children age 12-23 months who received all basic vaccines
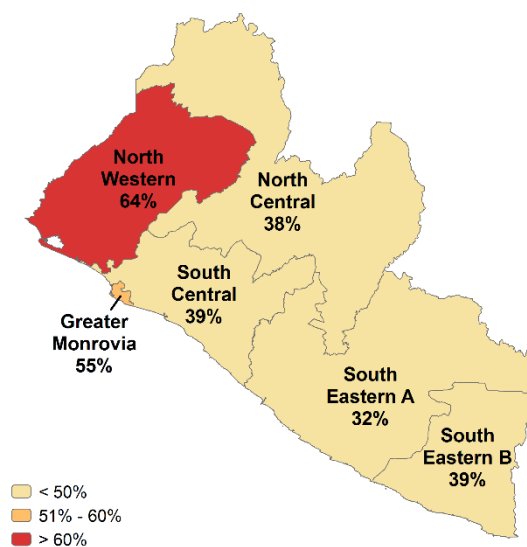
Vaccination Card Ownership and Availability

Vaccination cards are an essential tool in ensuring a child receives all recommended vaccinations on schedule. Not all mothers were able to produce their child's vaccination card at the time of the interview; only 60% of vaccination cards were seen among children 12-23 months and 48% among children 24 – 35 months **(Table 6.3)**.

LIST OF TABLES

For more information on vaccinations, see the following tables:

- **Table 6.1   Vaccinations by source of information**
- **Table 6.2   Vaccinations by background characteristics**
- **Table 6.3   Possession and observation of vaccination cards, according to background characteristics**

Table 6.1 Vaccinations by source of information

Percentage of children age 12-23 months and children age 24-35 months who received specific vaccines at any time before the survey, by source of information (vaccination card or mother's report), and percentage who received specific vaccines by the appropriate age, Liberia MIS 2016

Source of information	Children age 12-23 months vaccinated at any time before the survey according to:				Children age 24-35 months vaccinated at any time before the survey according to:			
	Vaccination card[1]	Mother's report	Either source	Vaccinated by appropriate age[2,3]	Vaccination card[1]	Mother's report	Either source	Vaccinated by appropriate age[2,3]
BCG	58.8	34.2	93.0	92.4	44.8	44.2	89.1	87.0
DPT-HepB-Hib[4]								
1	58.9	32.6	91.5	91.0	45.7	42.7	88.5	84.5
2	57.1	28.3	85.4	82.9	43.7	35.2	78.9	74.5
3	49.5	18.4	68.0	67.6	38.9	20.8	59.7	54.9
Polio[5]								
0 (birth dose)	46.7	31.1	77.7	77.7	40.4	40.0	80.4	78.3
1	59.5	33.3	92.8	92.3	47.5	42.8	90.3	87.0
2	57.7	23.6	81.3	80.0	45.0	31.1	76.1	73.0
3	51.7	10.3	62.0	60.7	41.1	10.6	51.6	48.8
Pneumococcal								
1	56.4	31.4	87.8	87.3	39.6	41.4	81.0	77.7
2	53.2	26.0	79.2	77.7	36.6	33.8	70.4	68.0
3	48.2	16.8	65.0	62.3	32.7	20.5	53.3	49.1
Rotavirus								
1	16.4	17.2	33.6	30.3	6.1	22.6	28.7	24.0
2	9.4	10.4	19.8	18.4	3.1	13.4	16.5	10.9
3	5.2	6.0	11.2	9.2	2.3	9.7	12.0	8.0
Measles	45.0	28.8	73.7	67.1	35.3	38.5	73.7	60.1
Yellow fever	42.7	26.4	69.1	63.2	33.1	35.9	69.0	58.4
All basic vaccinations[6]	39.0	6.4	45.4	42.4	29.4	5.3	34.8	28.3
All age-appropriate vaccinations[7]	4.1	1.9	6.0	6.0	2.2	2.0	4.2	2.0
No vaccinations	0.0	2.9	2.9	na	0.0	5.0	5.0	na
Number of children	327	217	543	543	247	264	512	512

na = Not applicable
BCG = Bacille Calmette-Guérin
DPT = Diphtheria-pertussis-tetanus
HepB = Hepatitis B
Hib = Haemophilus influenzae type b
[1] Vaccination card, booklet, or other home-based record
[2] Received by age 12 months
[3] For children whose vaccination information is based on the mother's report, date of vaccination is not collected. The proportions of vaccinations given during the first and second years of life are assumed to be the same as for children with a written record of vaccination.
[4] DPT-HepB-Hib is sometimes referred to as pentavalent.
[5] Polio 0 is the polio vaccine given at birth.
[6] BCG, three doses of DPT-HepB-Hib, three doses of oral polio vaccine (excluding polio vaccine given at birth), and one dose of measles vaccine
[7] For children 12-23 months and children 24-35 months: BCG, three doses of DPT-HepB-Hib, four doses of oral polio vaccine, three doses of pneumococcal vaccine, three doses of rotavirus vaccine, one dose of measles vaccine, and one dose of yellow fever vaccine

Table 6.2 Vaccinations by background characteristics

Percentage of children age 12-23 months and age 24-35 months who received specific vaccines at any time before the survey (according to a vaccination card or the mother's report), percentage with all basic vaccinations, and percentage with all age appropriate vaccinations, by background characteristics, Liberia MIS 2016

Background characteristic		Children age 12-23 months																				Children age 24-35 months:	
		DPT-HepB-Hib[1]			Polio[2]				Pneumococcal			Rotavirus					All basic vacci-nations[3]	All age appro-priate vacci-nations[4]	No vacci-nations	Number of children		All age appro-priate vacci-nations[4]	Number of children
	BCG	1	2	3	0 (birth dose)	1	2	3	1	2	3	1	2	3	Measles	Yellow fever							
Sex																							
Male	92.4	91.9	85.2	66.7	77.3	92.3	82.4	63.6	85.9	77.7	63.4	36.1	19.9	8.1	72.7	67.6	45.0	5.5	3.3	282		3.5	264
Female	93.6	91.1	85.5	69.4	78.2	93.4	80.1	60.2	89.9	80.8	66.7	30.9	19.7	14.5	74.8	70.7	45.8	6.5	2.4	261		4.9	248
Residence																							
Urban	95.6	93.8	88.1	70.4	78.5	94.1	81.3	64.6	89.0	80.8	64.9	34.9	19.7	12.1	79.3	74.0	49.5	7.4	1.6	307		4.5	276
Rural	89.6	88.6	81.8	64.8	76.7	91.1	81.3	58.5	86.2	77.1	65.1	31.8	20.0	10.1	66.5	62.7	40.0	4.2	4.6	236		3.8	235
Region																							
Greater Monrovia	95.7	93.4	86.3	70.9	84.4	94.3	81.9	69.4	88.6	81.3	68.1	31.9	20.3	11.9	81.8	76.7	55.1	10.3	2.6	169		3.8	153
North Western	95.7	94.8	88.1	82.9	82.4	94.5	91.1	75.9	94.8	89.3	85.4	47.7	35.2	19.4	82.2	82.2	63.8	16.9	2.2	48		13.2	42
South Central	87.3	85.8	78.5	61.2	73.2	87.9	68.7	60.2	81.4	70.8	61.3	30.9	18.7	9.5	69.5	59.5	38.7	5.7	6.7	96		2.9	86
South Eastern A	85.2	81.6	74.2	50.1	73.0	79.4	70.0	48.0	73.9	64.1	49.4	26.0	16.2	8.6	69.3	67.8	32.0	1.8	11.0	35		4.2	25
South Eastern B	92.0	96.1	88.2	67.2	80.0	97.6	82.9	64.2	94.8	85.8	62.4	39.7	19.3	9.6	64.3	62.9	39.0	2.8	0.2	31		7.2	26
North Central	94.6	93.2	89.5	68.5	72.8	95.6	87.3	53.9	90.4	80.9	61.8	33.2	16.4	10.0	68.3	64.6	38.1	0.0	0.0	164		2.6	179
Education																							
No education	91.9	85.1	76.9	59.2	70.3	89.1	74.3	56.5	82.8	72.4	55.1	30.4	17.2	8.8	65.5	61.0	34.6	3.7	4.5	169		5.0	182
Primary	91.6	89.9	84.1	65.8	77.0	92.7	82.0	64.4	85.4	77.4	66.0	32.6	15.3	8.3	74.6	68.7	47.1	4.0	2.4	164		4.3	148
Secondary or higher	94.6	97.7	92.6	74.9	83.9	95.6	85.3	62.7	93.1	84.9	70.0	38.8	26.7	15.9	78.2	74.4	50.2	9.4	2.2	195		3.2	157
More than secondary	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	15		*	25
Wealth quintile																							
Lowest	85.5	84.0	74.3	59.1	71.6	86.4	71.7	53.6	81.8	73.2	56.9	28.1	14.9	7.8	63.2	57.5	34.7	3.2	6.0	138		3.7	117
Second	96.3	94.1	90.3	70.3	73.9	94.3	85.5	64.2	91.9	79.8	67.1	42.0	24.2	13.6	75.0	69.8	44.7	3.4	1.8	114		1.7	116
Middle	95.1	95.7	90.4	71.6	77.8	95.9	86.5	65.9	89.5	79.8	70.0	31.5	14.4	6.8	75.0	71.4	49.3	5.4	0.6	94		6.6	99
Fourth	93.7	97.2	92.2	65.3	78.4	93.0	79.8	58.0	89.5	79.1	56.8	38.3	26.3	11.2	75.1	71.6	39.4	5.6	2.4	111		4.4	87
Highest	97.4	88.2	82.3	78.5	91.8	97.4	87.3	73.2	87.9	87.1	60.2	27.5	19.6	18.3	85.8	80.9	66.6	14.9	2.6	87		5.2	92
Total	93.0	91.5	85.4	68.0	77.7	92.8	81.3	62.0	87.8	79.2	65.0	33.6	19.8	11.2	73.7	69.1	45.4	6.0	2.9	543		4.2	512

Note: Children are considered to have received the vaccine if it was either written on the child's vaccination card or reported by the mother. For children whose vaccination information is based on the mother's report, date of vaccination is not collected. The proportions of vaccinations given during the first and second years of life are assumed to be the same as for children with a written record of vaccination. The asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been supressed.
[1] DPT-HepB-Hib is sometimes referred to as pentavalent.
[2] Polio 0 is the polio vaccination given at birth.
[3] BCG, three doses of DPT-HepB-Hib, three doses of oral polio vaccine (excluding polio vaccine given at birth), and one dose of measles
[4] For children 12-23 months and children 24-35 months: BCG, three doses of DPT-HepB-Hib, four doses of oral polio vaccine, three doses of pneumococcal vaccine, three doses of rotavirus vaccine, one dose of measles vaccine, and one dose of yellow fever vaccine

Table 6.3 Possession and observation of vaccination cards, according to background characteristics

Percentage of children age 12-23 months and children age 24-35 months who ever had a vaccination card, and percentage with a vaccination card seen, according to background characteristics, Liberia MIS 2016

Background characteristic	Children age 12-23 months			Children age 24-35 months		
	Percentage who ever had a vaccination card[1]	Percentage with a vaccination card seen[1]	Number of children	Percentage who ever had a vaccination card[1]	Percentage with a vaccination card seen[1]	Number of children
Sex						
Male	89.8	59.3	282	92.3	45.0	264
Female	91.3	61.0	261	87.9	51.8	248
Residence						
Urban	91.2	58.2	307	93.0	43.4	276
Rural	89.7	62.6	236	86.8	54.1	235
Region						
Greater Monrovia	89.3	51.1	169	94.4	41.3	153
North Western	93.0	67.1	48	86.4	61.6	42
South Central	88.1	60.6	96	86.5	47.0	86
South Eastern A	82.1	49.5	35	80.4	35.8	25
South Eastern B	97.5	66.7	31	93.2	53.6	26
North Central	93.1	68.2	164	90.1	52.8	179
Education						
No education	86.1	55.6	169	84.0	51.6	182
Primary	91.4	64.6	164	90.6	51.3	148
Secondary or higher	92.9	60.4	195	95.3	42.2	157
More than secondary	*	*	15	*	*	25
Wealth quintile						
Lowest	84.3	54.0	138	83.4	43.8	117
Second	93.9	75.0	114	92.2	59.3	116
Middle	96.5	68.7	94	87.1	51.2	99
Fourth	90.4	44.4	111	95.2	46.4	87
Highest	89.8	61.2	87	94.5	38.9	92
Total	90.5	60.2	543	90.2	48.3	512

Note: An asterisk indicates that the figure is based on fewer than 25 unweighted cases and has been suppressed.
[1] Vaccination card, booklet, or other home-based record

MALARIA KNOWLEDGE AND MESSAGING

7

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Key Findings

- ***Knowledge and perceptions of malaria prevention:*** Almost all women have heard of malaria (99%). Among women who have heard of malaria, 95% know that the illness can be avoided, and 90% know that mosquitos transmit the virus from person to person.

- ***Knowledge and perceptions of malaria treatment:*** Among women who have heard of malaria and know that it can be avoided, almost half (49%) perceive that people do not take actions to prevent themselves from getting malaria because they don't take malaria seriously or perceive that there is no risk.

- ***Knowledge and perception of malaria in pregnancy:*** Among women who know SP/Fansidar is used to prevent malaria in pregnant women, 45% perceive that pregnant women do not use SP/Fansidar because they are worried about the side effects.

- ***Malaria messages:*** Only 58% of women have seen or heard a message about malaria in the past few months. Sources of the malaria messages include radio (66%) and community health worker/traditional birth attendant/health promoters (62%).

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Behaviour change communication (BCC) and information, education, and communication (IEC) programmes are essential to effective control, diagnosis, treatment, and prevention of malaria. Effective communication not only promotes positive action to prevent and control malaria but also identifies community needs and guides their informed choices, which eventually improve health conditions.

This chapter assesses the extent to which malaria communication messages reach women age 15-49 and the channels through which women receive these messages. The data highlight women's basic knowledge of causes, symptoms, treatment, and prevention. Trends over time can be used to assess the success of behaviour change programs.

7.1 KNOWLEDGE AND PERCEPTIONS OF MALARIA PREVENTION

Knowledge is an important influence in the adoption of recommended malaria prevention behaviours. During the 2016 LMIS, women age 15-49 were asked if they had heard of malaria. Those who had heard of malaria were then asked the signs and symptoms, who is most likely to get the parasite, and what the specific causes of illness are.

Nearly all women in Liberia (99%) have heard of malaria. Among these women, some of the specific signs and symptoms they report include fever (67%), chills (58%), weakness (47%), vomiting (32%), and headache (31%) **(Table 7.1).** The majority (84%) say that children are most likely to be infected, and elderly are the least likely (11%) **(Table 7.2).** When asked to give specific causes of malaria, 90% cited mosquitoes as a cause, and 43% cited dirty surroundings **(Table 7.3).**

Ninety-five percent of women who have heard of malaria say there are ways to avoid malaria. Of those women, 88% cited sleeping under a mosquito net as a way to avoid getting malaria, and 19% each cited using mosquito coils and insecticide spray **(Table 7.4).** However, women also listed less effective and even ineffective prevention methods such as keeping surroundings clean (52%) and cutting the grass (12%).

Women were also asked why they thought people did not take action to prevent themselves from getting malaria. The main perceived reason is that they do not take the risk of malaria seriously, or they think it does not pose a risk (49%). Eighteen percent of women think that people do not take preventive action because it would cost too much, and one in four women (26%) don't know why people do not take action to prevent malaria **(Table 7.5).**

Patterns by background characteristics

- More rural women (71%) cited fever as a specific sign and symptom of malaria than urban woman (64%) (**Table 7.1**)

- The percentage of women who cited children as the group most affected by malaria ranges from 76% in South Central to 94% in North Central (**Table 7.2**).

- Women with secondary education (98%) are slightly more likely to know that there are ways to avoid malaria compared with women with no education (92%) (**Table 7.4**).

7.2   KNOWLEDGE AND PERCEPTIONS OF MALARIA TREATMENT

Although the importance of messages about malaria prevention and treatment is documented in the National Malaria Control Programme (NMCP) communication strategy, sleeping under ITNs remains the focus of messaging about malaria prevention. Increasing awareness of the importance of a definitive diagnosis of malaria and the use of recommended ACTs as first-line treatment for malaria are also key messages.

Almost all women who have heard of malaria (99%) state that malaria is treatable. When asked what medicines are mainly used to treat malaria, the recommended antimalarial ACT was cited the most often (81%), followed by quinine (26%), and aspirin, panadol, and paracetamol (22%) (**Table 7.6**). When asked why they think people do not seek prompt treatment for malaria, women were most likely to say that treatment costs too much (33%). Other common perceived reasons people do not seek prompt treatment include going to a drug store (21%), thinking they can treat themselves at home (17%), being too weak or too sick to go for treatment (17%), and distance or lack of access to a health centre (17%) (**Table 7.7**).

Patterns by background characteristics

- Among women who know malaria can be treated, 88% of women in rural areas cite ACTs as a drug for malaria treatment compared with 78% of urban women (**Table 7.6**).

- Forty-five percent of women in the highest wealth quintile perceive that people do not seek prompt treatment because it costs too much, but only 20% of the women in the lowest wealth quintile give that as a reason (**Table 7.7**).

- Thirty-seven percent of women in the lowest wealth quintile perceive that people do not seek prompt treatment because there is 'no access/distance to health centre,' while only 6% of women in the highest wealth quintile agree (**Table 7.7**).

7.3   KNOWLEDGE AND PERCEPTIONS OF MALARIA IN PREGNANCY

Intermittent preventive treatment of malaria during pregnancy (IPTp) with more than two doses of SP/Fansidar is a major tenet of the malaria in pregnancy policy in Liberia. IPTp uptake is promoted at the community level through comprehensive community health education materials that promote antenatal

care (ANC) attendance and the importance of prevention of malaria during pregnancy, as well as nationwide radio campaigns and printing of posters about malaria in pregnancy.

Survey data show that among women who have heard of malaria, only 56% have heard of SP/Fansidar. Among those who have heard of SP/Fansidar, 55% said that it is used to prevent malaria during pregnancy, while 39% said that it is used to treat malaria **(Table 7.8)**. When women who know SP/Fansidar is used to prevent malaria in pregnancy were asked why they think pregnant women don't take any or enough SP/Fansidar during pregnancy, the most common reason given was that pregnant women are worried about the side effects (45%) **(Table 7.9)**.

Patterns by background characteristics

- Awareness of SP/Fansidar does not vary much by residence, education, or wealth of the woman; however, it varies by region from 45% of women in South Eastern B to 63% of those in South Eastern A and North Central regions **(Table 7.8)**.

- Among women who know SP/Fansidar is used to prevent malaria in pregnant women, women with at least some secondary education are more likely to perceive that pregnant women do not use SP/Fansidar because they are worried about the side effects (51%) than women with no education (36%) **(Table 7.9)**.

7.4 MALARIA MESSAGES

The current BCC strategy in Liberia focuses on the dissemination of malaria-related messaging through mass media, interpersonal communication, and community engagement activities. The purpose of these messages is to help ensure that children under age 5 receive a diagnostic test and, if positive, effective ACT treatment within 24 hours; that pregnant women receive IPTp at every ANC visit after the first trimester; and that community members are aware of the benefits of insecticide-treated bed nets and are using them to prevent malaria.

Fifty-eight percent of women interviewed in the survey reported that they had seen or heard a message about malaria in the few months before the survey. Among women who saw or heard a malaria message, the most common messages are those about bed nets, such as 'use your mosquito net' (98%), 'everywhere, every night, sleep under the net' (96%), and 'hang up, keep up' (57%). Other messages were also reported by large majorities of women who had been exposed to a malaria message, that is, 'if you have fever, go to the health facility' (93%) and 'pregnant women should take drugs to prevent malaria' (91%) **(Table 7.10)**. The most common sources where the malaria messages were seen or heard include radio (66%) and community health worker/traditional birth attendant/health promoters (62%) **(Table 7.11)**.

Patterns by background characteristics

- Rural women are much more likely than urban women to have seen or heard a message about malaria in the few months before the survey (72% versus 51%) **(Table 7.10)**.

- The proportion of women who saw or heard a malaria message decreases as education and wealth quintile increase. It ranges from only 39% of women in South Eastern A region to 78% of those in North Western region **(Table 7.10)**.

- Among those who were exposed to malaria messages, urban women are more likely to have seen or heard malaria messages through radio (75% versus 54%) and television (43% versus 0%) than rural women **(Table 7.11)**.

- Women with no education are more likely to have seen or heard malaria messages through community health worker/traditional birth attendant/health promoters than women with secondary or higher education (67% versus 59%) **(Table 7.11)**.

LIST OF TABLES

For more information on malaria-related knowledge, attitudes, and behaviours, see the following tables:

Table 7.1 Knowledge of malaria symptoms

Among women age 15-49, percentage who have heard of malaria, and among those who have heard of malaria, percentage who report specific signs or symptoms of malaria, according to background characteristics, Liberia MIS 2016

Background characteristic	All women		Among women who have heard of malaria, percentage who report specific signs and symptoms of malaria:										
	Percentage who have heard of malaria	Number of women	Fever	Chills	Headache	Joint pains	Poor appetite	Body pain	Vomiting	Weakness	Other[1]	Does not know any	Number of women who have heard of malaria
Age													
15-19	98.9	902	63.2	50.6	30.2	5.9	17.2	9.0	31.8	46.5	14.1	1.7	892
20-24	98.0	855	67.1	58.4	30.0	7.4	23.5	9.7	34.2	49.8	15.1	0.2	838
25-29	99.8	706	68.3	60.1	28.2	8.8	29.5	14.0	33.6	50.0	13.3	0.4	704
30-34	99.4	680	67.7	57.2	30.7	10.6	30.2	12.9	31.5	47.7	16.4	0.5	675
35-39	98.2	510	67.2	63.6	30.4	14.1	29.5	11.4	30.8	47.8	12.1	0.0	501
40-44	99.8	352	66.6	64.4	33.4	17.9	30.7	16.2	30.0	42.8	14.9	0.3	351
45-49	99.3	286	67.6	65.0	35.2	20.6	24.9	17.4	20.2	41.5	15.1	0.2	284
Residence													
Urban	99.0	2,749	64.1	56.3	32.6	11.2	29.6	11.9	33.5	52.9	13.5	0.6	2,722
Rural	98.9	1,541	71.0	62.2	26.9	8.8	18.6	12.1	27.9	37.6	16.1	0.6	1,523
Region													
Greater Monrovia	98.7	1,679	60.8	53.1	29.4	11.9	29.0	11.4	33.9	53.0	15.0	0.4	1,657
North Western	99.5	279	69.8	60.0	28.5	7.3	26.4	6.2	30.1	51.7	24.0	0.3	277
South Central	98.6	729	69.8	57.7	30.0	9.7	23.1	14.3	27.6	42.2	14.3	0.5	719
South Eastern A	99.5	264	65.3	54.8	20.8	7.6	16.1	8.9	21.5	35.6	17.9	0.8	262
South Eastern B	96.4	233	63.1	26.2	18.8	8.6	21.5	8.5	24.4	46.7	29.8	1.3	225
North Central	99.9	1,106	73.3	73.9	37.7	10.2	25.1	14.2	34.6	44.3	7.3	0.7	1,105
Education													
No education	98.2	1,339	69.8	62.9	28.4	11.1	20.0	14.1	24.9	38.0	13.7	0.7	1,314
Primary	98.9	1,067	67.8	59.2	30.4	8.0	19.4	7.2	30.1	42.6	14.4	0.9	1,054
Secondary or higher	99.6	1,885	63.7	54.8	32.1	11.1	33.0	13.2	36.9	56.7	14.9	0.3	1,877
Wealth quintile													
Lowest	99.3	688	66.8	67.5	31.4	8.3	19.7	14.9	25.2	37.6	14.3	0.8	683
Second	98.6	755	74.6	65.7	30.1	11.1	22.9	12.1	30.7	41.0	15.4	0.5	745
Middle	99.2	819	67.7	56.2	28.0	8.5	24.0	11.0	30.1	46.6	15.0	0.9	813
Fourth	98.3	970	59.5	54.4	29.7	7.5	27.2	10.7	31.7	51.8	16.0	0.7	953
Highest	99.4	1,058	66.3	52.7	33.0	15.2	31.3	12.0	37.1	55.1	12.0	0.2	1,051
Total	99.0	4,290	66.6	58.4	30.5	10.3	25.6	12.0	31.5	47.4	14.4	0.6	4,246

Note: Percentages may add to more than 100 since multiple responses were allowed.
[1] Other includes eyes/urine turn yellow/other colour.

Table 7.2 Knowledge of groups most affected by malaria

Among women age 15-49 who have heard of malaria, percentage who cite specific groups of people as most likely to get malaria, according to background characteristics, Liberia MIS 2016

Background characteristic	Children	Pregnant women	Adults	Elderly	Everyone	Does not know	Number of women who have heard of malaria
Age							
15-19	80.0	18.4	12.0	10.1	16.5	5.9	892
20-24	82.2	24.9	11.6	12.2	14.5	4.8	838
25-29	83.8	28.1	13.8	11.4	15.9	3.5	704
30-34	87.4	28.2	13.6	9.4	13.5	2.8	675
35-39	88.1	26.2	12.7	10.4	11.5	2.0	501
40-44	86.6	25.6	12.6	10.4	12.2	3.0	351
45-49	81.5	22.6	16.3	15.4	20.4	2.9	284
Residence							
Urban	83.4	22.2	13.7	11.3	14.8	3.9	2,722
Rural	84.7	28.9	11.4	10.7	15.0	3.9	1,523
Region							
Greater Monrovia	80.9	21.5	16.9	12.5	16.7	4.9	1,657
North Western	91.3	38.0	15.8	9.1	35.6	2.4	277
South Central	75.5	20.2	11.5	9.2	18.7	3.0	719
South Eastern A	77.5	21.3	9.1	5.9	20.0	4.2	262
South Eastern B	81.6	22.3	7.3	8.1	13.6	5.7	225
North Central	93.8	30.1	9.1	12.3	3.4	3.0	1,105
Education							
No education	82.4	25.2	10.2	11.1	15.5	4.3	1,314
Primary	84.5	24.6	11.8	10.2	13.1	5.6	1,054
Secondary or higher	84.5	24.2	15.4	11.5	15.4	2.7	1,877
Wealth quintile							
Lowest	84.8	23.8	9.8	9.4	11.5	3.9	683
Second	88.1	31.6	9.9	13.3	10.3	4.1	745
Middle	85.2	25.5	12.9	8.7	19.0	2.6	813
Fourth	80.4	22.2	14.7	9.2	16.9	5.2	953
Highest	82.2	21.6	15.4	14.0	15.2	3.6	1,051
Total	83.8	24.6	12.9	11.0	14.9	3.9	4,246

Note: Percentages may add to more than 100 since multiple responses were allowed.

Table 7.3 Knowledge of causes of malaria

Among women age 15-49 who have heard of malaria, percentage who cite specific causes of malaria, according to background characteristics, Liberia MIS 2016

Background characteristic	Mosquitoes	Dirty water	Dirty surroundings	Beer	Certain foods	Plasmodium parasite	Other[1]	Does not know any	Number of women who have heard of malaria
Age									
15-19	85.3	23.6	36.6	0.5	9.6	1.6	10.8	4.1	892
20-24	91.6	25.5	42.8	0.6	9.1	0.8	8.4	3.5	838
25-29	91.1	29.1	45.7	0.5	7.6	1.7	9.6	3.1	704
30-34	90.2	29.2	44.0	1.2	7.6	1.5	6.4	3.1	675
35-39	90.4	28.9	47.2	0.6	5.7	1.0	7.3	3.8	501
40-44	90.9	31.2	45.8	0.7	8.8	2.1	7.1	2.8	351
45-49	92.6	33.2	45.1	0.4	6.4	2.5	6.3	3.6	284
Residence									
Urban	91.4	27.1	46.3	0.8	7.8	1.7	7.2	2.6	2,722
Rural	87.2	28.7	37.3	0.4	8.7	1.0	10.5	5.0	1,523
Region									
Greater Monrovia	89.9	31.0	49.1	0.7	8.5	1.7	7.6	3.2	1,657
North Western	91.2	49.2	61.6	0.8	16.0	0.4	10.3	2.5	277
South Central	87.2	23.7	32.7	0.0	4.9	1.6	8.2	6.0	719
South Eastern A	90.5	31.2	43.6	0.3	4.1	1.4	4.8	2.6	262
South Eastern B	84.6	22.3	44.5	0.0	4.4	1.1	13.1	5.8	225
North Central	92.1	20.2	35.8	1.1	9.4	1.3	9.2	2.2	1,105
Education									
No education	86.5	28.4	37.6	0.4	8.2	1.1	8.8	6.0	1,314
Primary	87.7	27.2	38.9	0.3	9.9	0.5	10.4	4.3	1,054
Secondary or higher	93.4	27.5	49.3	1.0	7.1	2.2	7.0	1.2	1,877
Wealth quintile									
Lowest	84.2	25.1	30.9	0.7	7.7	0.9	8.3	8.0	683
Second	91.8	25.6	38.7	0.6	8.6	1.1	11.5	2.7	745
Middle	90.8	28.1	44.3	0.3	8.0	1.4	8.9	1.8	813
Fourth	88.5	28.5	45.5	0.5	8.2	1.0	8.7	4.2	953
Highest	92.6	29.8	50.9	1.1	8.1	2.5	5.5	1.8	1,051
Total	89.9	27.7	43.1	0.6	8.1	1.5	8.4	3.5	4,246

Note: Percentages may add to more than 100 since multiple responses were allowed.
[1] Other includes cold surroundings.

Table 7.4 Knowledge of ways to avoid malaria

Among women age 15-49 who have heard of malaria, percentage who say there are ways to avoid getting malaria, and among those, percentage who cite specific ways to avoid malaria, according to background characteristics, Liberia MIS 2016

Background characteristic	Women who have heard of malaria		Among women who have heard of malaria and who say there are ways to avoid getting malaria, percentage who cite specific ways to avoid malaria									Number of women
	Percentage who say there are ways to avoid malaria	Number of women who have heard of malaria	Sleep under mosquito net	Use mosquito coils	Use insecticide spray	Keep doors and windows closed	Use insect repellent	Keep surroundings clean	Cut the grass	Pregnant women take medicine	Other[1]	
Age												
15-19	91.5	892	85.1	23.7	18.0	8.7	2.8	44.3	10.4	1.8	10.1	816
20-24	95.3	838	89.9	18.4	19.3	7.6	1.8	50.9	9.9	2.1	8.1	799
25-29	96.5	704	91.6	18.2	20.5	7.6	3.1	53.5	15.0	3.3	8.4	680
30-34	95.6	675	88.7	19.8	17.8	8.4	2.9	51.4	11.6	2.9	5.5	645
35-39	95.4	501	88.9	15.4	15.4	7.1	3.1	55.5	12.7	2.0	6.7	478
40-44	95.0	351	85.6	14.4	22.4	7.4	2.2	58.2	14.5	2.9	9.0	334
45-49	95.3	284	84.7	13.6	18.6	9.6	2.9	56.9	13.0	2.7	8.5	270
Residence												
Urban	96.1	2,722	88.0	23.8	25.9	8.2	3.2	53.1	9.9	2.6	8.2	2,615
Rural	92.3	1,523	88.5	9.1	5.4	7.7	1.7	48.9	16.0	2.2	8.0	1,406
Region												
Greater Monrovia	95.8	1,657	85.9	27.6	30.5	8.2	3.9	52.4	8.2	3.0	8.5	1,587
North Western	98.8	277	92.3	10.4	8.4	10.4	1.3	74.4	30.4	2.0	7.7	274
South Central	92.9	719	86.6	16.6	14.1	4.0	1.8	42.0	6.8	1.9	8.9	668
South Eastern A	94.7	262	88.8	14.9	7.6	4.8	0.3	41.1	11.2	3.5	7.8	249
South Eastern B	90.2	225	83.7	5.4	11.6	3.5	0.4	53.1	21.5	2.5	14.5	203
North Central	94.2	1,105	92.4	11.9	10.6	11.2	2.7	52.8	14.8	1.7	5.8	1,041
Education												
No education	91.7	1,314	87.8	15.4	13.1	6.4	2.2	43.8	15.1	2.3	6.8	1,205
Primary	92.2	1,054	85.5	15.8	12.7	9.3	1.9	51.4	10.3	2.5	9.1	972
Secondary or higher	98.2	1,877	89.9	22.2	25.6	8.4	3.3	56.9	10.9	2.5	8.4	1,844
Wealth quintile												
Lowest	90.0	683	87.3	11.8	6.7	7.2	1.9	44.3	15.4	2.9	7.5	615
Second	94.7	745	91.5	9.5	5.0	11.1	1.8	52.8	16.0	1.6	8.3	706
Middle	95.4	813	89.2	14.2	13.0	7.0	1.8	51.8	13.3	1.6	7.6	775
Fourth	94.5	953	86.7	25.2	23.9	5.8	3.3	47.4	8.4	2.9	10.4	901
Highest	97.5	1,051	87.0	26.7	35.1	9.0	3.9	58.9	9.6	2.9	6.7	1,025
Total	94.7	4,246	88.2	18.7	18.7	8.0	2.7	51.6	12.0	2.4	8.1	4,022

Note: Percentages may add to more than 100 since multiple responses were allowed.
[1] Other includes use clean food/water.

Table 7.5 Perceived reasons people do not take action to prevent malaria

Among women age 15-49 who have heard of malaria and know that malaria can be avoided, percentage who think people do not take action to prevent themselves from getting malaria for specific perceived reasons, according to background characteristics, Liberia MIS 2016

Background characteristic	Perceived reasons people do not take action to prevent themselves from getting malaria						Number of women who have heard of malaria and know that malaria can be avoided
	Don't take malaria seriously (no risk)	Costs too much	Don't know what to do	Don't think prevention measures will work	Other[1]	Don't know	
Age							
15-19	45.2	16.4	13.7	6.4	9.4	30.7	816
20-24	48.1	17.6	13.4	6.7	12.6	25.8	799
25-29	51.4	20.0	10.7	6.7	11.9	23.4	680
30-34	48.0	17.3	12.9	6.8	13.0	24.8	645
35-39	51.1	17.5	10.5	8.0	11.5	24.2	478
40-44	49.1	17.7	11.2	8.2	11.5	22.8	334
45-49	52.9	15.7	10.2	2.2	13.7	22.3	270
Residence							
Urban	48.2	22.0	13.6	7.2	12.3	22.5	2,615
Rural	49.8	9.4	9.5	5.6	10.7	31.2	1,406
Region							
Greater Monrovia	49.5	24.3	9.0	6.5	13.0	21.2	1,587
North Western	59.1	9.9	15.1	14.9	8.8	23.9	274
South Central	51.0	9.6	7.5	2.3	18.3	27.6	668
South Eastern A	55.5	10.8	11.9	7.1	8.4	18.1	249
South Eastern B	44.6	5.4	9.4	4.0	11.3	35.9	203
North Central	42.8	18.5	19.8	7.8	7.4	31.1	1,041
Education							
No education	46.1	15.0	9.3	5.6	9.0	31.5	1,205
Primary	50.9	13.5	13.1	6.1	10.0	28.2	972
Secondary or higher	49.4	21.4	13.6	7.5	14.5	20.2	1,844
Wealth quintile							
Lowest	47.8	14.4	12.2	6.3	12.4	26.6	615
Second	43.2	13.1	14.6	6.2	8.6	35.3	706
Middle	49.7	14.1	12.1	7.6	11.0	27.5	775
Fourth	50.2	20.2	10.4	5.3	11.4	23.7	901
Highest	51.3	23.0	12.1	7.5	14.5	18.3	1,025
Total	48.8	17.6	12.2	6.6	11.8	25.5	4,022

Note: Percentages may add to more than 100 since multiple responses were allowed.
[1] Other includes careless or lazy, do not have net, net too hot/uncomfortable.

Table 7.6 Knowledge of malaria treatment

Among women age 15-49 who have heard of malaria, percentage who say malaria can be treated, and among those, percentage who cite specific drugs for malaria treatment, according background characteristics, Liberia MIS 2016

Background characteristic	Percent-age who say malaria can be treated	Number of women who have heard of malaria	Among women who have heard of malaria and who say malaria can be treated, percentage who cite specific drugs for malaria treatment								Number of women who know malaria can be treated
			SP/ Fansidar	Chloro-quine	Quinine	Any ACT	Amodia-quine	Aspirin, Panadol, Parace-tamol	Other	Does not know any	
Age											
15-19	98.6	892	2.4	6.4	22.7	73.1	8.9	27.2	5.8	6.6	880
20-24	99.3	838	3.1	4.1	25.0	82.2	8.2	19.3	6.9	2.6	832
25-29	99.2	704	4.7	9.6	28.7	84.4	12.2	20.4	5.9	2.7	699
30-34	99.5	675	6.6	8.2	27.8	84.8	11.2	19.4	8.0	0.8	672
35-39	99.1	501	4.1	9.2	25.7	83.4	7.4	24.4	5.8	2.3	497
40-44	98.9	351	3.7	10.0	24.8	84.3	7.8	19.7	6.3	2.0	347
45-49	98.9	284	5.6	12.6	34.2	80.8	8.5	27.8	7.9	1.1	280
Residence											
Urban	99.3	2,722	5.6	10.5	31.3	77.6	12.4	21.1	8.8	3.3	2,702
Rural	98.8	1,523	1.4	3.0	17.2	88.0	4.1	24.6	2.6	2.4	1,505
Region											
Monrovia	99.7	1,657	7.1	13.3	36.9	73.7	14.2	22.2	11.4	4.2	1,652
North Western	99.8	277	2.8	4.6	34.0	85.9	6.7	47.2	4.5	1.6	277
South Central	98.6	719	3.1	4.3	27.5	76.6	7.7	26.6	5.3	2.4	709
South Eastern A	99.4	262	2.0	4.1	14.6	87.6	3.3	9.4	1.2	2.1	261
South Eastern B	94.2	225	1.2	2.3	12.6	88.5	6.8	22.2	5.5	3.8	212
North Central	99.2	1,105	1.6	4.6	12.8	91.7	5.9	16.8	2.1	2.0	1,097
Education											
No education	98.4	1,314	2.2	4.2	19.9	81.0	6.6	25.9	4.2	3.9	1,293
Primary	99.2	1,054	2.8	5.3	20.8	81.8	7.4	24.3	3.8	3.1	1,046
Secondary or higher	99.5	1,877	6.1	11.7	33.7	81.2	12.5	18.8	9.8	2.3	1,868
Wealth quintile											
Lowest	97.6	683	2.2	4.2	13.6	85.7	2.8	20.1	3.8	2.2	667
Second	99.0	745	1.0	3.3	14.3	88.5	5.2	20.8	1.6	2.9	738
Middle	99.4	813	2.6	4.0	24.5	83.0	9.0	26.0	4.1	2.1	808
Fourth	99.1	953	3.9	11.2	32.2	76.4	11.9	23.0	7.9	4.8	945
Highest	99.8	1,051	8.9	13.1	38.7	76.5	14.6	21.6	12.5	2.6	1,049
Total	99.1	4,246	4.1	7.8	26.2	81.3	9.4	22.4	6.6	3.0	4,207

Note: Percentages may add to more than 100 since multiple responses were allowed.

Table 7.7 Perceived reasons people do not seek treatment for malaria promptly

Among women age 15–49 who have heard of malaria and know malaria can be treated, percentage who think people do not seek treatment as soon as they feel they have malaria for specific perceived reasons, according to background characteristics, Liberia MIS 2016

Background characteristic	Perceived reasons people do not seek prompt treatment for malaria												Number of women who know malaria can be treated
	No access/ distance to health centre	Costs too much	Didn't know where to go	Think they can treat at home	No drugs at health centre	Negative behaviour of provider	Go to traditional healer	Went to drug store	Illness not serious	Weakness/ too sick to go	Other	Don't know	
Age													
15-19	13.7	30.1	2.3	14.9	6.8	2.9	9.3	22.4	16.5	15.9	3.8	16.0	880
20-24	18.7	31.8	4.4	16.4	10.7	3.4	11.7	20.9	16.4	18.7	4.3	11.5	832
25-29	16.8	39.0	3.1	19.4	9.1	3.2	8.7	19.9	15.0	16.7	5.1	13.0	699
30-34	17.5	32.7	4.2	17.7	8.3	4.3	8.9	19.2	17.3	17.5	7.0	14.0	672
35-39	17.7	35.0	2.5	15.7	11.6	3.0	11.2	22.2	14.0	17.5	3.6	12.9	497
40-44	17.8	29.5	3.4	17.7	11.2	5.6	9.6	19.6	15.0	16.7	8.5	12.6	347
45-49	17.0	29.9	0.9	20.3	9.1	6.5	6.7	21.1	14.6	14.5	5.9	15.5	280
Residence													
Urban	10.4	40.9	4.3	19.0	7.4	4.5	7.7	24.2	17.7	16.7	5.8	11.4	2,702
Rural	28.3	18.4	1.1	13.6	12.6	2.5	13.2	14.9	12.4	17.6	4.0	17.5	1,505
Region													
Greater Monrovia	4.1	49.3	2.7	18.9	2.8	3.9	4.3	24.8	19.8	15.2	5.8	10.5	1,652
North Western	26.7	22.1	1.8	26.9	7.1	3.5	6.8	20.5	20.4	30.1	4.0	13.0	277
South Central	19.9	22.5	1.4	22.1	9.3	2.4	10.4	19.6	14.6	13.7	4.7	10.8	709
South Eastern A	18.4	28.8	1.0	12.3	3.9	3.1	14.1	15.2	20.4	19.7	4.7	5.7	261
South Eastern B	10.4	8.1	1.1	13.1	6.3	2.8	22.4	22.6	17.6	27.3	5.4	24.7	212
North Central	32.4	23.3	6.2	10.5	21.5	4.8	14.5	16.7	8.1	16.0	4.7	20.0	1,097
Education													
No education	19.1	24.7	2.1	15.0	10.1	2.8	10.7	17.4	13.0	16.2	4.5	19.2	1,293
Primary	21.7	27.3	3.4	14.1	11.0	3.2	11.3	17.2	16.3	17.4	5.0	13.2	1,046
Secondary or higher	12.6	41.5	3.7	20.2	7.8	4.7	8.1	25.3	17.6	17.4	5.6	10.0	1,868
Wealth quintile													
Lowest	37.0	19.5	3.4	13.5	17.8	3.6	15.7	13.7	8.4	13.3	4.3	15.5	667
Second	26.0	16.9	3.5	13.4	17.9	4.7	18.2	15.2	12.0	19.8	3.5	18.3	738
Middle	17.4	28.2	3.2	16.8	9.7	4.0	8.4	20.7	17.2	20.2	5.9	13.8	808
Fourth	7.5	45.3	2.7	19.1	2.0	1.7	5.4	23.9	17.6	16.5	5.3	11.6	945
Highest	5.6	44.8	3.2	20.4	4.1	4.9	4.7	26.8	20.6	15.5	6.0	10.9	1,049
Total	16.8	32.8	3.2	17.1	9.3	3.8	9.7	20.9	15.8	17.0	5.1	13.6	4,207

Note: Percentages may add to more than 100 since multiple responses were allowed.

Table 7.8 Knowledge of SP/Fansidar

Among women age 15-49 who have heard of malaria, percentage who have heard of SP/Fansidar, and among women who have heard of SP/Fansidar, percentage who cite specific uses of SP/Fansidar, according to background characteristics, Liberia MIS 2016

Background characteristic	Heard of SP/Fansidar	Number of women who have heard of malaria	Prevent malaria during pregnancy	Treat malaria	Other	Don't know	Number of women who have heard of SP/Fansidar
Age							
15-19	33.1	892	47.9	39.0	1.7	15.1	296
20-24	59.8	838	60.1	31.7	0.1	12.5	501
25-29	63.8	704	61.5	34.9	0.6	8.5	449
30-34	67.2	675	57.4	40.5	0.9	7.9	454
35-39	65.6	501	54.2	41.9	1.7	8.1	329
40-44	59.7	351	51.6	42.1	2.6	10.9	210
45-49	54.7	284	39.1	60.3	3.1	6.3	155
Residence							
Urban	56.2	2,722	54.9	39.1	1.3	11.5	1,531
Rural	56.6	1,523	56.3	39.0	1.0	7.4	862
Region							
Greater Monrovia	54.0	1,657	46.4	47.8	1.0	13.9	896
North Western	59.9	277	53.2	50.3	1.6	8.3	166
South Central	51.6	719	67.6	24.8	1.4	9.8	371
South Eastern A	63.1	262	75.1	21.9	2.7	6.1	166
South Eastern B	45.3	225	57.0	25.8	2.8	19.6	102
North Central	62.7	1,105	56.2	38.7	0.6	5.1	693
Education							
No education	53.0	1,314	54.7	40.2	1.6	8.3	697
Primary	56.1	1,054	55.7	39.7	1.2	7.3	592
Secondary or higher	58.8	1,877	55.7	38.0	1.0	12.6	1,105
Wealth quintile							
Lowest	54.0	683	60.6	34.0	1.1	7.3	369
Second	56.1	745	59.1	34.2	0.7	8.5	418
Middle	62.9	813	58.1	37.7	1.8	9.2	511
Fourth	55.7	953	49.5	41.4	0.8	10.4	531
Highest	53.6	1,051	52.5	45.0	1.5	13.4	564
Total	56.4	4,246	55.4	39.0	1.2	10.0	2,393

Note: Percentages may add to more than 100 since multiple responses were allowed.

Table 7.9 Perceived reasons pregnant women do not prevent malaria through use of SP/Fansidar

Among women age 15-49 who know SP/Fansidar is used to prevent malaria in pregnant women, reasons given why certain pregnant women don't take any or enough SP/Fansidar during pregnancy to prevent malaria, according to background characteristics, Liberia MIS 2016

Background characteristic	No access/distance to health centre	Costs too much	Didn't think/know they need to	Don't think it works	Worried about side effects	Don't know where to get it	Not available/Stock out	Provider didn't explain/No info	Negative provider interaction	Empty stomach	Other[1]	Does not know any	Number of women who know SP/Fansidar is used to prevent malaria in pregnant women
Age													
15-19	24.8	5.3	9.3	1.8	52.1	3.6	3.7	5.3	0.2	1.3	4.7	28.8	142
20-24	26.6	5.9	9.9	0.7	48.2	5.1	4.3	7.6	1.9	1.7	12.1	20.3	301
25-29	20.2	4.9	9.3	2.5	46.7	4.1	6.9	5.6	3.2	1.7	11.3	23.7	276
30-34	16.4	4.7	4.8	3.0	43.0	4.9	4.4	5.2	2.9	0.7	9.3	32.1	260
35-39	20.0	2.8	5.0	0.6	40.6	5.7	5.7	9.9	1.5	0.8	11.9	26.8	178
40-44	27.4	3.5	4.8	3.7	41.4	6.5	6.7	10.2	1.5	2.6	10.6	24.5	108
45-49	28.3	5.0	17.8	8.8	41.6	6.9	9.1	15.0	0.0	0.0	8.0	22.9	61
Residence													
Urban	20.9	5.6	10.5	2.6	46.7	6.5	4.6	8.8	2.6	1.2	10.3	26.0	841
Rural	24.9	3.3	3.6	1.7	43.2	2.4	6.8	4.8	1.0	1.6	10.1	24.8	486
Region													
Greater Monrovia	14.1	4.9	11.4	2.6	40.8	5.5	6.0	3.9	4.5	1.1	12.6	28.6	415
North Western	9.3	0.5	0.0	0.9	73.7	1.0	5.8	16.9	0.8	0.0	1.8	5.8	89
South Central	21.4	1.4	5.2	4.1	21.9	2.2	3.4	1.4	0.9	0.7	19.2	34.6	251
South Eastern A	8.6	7.0	9.9	4.3	33.2	3.3	7.3	11.3	1.5	0.7	3.8	31.5	124
South Eastern B	1.7	1.5	6.9	1.4	39.2	2.9	1.4	1.3	0.0	13.6	14.2	37.0	58
North Central	42.1	7.5	7.5	0.5	63.8	8.0	5.9	12.2	0.8	0.7	5.4	17.4	390
Education													
No education	20.5	4.4	5.5	2.9	36.3	3.5	3.7	6.7	0.5	1.0	9.4	32.9	381
Primary	25.9	6.9	6.7	2.4	46.4	5.9	8.1	7.8	2.1	1.4	9.7	21.3	330
Secondary or higher	21.5	3.8	10.2	1.8	50.5	5.4	5.0	7.5	2.9	1.5	11.0	23.3	615
Wealth quintile													
Lowest	24.2	6.3	5.0	1.6	43.5	5.5	4.7	10.1	0.1	0.9	7.0	28.6	224
Second	35.5	6.0	7.4	1.9	48.1	5.5	8.4	10.7	1.7	2.4	10.5	17.0	247
Middle	21.7	4.8	5.4	2.4	50.6	3.5	4.7	7.5	2.4	1.8	9.6	24.1	297
Fourth	11.8	3.9	10.8	2.9	38.7	2.8	3.2	5.7	1.9	0.5	10.0	33.6	263
Highest	19.9	3.3	10.9	2.4	45.4	7.5	6.1	3.7	3.5	1.0	13.3	24.8	296
Total	22.3	4.7	8.0	2.3	45.4	5.0	5.4	7.3	2.0	1.3	10.2	25.6	1,326

Note: Percentages may add to more than 100 since multiple responses were allowed.
[1] Other includes husband wouldn't let her go.

Table 7.10 Exposure to malaria messages

Among women age 15-49 who have heard of malaria, percentage who have heard a message about malaria in the past few months, and among those who have seen or heard a message about malaria, percentage who cited specific messages, according to background characteristics, Liberia MIS 2016

Background characteristic	Percentage who have seen or heard a message about malaria	Number of women who have heard of malaria	Among women who have seen or heard malaria messages, percentage who have seen or heard specific messages						Number of women who saw or heard a malaria message
			If have fever, go to the health facility	Everywhere, every night, sleep under the net	Pregnant women should take drugs to prevent malaria	Hang up keep up	Use your mosquito net	Other	
Age									
15-19	49.4	892	89.3	96.0	82.2	45.3	97.4	6.8	441
20-24	59.9	838	93.1	95.8	91.9	57.2	97.9	6.5	502
25-29	61.1	704	92.8	94.1	92.2	57.4	99.3	7.3	430
30-34	55.7	675	93.5	96.2	92.9	63.6	98.8	8.3	376
35-39	64.9	501	96.6	96.6	93.2	61.2	98.8	5.4	325
40-44	61.7	351	96.1	95.1	92.8	61.4	97.5	9.5	217
45-49	60.8	284	97.0	96.8	94.0	60.6	96.9	6.5	172
Residence									
Urban	50.5	2,722	92.3	93.8	90.9	56.2	97.9	7.8	1,375
Rural	71.5	1,523	94.8	98.1	90.6	58.5	98.5	6.2	1,089
Region									
Greater Monrovia	45.8	1,657	89.4	92.1	87.9	46.2	97.7	8.7	759
North Western	77.6	277	97.5	99.4	87.2	66.4	99.1	8.6	215
South Central	71.7	719	91.5	97.1	91.7	51.6	98.8	7.3	515
South Eastern A	38.6	262	91.4	95.2	86.6	51.1	97.6	11.1	101
South Eastern B	50.6	225	96.2	94.6	95.3	41.2	96.4	15.2	114
North Central	68.8	1,105	97.4	97.5	93.9	72.7	98.4	3.2	760
Education									
No education	62.9	1,314	95.0	95.0	91.6	58.6	98.5	7.4	826
Primary	63.0	1,054	91.9	97.0	89.6	58.5	98.6	6.1	665
Secondary or higher	51.8	1,877	93.1	95.5	90.9	55.2	97.7	7.6	973
Wealth quintile									
Lowest	62.2	683	95.7	98.6	93.7	64.8	98.4	3.7	425
Second	68.4	745	95.0	97.5	90.0	57.3	98.1	8.2	509
Middle	64.5	813	94.5	96.8	90.3	64.4	98.3	5.9	525
Fourth	54.8	953	89.4	92.0	90.4	48.6	98.7	7.2	522
Highest	46.0	1,051	92.9	94.1	89.9	52.0	97.4	10.1	483
Total	58.0	4,246	93.4	95.7	90.8	57.2	98.2	7.1	2,464

Note: Percentages may add to more than 100 since multiple responses were allowed.

Table 7.11 Sources of malaria messages

Among women age 15-49 who have seen or heard a malaria message in the few months before the survey, percentage who cited specific places they saw/heard a message, according to background characteristics, Liberia MIS 2016

Background characteristic	Radio	Billboard	Poster	T-shirt	Leaflet/ factsheet/ brochure	Television	Video club	School	Community health worker/ traditional birth attendant/ health promoters	Peer education	Other[1]	Number of women who have seen or heard a malaria message
Age												
15-19	66.7	0.8	2.0	0.5	0.9	2.5	0.5	11.0	59.7	12.8	15.2	441
20-24	57.3	1.0	2.7	1.6	0.5	1.8	0.1	3.0	64.4	10.8	19.6	502
25-29	65.7	1.9	4.5	2.5	4.3	1.9	0.2	1.9	61.6	9.3	19.8	430
30-34	68.6	1.5	2.8	1.4	2.2	1.4	0.0	0.8	61.9	12.8	15.2	376
35-39	66.4	0.9	1.2	0.3	1.1	0.6	0.0	0.2	62.4	7.9	20.3	325
40-44	73.0	1.2	3.9	4.0	3.8	7.1	0.5	0.1	56.9	13.1	17.2	217
45-49	69.4	2.1	3.1	1.6	0.7	4.9	0.0	0.0	67.9	11.2	13.1	172
Residence												
Urban	74.5	2.1	4.2	2.5	2.4	4.3	0.2	3.3	59.7	10.3	10.3	1,375
Rural	54.4	0.2	1.1	0.5	1.2	0.0	0.1	2.8	65.0	12.1	26.8	1,089
Region												
Greater Monrovia	76.4	3.1	7.0	2.8	3.1	7.2	0.1	4.4	56.0	14.0	11.1	759
North Western	76.3	0.8	3.5	1.8	0.4	0.2	0.3	6.9	84.2	42.6	11.9	215
South Central	58.8	0.3	0.8	0.4	0.4	0.4	0.3	0.8	80.7	6.6	8.6	515
South Eastern A	57.9	0.0	0.7	0.2	6.1	0.0	0.2	4.0	75.7	19.0	2.6	101
South Eastern B	34.3	0.0	0.6	0.4	1.3	0.2	0.0	4.4	81.2	6.8	5.1	114
North Central	62.2	0.6	0.5	1.4	1.7	0.3	0.1	1.9	44.4	1.8	35.6	760
Education												
No education	57.2	0.7	1.5	1.1	0.7	1.0	0.2	0.2	67.0	10.0	21.8	826
Primary	60.7	0.2	2.9	0.8	1.8	1.5	0.1	2.5	60.8	9.7	21.0	665
Secondary or higher	76.1	2.5	3.9	2.5	2.9	4.2	0.2	5.9	58.6	12.9	11.7	973
Wealth quintile												
Lowest	55.4	0.5	0.8	0.1	0.6	0.0	0.0	1.0	64.1	6.4	21.1	425
Second	51.9	0.1	1.1	0.7	1.4	0.0	0.0	2.5	62.6	9.7	33.0	509
Middle	66.8	0.0	1.5	1.2	1.2	0.7	0.4	3.1	68.1	13.6	14.8	525
Fourth	72.2	1.5	2.9	2.1	1.6	2.1	0.1	4.0	58.1	11.0	11.0	522
Highest	80.7	4.3	7.9	3.7	4.6	9.3	0.3	4.6	57.2	13.9	8.4	483
Total	65.6	1.3	2.8	1.6	1.9	2.4	0.2	3.1	62.0	11.1	17.6	2,464

Note: Percentages may add to more than 100 since multiple responses were allowed.
[1] Other includes hospital, clinic.

REFERENCES

Doolan, D. L., C. Dobano, and J. K. Baird. 2009. "Acquired Immunity to Malaria." *Clin Microbio Rev* 22: 13-36.

Government of Liberia Ministry of Health (GoL). "Republic of Liberia Investment Plan for Building a Resilient Health System in Liberia: 2015-2021." https://www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/case-counts.html.

Korenromp, E. L., J. Armstrong-Schellenberg, B. Williams, B. Nahlen, and R. W. Snow. 2004. "Impact of Malaria Control on Childhood Anemia in Africa – A Quantitative Review." *Trop Med Int Health* 9(10): 1050-1065.

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

President's Malaria Initiative (PMI) 2017. Liberia Malaria Operation Plan FY 2017. https://www.pmi.gov/docs/default-source/default-document-library/malaria-operational-plans/fy17/fy-2017-liberia-malaria-operational-plan.pdf?sfvrsn=6.

Roll Back Malaria Partnership. 2003. Monitoring and Evaluation Reference Group Anemia Task Force. Minutes of meeting presented at WHO Headquarters, Geneva, 27-28 Oct 2003. Geneva: World Health Organization.

World Health Organization. 2004. *A Strategic Framework for Malaria Prevention and Control during Pregnancy in the African Region*. Geneva: World Health Organization.

World Health Organization. 2012a. *WHO Evidence Review Group: Intermittent Preventive Treatment of Malaria in Pregnancy (IPTp) with Sulfadoxine-Pyrimethamine (SP)*. Report of meeting held at WHO Headquarters, Geneva, 9-11 July 2012. Geneva: World Health Organization. http://www.who.int/malaria/mpac/sep2012/iptp_sp_erg_meeting_report_july2012.pdf.

World Health Organization. 2012b. Global Malaria Programme. Updated WHO Policy Recommendation (October 2012) *Intermittent Preventive Treatment of Malaria in Pregnancy Using Sulfadoxine-Pyrimethamine (IPTp-SP)*. http://who.int/malaria/iptp_sp_updated_policy_recommendation_en_102012.pdf?ua=1.

SAMPLE DESIGN

Appendix A

A.1   INTRODUCTION

This appendix describes the objectives of the survey, the overall sample size, survey domains, and any subsamples used.

The 2016 Liberia Malaria Indicator Survey (LMIS) is a nationwide survey with a nationally representative sample of approximately 4,500 households. The survey provides information on key malaria control indictors, such as the proportion of households having at least one bed net and at least one insecticide-treated net (ITN). Among children, it looks at the proportion under age 5 who slept under a bed net the previous night and under an ITN, in addition to prevalence of malaria among children age 6-59 months. Among pregnant women, the survey assesses the proportion of pregnant women who slept under a bed net the previous night and who received intermittent preventive treatment (IPT) for malaria during their last pregnancy.

In Liberia, there are 15 counties. Each county consists of districts, and each district consists of clans. For this survey, the counties were regrouped to form five geographical regions, each region consisting of three counties. In addition to reporting the survey estimates for the country as a whole and for urban and rural areas separately, the survey reports estimates for the capital city, Greater Monrovia, and for each of the five geographical regions as follows:

- North Western: Bomi, Grand Cape Mount, and Gbarpolu

- South Central: Montserrado (excluding Greater Monrovia district), Margibi, and Grand Bassa

- North Central: Bong, Nimba, and Lofa

- South Eastern A: River Cess, Sinoe, and Grand Gedeh

- South Eastern B: River Gee, Grand Kru, and Maryland

A.2   SAMPLE FRAME

The sampling frame used for the 2016 LMIS is the National Population and Housing Census conducted in March 2008 (NPHC 2008). A total of 7,012 enumeration areas (EAs) were constructed for the census, which had complete coverage of the country. The census frame had been updated several times to reflect the correct urban/rural distribution in the country. A final complete list of EAs is available at the Liberia Institute of Statistics and Geo-Information Services (LISGIS). In this list, each EA contains its identification information and the number of households from the summary sheets of the census. Table A.1 below shows distribution of residential households in the sampling frame by region and by residence type. In Liberia, about 56% of residential households are in urban areas. Thirty percent of households are in the capital city, Monrovia.

Table A.1 Households

Distribution of residential households in the sampling frame by region and residence, Liberia 2016

Region	Number of households in frame			Percentage of total households in the frame	Percent urban
	Urban	Rural	Total		
Greater Monrovia*	20,1251	0	201,251	30.0	100.0
North Western	7,317	51,789	59,106	8.8	12.4
South Central**	52,422	71,764	124,186	18.5	42.2
North Central	92,029	108,157	200,186	29.9	46.0
South Eastern A	11,170	36,783	47,953	7.25	23.3
South Eastern B	12,745	25,300	38,045	5.7	33.5
Liberia	376,934	293,793	670,727	100.0	56.2

Source: The 2008 NPHC provided by the LISGIS
* Greater Monrovia district in South Central region
** Excluding Greater Monrovia district

Table A.2 below shows the distribution of EAs and the average EA size (number of residential households residing in the EA) by region and by type of residence. On average, an EA has 96 households, 103 in urban areas and 88 in rural areas. The average size of EAs makes them convenient as a first-stage survey cluster with a sample 'take' of around 30 households per cluster at the second stage of sampling. Therefore, a 2016 LMIS cluster corresponds to a census EA.

Table A.2 Enumeration areas

Distribution of the enumeration areas in the sampling frame and average number of residential households per enumeration area, by region and residence, Liberia 2016

Region	Number of enumeration areas in frame			Average number of residential households in enumeration area		
	Urban	Rural	Total	Urban	Rural	Total
Greater Monrovia*	1,967	0	1,967	102	NA	102
North Western	84	615	699	87	84	85
South Central**	454	728	1,182	115	99	105
North Central	930	1,279	2,209	99	85	91
South Eastern A	111	435	546	101	85	88
South Eastern B	109	300	409	117	84	93
Liberia	3,655	3,357	7,012	103	88	96

Source: The 2008 NPHC provided by the LISGIS
* Greater Monrovia district in South Central Region
** Excluding Greater Monrovia district

A.3   SAMPLE DESIGN AND IMPLEMENTATION

The sample for the 2016 LMIS is a stratified sample selected in two stages. In the first stage, 150 EAs were selected with a stratified probability proportional to size (PPS) sampling from the sampling frame. The EA size is the number of residential households residing in the EA as recorded in the census. Stratification was achieved by separating every region into urban and rural areas; Greater Monrovia was assigned a separate stratum. Therefore, the 2016 LMIS contains 11 sampling strata, including 5 rural strata, and 6 urban strata. Samples were selected independently in every stratum, with a predetermined number of EAs to be selected, as shown in Table A.3.

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

At the second stage, for each selected EA, a fixed number of 30 households was selected from the list created during the household listing. Household selection was performed in the central office prior to the main survey. The survey interviewers interviewed only the pre-selected households. To prevent bias, no

replacements and no changes of the pre-selected households were allowed in the implementing stages. All women age 15-49 in the selected households were eligible for an interview.

Table A.3 below shows the sample allocation of enumeration areas (clusters) by region and by urban-rural residence. Because of the desire to produce results by region, as well as budgetary and implementing constraints, the sample allocation is an equal size allocation at the regional level, with 25 clusters in each region. The 25 clusters in each region were then allocated to each of the counties in the region and to its urban/rural areas. Among the 150 clusters selected, 70 clusters are in urban areas and 80 clusters are in rural areas. Table A.3 below shows the number of households selected by region and by type of residence. The total number of households selected in the 2016 LMIS is 4,500, with 2,100 in urban areas and 2,400 in rural areas.

Table A.3 Sample allocation of enumeration areas and households

Sample allocation of enumeration areas and selected households by region, according to residence, Liberia 2016

Region	Allocation of enumeration areas			Allocation of selected households		
	Urban	Rural	Total	Urban	Rural	Total
Greater Monrovia[*]	25	0	25	750	0	750
North Western	4	21	25	120	630	750
South Central[**]	11	14	25	330	420	750
North Central	12	13	25	360	390	750
South Eastern A	7	18	25	210	540	750
South Eastern B	11	14	25	330	420	750
Liberia	70	80	150	2,100	2,400	4,500

* Greater Monrovia district in South Central Region
** Excluding Greater Monrovia district

Table A.4 below shows the expected number of women age 15-49 in the sampled households and the expected number of completed interviews with women by region and type of residence. The total expected number of interviewed women in the 2016 LMIS is 4,355, with 2,185 in urban areas and 2,170 in rural areas.

Table A.5 shows the expected number of children age 6-59 months in sampled households by region and by type of residence. The same table shows the expected number of children 6-59 months tested for malaria. These calculations were based on the results obtained from the 2013 LDHS and 2011 LMIS, using the following assumptions: the household completion rate is 96% in both urban and rural areas; the response rate for women is 98% in both urban and rural areas; in urban areas, there is about 1 woman per household, whereas in rural areas there are about 0.96 women per household; there are about 0.68 children 6-59 months per household, and the completion rate for the malaria rapid diagnostic test among these children is about 97%.

Table A.4 Sample allocations of completed interviews with women

Sample allocation of expected number of women age 15-49 found and sample allocation of expected number of completed interviews with women by region, according to residence, Liberia 2016

Region	Expected number of women 15-49 in interviewed households			Expected number of women 15-49 with completed interviews		
	Urban	Rural	Total	Urban	Rural	Total
Greater Monrovia[*]	799	0	799	781	0	781
North Western	128	583	711	125	569	694
South Central[**]	351	389	740	343	380	723
North Central	383	361	744	374	352	726
South Eastern A	224	501	725	219	489	708
South Eastern B	351	389	740	343	380	723
Liberia	2,236	2,223	4,459	2,185	2,170	4,355

* Greater Monrovia district in South Central Region
** Excluding Greater Monrovia district

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

Sample allocation of expected number of children age 6-59 months and sample allocation of expected number of children age 6-59 months tested with rapid diagnostic test (RDT) for malaria by region, according to residence, Liberia 2016

	Expected number of children 6-59 months			Expected number of children 6-59 months tested for malaria (RDT)		
Region	Urban	Rural	Total	Urban	Rural	Total
Greater Monrovia*	493	0	493	479	0	479
North Western	79	413	492	77	401	478
South Central**	216	276	492	210	268	478
North Central	236	256	492	229	249	478
South Eastern A	138	355	493	134	345	479
South Eastern B	216	276	492	210	268	478
Liberia	1,378	1,576	2,954	1,339	1,531	2,870

* Greater Monrovia district in South Central Region
** Excluding Greater Monrovia district

A.4 SAMPLE PROBABILITIES AND SAMPLING WEIGHTS

Because of the nonproportional allocation of the sample to the different reporting domains, sampling weights will be required for any analysis using the 2016 LMIS data to ensure the actual representativity of the sample. Because the 2016 LMIS sample is a two-stage stratified cluster sample, sampling weights were calculated based on sampling probabilities, which were calculated separately for each sampling stage and for each cluster. We use the following notations:

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

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

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

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

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

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

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

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

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

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

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

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

ESTIMATES OF SAMPLING ERRORS *Appendix* **B**

The estimates from a sample survey are affected by two types of errors: nonsampling errors and sampling errors. Nonsampling errors are the results of mistakes made in implementing data collection and data processing, such as failure to locate and interview the correct household, misunderstanding of the questions on the part of either the interviewer or the respondent, and data entry errors. Although numerous efforts were made during the implementation of the 2016 Liberia Malaria Indicator Survey (LMIS) to minimize this type of error, nonsampling errors are impossible to avoid and difficult to evaluate statistically.

Sampling errors, on the other hand, can be evaluated statistically. The sample of respondents selected in the 2016 LMIS 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 amongpossible samples. Although the degree of variability is not known exactly, it can be estimated from the survey results.

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

If the sample of respondents had been selected as a simple random sample, it would have been possible to use straightforward formulas for calculating sampling errors. However, the 2016 LMIS 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 SAS, using programs developed by ICF. These programs use the Taylor linearization method of variance estimation for survey estimates that are means, proportions, or ratios.

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

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

in which

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

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

In addition to the standard error, the design effect (DEFT) for each estimate is also calculated. The design effect is defined as the ratio between the standard error using the given sample design and the standard

error that would result if a simple random sample had been used. A DEFT value of 1.0 indicates that the sample design is as efficient as a simple random sample, while a value greater than 1.0 indicates the increase in the sampling error due to the use of a more complex and less statistically efficient design. Relative standard errors and confidence limits for the estimates are also calculated.

Sampling errors for the 2016 LMIS are calculated for selected variables considered to be of primary interest. The results are presented in this appendix for the country as a whole, for urban and rural areas, and for each of the country's regions. For each variable, the type of statistic (mean, proportion, or rate) and the base population are given in Table B.1. Tables B.2 through B.10 present the value of the statistic (R), its standard error (SE), the number of unweighted (N) and weighted (WN) cases, the design effect (DEFT), the relative standard error (SE/R), and the 95 percent confidence limits (R±2SE), for each variable. The 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 the child who has a fever in the last 2 weeks) can be interpreted as follows: the overall average from the national sample is 0.384, and its standard error is 0.015. Therefore, to obtain the 95 percent confidence limits, one adds and subtracts twice the standard error to the sample estimate, i.e., $0.384 \pm 2\times0.015$. There is a high probability (95 percent) that the true proportion of children who have a fever in the last 2 weeks is between 0.354 and 0.414.

For the total sample, the value of the DEFT, averaged over all variables, is 1.75. This means that, due to multi-stage clustering of the sample, the average standard error is increased by a factor of 1.75 over that in an equivalent simple random sample.

Table B.1 List of selected variables for sampling errors, Liberia 2016

Variable	Type of estimate	Base population
No education	Proportion	All women 15-49
At least some secondary education	Proportion	All women 15-49
Ownership of at least one ITN	Proportion	Households
Child slept under an ITN last night	Proportion	Children under five in households
Pregnant women slept under an ITN last night	Proportion	All pregnant women 15-49 in households
Received 2+ doses of SP/Fansidar during antenatal visit	Proportion	Last birth of women 15-49 with live births last 2 years
Child has 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 has anaemia (haemoglobin <8.0 g/dl)	Proportion	Child 6-59 tested for anaemia
Child has malaria (based on rapid test)	Proportion	Children 6-59 tested (rapid test) for malaria

Table B.2 Sampling errors: Total sample, Liberia 2016

			Number of cases				Confidence limits	
Variable	Value (R)	Standard error (SE)	Un-weighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Lower (R-2SE)	Upper (R+2SE)
No education	0.312	0.015	4,290	4,290	2.188	0.050	0.281	0.343
At least some secondary education	0.439	0.019	4,290	4,290	2.527	0.044	0.401	0.478
Ownership of at least one ITN	0.615	0.016	4,218	4,218	2.198	0.027	0.582	0.648
Child slept under an ITN last night	0.437	0.019	3,232	3,315	1.747	0.043	0.400	0.474
Pregnant women slept under an ITN last night	0.395	0.043	300	304	1.513	0.108	0.310	0.480
Received 2+ doses of SP/Fansidar during antenatal visit	0.545	0.021	1,219	1,146	1.430	0.039	0.503	0.587
Child has fever in last 2 weeks	0.384	0.015	2,843	2,705	1.496	0.039	0.354	0.414
Child sought care/treatment from a health facility	0.782	0.020	1,134	1,039	1.464	0.026	0.741	0.822
Child took ACT	0.811	0.021	720	680	1.302	0.026	0.768	0.853
Child has anaemia (haemoglobin <8.0 g/dl)	0.083	0.008	2,792	2,873	1.507	0.098	0.067	0.099
Child has malaria (based on rapid test)	0.449	0.020	2,790	2,872	1.942	0.045	0.409	0.489

Table B.3 Sampling errors: Urban sample, Liberia 2016

| Variable | Value (R) | Standard error (SE) | Number of cases | | Design effect (DEFT) | Relative error (SE/R) | Confidence limits | |
			Un-weighted (N)	Weighted (WN)			Lower (R-2SE)	Upper (R+2SE)
No education	0.217	0.017	2,331	2,749	2.031	0.080	0.182	0.252
At least some secondary education	0.589	0.018	2,331	2,749	1.766	0.031	0.553	0.625
Ownership of at least one ITN	0.589	0.024	1,974	2,382	2.159	0.041	0.541	0.636
Child slept under an ITN last night	0.420	0.027	1,399	1,740	1.694	0.065	0.366	0.474
Pregnant women slept under an ITN last night	0.354	0.056	143	177	1.406	0.158	0.242	0.466
Received 2+ doses of SP/Fansidar during antenatal visit	0.516	0.027	542	639	1.249	0.052	0.463	0.570
Child has fever in last 2 weeks	0.341	0.020	1,235	1,447	1.359	0.057	0.302	0.380
Child sought care/treatment from a health facility	0.848	0.023	443	494	1.239	0.027	0.802	0.895
Child took ACT	0.740	0.034	280	337	1.196	0.046	0.672	0.808
Child has anaemia (haemoglobin <8.0 g/dl)	0.067	0.014	1,207	1,507	1.799	0.207	0.039	0.095
Child has malaria (based on rapid test)	0.295	0.022	1,206	1,506	1.594	0.076	0.250	0.340

Table B.4 Sampling errors: Rural sample, Liberia 2016

| Variable | Value (R) | Standard error (SE) | Number of cases | | Design effect (DEFT) | Relative error (SE/R) | Confidence limits | |
			Un-weighted (N)	Weighted (WN)			Lower (R-2SE)	Upper (R+2SE)
No education	0.481	0.026	1,959	1,541	2.295	0.054	0.429	0.533
At least some secondary education	0.172	0.025	1,959	1,541	2.932	0.146	0.122	0.222
Ownership of at least one ITN	0.650	0.021	2,244	1,836	2.124	0.033	0.607	0.693
Child slept under an ITN last night	0.456	0.026	1,833	1,575	1.811	0.056	0.405	0.507
Pregnant women slept under an ITN last night	0.453	0.064	157	127	1.596	0.141	0.325	0.580
Received 2+ doses of SP/Fansidar during antenatal visit	0.582	0.033	677	507	1.712	0.057	0.515	0.648
Child has fever in last 2 weeks	0.433	0.023	1,608	1,259	1.708	0.053	0.387	0.479
Child sought care/treatment from a health facility	0.721	0.028	691	545	1.533	0.039	0.664	0.778
Child took ACT	0.880	0.024	440	343	1.470	0.027	0.832	0.928
Child has anaemia (haemoglobin <8.0 g/dl)	0.101	0.008	1,585	1,366	1.052	0.079	0.085	0.117
Child has malaria (based on rapid test)	0.619	0.026	1,584	1,366	2.067	0.043	0.566	0.672

Table B.5 Sampling errors: Greater Monrovia sample, Liberia 2016

| Variable | Value (R) | Standard error (SE) | Number of cases | | Design effect (DEFT) | Relative error (SE/R) | Confidence limits | |
			Un-weighted (N)	Weighted (WN)			Lower (R-2SE)	Upper (R+2SE)
No education	0.190	0.023	913	1,679	1.751	0.120	0.144	0.235
At least some secondary education	0.662	0.020	913	1,679	1.282	0.030	0.621	0.702
Ownership of at least one ITN	0.555	0.035	721	1,392	1.877	0.063	0.485	0.624
Child slept under an ITN last night	0.367	0.036	479	942	1.406	0.098	0.295	0.439
Pregnant women slept under an ITN last night	0.292	0.096	44	91	1.434	0.330	0.099	0.484
Received 2+ doses of SP/Fansidar during antenatal visit	0.471	0.028	202	368	0.793	0.059	0.415	0.527
Child has fever in last 2 weeks	0.310	0.032	442	815	1.339	0.102	0.247	0.373
Child sought care/treatment from a health facility	0.870	0.030	134	253	0.966	0.035	0.810	0.930
Child took ACT	0.700	0.057	95	183	1.105	0.081	0.586	0.814
Child has anaemia (Haemoglobin <8.0 g/dl)	0.032	0.018	406	811	1.692	0.560	0.000	0.068
Child has malaria (based on rapid test)	0.124	0.016	406	811	0.970	0.129	0.092	0.156

Table B.6 Sampling errors: North Western sample, Liberia 2016

| Variable | Value (R) | Standard error (SE) | Number of cases | | Design effect (DEFT) | Relative error (SE/R) | Confidence limits | |
			Un-weighted (N)	Weighted (WN)			Lower (R-2SE)	Upper (R+2SE)
No education	0.448	0.038	522	279	1.749	0.085	0.372	0.525
At least some secondary education	0.285	0.058	522	279	2.889	0.202	0.170	0.400
Ownership of at least one ITN	0.633	0.040	718	424	2.232	0.064	0.553	0.714
Child slept under an ITN last night	0.559	0.033	482	283	1.235	0.060	0.492	0.625
Pregnant women slept under an ITN last night	0.604	0.084	43	25	1.122	0.140	0.435	0.772
Received 2+ doses of SP/Fansidar during antenatal visit	0.678	0.057	182	98	1.648	0.084	0.564	0.792
Child has fever in last 2 weeks	0.532	0.040	427	226	1.560	0.076	0.451	0.613
Child sought care/treatment from a health facility	0.807	0.048	215	120	1.688	0.059	0.711	0.902
Child took ACT	0.871	0.038	152	80	1.248	0.043	0.795	0.946
Child has anaemia (haemoglobin <8.0 g/dl)	0.082	0.016	422	245	1.102	0.195	0.050	0.114
Child has malaria (based on rapid test)	0.461	0.032	422	245	1.288	0.070	0.397	0.526

Table B.7 Sampling errors: South Central sample, Liberia 2016

Variable	Value (R)	Standard error (SE)	Un-weighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Lower (R-2SE)	Upper (R+2SE)
			Number of cases				Confidence limits	
No education	0.469	0.041	728	729	2.207	0.087	0.387	0.551
At least some secondary education	0.269	0.049	728	729	2.960	0.182	0.171	0.367
Ownership of at least one ITN	0.454	0.035	692	761	1.837	0.077	0.385	0.524
Child slept under an ITN last night	0.312	0.040	537	620	1.591	0.127	0.233	0.391
Pregnant women slept under an ITN last night	0.264	0.059	63	70	1.066	0.224	0.146	0.382
Received 2+ doses of SP/Fansidar during antenatal visit	0.386	0.067	189	208	1.993	0.175	0.251	0.521
Child has fever in last 2 weeks	0.336	0.030	464	506	1.387	0.090	0.275	0.396
Child sought care/treatment from a health facility	0.787	0.047	157	170	1.460	0.059	0.694	0.880
Child took ACT	0.739	0.039	99	108	0.922	0.053	0.660	0.817
Child has anaemia (haemoglobin <8.0 g/dl)	0.100	0.021	471	541	1.548	0.215	0.057	0.142
Child has malaria (based on rapid test)	0.521	0.040	471	541	1.603	0.077	0.441	0.601

Table B.8 Sampling errors: North Central sample, Liberia 2016

Variable	Value (R)	Standard error (SE)	Un-weighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Lower (R-2SE)	Upper (R+2SE)
			Number of cases				Confidence limits	
No education	0.326	0.033	742	1,106	1.929	0.102	0.260	0.393
At least some secondary education	0.332	0.046	742	1,106	2.624	0.137	0.240	0.423
Ownership of at least one ITN	0.769	0.026	703	1,119	1.653	0.034	0.716	0.822
Child slept under an ITN last night	0.558	0.030	662	1,073	1.244	0.054	0.497	0.618
Pregnant women slept under an ITN last night	0.553	0.083	48	76	1.149	0.150	0.388	0.718
Received 2+ doses of SP/Fansidar during antenatal visit	0.649	0.036	222	322	1.092	0.055	0.577	0.720
Child has fever in last 2 weeks	0.436	0.028	559	829	1.254	0.065	0.379	0.493
Child sought care/treatment from a health facility	0.726	0.043	242	361	1.358	0.059	0.640	0.811
Child took ACT	0.875	0.034	148	230	1.217	0.039	0.806	0.943
Child has anaemia (Haemoglobin <8.0 g/dl)	0.117	0.013	587	948	1.006	0.115	0.090	0.144
Child has malaria (based on rapid test)	0.617	0.034	586	947	1.691	0.056	0.549	0.686

Table B.9 Sampling errors: South Eastern A sample, Liberia 2016

Variable	Value (R)	Standard error (SE)	Un-weighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Lower (R-2SE)	Upper (R+2SE)
			Number of cases				Confidence limits	
No education	0.396	0.023	640	264	1.165	0.057	0.351	0.441
At least some secondary education	0.230	0.040	640	264	2.386	0.173	0.150	0.310
Ownership of at least one ITN	0.639	0.032	680	291	1.728	0.050	0.576	0.703
Child slept under an ITN last night	0.331	0.045	479	197	1.699	0.137	0.241	0.421
Pregnant women slept under an ITN last night	0.335	0.077	62	28	1.298	0.230	0.181	0.489
Received 2+ doses of SP/Fansidar during antenatal visit	0.606	0.049	208	86	1.451	0.081	0.508	0.705
Child has fever in last 2 weeks	0.379	0.032	427	172	1.279	0.084	0.315	0.442
Child sought care/treatment from a health facility	0.724	0.055	153	65	1.503	0.076	0.615	0.834
Child took ACT	0.928	0.035	92	39	1.331	0.038	0.858	0.999
Child has anaemia (haemoglobin <8.0 g/dl)	0.086	0.017	379	152	1.132	0.195	0.052	0.119
Child has malaria (based on rapid test)	0.584	0.047	378	152	1.648	0.081	0.489	0.679

Table B.10 Sampling errors: South Eastern B sample, Liberia 2016

Variable	Value (R)	Standard error (SE)	Un-weighted (N)	Weighted (WN)	Design effect (DEFT)	Relative error (SE/R)	Lower (R-2SE)	Upper (R+2SE)
			Number of cases				Confidence limits	
No education	0.374	0.024	745	233	1.377	0.065	0.326	0.423
At least some secondary education	0.307	0.029	745	233	1.717	0.095	0.249	0.365
Ownership of at least one ITN	0.703	0.037	704	231	2.138	0.053	0.629	0.777
Child slept under an ITN last night	0.439	0.035	593	201	1.399	0.079	0.369	0.508
Pregnant women slept under an ITN last night	0.601	0.077	40	15	1.080	0.128	0.447	0.755
Received 2+ doses of SP/Fansidar during antenatal visit	0.684	0.033	216	64	1.031	0.049	0.617	0.751
Child has fever in last 2 weeks	0.443	0.034	524	157	1.400	0.077	0.375	0.511
Child sought care/treatment from a health facility	0.746	0.056	233	70	1.597	0.075	0.634	0.858
Child took ACT	0.908	0.027	134	39	1.000	0.029	0.855	0.962
Child has anaemia (haemoglobin <8.0 g/dl)	0.085	0.012	527	176	0.976	0.142	0.061	0.109
Child has malaria (based on rapid test)	0.688	0.044	527	176	2.046	0.064	0.600	0.776

DATA QUALITY TABLES

Table A.5   Sample implementation: Women

Percent distribution of households and eligible women by results of the household and individual interviews, and household, eligible women and overall women response rates, according to urban-rural residence and region (unweighted), Liberia MIS 2016

	Residence		Region						Total
Result	Urban	Rural	Monrovia	North Western	South Central	South Eastern A	South Eastern B	North Central	
Selected households									
Completed (C)	94.4	93.8	96.1	95.6	93.9	90.8	92.9	95.1	94.1
Household present but no competent respondent at home (HP)	0.8	0.5	0.5	0.5	0.5	1.5	0.7	0.1	0.6
Refused (R)	0.2	0.3	0.4	0.0	0.8	0.1	0.3	0.0	0.3
Dwelling not found (DNF)	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Household absent (HA)	2.1	2.6	0.8	1.5	3.5	3.6	2.8	1.9	2.3
Dwelling vacant/address not a dwelling (DV)	1.7	1.4	1.2	1.2	0.8	1.3	2.5	2.0	1.5
Dwelling destroyed (DD)	0.6	0.9	0.8	0.8	0.3	1.7	0.7	0.3	0.8
Other (O)	0.1	0.5	0.1	0.4	0.0	0.8	0.3	0.5	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of sampled households	2,092	2,392	750	751	737	749	758	739	4,484
Household response rate (HRR)[1]	98.8	99.1	99.0	99.4	98.4	98.1	99.0	99.9	99.0
Eligible women									
Completed (EWC)	97.3	97.4	97.1	99.2	96.6	95.8	97.1	98.7	97.3
Not at home (EWNH)	2.0	1.8	2.3	0.6	2.4	2.8	1.8	1.1	1.9
Postponed (EWP)	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0
Refused (EWR)	0.3	0.2	0.4	0.0	0.4	0.1	0.3	0.1	0.2
Incapacitated (EWI)	0.2	0.4	0.1	0.2	0.4	0.4	0.7	0.0	0.3
Other (EWO)	0.2	0.1	0.0	0.0	0.3	0.6	0.1	0.0	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of women	2,396	2,011	940	526	754	668	767	752	4,407
Eligible women response rate (EWRR)[2]	97.3	97.4	97.1	99.2	96.6	95.8	97.1	98.7	97.3
Overall women response rate (ORR)[3]	96.2	96.6	96.2	98.7	95.0	94.0	96.2	98.5	96.4

[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

Table C.1   Household age distribution

Single-year age distribution of the de facto household population by sex (weighted), Liberia MIS 2016

	Women		Men	
Age	Number	Percent	Number	Percent
0	320	3.0	336	3.3
1	308	2.8	317	3.1
2	288	2.7	322	3.1
3	348	3.2	341	3.3
4	344	3.2	400	3.9
5	304	2.8	276	2.7
6	369	3.4	405	3.9
7	355	3.3	348	3.4
8	343	3.2	315	3.1
9	299	2.8	313	3.0
10	345	3.2	375	3.6
11	269	2.5	286	2.8
12	272	2.5	304	2.9
13	329	3.0	287	2.8
14	306	2.8	229	2.2
15	183	1.7	258	2.5
16	233	2.2	244	2.4
17	174	1.6	211	2.0
18	181	1.7	190	1.8
19	212	2.0	163	1.6
20	252	2.3	172	1.7
21	168	1.6	163	1.6
22	214	2.0	167	1.6
23	198	1.8	135	1.3
24	177	1.6	124	1.2
25	123	1.1	145	1.4
26	197	1.8	152	1.5
27	135	1.2	107	1.0
28	173	1.6	136	1.3
29	151	1.4	124	1.2
30	225	2.1	131	1.3
31	110	1.0	97	0.9
32	141	1.3	140	1.4
33	140	1.3	89	0.9
34	108	1.0	107	1.0
35	116	1.1	162	1.6
36	146	1.4	122	1.2
37	90	0.8	102	1.0
38	116	1.1	100	1.0
39	110	1.0	113	1.1
40	110	1.0	135	1.3
41	77	0.7	80	0.8
42	74	0.7	107	1.0
43	72	0.7	63	0.6
44	55	0.5	63	0.6
45	98	0.9	108	1.0
46	49	0.5	101	1.0
47	40	0.4	46	0.4
48	75	0.7	84	0.8
49	35	0.3	74	0.7
50	116	1.1	64	0.6
51	95	0.9	34	0.3
52	107	1.0	60	0.6
53	60	0.6	33	0.3
54	54	0.5	46	0.4
55	67	0.6	36	0.4
56	61	0.6	52	0.5
57	31	0.3	34	0.3
58	39	0.4	54	0.5
59	35	0.3	36	0.3
60	76	0.7	61	0.6
61	23	0.2	21	0.2
62	37	0.3	41	0.4
63	23	0.2	23	0.2
64	32	0.3	22	0.2
65	55	0.5	27	0.3
66	18	0.2	10	0.1
67	22	0.2	12	0.1
68	36	0.3	23	0.2
69	21	0.2	17	0.2
70+	257	2.4	215	2.1
Don't know/missing	6	0.1	20	0.2
Total	10,833	100.0	10,308	100.0

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

Table C.2.1 Age distribution of eligible and interviewed women

De facto household population of women age 10-54, interviewed women age 15-49; and percent distribution and percentage of eligible women who were interviewed (weighted), by 5-year age groups, Liberia MIS 2016

Age group	Household population of women age 10-54	Interviewed women age 15-49		Percentage of eligible women interviewed
		Number	Percentage	
10-14	1,521	-	-	-
15-19	983	963	20.8	98.0
20-24	1,010	983	21.2	97.3
25-29	780	755	16.3	96.8
30-34	723	708	15.3	98.0
35-39	578	569	12.3	98.4
40-44	389	371	8.0	95.5
45-49	298	288	6.2	96.6
50-54	433	-	-	-
15-49	4,760	4,636	100.0	97.4

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

Table C.3 Completeness of reporting

Percentage of observations missing information for selected demographic and health questions (weighted), Liberia MIS 2016

Subject	Percentage with information missing	Number of cases
Month only (births in the 15 years preceding the survey)	1.19	3,219
Month and year (births in the 15 years preceding the survey)	0.00	3,219
Age at death (deceased children born in the 15 years preceding the survey)	0.00	120
Respondent's education (all women age 15-49)	0.04	4,290
Diarrhea in last 2 weeks (living children 0-59 months)	0.00	2,705
Height (living children age 0-59 months from the household questionnaire)	100.00	3,337
Weight (living children age 0-59 months from the household questionnaire)	100.00	3,337
Height or weight (living children age 0-59 months from the household questionnaire)	100.00	3,337
Anemia (living children age 6-59 months from the household questionnaire)	4.88	3,021

[1] Both year and age missing

PERSONS INVOLVED IN THE 2016 LIBERIA MALARIA INDICATOR SURVEY *Appendix* D

Project Manager
D. Levi Hinneh

Assistant Project Manager
Victor S. Koko

Coordinators
Tete Z. Moore (October 10, 1988 -August 29, 2017)
Mohammed Dunbar
Stephen S. Seah
George M. Kardah
Joseph O. Alade
Emmanuel T.S. Dahn

Field Teams

Team 1
Martenneh Dorley
Charles M. Vonleh
Ma Zoe Flomo

Team 2
Mydia R. Woods
Jestina N. Hinneh
Tamba Davis

Team 3
Gafielous C. Dennis
Moses R. kerkulah
Nettee D. Corneh

Team 4
Mildred T. Grear
Emmanuel B. Morris
Yei B. Zawolo

Team 5
Mercy Paye
Belloh V. Chea
Victor N. Nyan

Team 6
Georgia M. Teah
Christian D. Forkay
Florance Gadeh

Team 7
Joseph Alade
L. Mambu Freeman
Thomas Hinneh

Team 8
Precious Bollie
Mulbah Pewu
J. Nyanquoi Kerbay

Team 9
Prince Gonqueh
Varney Sonie
Yah C. Yelekor

Team 10
Pekay Nyepon
Prince Queye
Amanda K. Clarke

Team 11
Prince Beh
Ebrutus Ricks
Lovette Faryaih

Team 12
Alphonso Kuiah
Willington Hill
Famatta Farley

Field Monitors
Yah M. Zolia
Catherine Cooper
Sampson Arzoaqouoi

Luke Bawo
Stanford Wesseh
Nelson Dunbar
Fulton Shannon

Logistic Drivers
Gabriel Daliah
Thomas Quoi
Wellington Livingstone
John Cox
Saywah Varnie
Emmanuel Kamara
Cyrus Harris
Ayouba Dukuly
Patrick Kollie
Titus S. Hill
Mark Wieah
Emmauel Barbu
Jonathan Foko
Joe Kollie
James Tarr
Stephen Kolliego
Alieu Dukuly
Christopher Tamba
Emmanuel Williams
Prince Doegolia
Theodore Walker
Abraham Zaikan
Jide Okedara
Richard Biah
Sekou Kromah
Alieu Sinyon
Clarence Togbah
Alphonso Kamara
Jerome Nuah

Biomarker Technicians
Natu Banks
Benetta D. Leyou
Wannie Wesley
Grace M. Doe
Larwuo G. Pewu
Jenneh K. Fahnbulleh
Garmein S. Galapkai
Abenego Wright
Jestina Maxwell
Arena Y. Glay
Edrache Tarley
Karen Davis
Miatta W. Kullie
Wihelmena S. Miller
Esther Cole
Ruth N. Gwaikolo

Linda V. Kikeh
Ana B. Dunbar
Alice Tracy Kallon
Lydia K. Konah
Saysay M. Kpardeh
Patience Sorsor
Arnesa Cooper
Isaac B. Zeah

Data Processing Staff
Fedesco W. Freeman
Clement N. Chea
Stephen Freeman
Dagai Kollie
Abayomi T. Santi
Richelieu Nyema
Emmanuel Hiama
Jefferson Redd
Famata Faley
Pekay Nyepon
Eric Redd
Ophelia Bracewell
Stanley Vah
Samuel Kollie

Technical Committee Members
Dr. Moses Jeuronlon
Mr. C. Sanford Wesseh
Mr. Oliver Pratt
Mr. D. Levi Hinneh
Mr. Victor S. Koko
Dr. Lekilay Tehmie
Mr. Paye K. Nyansaiye
Mr. Patrick Hardy
Mr. Joseph Alade
Mr. Luke Baawo
Mr. Nelson Dunbar
Mr. Emmanuel T.S. Dahn
Mr. Fulton Shannon
Mr. Francis Wreh
Mr. Johnson Kei
Mr. Thomas Davis
Mr, Kaa Williams
Dr. Ramlat Jose
Dr. Christie Reed
Mr. Kwabena Larbi
Dr. Anthony Asige
Dr. Philderald Pratt
Dr. Steve Kennedy
Mr. T. Wynstine Williams
Miss. Gloria Guezo
Miss. Ruth Ricks

Mr. Sam Tannous
Mr. Daniel E. Somah
Mr. Joseph Julius Janafo
Mrs. Tebade Collins Kollah

The DHS Program
Deborah Kortso Collison
Joanna Lowell
Anne Cross
Albert Themme
Claudia Marchena
Mianmian Yu
Chris Gramer
Joan Wardell
Nancy Johnson
Gulnara Semenov
Cameron Taylor
Michelle Gamber
Michael Amakye (Consultant)
Mahmoud Elkasabi
Tom Fish
Fiona West
Trinadh Dontamsetti
Trevor Croft

QUESTIONNAIRES

2016 LIBERIA MALARIA INDICATOR SURVEY
HOUSEHOLD QUESTIONNAIRE
NATIONAL MALARIA CONTROL PROGRAM-MINISTRY OF HEALTH
LIBERIA INSTITUTE OF STATISTICS AND GEO-INFORMATION SERVICES

IDENTIFICATION

PLACE NAME

NAME OF HOUSEHOLD HEAD

LMIS CLUSTER NUMBER . . . .

HOUSEHOLD NUMBER . . . .

INTERVIEWER VISITS

	1	2	3	FINAL VISIT		
DATE				DAY		
				MONTH		
				YEAR	2 0 1	
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

SUPERVISOR		OFFICE EDITOR	KEYED BY
NAME NUMBER		NUMBER	NUMBER

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<u>INTRODUCTION AND CONSENT</u>

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

GIVE FACT SHEET WITH CONTACT INFORMATION.

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

SIGNATURE OF INTERVIEWER _____   DATE _____

RESPONDENT AGREES
   TO BE INTERVIEWED . .   1

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

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

HOUSEHOLD SCHEDULE

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

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	07 = PARENT-IN-LAW
02 = WIFE OR HUSBAND	08 = BROTHER OR SISTER
03 = SON OR DAUGHTER	09 = OTHER RELATIVE
04 = SON-IN-LAW OR DAUGHTER-IN-LAW	10 = ADOPTED/FOSTER/ STEPCHILD
05 = GRANDCHILD	11 = NOT RELATED
06 = PARENT	12 = CO-WIFE
	98 = DON'T KNOW

LINE NO.						
	10	**11**	**12**	**13**	**14**	**15**
	In the last 4 weeks, has (NAME) been sick with a fever at any time?	Did (NAME) get any treatment for the fever in the last 4 weeks?	Where did (NAME) go for treatment? USE CODES BELOW. IF MORE THAN ONE PLACE, RECORD FIRST PLACE TREAT-MENT WAS SOUGHT.	How much did the treatment cost? INCLUDE COST OF DOCTOR, NURSE, DRUGS, TESTS. IF > 9990 LIBERIAN DOLLARS, RECORD '9990' IF 'FREE', RECORD '9995' IF 'DON'T KNOW', RECORD '9998'	Did (NAME) get tested for malaria?	Did (NAME) get told the results?
01	Y N DK 1 2 ⊤ 8 ↓ NEXT LINE	Y N DK 1 2 ⊤ 8 ↓ NEXT LINE	☐☐	LIBERIAN DOLLARS ☐☐☐☐	Y N DK 1 2 ⊤ 8 ↓ NEXT LINE	Y N DK 1 2 ⊤ 8 ↓ NEXT LINE
02	1 2 ⊤ 8 ↓ NEXT LINE	1 2 ⊤ 8 ↓ NEXT LINE	☐☐	☐☐☐☐	1 2 ⊤ 8 ↓ NEXT LINE	1 2 ⊤ 8 ↓ NEXT LINE
03	1 2 ⊤ 8 ↓ NEXT LINE	1 2 ⊤ 8 ↓ NEXT LINE	☐☐	☐☐☐☐	1 2 ⊤ 8 ↓ NEXT LINE	1 2 ⊤ 8 ↓ NEXT LINE
04	1 2 ⊤ 8 ↓ NEXT LINE	1 2 ⊤ 8 ↓ NEXT LINE	☐☐	☐☐☐☐	1 2 ⊤ 8 ↓ NEXT LINE	1 2 ⊤ 8 ↓ NEXT LINE
05	1 2 ⊤ 8 ↓ NEXT LINE	1 2 ⊤ 8 ↓ NEXT LINE	☐☐	☐☐☐☐	1 2 ⊤ 8 ↓ NEXT LINE	1 2 ⊤ 8 ↓ NEXT LINE
06	1 2 ⊤ 8 ↓ NEXT LINE	1 2 ⊤ 8 ↓ NEXT LINE	☐☐	☐☐☐☐	1 2 ⊤ 8 ↓ NEXT LINE	1 2 ⊤ 8 ↓ NEXT LINE
07	1 2 ⊤ 8 ↓ NEXT LINE	1 2 ⊤ 8 ↓ NEXT LINE	☐☐	☐☐☐☐	1 2 ⊤ 8 ↓ NEXT LINE	1 2 ⊤ 8 ↓ NEXT LINE
08	1 2 ⊤ 8 ↓ NEXT LINE	1 2 ⊤ 8 ↓ NEXT LINE	☐☐	☐☐☐☐	1 2 ⊤ 8 ↓ NEXT LINE	1 2 ⊤ 8 ↓ NEXT LINE
09	1 2 ⊤ 8 ↓ NEXT LINE	1 2 ⊤ 8 ↓ NEXT LINE	☐☐	☐☐☐☐	1 2 ⊤ 8 ↓ NEXT LINE	1 2 ⊤ 8 ↓ NEXT LINE
10	1 2 ⊤ 8 ↓ NEXT LINE	1 2 ⊤ 8 ↓ NEXT LINE	☐☐	☐☐☐☐	1 2 ⊤ 8 ↓ NEXT LINE	1 2 ⊤ 8 ↓ NEXT LINE

CODES FOR Q. 12: TREATMENT FOR FEVER

01 = GOVERNMENT HOSPITAL
02 = GOVERNMENT HEALTH CENTER
03 = GOVERNMENT HEALTH CLINIC
04 = PRIVATE HOSPITAL/CLINIC
05 = PHARMACY
06 = PRIVATE DOCTOR
07 = MOBILE CLINIC
08 = MEDICINE STORE/DRUG STORE

09 = TRADITIONAL PRACTITIONER
10 = BLACK BAGGER, DRUG PEDDLER
96 = OTHER
98 = DOES NOT KNOW

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
	Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with the head of the household. AFTER LISTING THE NAMES AND RECORDING THE RELATIONSHIP AND SEX FOR EACH PERSON, ASK QUESTIONS 2A-2C TO BE SURE THAT THE LISTING IS COMPLETE. THEN ASK APPROPRIATE QUESTIONS IN COLUMNS 5-15 FOR EACH PERSON.	What is the relationship of (NAME) to the head of the household? SEE CODES BELOW.	Is (NAME) male or female?	Does (NAME) usually live here?	Did (NAME) stay here last night?	How old is (NAME)? IF 95 OR MORE, RECORD '95'.	CIRCLE LINE NUMBER OF ALL WOMEN AGE 15-49	CIRCLE LINE NUMBER OF ALL CHILDREN AGE 0-5
			M F 1 2	Y N 1 2	Y N 1 2	IN YEARS		
11							11	11
12			1 2	1 2	1 2		12	12
13			1 2	1 2	1 2		13	13
14			1 2	1 2	1 2		14	14
15			1 2	1 2	1 2		15	15
16			1 2	1 2	1 2		16	16
17			1 2	1 2	1 2		17	17
18			1 2	1 2	1 2		18	18
19			1 2	1 2	1 2		19	19
20			1 2	1 2	1 2		20	20

TICK HERE IF CONTINUATION SHEET USED ☐

CODES FOR Q. 3: RELATIONSHIP TO HEAD OF HOUSEHOLD

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

LINE NO.						
	10	**11**	**12**	**13**	**14**	**15**
	In the last 4 weeks, has (NAME) been sick with a fever at any time?	Did (NAME) get any treatment for the fever in the last 4 weeks?	Where did (NAME) go for treatment? USE CODES BELOW. IF MORE THAN ONE PLACE, RECORD FIRST PLACE TREAT-MENT WAS SOUGHT.	How much did the treatment cost? INCLUDE COST OF DOCTOR, NURSE, DRUGS, TESTS. IF > 9990 LIBERIAN DOLLARS, RECORD '9990' IF 'FREE', RECORD '9995' IF 'DON'T KNOW', RECORD '9998'	Did (NAME) get tested for malaria?	Did (NAME) get told the results?
11	Y N DK 1 2 ⊤ 8 NEXT LINE	Y N DK 1 2 ⊤ 8 NEXT LINE	▭▭	LIBERIAN DOLLARS ▭▭▭▭	Y N DK 1 2 ⊤ 8 NEXT LINE	Y N DK 1 2 ⊤ 8 NEXT LINE
12	1 2 ⊤ 8 NEXT LINE	1 2 ⊤ 8 NEXT LINE	▭▭	▭▭▭▭	1 2 ⊤ 8 NEXT LINE	1 2 ⊤ 8 NEXT LINE
13	1 2 ⊤ 8 NEXT LINE	1 2 ⊤ 8 NEXT LINE	▭▭	▭▭▭▭	1 2 ⊤ 8 NEXT LINE	1 2 ⊤ 8 NEXT LINE
14	1 2 ⊤ 8 NEXT LINE	1 2 ⊤ 8 NEXT LINE	▭▭	▭▭▭▭	1 2 ⊤ 8 NEXT LINE	1 2 ⊤ 8 NEXT LINE
15	1 2 ⊤ 8 NEXT LINE	1 2 ⊤ 8 NEXT LINE	▭▭	▭▭▭▭	1 2 ⊤ 8 NEXT LINE	1 2 ⊤ 8 NEXT LINE
16	1 2 ⊤ 8 NEXT LINE	1 2 ⊤ 8 NEXT LINE	▭▭	▭▭▭▭	1 2 ⊤ 8 NEXT LINE	1 2 ⊤ 8 NEXT LINE
17	1 2 ⊤ 8 NEXT LINE	1 2 ⊤ 8 NEXT LINE	▭▭	▭▭▭▭	1 2 ⊤ 8 NEXT LINE	1 2 ⊤ 8 NEXT LINE
18	1 2 ⊤ 8 NEXT LINE	1 2 ⊤ 8 NEXT LINE	▭▭	▭▭▭▭	1 2 ⊤ 8 NEXT LINE	1 2 ⊤ 8 NEXT LINE
19	1 2 ⊤ 8 NEXT LINE	1 2 ⊤ 8 NEXT LINE	▭▭	▭▭▭▭	1 2 ⊤ 8 NEXT LINE	1 2 ⊤ 8 NEXT LINE
20	1 2 ⊤ 8 NEXT LINE	1 2 ⊤ 8 NEXT LINE	▭▭	▭▭▭▭	1 2 ⊤ 8 NEXT LINE	1 2 ⊤ 8 NEXT LINE

CODES FOR Q. 12: TREATMENT FOR FEVER

01 = GOVERNMENT HOSPITAL
02 = GOVERNMENT HEALTH CENTER
03 = GOVERNMENT HEALTH CLINIC
04 = PRIVATE HOSPITAL/CLINIC
05 = PHARMACY
06 = PRIVATE DOCTOR
07 = MOBILE CLINIC
08 = MEDICINE STORE/DRUG STORE

09 = TRADITIONAL PRACTITIONER
10 = BLACK BAGGER, DRUG PEDDLER
96 = OTHER
98 = DOES NOT KNOW

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP

101	What is the main source of drinking water for members of your household?	**PIPED WATER**
		    PIPED INTO DWELLING 11
		    PIPED TO YARD/PLOT 12
		    PIPED TO NEIGHBOR 13
		    PUBLIC TAP/STANDPIPE 14
		
		HAND PUMP/TUBE WELL OR BOREHOLE 21
		
		DUG WELL
		    PROTECTED WELL 31
		    UNPROTECTED WELL 32
		WATER FROM SPRING
		    PROTECTED SPRING 41
		    UNPROTECTED SPRING 42
		
		RAINWATER 51
		TANKER TRUCK 61
		CART WITH SMALL TANK 71
		SURFACE WATER (RIVER/DAM/
		    LAKE/POND/STREAM/CANAL/
		    IRRIGATION CHANNEL) 81
		BOTTLED WATER 91
		MINERAL WATER IN 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 NEIGHBOR 13
		    PUBLIC TAP/STANDPIPE 14
		
		HAND PUMP/TUBE WELL OR BOREHOLE 21
		
		DUG WELL
		    PROTECTED WELL 31
		    UNPROTECTED WELL 32
		WATER FROM SPRING
		    PROTECTED SPRING 41
		    UNPROTECTED SPRING 42
		
		RAINWATER 51
		TANKER TRUCK 61
		CART WITH SMALL TANK 71
		SURFACE WATER (RIVER/DAM/
		    LAKE/POND/STREAM/CANAL/
		    IRRIGATION CHANNEL) 81
		
		OTHER _____ 96
		                    (SPECIFY)
			→ 105

103	Where is that water source located?	IN OWN DWELLING . . . . 1 IN OWN YARD/PLOT . . . . 2 ELSEWHERE 3	→ 105
104	How long does it take to go there, get water, and come back?	MINUTES . . . . ☐☐☐ DON'T KNOW 998	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
105	What kind of toilet facility do members of your household usually use? IF NOT POSSIBLE TO DETERMINE, ASK PERMISSION TO OBSERVE THE FACILITY.	**FLUSH OR POUR FLUSH TOILET** 　　FLUSH TO PIPED SEWER SYSTEM . . . . 11 　　FLUSH TO SEPTIC TANK . . . . 12 　　FLUSH TO PIT LATRINE . . . . 13 　　FLUSH TO SOMEWHERE ELSE . . . . 14 　　FLUSH, DON'T KNOW WHERE . . . . 15 **PIT LATRINE** 　　VENTILATED IMPROVED PIT LATRINE . . . . . 21 　　PIT LATRINE WITH SLAB . . . . 22 　　PIT LATRINE WITHOUT SLAB/OPEN PIT . . 23 COMPOSTING TOILET . . . . 31 BUCKET TOILET . . . . 41 HANGING TOILET/HANGING LATRINE . . . . 51 NO FACILITY/BUSH/FIELD . . . . 61 OTHER _____ 96 　　　　　　　(SPECIFY)	→ 108
106	Do you share this toilet facility with other households?	YES . . . . 1 NO 2	→ 108
107	Including your own household, how many households use this toilet facility?	NO. OF HOUSEHOLDS 　　IF LESS THAN 10 . . . . ☐ 0 ☐ 10 OR MORE HOUSEHOLDS . . . . 95 DON'T KNOW 98	
108	What type of fuel does your household mainly use for cooking? PROBE: By what means do you cook your food?	ELECTRICITY . . . . 01 GAS CYLINDER . . . . 02 KEROSENE STOVE . . . . 03 FIRE COAL/CHARCOAL . . . . 04 WOOD . . . . 05 NO FOOD COOKED IN HOUSEHOLD . . . . 95 OTHER _____ 96 　　　　　　　(SPECIFY)	
109	How many rooms in this household are used for sleeping?	ROOMS . . . . ☐☐	
110	Does this household own any livestock, herds, other farm animals, or poultry like chickens, ducks or guinea fowl?	YES . . . . 1 NO 2	→ 112
111	How many of the following animals does this household own? IF NONE, RECORD '00'. IF 95 OR MORE, RECORD '95'. IF UNKNOWN, RECORD '98'. a) Cows or bulls? b) Pigs? c) Goats? d) Sheep? e) Chickens, ducks or guinea fowl?	 a) COWS/BULLS . . . . ☐☐ b) PIGS . . . . ☐☐ c) GOATS . . . . ☐☐ d) SHEEP . . . . ☐☐ e) CHICKENS/POULTRY . . . . ☐☐	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
112	Does any member of your household farm any agricultural land?	YES . . . . 1 NO 2	→ 114
113	How many acres of agricultural land do members of this household farm? IF 95 OR MORE, CIRCLE '950'.	ACRES . . . . ☐☐.☐ 95 OR MORE ACRES . . . . 950 DON'T KNOW 998	
114	Does your household have: a) Electricity that is connected? b) A generator? c) A radio? d) A mobile telephone? e) An ice box? f) A table? g) Chairs? h) A cupboard? i) A mattress (not made of straw or grass)? j) A sewing machine? k) A television? l) A computer? m) A bench or stool?	YES NO a) ELECTRICITY . . . . 1 2 b) GENERATOR . . . . 1 2 c) RADIO . . . . 1 2 d) MOBILE TELEPHONE . . . . . . 1 2 e) ICE BOX (REFRIGERATOR) . . 1 2 f) TABLE . . . . 1 2 g) CHAIRS . . . . 1 2 h) CUPBOARD . . . . 1 2 i) MATTRESS . . . . 1 2 j) SEWING MACHINE . . . . 1 2 k) TELEVISION . . . . 1 2 l) COMPUTER . . . . 1 2 m) BENCH OR STOOL 1 2	
115	Does any member of this household own: a) A watch? b) A bicycle? c) A motorcycle or motor scooter? d) A car or truck? e) A boat or a canoe?	YES NO a) WATCH . . . . 1 2 b) BICYCLE . . . . 1 2 c) MOTORCYCLE/SCOOTER . . . . . 1 2 d) CAR/TRUCK . . . . 1 2 e) BOAT OR CANOE 1 2	
116	Does any member of this household have a bank account?	YES . . . . 1 NO 2	
117	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	→119
118	Who sprayed the dwelling?	GOVERNMENT WORKER/PROGRAM . . . . A PRIVATE COMPANY . . . . B NONGOVERNMENTAL ORGANIZATION (NGO) . . C OTHER _____ X (SPECIFY) DON'T KNOW . . . . Z	
119	Does your household have any mosquito nets?	YES . . . . 1 NO 2	→ 120
119A	Why doesn't your household have any mosquito nets?	NO MOSQUITOES . . . . A NOT AVAILABLE . . . . B DON'T LIKE TO USE NETS . . . . C TOO EXPENSIVE . . . . D DID NOT RECEIVE . . . . E SPOILED . . . . F HAVE WINDOW SCREENS . . . . G OTHER _____ X (SPECIFY)	→130A
120	How many mosquito nets does your household have? IF 7 OR MORE NETS, RECORD '7'.	NUMBER OF NETS . . . . ☐	

		NET #1	NET #2	NET #3
121	ASK THE RESPONDENT TO SHOW YOU ALL THE NETS IN THE HOUSEHOLD. IF MORE THAN 3 NETS, USE ADDITIONAL QUESTIONNAIRE(S).	OBSERVED . . . . 1 NOT OBSERVED 2	OBSERVED . . . . 1 NOT OBSERVED 2	OBSERVED . . . . 1 NOT OBSERVED 2
122	How many months ago did your household get the mosquito net? IF LESS THAN ONE MONTH AGO, RECORD '00'.	MONTHS AGO . . . . . ☐☐ MORE THAN 36 MONTHS AGO . . . . . 95 NOT SURE 98	MONTHS AGO . . . . . ☐☐ MORE THAN 36 MONTHS AGO . . . . . 95 NOT SURE 98	MONTHS AGO . . . . . ☐☐ MORE THAN 36 MONTHS AGO . . . . . 95 NOT SURE 98
123	OBSERVE OR ASK BRAND/TYPE OF MOSQUITO NET. IF BRAND IS UNKNOWN AND YOU CANNOT OBSERVE THE NET, SHOW PICTURES OF TYPICAL NET TYPES/BRANDS TO RESPONDENT.	LONG-LASTING INSECTICIDE-TREATED NET (LLIN) OLYSET . . . . 11⌐ PERMANET . . . . 12⌐ BASF NET . . . . . 13⌐ DURANET . . . . 14⌐ OTHER/DON'T KNOW BRAND BUT LLIN 16⌐ (SKIP TO 126) ← OTHER TYPE . . . . 96 DON'T KNOW TYPE 98	LONG-LASTING INSECTICIDE-TREATED NET (LLIN) OLYSET . . . . 11⌐ PERMANET . . . . 12⌐ BASF NET . . . . . 13⌐ DURANET . . . . 14⌐ OTHER/DON'T KNOW BRAND BUT LLIN 16⌐ (SKIP TO 126) ← OTHER TYPE . . . . 96 DON'T KNOW TYPE 98	LONG-LASTING INSECTICIDE-TREATED NET (LLIN) OLYSET . . . . 11⌐ PERMANET . . . . 12⌐ BASF NET . . . . . 13⌐ DURANET . . . . 14⌐ OTHER/DON'T KNOW BRAND BUT LLIN 16⌐ (SKIP TO 126) ← OTHER TYPE . . . . 96 DON'T KNOW TYPE 98
124	Since you got the net, was it ever soaked or dipped in a liquid to kill or repel mosquitoes?	YES . . . . 1 NO . . . . 2⌐ (SKIP TO 126) ← NOT SURE . . . . 8⌐	YES . . . . 1 NO . . . . 2⌐ (SKIP TO 126) ← NOT SURE . . . . 8⌐	YES . . . . 1 NO . . . . 2⌐ (SKIP TO 126) ← NOT SURE . . . . 8⌐
125	How many months ago was the net last soaked or dipped? IF LESS THAN ONE MONTH AGO, RECORD '00'.	MONTHS AGO . . . . . ☐☐ MORE THAN 24 MONTHS AGO . . . . 95 NOT SURE 98	MONTHS AGO . . . . . ☐☐ MORE THAN 24 MONTHS AGO . . . . 95 NOT SURE 98	MONTHS AGO . . . . . ☐☐ MORE THAN 24 MONTHS AGO . . . . 95 NOT SURE 98
126	Did you get the net through a mass distribution campaign, during an antenatal care visit, or during a delivery in a health facility?	YES, MASS DISTRIBUTION CAMPAIGN . . . . 1⌐ YES, ANC . . . . 2⌐ YES, HEALTH FACILITY DELIVERY . . . . 3⌐ (SKIP TO 127A) ← NO 4	YES, MASS DISTRIBUTION CAMPAIGN . . . . 1⌐ YES, ANC . . . . 2⌐ YES, HEALTH FACILITY DELIVERY . . . . 3⌐ (SKIP TO 127A) ← NO 4	YES, MASS DISTRIBUTION CAMPAIGN . . . . 1⌐ YES, ANC . . . . 2⌐ YES, HEALTH FACILITY DELIVERY . . . . 3⌐ (SKIP TO 127A) ← NO 4
127	Where did you get the net?	GOVERNMENT HEALTH FACILITY . . . . 01 PRIVATE HEALTH FACILITY . . . . 02 PHARMACY . . . . 03 SHOP/MARKET . . . . 04 CHW . . . . 05 RELIGIOUS INSTITUTION . . . . . 06 PRIVATE DOCTOR . . . . . 07 MOBILE CLINIC . . . . 08 MEDICINE/DRUG STORE 09 TRADITIONAL PRACTITIONER . . . . . 10 STREET CORNER . . . . . 11 NEIGHBOR/FRIEND RELATIVE . . . . 12 OTHER . . . . 96 DON'T KNOW 98	GOVERNMENT HEALTH FACILITY . . . . 01 PRIVATE HEALTH FACILITY . . . . 02 PHARMACY . . . . 03 SHOP/MARKET . . . . 04 CHW . . . . 05 RELIGIOUS INSTITUTION . . . . . 06 PRIVATE DOCTOR . . . . . 07 MOBILE CLINIC . . . . 08 MEDICINE/DRUG STORE 09 TRADITIONAL PRACTITIONER . . . . . 10 STREET CORNER . . . . . 11 NEIGHBOR/FRIEND RELATIVE . . . . 12 OTHER . . . . 96 DON'T KNOW 98	GOVERNMENT HEALTH FACILITY . . . . 01 PRIVATE HEALTH FACILITY . . . . 02 PHARMACY . . . . 03 SHOP/MARKET . . . . 04 CHW . . . . 05 RELIGIOUS INSTITUTION . . . . . 06 PRIVATE DOCTOR . . . . . 07 MOBILE CLINIC . . . . 08 MEDICINE/DRUG STORE 09 TRADITIONAL PRACTITIONER . . . . . 10 STREET CORNER . . . . . 11 NEIGHBOR/FRIEND RELATIVE . . . . 12 OTHER . . . . 96 DON'T KNOW 98

		NET #1	NET #2	NET #3
127A	Did you buy the net or was it given to you for free?	BOUGHT . . . . 1 FREE . . . . 2⌐ (SKIP TO 128) ← DON'T KNOW . . . . 8⌐	BOUGHT . . . . 1 FREE . . . . 2⌐ (SKIP TO 128) ← DON'T KNOW . . . . 8⌐	BOUGHT . . . . 1 FREE . . . . 2⌐ (SKIP TO 128) ← DON'T KNOW . . . . 8⌐
127B	How much did you pay for the net? IF 995 OR MORE, RECORD '995'.	COST IN LIB. $ ☐☐☐	COST IN LIB. $ ☐☐☐	COST IN LIB. $ ☐☐☐
128	Did anyone sleep under this mosquito net last night?	YES . . . . 1⌐ (SKIP TO 129) ← NO . . . . 2 NOT SURE . . . . 8⌐ (SKIP TO 130) ←	YES . . . . 1⌐ (SKIP TO 129) ← NO . . . . 2 NOT SURE . . . . 8⌐ (SKIP TO 130) ←	YES . . . . 1⌐ (SKIP TO 129) ← NO . . . . 2 NOT SURE . . . . 8⌐ (SKIP TO 130) ←

128A	What are some of the reasons why this mosquito net was not used?
	
	CIRCLE ALL THAT APPLY
		TOO HOT/ DIFFICULT
		  TO BREATH . . . . A⌐
		SIZE OF THE BED . . . . . B⌐
		NOT HUNG UP/
		  STORED AWAY . . C⌐
		NET NOT IN GOOD
		  CONDITION . . . . D⌐
		MATERIAL IS TOO
		  HARD/ROUGH . . . . . E⌐
		CHILD DOESN'T LIKE . . F⌐
		SKIN IRRITATION/
		  ITCHING . . . . G⌐
		BAD FOR HEALTH . . . . . H⌐
		SUPERSTITION
		  /WITCHCRAFT . . . . . I⌐
		TOO WEAK TO HANG . . J⌐
		CHEMICAL SMELL/
		  TOXIC . . . . K⌐
		SAVING FOR LATER . . L⌐
		NO MOSQUITOES . . . . . M⌐
		USUAL USER(S) DID NOT
		  SLEEP HERE . . . . . N⌐
		
		OTHER _____ X⌐
		  (SPECIFY)
		
		DON'T KNOW . . . . Z⌐
		(SKIP TO 130) ←
			TOO HOT/ DIFFICULT
			  TO BREATH . . . . A⌐
			SIZE OF THE BED . . . . . B⌐
			NOT HUNG UP/
			  STORED AWAY . . C⌐
			NET NOT IN GOOD
			  CONDITION . . . . D⌐
			MATERIAL IS TOO
			  HARD/ROUGH . . . . . E⌐
			CHILD DOESN'T LIKE . . F⌐
			SKIN IRRITATION/
			  ITCHING . . . . G⌐
			BAD FOR HEALTH . . . . . H⌐
			SUPERSTITION
			  /WITCHCRAFT . . . . . I⌐
			TOO WEAK TO HANG . . J⌐
			CHEMICAL SMELL/
			  TOXIC . . . . K⌐
			SAVING FOR LATER . . L⌐
			NO MOSQUITOES . . . . . M⌐
			USUAL USER(S) DID NOT
			  SLEEP HERE . . . . . N⌐
			
			OTHER _____ X⌐
			  (SPECIFY)
			
			DON'T KNOW . . . . Z⌐
			(SKIP TO 130) ←
				TOO HOT/ DIFFICULT
				  TO BREATH . . . . A⌐
				SIZE OF THE BED . . . . . B⌐
				NOT HUNG UP/
				  STORED AWAY . . C⌐
				NET NOT IN GOOD
				  CONDITION . . . . D⌐
				MATERIAL IS TOO
				  HARD/ROUGH . . . . . E⌐
				CHILD DOESN'T LIKE . . F⌐
				SKIN IRRITATION/
				  ITCHING . . . . G⌐
				BAD FOR HEALTH . . . . . H⌐
				SUPERSTITION
				  /WITCHCRAFT . . . . . I⌐
				TOO WEAK TO HANG . . J⌐
				CHEMICAL SMELL/
				  TOXIC . . . . K⌐
				SAVING FOR LATER . . L⌐
				NO MOSQUITOES . . . . . M⌐
				USUAL USER(S) DID NOT
				  SLEEP HERE . . . . . N⌐
				
				OTHER _____ X⌐
				  (SPECIFY)
				
				DON'T KNOW . . . . Z⌐
				(SKIP TO 130) ←

129	Who slept under this mosquito net last night? RECORD THE PERSON'S NAME AND LINE NUMBER FROM HOUSEHOLD SCHEDULE.	NAME _____ LINE NO. . . . . . ☐☐ NAME _____ LINE NO. . . . . . ☐☐ NAME _____ LINE NO. . . . . . ☐☐ NAME _____ LINE NO. . . . . . ☐☐	NAME _____ LINE NO. . . . . . ☐☐ NAME _____ LINE NO. . . . . . ☐☐ NAME _____ LINE NO. . . . . . ☐☐ NAME _____ LINE NO. . . . . . ☐☐	NAME _____ LINE NO. . . . . . ☐☐ NAME _____ LINE NO. . . . . . ☐☐ NAME _____ LINE NO. . . . . . ☐☐ NAME _____ LINE NO. . . . . . ☐☐
130		GO BACK TO 121 FOR NEXT NET; OR, IF NO MORE NETS, GO TO 130B.	GO BACK TO 121 FOR NEXT NET; OR, IF NO MORE NETS, GO TO 130B.	GO TO 121 IN FIRST COLUMN OF A NEW QUESTIONNAIRE; OR, IF NO MORE NETS, GO TO 130B.

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
130A	In the last 12 months, did any member of your household have a mosquito net?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	⟶ 130F
130B	In the last 12 months has any member of your household disposed of a mosquito net?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	⟶ 130F
130C	Now I want to talk about the last net that was disposed of. For how long did the household member use this net?	LESS THAN 2 YEARS . . . . 1 2-4 YEARS . . . . 2 MORE THAN 4 YEARS . . . . 3 DON'T KNOW 8	
130D	What was the main reason the household member disposed of this mosquito net?	TORN . . . . 11 NO LONGER REPELLED MOSQUITOES . . . . 12 GOT A NEW ONE . . . . 13 PUT TO THE STORAGE/ END OF RAINY SEASON . . . . 14 INSTALLED SCREENS . . . . 15 ITCHING/ SKIN IRRITATION/ HEALTH PROBLEMS . . . . . 16 CAN'T BREATH/ TOO HOT . . . . 17 TOXIC CHEMICALS . . . . 18 OTHER _____ 96 (SPECIFY) DON'T KNOW 98	
130E	Was this a soft mosquito net or a hard mosquito net?	SOFT . . . . 1 HARD . . . . 2 DON'T KNOW 8	
130F	If you had a choice, would you like to have a soft mosquito net or a hard mosquito net?	SOFT . . . . 1 HARD . . . . 2 NO PREFERENCE . . . . 3 DON'T KNOW 8	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
131	OBSERVE MAIN MATERIAL OF THE FLOOR OF THE DWELLING. RECORD OBSERVATION.	**NATURAL FLOOR** EARTH/SAND/MUD . . . . 11 **RUDIMENTARY FLOOR** WOOD PLANKS . . . . 21 **FINISHED FLOOR** PARQUET OR POLISHED WOOD . . . . 31 FLOOR MAT, LINOLEUM, VINYL . . . . 32 CERAMIC TILES/TERRAZO . . . . 33 CONCRETE, CEMENT . . . . 34 CARPET . . . . 35 OTHER _____ 96 (SPECIFY)	
132	OBSERVE MAIN MATERIAL OF THE ROOF OF THE DWELLING. RECORD OBSERVATION.	**NATURAL ROOFING** THATCH/PALM LEAF . . . . 12 **RUDIMENTARY ROOFING** RUSTIC MAT . . . . 21 PALM/BAMBOO . . . . 22 WOOD PLANKS . . . . 23 TARPAULIN, PLASTIC . . . . 24 **FINISHED ROOFING** ZINC/METAL/ALUMINUM . . . . 31 WOOD . . . . 32 CERAMIC TILES . . . . 34 CONCRETE/ CEMENT . . . . 35 ASBESTOS SHEETS/ SHINGLES . . . . 36 OTHER _____ 96 (SPECIFY)	
133	OBSERVE MAIN MATERIAL OF THE EXTERIOR WALLS OF THE DWELLING. RECORD OBSERVATION.	**NATURAL WALLS** MUD AND STICKS . . . . 11 CANE/ PALM/ TRUNKS . . . . 12 STRAW/ THATCH MATS . . . . 13 **RUDIMENTARY WALLS** MUD BRICKS . . . . 21 PLYWOOD . . . . 22 CARDBOARD/ PLASTIC . . . . 23 REUSED WOOD . . . . 24 **FINISHED WALLS** ZINC/ METAL . . . . 31 CEMENT . . . . 32 STONE BLOCKS . . . . 33 BRICKS . . . . 34 WOOD PLANKS/ SHINGLES . . . . 35 OTHER _____ 96 (SPECIFY)	
134	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:

_____

_____

_____

_____

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_____

SUPERVISOR'S OBSERVATIONS

_____

_____

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EDITOR'S OBSERVATIONS

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2016 LIBERIA MALARIA INDICATOR SURVEY
WOMAN'S QUESTIONNAIRE
NATIONAL MALARIA CONTROL PROGRAM-MINISTRY OF HEALTH
LIBERIA INSTITUTE OF STATISTICS AND GEO-INFORMATION SERVICES

IDENTIFICATION

PLACE NAME _____

NAME OF HOUSEHOLD HEAD _____

LMIS CLUSTER NUMBER . . . .

HOUSEHOLD NUMBER . . . .

NAME AND LINE NUMBER OF WOMAN _____

INTERVIEWER VISITS

	1	2	3	FINAL VISIT	
DATE	_____	_____	_____	DAY	
				MONTH	
				YEAR	2 0 1
INTERVIEWER'S NAME	_____	_____	_____	INT. NO.	
RESULT*	_____	_____	_____	RESULT*	
NEXT VISIT: DATE	_____	_____		TOTAL NUMBER OF VISITS	
TIME	_____	_____			

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

SUPERVISOR		OFFICE EDITOR	KEYED BY
NAME NUMBER		NUMBER	NUMBER

INTRODUCTION AND CONSENT

Hello. My name is _____. I am working with the Ministry of Health. We are conducting a survey about malaria all over Liberia. The information we collect will help the government to plan health services. Your household was selected for the survey. The questions usually take about 30 minutes. All of the answers you give will be confidential and will not be shared with anyone other than members of our survey team. You don't have to be in the survey, but we hope you will agree to answer the questions since your views are important. If I ask you any question you don't want to answer, just let me know and I will go on to the next question or you can stop the interview at any time.

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

Do you have any questions?

May I begin the interview now?

SIGNATURE OF INTERVIEWER _____   DATE _____

RESPONDENT AGREES
TO BE INTERVIEWED . .   1

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

SECTION 1. RESPONDENT'S BACKGROUND

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
101	RECORD THE TIME.	HOURS . . . . ☐☐ MINUTES . . . . ☐☐	
102	In what month and year were you born?	MONTH . . . . ☐☐ DON'T KNOW MONTH . . . . 98 YEAR . . . . ☐☐☐☐ DON'T KNOW YEAR 9998	
103	How old were you at your last birthday? COMPARE AND CORRECT 102 AND/OR 103 IF INCONSISTENT.	AGE IN COMPLETED YEARS . . . . ☐☐	
104	Have you ever attended school?	YES . . . . 1 NO 2	⟶ 108
105	What is the highest level of school you attended: elementary, junior high, senior high, or higher?	ELEMENTARY (1-6) . . . . 1 JUNIOR HIGH (7-9) . . . . 2 SENIOR HIGH (10-12) . . . . 3 HIGHER 4	⟶ 106A
106	What is the highest grade you completed? IF COMPLETED NO GRADES, RECORD '00'.	**GRADE** . . . . ☐☐	⟶ 107
106A	How many years of higher education did you complete? IF COMPLETED LESS THAN ONE YEAR OF HIGHER EDUCATION, RECORD '00'.	**YEARS** . . . . ☐☐	
107	CHECK 105: ELEMENTARY OR ☐ JUNIOR HIGH OR SENIOR HIGH ↓	HIGHER ☐	⟶ 109

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
108	Now I would like you to read this sentence to me. SHOW CARD TO RESPONDENT. IF RESPONDENT CANNOT READ WHOLE SENTENCE, PROBE: Can you read any part of the sentence to me?	CANNOT READ AT ALL . . . . 1 ABLE TO READ ONLY PART OF THE SENTENCE . . . . 2 ABLE TO READ WHOLE SENTENCE . . . . 3 NO CARD WITH REQUIRED LANGUAGE _____ 4 (SPECIFY LANGUAGE) BLIND/VISUALLY IMPAIRED 5	
109	What is your religion?	CHRISTIAN . . . . 01 MUSLIM . . . . 02 TRADITIONAL RELIGION . . . . 03 NO RELIGION . . . . 04 OTHER _____ 96 (SPECIFY)	
110A	What dialect do you speak well (besides English)? IF RESPONDENT CAN SPEAK SEVERAL DIALECTS, ASK WHICH ONE SHE SPEAKS MOST, OR WHICH IS HER FIRST LANGUAGE, OR MOTHER TONGUE	BASSA . . . . 01 GBANDI . . . . 02 BELLE . . . . 03 DEY . . . . 04 GIO . . . . 05 GOLA . . . . 06 GREBO . . . . 07 KISSI . . . . 08 KPELLE . . . . 09 KRAHN . . . . 10 KRU . . . . 11 LORMA . . . . 12 MANDINGO . . . . 13 MANO . . . . 14 MENDE . . . . 15 SAPRO . . . . 16 VAI . . . . 17 NONE / ONLY ENGLISH . . . . 18 OTHER 96	

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 (belly born) who are now living with you?	YES .... 1 NO 2	→ 204
203	a) How many sons live with you? b) And how many daughters live with you? IF NONE, RECORD '00'.	a) SONS AT HOME .... b) DAUGHTERS AT HOME	
204	Do you have any sons or daughters to whom you have given birth (belly born) who are alive but do not live with you?	YES .... 1 NO 2	→ 206
205	a) How many sons are alive but do not live with you? b) And how many daughters are alive but do not live with you? IF NONE, RECORD '00'.	a) SONS ELSEWHERE .... b) DAUGHTERS ELSEWHERE	
206	Have you ever given birth to a boy or girl who was belly born alive but later died? IF NO, PROBE: Any baby who cried, who made any movement, sound, or effort to breathe, or who showed any other signs of life even if for a very short time?	YES .... 1 NO 2	→ 208
207	a) How many boys have died? b) And how many girls have died? IF NONE, RECORD '00'.	a) BOYS DEAD .... b) GIRLS DEAD	
208	SUM ANSWERS TO 203, 205, AND 207, AND ENTER TOTAL. IF NONE, RECORD '00'.	TOTAL BIRTHS	
209	CHECK 208: Just to make sure that I have this right: you have had in TOTAL _____ births (belly born) during your life. Is that correct? YES NO ▢ PROBE AND CORRECT 201-208 AS NECESSARY.		
210	CHECK 208: ONE OR MORE ▢ NO BIRTHS ▢ BIRTHS		→ 225
211	Now I'd like to ask you about your more recent births. How many births have you had since January 2011? RECORD NUMBER OF LIVE BIRTHS FROM 2011-2016 IF NONE CIRCLE '00"	TOTAL IN 2011-2016 ..... NONE 00	→ 225 → 225

212	Now I would like to record the names of all your births in 2011-2016, whether still alive or not, starting with the most recent one you had.
	RECORD IN 213 NAMES OF ALL THE BIRTHS IN 2011-2016. RECORD TWINS AND TRIPLETS ON SEPARATE ROWS. IF THERE ARE MORE THAN 5 BIRTHS, USE AN ADDITIONAL QUESTIONNAIRE STARTING WITH THE SECOND ROW.

213	214	215	216	217	218 IF ALIVE:	219 IF ALIVE:	220 IF ALIVE:	221
What name was given to your (most recent/ previous) baby? RECORD NAME. BIRTH HISTORY NUMBER.	Is (NAME) a boy or a girl?	Were any of these births twins?	On what day, month, and year was (NAME) born?	Is (NAME) still alive?	How old was (NAME) at (NAME)'s last birthday? RECORD AGE IN COMP-LETED YEARS.	Is (NAME) living with you?	RECORD HOUSEHOLD LINE NUMBER OF CHILD. RECORD '00' IF CHILD NOT LISTED IN HOUSEHOLD.	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)

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 NUMBERS ARE ☐ ARE SAME DIFFERENT ↓ (PROBE AND RECONCILE) ←		
224	CHECK 216: ENTER THE NUMBER OF BIRTHS IN 2011-2016	NUMBER OF BIRTHS . . . . ☐ NONE 0	
225	Are you pregnant now?	YES . . . . 1 NO . . . . 2 UNSURE 8	→226A
226	How many months pregnant are you? RECORD NUMBER OF COMPLETED MONTHS.	MONTHS . . . . ☐☐	→ 227
226A	Are you or your partner currently doing something or using any method to delay or avoid getting pregnant?	YES . . . . 1 NO 2	→226D
226B	Which method are you using? RECORD ALL MENTIONED. IF MORE THAN ONE METHOD MENTIONED, FOLLOW SKIP INSTRUCTION FOR HIGHEST METHOD IN LIST.	FEMALE STERILIZATION . . . . A MALE STERILIZATION . . . . B IUD . . . . C INJECTABLES/DEPO . . . . D IMPLANTS . . . . E PILL . . . . F CONDOM . . . . G FEMALE CONDOM . . . . H EMERGENCY CONTRACEPTION . . . . I CYCLEBEADS/STANDARD DAYS METHOD . . J LACTATIONAL AMENORRHEA METHOD . . . . . K RHYTHM METHOD . . . . L WITHDRAWAL . . . . M OTHER MODERN METHOD . . . . X OTHER TRADITIONAL METHOD . . . . Y	→227 →227 →227

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP

226C	Where did you obtain (CURRENT METHOD) the last time?
	
	PROBE TO IDENTIFY THE TYPE OF SOURCE.
	
	IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE.
	
	_____
	(NAME OF PLACE)
		PUBLIC SECTOR
		GOVERNMENT HOSPITAL 11
		GOVERNMENT HEALTH CENTER 12
		HEALTH CLINIC 13
		MOBILE CLINIC 14
		COMMUNITY HEALTH
		    WORKER/ OUTREACH 15
		OTHER PUBLIC SECTOR 16
		        _____
		        (SPECIFY)
		
		PRIVATE MEDICAL SECTOR
		PRIVATE HOSPITAL/CLINIC 21
		PHARMACY/ MED. STORE 22
		PRIVATE DOCTOR 23
		PLANNED PARENTHOOD
		    ASSOCIATION OF LIBERIA 25
		OTHER PRIVATE MEDICAL SECTOR 26
		        _____
		        (SPECIFY)
		
		OTHER SOURCE
		SHOP 31
		CHURCH 32
		FRIEND/RELATIVE 33
		
		OTHER _____ 96
		             (SPECIFY)
			→ 227

226D	Do you know of a place where you can obtain a method of family planning?	YES . . . . 1 NO 2	
227	CHECK 224: ONE OR MORE BIRTHS IN ☐ 2011-2016 (GO TO 301) ←	NO BIRTHS IN ☐ 2011-2016 Q. 224 IS BLANK ☐	→ 701 → 701

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
301	RECORD BIRTH HISTORY NUMBER FOR THE MOST RECENT BIRTH IN 2011-2016 FROM 213 IN BIRTH HISTORY.	MOST RECENT BIRTH BIRTH HISTORY NUMBER . . . . ☐☐	
301A	RECORD THE NAME AND SURVIVAL STATUS OF THE MOST RECENT BIRTH FROM 213 AND 217, LINE 01:	NAME _____ LIVING ☐　　　　DEAD ☐ 　　↓　　　　　　　↓	
302	Now I would like to ask you some questions about your last pregnancy that resulted in a live birth. When you got pregnant with (NAME), did you see anyone for antenatal care for this pregnancy?	YES . . . . 1 NO 2	→ 303E
303	Whom did you see? Anyone else? PROBE TO IDENTIFY EACH TYPE OF PERSON AND RECORD ALL MENTIONED.	**HEALTH PERSONNEL** 　DOCTOR . . . . A 　NURSE/MIDWIFE . . . . B 　PHYSICIAN ASSISTANT . . . . C **OTHER PERSON** 　TRADITIONAL BIRTH ATTENDANT . . . . D 　COMMUNITY HEALTH WORKER/ 　　OUTREACH . . . . E OTHER _____ X 　　　　　　　(SPECIFY)	
303A	Where did you receive antenatal care for this pregnancy? Anywhere else? PROBE TO IDENTIFY THE TYPE OF SOURCE. IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE. _____ 　　　　(NAME OF PLACE)	**HOME** 　HER HOME . . . . A 　OTHER HOME . . . . B **PUBLIC SECTOR** 　GOVERNMENT HOSPITAL . . . . C 　GOVERNMENT HEALTH CENTER . . . . D 　GOVERNMENT HEALTH CLINIC . . . . E 　COMMUNITY HEALTH 　　WORKER/ OUTREACH . . . . F 　OTHER PUBLIC 　　MEDICAL SECTOR 　　_____ G 　　　　　(SPECIFY) **PRIVATE MEDICAL SECTOR** 　PRIVATE HOSPITAL/ CLINIC . . . . H 　PRIVATE DOCTOR . . . . I 　PLANNED PARENTHOOD ASSN. LIB. . . . . . J 　OTHER PRIVATE 　　MEDICAL SECTOR 　　_____ K 　　　　　(SPECIFY) OTHER _____ X 　　　　　(SPECIFY)	
303B	How many months pregnant were you when you first received antenatal care for this pregnancy?	MONTHS . . . . ☐☐ DON'T KNOW/ DON'T REMEMBER 98	
303C	How many times did you receive antenatal care during this pregnancy?	NUMBER 　OF TIMES . . . . ☐☐ DON'T KNOW/ DON'T REMEMBER 98	

NO.	QUESTIONS AND FILTERS	MOST RECENT BIRTH NAME _____	SKIP
303D	Did you get a mosquito net during any ANC visit?	YES . . . . 1 NO . . . . 2 DON'T KNOW/ DON'T REMEMBER 8	
303E	Did you get a mosquito net during your delivery?	YES . . . . 1 NO . . . . 2 DON'T KNOW/ DON'T REMEMBER 8	
303F	During this pregnancy, did anyone tell you that you were supposed to get two mosquito nets, one at an ANC visit and one at delivery?	YES . . . . 1 NO . . . . 2 DON'T KNOW/ DON'T REMEMBER 8	
303G	During this pregnancy, did anyone tell you that pregnant women need to take some kind of medicine to keep them from getting malaria? EMPHASIZE THE WORD "KEEP".	YES . . . . 1 NO . . . . 2 DON'T KNOW/ DON'T REMEMBER 8	
304	During this pregnancy, did you take any medicine to keep you from getting malaria? EMPHASIZE 'KEEP'. DO NOT CIRCLE '1' IF SHE WAS ONLY GIVEN DRUGS BECAUSE SHE HAD MALARIA.	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	→403
304A	What medicine did you take to keep you from getting malaria? RECORD ALL MENTIONED. IF SHE DOES NOT KNOW THE TYPE OF DRUGS, SHOW HER TYPICAL ANTIMALARIAL DRUGS. TREATMENT WITH SP/FANSIDAR USUALLY CONSISTS OF TAKING 3 BIG WHITE TABLETS AT THE HEALTH FACILITY.	SP/FANSIDAR . . . . A CHLOROQUINE . . . . B OTHER _____ X (SPECIFY) DON'T KNOW . . . . Z	
304B	CHECK 304A: DRUGS TAKEN FOR MALARIA PREVENTION CODE 'A' ☐ CIRCLED ↓ CODE 'B' OR 'X' ☐ OR 'Z' CIRCLED BUT NOT 'A'		→ 403
305	How many times did you take SP/Fansidar during this pregnancy?	TIMES . . . . ☐☐	
306	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 VISIT . . . . 2 OTHER SOURCE 6	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
403	RECORD BIRTH HISTORY NUMBER FOR THE MOST RECENT BIRTH FROM 213 IN BIRTH HISTORY.	MOST RECENT BIRTH BIRTH HISTORY NUMBER . . . . ☐☐	
404	FROM 213 AND 217:	NAME _____ LIVING ☐ DEAD ☐	

405	Where did you give birth to (NAME)?
	
	PROBE TO IDENTIFY THE TYPE OF SOURCE.
	
	IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE.
	
	_____
	(NAME OF PLACE)
		HOME
		    HER HOME 11
		    OTHER HOME 12
		
		PUBLIC SECTOR
		    GOV. HOSPITAL 21
		    GOVERNMENT HEALTH
		        CENTER 22
		    GOVERNMENT HEALTH
		        CLINIC 23
		    OTHER PUBLIC
		        SECTOR
		        _____ 26
		           (SPECIFY)
		
		PRIVATE MEDICAL SECTOR
		    PRIVATE HOSPITAL/
		        CLINIC 31
		    OTHER PRIVATE
		        MEDICAL SECTOR
		        _____ 36
		           (SPECIFY)
		
		OTHER _____ 96
		           (SPECIFY)	

405A	CHECK 405: PLACE OF DELIVERY	CODE 11, 12, OR 96 ☐ OTHER ☐ CIRCLED (SKIP TO 420) ←	
406	I would like to talk to you about checks on your health after delivery, for example, someone asking you questions about your health or examining you. Did anyone check on your health while you were still in the facility?	YES . . . . 1 NO . . . . 2 (SKIP TO 409) ←	

NO.	QUESTIONS AND FILTERS	MOST RECENT BIRTH NAME _____	
407	How long after delivery did the first check take place? IF LESS THAN ONE DAY, RECORD HOURS; IF LESS THAN ONE WEEK, RECORD DAYS.	HOURS .... 1 DAYS .... 2 WEEKS .... 3 DON'T KNOW 998	

408	Who checked on your health at that time?
	
	PROBE FOR MOST QUALIFIED PERSON.
		HEALTH PERSONNEL
		   DOCTOR 11
		   NURSE/MIDWIFE 12
		   PHYSICIAN ASST. 13
		
		OTHER PERSON
		   TRADITIONAL BIRTH
		      ATTENDANT 21
		   COMMUNITY HEALTH
		      WORKER/
		      OUTREACH 22
		
		OTHER _____ 96
		        (SPECIFY)	

409	Now I would like to talk to you about checks on (NAME)'s health after delivery – for example, someone examining (NAME), checking the cord, or seeing if (NAME) is OK. Did anyone check on (NAME)'s health while you were still in the facility?	YES .... 1 NO .... 2⌐ (SKIP TO 412) ◄⎯⎯ DON'T KNOW .... 8⌐	
410	How long after delivery was (NAME)'s health first checked? IF LESS THAN ONE DAY, RECORD HOURS; IF LESS THAN ONE WEEK, RECORD DAYS.	HOURS .... 1 DAYS .... 2 WEEKS .... 3 DON'T KNOW 998	

411	Who checked on (NAME)'s health at that time?
	
	PROBE FOR MOST QUALIFIED PERSON.
		HEALTH PERSONNEL
		   DOCTOR 11
		   NURSE/MIDWIFE 12
		   PHYSICIAN ASST. 13
		
		OTHER PERSON
		   TRADITIONAL BIRTH
		      ATTENDANT 21
		   COMMUNITY HEALTH
		      WORKER/
		      OUTREACH 22
		
		OTHER _____ 96
		        (SPECIFY)	

412	Now I want to talk to you about what happened after you left the facility. Did anyone check on your health after you left the facility?	YES .... 1 NO .... 2⌐ (SKIP TO 416) ◄⎯⎯	

NO.	QUESTIONS AND FILTERS	MOST RECENT BIRTH NAME _____	
413	How long after delivery did that check take place? IF LESS THAN ONE DAY, RECORD HOURS; IF LESS THAN ONE WEEK, RECORD DAYS.	HOURS . . . . 1 DAYS . . . . 2 WEEKS . . . . 3 DON'T KNOW 998	

414	Who checked on your health at that time?
	
	PROBE FOR MOST QUALIFIED PERSON.
		HEALTH PERSONNEL
		    DOCTOR 11
		    NURSE/MIDWIFE 12
		    PHYSICIAN ASST. 13
		
		OTHER PERSON
		    TRADITIONAL BIRTH
		        ATTENDANT 21
		    COMMUNITY HEALTH
		        WORKER/
		        OUTREACH 22
		
		OTHER _____ 96
		            (SPECIFY)	

415	Where did the check take place?
	
	PROBE TO IDENTIFY THE TYPE OF SOURCE.
	
	IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE.
	
	_____
	      (NAME OF PLACE)
		HOME
		    HER HOME 11
		    OTHER HOME 12
		
		PUBLIC SECTOR
		    GOV. HOSPITAL 21
		    GOVERNMENT HEALTH
		        CENTER 22
		    GOVERNMENT HEALTH
		        CLINIC 23
		    OTHER PUBLIC SECTOR
		
		      _____ 26
		          (SPECIFY)
		
		PRIVATE MEDICAL SECTOR
		    PRIVATE HOSPITAL/
		        CLINIC 31
		    OTHER PRIVATE
		        MEDICAL SECTOR
		
		      _____ 36
		          (SPECIFY)
		
		OTHER _____ 96
		          (SPECIFY)	

416	I would like to talk to you about checks on (NAME)'s health after you left (FACILITY IN 405). Did any health care provider or a traditional birth attendant check on (NAME)'s health in the two months after you left (FACILITY IN 405)?	YES . . . . 1 NO . . . . 2 (SKIP TO 501) DON'T KNOW 8	

NO.	QUESTIONS AND FILTERS	MOST RECENT BIRTH NAME _____	
417	How many hours, days or weeks after the birth of (NAME) did that check take place? IF LESS THAN ONE DAY, RECORD HOURS; IF LESS THAN ONE WEEK, RECORD DAYS.	HOURS 1 DAYS . . . . 2 WEEKS . . . . 3 DON'T KNOW 998	

418	Who checked on (NAME)'s health at that time?
	
	PROBE FOR MOST QUALIFIED PERSON.
		HEALTH PERSONNEL
		   DOCTOR 11
		   NURSE/MIDWIFE 12
		   PHYSICIAN ASST. 13
		
		OTHER PERSON
		   TRADITIONAL BIRTH
		      ATTENDANT 21
		   COMMUNITY HEALTH
		      WORKER/
		      OUTREACH 22
		
		OTHER _____ 96
		             (SPECIFY)	

419	Where did this check of (NAME) take place?
	
	PROBE TO IDENTIFY THE TYPE OF SOURCE.
	
	IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE.
	
	_____
	    (NAME OF PLACE)
		HOME
		   HER HOME . . . . 11 ⌐
		   OTHER HOME . . . . 12 ⌐
		
		PUBLIC SECTOR
		   GOV. HOSPITAL . . . . 21 ⌐
		   GOVERNMENT HEALTH
		      CENTER . . . . 22 ⌐
		   GOVERNMENT HEALTH
		      CLINIC . . . . 23 ⌐
		   OTHER PUBLIC SECTOR
		
		         _____ 26 ⌐
		           (SPECIFY)
		
		PRIVATE MEDICAL SECTOR
		   PRIVATE HOSPITAL/
		      CLINIC . . . . 31 ⌐
		   OTHER PRIVATE
		      MEDICAL SECTOR
		
		         _____ 36 ⌐
		           (SPECIFY)
		
		OTHER _____ 96 ⌐
		           (SPECIFY)
		
		(SKIP TO 501) ◄—┘	

420	I would like to talk to you about checks on your health after delivery, for example, someone asking you questions about your health or examining you. Did anyone check on your health after you gave birth to (NAME)?	YES . . . . 1 NO . . . . 2 ⌐ (SKIP TO 424) ◄—┘	

NO.	QUESTIONS AND FILTERS	MOST RECENT BIRTH NAME _____	
421	How long after delivery did the first check take place? IF LESS THAN ONE DAY, RECORD HOURS; IF LESS THAN ONE WEEK, RECORD DAYS.	HOURS .... 1 DAYS .... 2 WEEKS .... 3 DON'T KNOW 998	
422	Who checked on your health at that time? PROBE FOR MOST QUALIFIED PERSON.	**HEALTH PERSONNEL** DOCTOR .... 11 NURSE/MIDWIFE ..... 12 PHYSICIAN ASST. ..... 13 **OTHER PERSON** TRADITIONAL BIRTH ATTENDANT .... 21 COMMUNITY HEALTH WORKER/ OUTREACH .... 22 OTHER _____ 96 (SPECIFY)	
423	Where did this first check take place? PROBE TO IDENTIFY THE TYPE OF SOURCE. IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE)	**HOME** HER HOME .... 11 OTHER HOME .... 12 **PUBLIC SECTOR** GOV. HOSPITAL .... 21 GOVERNMENT HEALTH CENTER .... 22 GOVERNMENT HEALTH CLINIC .... 23 OTHER PUBLIC SECTOR _____ 26 (SPECIFY) **PRIVATE MEDICAL SECTOR** PRIVATE HOSPITAL/ CLINIC .... 31 OTHER PRIVATE MEDICAL SECTOR _____ 36 (SPECIFY) OTHER _____ 96 (SPECIFY)	
424	I would like to talk to you about checks on (NAME)'s health after delivery – for example, someone examining (NAME), checking the cord, or seeing if (NAME) is OK. In the two months after (NAME) was born, did any health care provider or a traditional birth attendant check on (NAME)'s health?	YES .... 1 NO .... 2 (SKIP TO 501) ◄ DON'T KNOW 8	

NO.	QUESTIONS AND FILTERS	MOST RECENT BIRTH NAME _____	
425	How many hours, days or weeks after the birth of (NAME) did the first check take place? IF LESS THAN ONE DAY, RECORD HOURS; IF LESS THAN ONE WEEK, RECORD DAYS.	HOURS AFTER BIRTH . . . . . 1 ☐☐ DAYS AFTER BIRTH . . . . . 2 ☐☐ WEEKS AFTER BIRTH . . . . . 3 ☐☐ DON'T KNOW 998	
426	Who checked on (NAME)'s health at that time? PROBE FOR MOST QUALIFIED PERSON.	**HEALTH PERSONNEL** DOCTOR . . . . 11 NURSE/MIDWIFE . . . . . 12 PHYSICIAN ASST. . . . . . 13 **OTHER PERSON** TRADITIONAL BIRTH ATTENDANT . . . . 21 COMMUNITY HEALTH WORKER/ OUTREACH . . . . 22 OTHER _____ 96 (SPECIFY)	
427	Where did this first check of (NAME) take place? PROBE TO IDENTIFY THE TYPE OF SOURCE. IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE)	**HOME** HER HOME . . . . 11 OTHER HOME . . . . 12 **PUBLIC SECTOR** GOV. HOSPITAL . . . . 21 GOVERNMENT HEALTH CENTER . . . . 22 GOVERNMENT HEALTH CLINIC . . . . 23 OTHER PUBLIC SECTOR _____ 26 (SPECIFY) **PRIVATE MEDICAL SECTOR** PRIVATE HOSPITAL/ CLINIC . . . . 31 OTHER PRIVATE MEDICAL SECTOR _____ 36 (SPECIFY) OTHER _____ 96 SPECIFY	

501	CHECK 213: RECORD THE BIRTH HISTORY NUMBER in 502 AND THE NAME AND SURVIVAL STATUS IN 503 FOR EACH BIRTH IN 2011-2016. ASK QUESTIONS ABOUT ALL OF THESE BIRTHS. BEGIN WITH THE MOST RECENT BIRTH. IF THERE WERE MORE THAN 2 BIRTHS, USE ADDITIONAL QUESTIONNAIRES. Now I would like to ask some questions about the health of your children born in 2011-2016. (We will talk about each separately.)	

502	BIRTH HISTORY NUMBER FROM 213 IN BIRTH HISTORY.	MOST RECENT BIRTH BIRTH HISTORY NUMBER . . . . ☐☐	NEXT-TO MOST RECENT BIRTH BIRTH HISTORY NUMBER . . . . ☐☐

503	FROM 213 AND 217:	NAME _____
		
		LIVING DEAD ☐
		       (SKIP TO 528) ◄
			NAME _____
			
			LIVING DEAD ☐
			       (SKIP TO 528) ◄

504	Has (NAME) been ill with a fever at any time in the last 2 weeks?	YES 1
		NO . . . . 2┐
		      (SKIP TO 528) ◄
		DON'T KNOW . . . . 8┘
			YES 1
			NO . . . . 2┐
			      (SKIP TO 528) ◄
			DON'T KNOW . . . . 8┘

506	Did you seek advice or treatment for the illness from any source?	YES 1
		NO . . . . 2┐
		      (SKIP TO 511) ◄
			YES 1
			NO . . . . 2┐
			      (SKIP TO 511) ◄

507	Where did you seek advice or treatment?
	
	Anywhere else?
	
	PROBE TO IDENTIFY THE TYPE OF SOURCE.
	
	IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE(S).
	
	_____
	(NAME OF PLACE)
		PUBLIC SECTOR
		GOV. HOSPITAL . . . . A
		GOVERNMENT HEALTH
		  CENTER . . . . B
		GOVERNMENT HEALTH
		  CLINIC C
		MOBILE CLINIC . . . . D
		CHW/OUTREACH . . . . . E
		OTHER PUBLIC SECTOR
		
		_____ F
		(SPECIFY)
		
		PRIVATE MEDICAL SECTOR
		PRIVATE HOSPITAL/
		  CLINIC . . . . G
		PHARMACY/MED.STORE . . H
		PRIVATE DOCTOR I
		PLANNED PARENTHOOD
		ASSOC. OF LIBERIA . . . . . J
		OTHER PRIVATE
		  MEDICAL SECTOR
		
		_____ K
		(SPECIFY)
		
		OTHER SOURCE
		TRADITIONAL
		  PRACTITIONER L
		MARKET . . . . M
		BLACK BAGGER/
		  DRUG PEDDLER . . . . . N
		
		OTHER _____ X
		(SPECIFY)
			PUBLIC SECTOR
			GOV. HOSPITAL . . . . A
			GOVERNMENT HEALTH
			  CENTER . . . . B
			GOVERNMENT HEALTH
			  CLINIC C
			MOBILE CLINIC . . . . D
			CHW/OUTREACH . . . . . E
			OTHER PUBLIC SECTOR
			
			_____ F
			(SPECIFY)
			
			PRIVATE MEDICAL SECTOR
			PRIVATE HOSPITAL/
			  CLINIC . . . . G
			PHARMACY/MED.STORE . . H
			PRIVATE DOCTOR I
			PLANNED PARENTHOOD
			ASSOC. OF LIBERIA . . . . . J
			OTHER PRIVATE
			  MEDICAL SECTOR
			
			_____ K
			(SPECIFY)
			
			OTHER SOURCE
			TRADITIONAL
			  PRACTITIONER L
			MARKET . . . . M
			BLACK BAGGER/
			  DRUG PEDDLER . . . . . N
			
			OTHER _____ X
			(SPECIFY)

NO.	QUESTIONS AND FILTERS	MOST RECENT BIRTH NAME_____	NEXT-TO-MOST RECENT BIRTH NAME_____
508	CHECK 507:	TWO OR MORE CODES CIRCLED ☐ ONLY ONE CODE CIRCLED ☐ (SKIP TO 510) ←	TWO OR MORE CODES CIRCLED ☐ ONLY ONE CODE CIRCLED ☐ (SKIP TO 510) ←
509	Where did you first seek advice or treatment? USE LETTER CODE FROM 507	FIRST PLACE .... ☐	FIRST PLACE .... ☐
510	How many days after the illness began did you first seek advice or treatment for (NAME)? IF THE SAME DAY RECORD '00'.	DAYS .... ☐☐	DAYS .... ☐☐
510A	At any time during the illness, did (NAME) have blood taken from (NAME)'s finger or heel for testing?	YES .... 1 NO .... 2 ⌐ (SKIP TO 511) ← DON'T KNOW .... 8 ⌡	YES .... 1 NO .... 2 ⌐ (SKIP TO 511) ← DON'T KNOW .... 8 ⌡
510B	Were you given malaria medicine for (NAME) after this test?	YES .... 1 ⌐ (SKIP TO 512) ← NO .... 2 DON'T KNOW 8	YES .... 1 ⌐ (SKIP TO 512) ← NO .... 2 DON'T KNOW 8
511	At any time during the illness, did (NAME) take any drugs for the illness?	YES .... 1 NO .... 2 ⌐ (SKIP TO 528) ← DON'T KNOW .... 8 ⌡	YES .... 1 NO .... 2 ⌐ (SKIP TO 528) ← DON'T KNOW .... 8 ⌡
512	What drugs did (NAME) take? Any other drugs? RECORD ALL MENTIONED. **PROBE**: IF AMODIAQUINE IS NAMED CLARIFY TO VERIFY IF IT IS ACT.	**ANTIMALARIAL DRUGS** ARTEMISININ COMBINATION THERAPY (ACT) ..... A SP/FANSIDAR .... B CHLOROQUINE .... C AMODIAQUINE .... D QUININE: PILLS .... E INJECTION/IV .... F ARTESUNATE: RECTAL .... G INJECTION/IV .... H OTHER ANTIMALARIAL _____ I (SPECIFY) **ANTIBIOTIC DRUGS** PILL/SYRUP .... J INJECTION/IV .... K **OTHER DRUGS** ASPIRIN .... L PARACETAMOL .... M IBUPROFEN .... N OTHER _____ X (SPECIFY) DON'T KNOW .... Z	**ANTIMALARIAL DRUGS** ARTEMISININ COMBINATION THERAPY (ACT) ..... A SP/FANSIDAR .... B CHLOROQUINE .... C AMODIAQUINE .... D QUININE: PILLS .... E INJECTION/IV .... F ARTESUNATE: RECTAL .... G INJECTION/IV .... H OTHER ANTIMALARIAL _____ I (SPECIFY) **ANTIBIOTIC DRUGS** PILL/SYRUP .... J INJECTION/IV .... K **OTHER DRUGS** ASPIRIN .... L PARACETAMOL .... M IBUPROFEN .... N OTHER _____ X (SPECIFY) DON'T KNOW .... Z

NO.	QUESTIONS AND FILTERS	MOST RECENT BIRTH NAME _____	NEXT-TO-MOST RECENT BIRTH NAME _____
513	CHECK 512: ANY CODE **A-I** CIRCLED?	YES NO ☐ ☐ (SKIP TO 528) ←	YES NO ☐ ☐ (SKIP TO 528) ←
514	CHECK 512: ARTEMISININ COMBINATION THERAPY ('A') GIVEN	CODE 'A' CODE 'A' CIRCLED NOT ☐ CIRCLED (SKIP TO 516) ←	CODE 'A' CODE 'A' CIRCLED NOT ☐ CIRCLED (SKIP TO 516) ←

515	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
			SAME DAY 0
			NEXT DAY 1
			TWO DAYS AFTER
			   FEVER 2
			THREE OR MORE DAYS
			   AFTER FEVER 3
			DON'T KNOW 8

516	CHECK 512: SP/FANSIDAR ('B') GIVEN	CODE 'B' CODE 'B' CIRCLED NOT ☐ CIRCLED (SKIP TO 518) ←	CODE 'B' CODE 'B' CIRCLED NOT ☐ CIRCLED (SKIP TO 518) ←

517	How long after the fever started did (NAME) first take SP/Fansidar?	SAME DAY 0
		NEXT DAY 1
		TWO DAYS AFTER
		   FEVER 2
		THREE OR MORE DAYS
		   AFTER FEVER 3
		DON'T KNOW 8
			SAME DAY 0
			NEXT DAY 1
			TWO DAYS AFTER
			   FEVER 2
			THREE OR MORE DAYS
			   AFTER FEVER 3
			DON'T KNOW 8

518	CHECK 512: CHLOROQUINE ('C') GIVEN	CODE 'C' CODE 'C' CIRCLED NOT ☐ CIRCLED (SKIP TO 520) ←	CODE 'C' CODE 'C' CIRCLED NOT ☐ CIRCLED (SKIP TO 520) ←

519	How long after the fever started did (NAME) first take chloroquine?	SAME DAY 0
		NEXT DAY 1
		TWO DAYS AFTER
		   FEVER 2
		THREE OR MORE DAYS
		   AFTER FEVER 3
		DON'T KNOW 8
			SAME DAY 0
			NEXT DAY 1
			TWO DAYS AFTER
			   FEVER 2
			THREE OR MORE DAYS
			   AFTER FEVER 3
			DON'T KNOW 8

520	CHECK 512: AMODIAQUINE ('D') GIVEN	CODE 'D' CODE 'D' CIRCLED NOT ☐ CIRCLED (SKIP TO 522) ←	CODE 'D' CODE 'D' CIRCLED NOT ☐ CIRCLED (SKIP TO 522) ←

521	How long after the fever started did (NAME) first take amodiaquine?	SAME DAY 0
		NEXT DAY 1
		TWO DAYS AFTER
		   FEVER 2
		THREE OR MORE DAYS
		   AFTER FEVER 3
		DON'T KNOW 8
			SAME DAY 0
			NEXT DAY 1
			TWO DAYS AFTER
			   FEVER 2
			THREE OR MORE DAYS
			   AFTER FEVER 3
			DON'T KNOW 8

NO.	QUESTIONS AND FILTERS	MOST RECENT BIRTH NAME _____	NEXT-TO-MOST RECENT BIRTH NAME _____
522	CHECK 512: QUININE ('E' OR 'F') GIVEN	CODE ⬚ CODE 'E' OR 'F' 'E' OR 'F' CIRCLED NOT CIRCLED ↓ (SKIP TO 524) ←	CODE ⬚ CODE 'E' OR 'F' 'E' OR 'F' CIRCLED NOT CIRCLED ↓ (SKIP TO 524) ←
523	How long after the fever started did (NAME) first take quinine?	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW 8
524	CHECK 512: ARTESUNATE ('G' OR 'H') GIVEN	CODE CODE 'G' OR 'H' 'G' OR 'H' ⬚ CIRCLED NOT CIRCLED ↓ (SKIP TO 526) ←	CODE CODE 'G' OR 'H' 'G' OR 'H' ⬚ CIRCLED NOT CIRCLED ↓ (SKIP TO 526) ←
525	How long after the fever started did (NAME) first take artesunate?	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW 8
526	CHECK 512: OTHER ANTIMALARIAL ('I') GIVEN	CODE 'I' CODE 'I' ⬚ CIRCLED NOT CIRCLED ↓ (SKIP TO 528) ←	CODE 'I' CODE 'I' ⬚ CIRCLED NOT CIRCLED ↓ (SKIP TO 528) ←
527	How long after the fever started did (NAME) first take (OTHER ANTIMALARIAL)?	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW 8	SAME DAY . . . . 0 NEXT DAY . . . . 1 TWO DAYS AFTER FEVER . . . . 2 THREE OR MORE DAYS AFTER FEVER . . . . 3 DON'T KNOW 8
528		GO BACK TO 503 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 601A.	GO TO 503 IN FIRST COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, GO TO 601A.

<u>SECTION 6A. CHILD IMMUNIZATION (MOST RECENT BIRTH)</u>

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
601A	CHECK 216 IN THE BIRTH HISTORY: ANY BIRTHS IN 2013-2016? ONE OR MORE BIRTHS IN 2013-2016 ☐↓ NO BIRTHS IN 2013-2016 ☐—————		→ 701
602A	RECORD THE NAME AND BIRTH HISTORY NUMBER FROM 213 OF THE LAST CHILD BORN IN 2013-2016. NAME OF MOST RECENT BIRTH _____ BIRTH HISTORY NUMBER . . . . ☐☐		
603A	CHECK 217 FOR CHILD: LIVING ☐↓ DEAD ☐—————		→ 601B
604A	Do you have a card or other document where (NAME)'s vaccinations are written down?	YES, HAS ONLY A CARD . . . . 1 YES, HAS ONLY AN OTHER DOCUMENT . . . . . 2 YES, HAS CARD AND OTHER DOCUMENT . . . . . 3 NO, NO CARD AND NO OTHER DOCUMENT . . 4	→ 607A → 607A
605A	Did you ever have a vaccination card for (NAME)?	YES . . . . 1 NO 2	
606A	CHECK 604A: CODE '2' CIRCLED ☐↓ CODE '4' CIRCLED ☐—————		→ 611A
607A	May I see the card or other document where (NAME)'s vaccinations are written down?	YES, ONLY CARD SEEN . . . . 1 YES, ONLY OTHER DOCUMENT SEEN . . . . 2 YES, CARD AND OTHER DOCUMENT SEEN . . 3 NO CARD AND NO OTHER DOCUMENT SEEN . . 4	→ 611A

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
	NAME OF MOST RECENT BIRTH _____	BIRTH HISTORY NUMBER . . . . ☐☐	
607A1	CHECK THE CARD: CHILD HEALTH CARD ☐ NEW VERSION ↓	CHILD HEALTH CARD ☐ PREVIOUS VERSIONS	→ 608A2

608A1 COPY DATES FROM THE CARD OR OTHER DOCUMENT.
WRITE '44' IN 'DAY' COLUMN IF CARD OR OTHER DOCUMENT SHOWS THAT A DOSE WAS GIVEN, BUT NO DATE IS RECORDED.

№ of Visit	FROM THE CHILD HEALTH CARD **NEW VERSION**	DAY		MONTH		YEAR			
1	POLIO- 0 (At birth)	☐	☐	☐	☐	☐	☐	☐	☐
	BCG (Anti-TB Vaccine at Birth)	☐	☐	☐	☐	☐	☐	☐	☐
2	POLIO-1	☐	☐	☐	☐	☐	☐	☐	☐
	ROTA- 1	☐	☐	☐	☐	☐	☐	☐	☐
	PENTA- 1	☐	☐	☐	☐	☐	☐	☐	☐
	PNEUMO- 1	☐	☐	☐	☐	☐	☐	☐	☐
3	POLIO- 2	☐	☐	☐	☐	☐	☐	☐	☐
	ROTA- 2	☐	☐	☐	☐	☐	☐	☐	☐
	PENTA- 2	☐	☐	☐	☐	☐	☐	☐	☐
	PNEUMO- 2	☐	☐	☐	☐	☐	☐	☐	☐
4	POLIO- 3	☐	☐	☐	☐	☐	☐	☐	☐
	ROTA- 3	☐	☐	☐	☐	☐	☐	☐	☐
	PENTA- 3	☐	☐	☐	☐	☐	☐	☐	☐
	PNEUMO- 3	☐	☐	☐	☐	☐	☐	☐	☐
5	MEASLES	☐	☐	☐	☐	☐	☐	☐	☐
	YELLOW FEVER	☐	☐	☐	☐	☐	☐	☐	☐

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
609A1	CHECK 608A1: 'BCG' TO 'YELLOW FEVER" ALL RECORDED? NO ☐ YES ☐		→ 610A → 626A

SECTION 6A. CHILD IMMUNIZATION (MOST RECENT BIRTH)

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
	NAME OF MOST RECENT BIRTH _____	BIRTH HISTORY NUMBER . . . . ☐☐	

| 608A2 | COPY DATES FROM THE CARD OR OTHER DOCUMENT. WRITE '44' IN 'DAY' COLUMN IF CARD OR OTHER DOCUMENT SHOWS THAT A DOSE WAS GIVEN, BUT NO DATE IS RECORDED. | |

FROM THE CHILD HEALTH CARD **PREVIOUS VERSIONS**	DAY	MONTH	YEAR
BCG			
ORAL POLIO VACCINE (OPV) 0 (BIRTH DOSE)			
ORAL POLIO VACCINE (OPV) 1			
ORAL POLIO VACCINE (OPV) 2			
ORAL POLIO VACCINE (OPV) 3			
PENTA-1			
PENTA-2			
PENTA-3			
MEASLES			
YELLOW FEVER			
ROTA-1			
ROTA-2			
ROTA-3			
PNEUMO-1			
PNEUMO-2			
PNEUMO-3			

| 609A2 | CHECK 608A2: 'BCG' TO 'PNEUMO-3" ALL RECORDED? NO ☐   YES ☐ | → 626A |

| 610A | 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 608A1 OR 608A2 THAT ARE NOT RECORDED AS HAVING BEEN GIVEN. | YES 1
(PROBE FOR VACCINATIONS AND WRITE '66' IN THE CORRESPONDING DAY COLUMN IN 608A1 OR 608A2 THEN WRITE '00' IN THE CORRESPONDING DAY COLUMN FOR ALL VACCINATIONS NOT GIVEN)

(THEN SKIP TO 626A)

NO 2
DON'T KNOW 8
(WRITE '00' IN THE CORRESPONDING DAY COLUMN FOR ALL VACCINATIONS NOT GIVEN)

(THEN SKIP TO 626A) | |

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
	NAME OF MOST RECENT BIRTH _____	BIRTH HISTORY NUMBER . . . . ☐☐	
611A	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	→ 626A
612A	Has (NAME) ever received a BCG vaccination against tuberculosis, that is, an injection in the upper right arm that usually causes a scar?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	
614A	Has (NAME) ever received oral polio vaccine, that is, about two drops in the mouth to prevent polio?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	→ 617A
615A	Did (NAME) receive the first oral polio vaccine in the first two weeks after birth or later?	FIRST TWO WEEKS . . . . 1 LATER 2	
616A	How many times did (NAME) receive the oral polio vaccine?	NUMBER OF TIMES . . . . ☐	
617A	Has (NAME) ever received a pentavalent vaccination, that is, an injection given in the upper left thigh sometimes at the same time as polio drops?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	→ 619A
618A	How many times did (NAME) receive the pentavalent vaccine?	NUMBER OF TIMES . . . . ☐	
619A	Has (NAME) ever received a pneumococcal vaccination, that is, an injection in the upper right thigh to prevent pneumonia?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	→ 621A
620A	How many times did (NAME) receive the pneumococcal vaccine?	NUMBER OF TIMES . . . . ☐	
621A	Has (NAME) ever received a rotavirus vaccination, that is, liquid in the mouth to prevent diarrhea?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	→ 623A
622A	How many times did (NAME) receive the rotavirus vaccine?	NUMBER OF TIMES . . . . ☐	
623A	Has (NAME) ever received a measles vaccination, that is, an injection in the upper left arm to prevent measles?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	
625A	Has (NAME) ever received a yellow fever vaccination, that is, an injection in the upper right arm to prevent yellow fever?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	
626A	Did you ever have a certificate for outstanding parent for (NAME)?	YES . . . . 1 NO 2	→ 628A
627A	May I see the certificate for outstanding parent for (NAME)?	YES, SEEN . . . . 1 YES, NOT SEEN 2	
628A	CONTINUE WITH 601B.		

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
601B	CHECK 216 IN THE BIRTH HISTORY: ANY MORE BIRTHS IN 2013-2016? MORE BIRTHS IN 2013-2016 ☐ NO MORE BIRTHS IN 2013-2016 ☐		→ 701
602B	RECORD THE NAME AND BIRTH HISTORY NUMBER FROM 213 OF NEXT-TO-MOST RECENT CHILD BORN IN 2013-2016. NAME OF NEXT-TO-MOST RECENT BIRTH _____ BIRTH HISTORY NUMBER . . . . ☐☐		
603B	CHECK 217 FOR CHILD: LIVING ☐ DEAD ☐		→ 628B
604B	Do you have a card or other document where (NAME)'s vaccinations are written down?	YES, HAS ONLY A CARD . . . . 1 YES, HAS ONLY AN OTHER DOCUMENT . . . . . 2 YES, HAS CARD AND OTHER DOCUMENT . . . . . 3 NO, NO CARD AND NO OTHER DOCUMENT . . 4	→ 607B → 607B
605B	Did you ever have a vaccination card for (NAME)?	YES . . . . 1 NO 2	
606B	CHECK 604B: CODE '2' CIRCLED ☐ CODE '4' CIRCLED ☐		→ 611B
607B	May I see the card or other document where (NAME)'s vaccinations are written down?	YES, ONLY CARD SEEN . . . . 1 YES, ONLY OTHER DOCUMENT SEEN . . . . 2 YES, CARD AND OTHER DOCUMENT SEEN . . 3 NO CARD AND NO OTHER DOCUMENT SEEN . . 4	→ 611B

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
	NAME OF NEXT-TO-MOST RECENT BIRTH _____	BIRTH HISTORY NUMBER . . . . ☐☐	
607B1	CHECK THE CARD: CHILD HEALTH CARD ☐ NEW VERSION ↓	CHILD HEALTH CARD ☐ PREVIOUS VERSIONS	→ 608B2

608B1 COPY DATES FROM THE CARD OR OTHER DOCUMENT.
WRITE '44' IN 'DAY' COLUMN IF CARD OR OTHER DOCUMENT SHOWS THAT A DOSE WAS GIVEN, BUT NO DATE IS RECORDED.

№ of Visit	FROM THE CHILD HEALTH CARD NEW VERSION	DAY	MONTH	YEAR
1	POLIO- 0 (At birth)			
	BCG (Anti-TB Vaccine at Birth)			
2	POLIO- 1			
	ROTA- 1			
	PENTA- 1			
	PNEUMO- 1			
3	POLIO- 2			
	ROTA- 2			
	PENTA- 2			
	PNEUMO- 2			
4	POLIO- 3			
	ROTA- 3			
	PENTA- 3			
	PNEUMO- 3			
5	MEASLES			
	YELLOW FEVER			

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
609B1	CHECK 608B1: 'BCG' TO 'YELLOW FEVER" ALL RECORDED? NO ☐		→ 610B
		YES ☐	→ 626B

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
	NAME OF NEXT-TO-MOST RECENT BIRTH _____	BIRTH HISTORY NUMBER . . . . ☐☐	

608B2: COPY DATES FROM THE CARD OR OTHER DOCUMENT.
WRITE '44' IN 'DAY' COLUMN IF CARD OR OTHER DOCUMENT SHOWS THAT A DOSE WAS GIVEN, BUT NO DATE IS RECORDED.

FROM THE CHILD HEALTH CARD **PREVIOUS VERSIONS**	DAY	MONTH	YEAR
BCG			
ORAL POLIO VACCINE (OPV) 0 (BIRTH DOSE)			
ORAL POLIO VACCINE (OPV) 1			
ORAL POLIO VACCINE (OPV) 2			
ORAL POLIO VACCINE (OPV) 3			
PENTA-1			
PENTA-2			
PENTA-3			
MEASLES			
YELLOW FEVER			
ROTA-1			
ROTA-2			
ROTA-3			
PNEUMO-1			
PNEUMO-2			
PNEUMO-3			

609B2: CHECK 608B2: 'BCG' TO 'PNEUMO-3' ALL RECORDED?

NO ☐ ↓   YES ☐ → 626B

610B: 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 608B1 OR 608B2 THAT ARE NOT RECORDED AS HAVING BEEN GIVEN.

YES 1
(PROBE FOR VACCINATIONS AND WRITE '66' IN THE CORRESPONDING DAY COLUMN IN 608B1 OR 608B2 THEN WRITE '00' IN THE CORRESPONDING DAY COLUMN FOR ALL VACCINATIONS NOT GIVEN)

(THEN SKIP TO 626B)

NO 2
DON'T KNOW 8
(WRITE '00' IN THE CORRESPONDING DAY COLUMN FOR ALL VACCINATIONS NOT GIVEN)

(THEN SKIP TO 626B)

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
	NAME OF NEXT-TO-MOST RECENT BIRTH _____	BIRTH HISTORY NUMBER . . . . ☐ ☐	
611B	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	→ 626B
612B	Has (NAME) ever received a BCG vaccination against tuberculosis, that is, an injection in the upper right arm that usually causes a scar?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	
614B	Has (NAME) ever received oral polio vaccine, that is, about two drops in the mouth to prevent polio?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	→ 617B
615B	Did (NAME) receive the first oral polio vaccine in the first two weeks after birth or later?	FIRST TWO WEEKS . . . . 1 LATER 2	
616B	How many times did (NAME) receive the oral polio vaccine?	NUMBER OF TIMES . . . . ☐	
617B	Has (NAME) ever received a pentavalent vaccination, that is, an injection given in the upper left thigh sometimes at the same time as polio drops?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	→ 619B
618B	How many times did (NAME) receive the pentavalent vaccine?	NUMBER OF TIMES . . . . ☐	
619B	Has (NAME) ever received a pneumococcal vaccination, that is, an injection in the upper right thigh to prevent pneumonia?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	→ 621B
620B	How many times did (NAME) receive the pneumococcal vaccine?	NUMBER OF TIMES . . . . ☐	
621B	Has (NAME) ever received a rotavirus vaccination, that is, liquid in the mouth to prevent diarrhea?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	→ 623B
622B	How many times did (NAME) receive the rotavirus vaccine?	NUMBER OF TIMES . . . . ☐	
623B	Has (NAME) ever received a measles vaccination, that is, an injection in the upper left arm to prevent measles?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	
625B	Has (NAME) ever received a yellow fever vaccination, that is, an injection in the upper right arm to prevent yellow fever?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	
626B	Did you ever have a certificate for outstanding parent for (NAME)?	YES . . . . 1 NO 2	→ 628B
627B	May I see the certificate for outstanding parent for (NAME)?	YES, SEEN . . . . 1 YES, NOT SEEN 2	
628B	CHECK 216 IN BIRTH HISTORY: ANY MORE BIRTHS IN 2013-2016? MORE BIRTHS IN 2013-2016 ☐ NO MORE BIRTHS IN 2013-2016 ☐ (GO TO 602B IN AN ADDITIONAL QUESTIONNAIRE)		→ 701

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
701	Now I would like to talk about something else. Before this interview, had you ever heard of a sickness called malaria?	YES . . . . 1 NO 2	→ 717
702	What are the things that can happen to you when you have malaria? Anything else? CIRCLE ALL MENTIONED.	FEVER . . . . A CHILLS . . . . B HEADACHE . . . . C JOINT PAIN . . . . D POOR APPETITE . . . . E BODY PAIN . . . . F VOMITING . . . . G WEAKNESS . . . . H DEATH . . . . J OTHER _____ X 　　　　　　(SPECIFY) DOES NOT KNOW ANY . . . . Z	
703	Who do you think can get sick from malaria more often? Who else? CIRCLE ALL MENTIONED.	CHILDREN . . . . A PREGNANT WOMEN . . . . B ADULTS . . . . C ELDERLY . . . . D EVERYONE . . . . E DOES NOT KNOW . . . . Z	
704	In your opinion, what causes malaria? Anything else? CIRCLE ALL MENTIONED.	MOSQUITOES . . . . A DIRTY WATER . . . . B DIRTY SURROUNDINGS . . . . C BEER . . . . D CERTAIN FOODS . . . . E PLASMODIUM PARASITE . . . . F OTHER _____ X 　　　　　　(SPECIFY) DOES NOT KNOW ANY . . . . Z	
705	Are there things people can do to stop them from getting malaria?	YES . . . . 1 NO 2	→ 708
706	What are some of these things that you think people can do to stop them from getting malaria? What else? CIRCLE ALL MENTIONED.	SLEEP UNDER MOSQUITO NET . . . . A USE MOSQUITO COILS . . . . B USE INSECTICIDE SPRAY . . . . C KEEP DOORS AND WINDOWS CLOSED . . . . . D USE INSECT REPELLENT . . . . E KEEP SURROUNDINGS CLEAN . . . . F CUT THE GRASS . . . . G PREGNANT WOMEN TAKE MEDICINE . . . . H OTHER _____ X 　　　　　　(SPECIFY)	
707	Why do you think people are not doing these things to stop them from getting malaria? Anything else? CIRCLE ALL MENTIONED.	DON'T TAKE SERIOUSLY (NO RISK) . . . . A COSTS TOO MUCH . . . . B DON'T KNOW WHAT TO DO . . . . C DON'T THINK THESE WILL WORK . . . . D OTHER _____ X 　　　　　　(SPECIFY) DON'T KNOW . . . . Z	
708	Can malaria be treated?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	→ 714

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
709	Why do you think people do not go for treatment as soon as they feel that they have got malaria? Anything else? CIRCLE ALL MENTIONED.	NO ACCESS/DISTANCE TO HEALTH CENTER .. A COSTS TOO MUCH .... B DIDN'T KNOW WHERE TO GO .... C THINK THEY CAN TREAT AT HOME .... D NO DRUGS AT HEALTH CENTER .... E NEGATIVE BEHAVIOR OF PROVIDER .... F GO TO TRADITIONAL HEALER .... G WENT TO DRUG STORE .... H ILLNESS NOT SERIOUS .... I WEAKNESS/ TOO SICK TO GO .... J OTHER _____ X (SPECIFY) DON'T KNOW .... Z	
710	What medicines are mainly used to treat malaria? Anything else? CIRCLE ALL MENTIONED. PROBE: IF AMODIAQUINE IS NAMED CLARIFY TO VERIFY IF IT IS ACT	SP/FANSIDAR .... A CHLOROQUINE .... B QUININE .... C ACT/AS-AQ .... D AMADIOQUINE .... E ASPIRIN, PANADOL, PARACETEMOL .... F OTHER _____ X (SPECIFY) DOES NOT KNOW ANY .... Z	→ 710B
710A	Have you heard of a medicine called SP/Fansidar?	YES .... 1 NO 2	→ 714
710B	What is SP/Fansidar used for? Anything else? CIRCLE ALL MENTIONED.	PREVENTON OF MALARIA DURING PREGNANCY .... A MALARIA TREATMENT .... B OTHER _____ X (SPECIFY) DON'T KNOW .... Z	

710C	CHECK 710B: CODE '**A**' PREVENTON OF MALARIA DURING PREGNANCY CIRCLED?
	
	    YES, CODE
	    'A' CIRCLED ☐
		OTHER ☐	→ 714

711	Why do you think pregnant women don't take any or enough SP/Fansidar during pregnancy? Anything else? CIRCLE ALL MENTIONED.	NO ACCESS TO HEALTH CENTER .... A COSTS TOO MUCH .... B DON'T THINK/KNOW THEY NEED TO .... C DON'T THINK IT WORKS .... D WORRIED ABOUT SIDE EFFECTS .... E DON'T KNOW WHERE TO GET IT .... F NOT AVAILABLE/STOCK-OUTS .... G PROVIDER DIDN'T EXPLAIN/NO INFO .... H NEGATIVE PROVIDER INTERACTION .... I EMPTY STOMACH .... J NO WATER TO TAKE MEDICINE .... K HUSBAND WOULDN'T LET HER GO .... L OTHER _____ X (SPECIFY) DOES NOT KNOW ANY .... Z	
714	In the past few months, have you seen or heard any messages about malaria?	YES .... 1 NO 2	→ 717

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP

715	In the past few months, have you heard or seen any of the following malaria messages?
	
	a) If have fever, go to the health facility?
	
	b) Everywhere, Every night. Sleep under the net?
	
	c) Pregnant women should take drugs to prevent malaria?
	
	d) Hang up keep up?
	
	e) Use your mosquito net?
	
	f) Other malaria messages?
		YES NO
		
		a) IF HAVE FEVER,
		    GO TO HEALTH FACILITY 1 2
		
		b) EVERYWHERE, EVERY NIGHT
		    SLEEP UNDER THE NET 1 2
		
		c) PREGNANT WOMEN SHOULD
		    TAKE DRUGS TO
		    PREVENT MALARIA 1 2
		
		d) HANG UP KEEP UP 1 2
		
		e) USE YOUR MOSQUITO NET 1 2
		
		f) OTHER 1 2
		
		_____
		(SPECIFY)	

715A	CHECK 715: ANY MALARIA MESSAGES HEARD OR SEEN
	
	    YES, ANY OTHER ☐
	      CODE '1' ☐
	      CIRCLED ↓
			→ 717

716	Where did you hear or see the messages?
	
	Anywhere else?
	
	CIRCLE ALL MENTIONED.
		RADIO .... A
		BILLBOARD .... B
		POSTER C
		T-SHIRT .... D
		LEAFLET/FACT SHEET/ BROCHURE .... E
		TELEVISION .... F
		VIDEO CLUB .... G
		SCHOOL .... H
		COMMUNITY HEALTH WORKERS
		    TTM, TBA, HEALTH PROMOTERS I
		PEER EDUCATORS .... J
		
		OTHER _____ X
		                       (SPECIFY)	

717	RECORD THE TIME.	HOUR .... ☐☐ MINUTES .... ☐☐	

INTERVIEWER'S OBSERVATIONS

TO BE FILLED IN AFTER COMPLETING INTERVIEW

COMMENTS ABOUT INTERVIEW:

_____

_____

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_____

_____

_____

COMMENTS ON SPECIFIC QUESTIONS:

_____

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_____

ANY OTHER COMMENTS:

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SUPERVISOR'S OBSERVATIONS

_____

_____

_____

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EDITOR'S OBSERVATIONS

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_____

2016 LIBERIA MALARIA INDICATOR SURVEY
BIOMARKER QUESTIONNAIRE
NATIONAL MALARIA CONTROL PROGRAM-MINISTRY OF HEALTH
LIBERIA INSTITUTE OF STATISTICS AND GEO-INFORMATION SERVICES

IDENTIFICATION

PLACE NAME _____

NAME OF HOUSEHOLD HEAD _____

LMIS CLUSTER NUMBER . . . .

HOUSEHOLD NUMBER . . . .

BIOMARKER WORKER VISITS

	1	2	3	FINAL VISIT
DATE	_____	_____	_____	DAY
BIOMARKER WORKER'S NAME	_____	_____	_____	MONTH
				YEAR **2 0 1**
				BIO.NO.
NEXT VISIT: DATE	_____	_____		TOTAL NUMBER OF VISITS
TIME	_____	_____		
NOTES:				TOTAL ELIGIBLE CHILDREN
	_____			
	_____			
	_____			
	_____			
	_____			

SUPERVISOR		INTERVIEWER		OFFICE EDITOR	KEYED BY
_____ NAME	NUMBER	_____ NAME	NUMBER	NUMBER	NUMBER

101	CHECK COLUMN 9 IN HOUSEHOLD QUESTIONNAIRE. RECORD THE LINE NUMBER AND NAME FOR ALL ELIGIBLE CHILDREN 0-5 YEARS IN QUESTION 102; IF MORE THAN SIX CHILDREN, USE ADDITIONAL QUESTIONNAIRE(S).			
		CHILD 1	CHILD 2	CHILD 3
102	CHECK HOUSEHOLD QUESTIONNAIRE: LINE NUMBER FROM COLUMN 9. NAME FROM COLUMN 2.	LINE NUMBER . . . . ☐☐ NAME _____	LINE NUMBER . . . . ☐☐ NAME _____	LINE NUMBER . . . . ☐☐ NAME _____

103	IF MOTHER INTERVIEWED: COPY CHILD'S DATE OF BIRTH (DAY, MONTH, AND YEAR) FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: What is (NAME)'s date of birth?	DAY . . . . ☐☐ MONTH . . . . ☐☐ YEAR . . . ☐☐☐☐	DAY . . . . ☐☐ MONTH . . . . ☐☐ YEAR . . . ☐☐☐☐	DAY . . . . ☐☐ MONTH . . . . ☐☐ YEAR . . . ☐☐☐☐
104	CHECK 103: CHILD BORN IN 2011-2016?	YES . . . . 1 NO . . . . 2 (SKIP TO 130) ←	YES . . . . 1 NO . . . . 2 (SKIP TO 130) ←	YES . . . . 1 NO . . . . 2 (SKIP TO 130) ←
105	CHECK 103: CHILD AGE 0-5 MONTHS, I.E., WAS CHILD BORN IN MONTH OF INTERVIEW OR 5 PREVIOUS MONTHS?	0-5 MONTHS . . . . 1 (SKIP TO 130) ← OLDER 2	0-5 MONTHS . . . . 1 (SKIP TO 130) ← OLDER 2	0-5 MONTHS . . . . 1 (SKIP TO 130) ← OLDER 2
106	CHECK HOUSEHOLD QUESTIONNAIRE: LINE NUMBER OF PARENT/OTHER ADULT RESPONSIBLE FOR THE CHILD FROM COLUMN 1 AND NAME FROM COLUMN 2.	LINE NUMBER . . . . ☐☐ (RECORD '00' IF NOT LISTED) NAME _____	LINE NUMBER . . . . ☐☐ (RECORD '00' IF NOT LISTED) NAME _____	LINE NUMBER . . . . ☐☐ (RECORD '00' IF NOT LISTED) NAME _____
107	ASK CONSENT FOR ANEMIA TEST FROM PARENT/OTHER ADULT.	As part of this survey, we are asking children all over the country to take an anemia test. Anemia is a serious health problem that usually results from poor nutrition, infection, or chronic disease. This survey will assist the government to develop programs to prevent and treat anemia. We ask that all children born in 2011 or later take part in anemia testing in this survey and give a few drops of blood from a finger or heel. The equipment used to take the blood is clean and completely safe. It has never been used before and will be thrown away after each test. The blood will be tested for anemia immediately, and the result will be told to you right away. The result will be kept strictly confidential and will not be shared with anyone other than members of our survey team. Do you have any questions? You can say yes or no. It is up to you to decide. Will you allow (NAME OF CHILD) to participate in the anemia test?		
108	CIRCLE THE CODE AND SIGN YOUR NAME.	GRANTED . . . . 1 _____ (SIGN) ← REFUSED . . . . 2 NOT PRESENT/OTHER . 3	GRANTED . . . . 1 _____ (SIGN) ← REFUSED . . . . 2 NOT PRESENT/OTHER . 3	GRANTED . . . . 1 _____ (SIGN) ← REFUSED . . . . 2 NOT PRESENT/OTHER . 3

		CHILD 1	CHILD 2	CHILD 3
	CHECK HOUSEHOLD QUESTIONNAIRE: LINE NUMBER FROM COLUMN 9. NAME FROM COLUMN 2.	LINE NUMBER .... ☐☐ NAME _____	LINE NUMBER .... ☐☐ NAME _____	LINE NUMBER .... ☐☐ NAME _____
109	ASK CONSENT FOR MALARIA TEST FROM PARENT/OTHER ADULT.	As part of this survey, we are asking children all over the country to take a test to see if they have malaria. Malaria is a serious illness caused by a parasite transmitted by a mosquito bite. This survey will assist the government to develop programs to prevent malaria. We ask that all children born in 2011 or later take part in malaria testing in this survey and give a few drops of blood from a finger or heel. One blood drop will be tested for malaria immediately, and the result will be told to you right away. All results will be kept strictly confidential and will not be shared with anyone other than members of our survey team. Do you have any questions? You can say yes or no. It is up to you to decide. Will you allow (NAME OF CHILD) to participate in the malaria test?		
110	CIRCLE THE CODE, SIGN YOUR NAME, AND ENTER YOUR BIOMARKER WORKER NUMBER.	GRANTED .... 1 REFUSED .... 2 ◄ _____ (SIGN AND ENTER YOUR BIOMARKER WORKER NUMBER) ☐☐☐☐ NOT PRESENT/OTHER . 3	GRANTED .... 1 REFUSED .... 2 ◄ _____ (SIGN AND ENTER YOUR BIOMARKER WORKER NUMBER) ☐☐☐☐ NOT PRESENT/OTHER . 3	GRANTED .... 1 REFUSED .... 2 ◄ _____ (SIGN AND ENTER YOUR BIOMARKER WORKER NUMBER) ☐☐☐☐ NOT PRESENT/OTHER . 3
111	PREPARE EQUIPMENT AND SUPPLIES ONLY FOR THE TEST(S) FOR WHICH CONSENT HAS BEEN OBTAINED AND PROCEED WITH THE TEST(S).			
113	RECORD HEMOGLOBIN LEVEL HERE AND IN THE ANEMIA AND MALARIA PAMPHLET.	G/DL ..... ☐☐.☐ NOT PRESENT ..... 994 REFUSED .... 995 OTHER 996	G/DL ..... ☐☐.☐ NOT PRESENT ..... 994 REFUSED .... 995 OTHER 996	G/DL ..... ☐☐.☐ NOT PRESENT ..... 994 REFUSED .... 995 OTHER 996
114	CIRCLE THE CODE FOR THE MALARIA RDT.	TESTED .... 1 NOT PRESENT .... 2 REFUSED .... 3 OTHER .... 6 (SKIP TO 116) ◄	TESTED .... 1 NOT PRESENT .... 2 REFUSED .... 3 OTHER .... 6 (SKIP TO 116) ◄	TESTED .... 1 NOT PRESENT .... 2 REFUSED .... 3 OTHER .... 6 (SKIP TO 116) ◄
115	RECORD THE RESULT OF THE MALARIA RDT HERE AND IN THE ANEMIA AND MALARIA PAMPHLET.	POSITIVE .... 1 (SKIP TO 118) ◄ NEGATIVE .... 2 OTHER 6	POSITIVE .... 1 (SKIP TO 118) ◄ NEGATIVE .... 2 OTHER 6	POSITIVE .... 1 (SKIP TO 118) ◄ NEGATIVE .... 2 OTHER 6

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

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

122	**SEVERE MALARIA REFERRAL** RECORD THE RESULT OF THE MALARIA RDT ON THE REFERRAL FORM.	The malaria test shows that (NAME OF CHILD) has malaria. Your child also has symptoms of severe malaria. The malaria treatment I have will not help your child, and I cannot give you the medication. Your child is very ill and must be taked to a health facility right away. (SKIP TO 128)
123	ALREADY TAKING ACT MEDICATION REFERRAL STATEMENT	You have told me that (NAME OF CHILD) had already received ACT for malaria. Therefore, I cannot give you additional ACT. However, the test shows that he/she has malaria. If your child has a fever for two days after the last dose of ACT, you should take the child to the nearest health facility for further examination. (SKIP TO 130)
124	READ INFORMATION FOR MALARIA TREATMENT AND CONSENT STATEMENT TO PARENT/OTHER ADULT.	The malaria test shows that your child has malaria. We can give you free medicine. The medicine is called Artesunate and Amodiaquine (AS-AQ) Fixed Dose Combination. AS-AQ is very effective and in a few days it should get rid of the fever and other symptoms. You do not have to give the child the medicine. This is up to you. Please tell me whether you accept the medicine or not.

125	CIRCLE THE APPROPRIATE CODE AND SIGN YOUR NAME.	ACCEPTED MEDICINE . 1 ⌐ _____ (SIGN) ← REFUSED . . . . 2 ⌐ OTHER 6	ACCEPTED MEDICINE . 1 ⌐ _____ (SIGN) ← REFUSED . . . . 2 ⌐ OTHER 6	ACCEPTED MEDICINE . 1 ⌐ _____ (SIGN) ← REFUSED . . . . 2 ⌐ OTHER 6
126	CHECK 125: MEDICATION ACCEPTED	ACCEPTED MEDICINE . 1 REFUSED . . . . 2 ⌐ OTHER . . . . 6 ⌐ (SKIP TO 130) ←	ACCEPTED MEDICINE . 1 REFUSED . . . . 2 ⌐ OTHER . . . . 6 ⌐ (SKIP TO 130) ←	ACCEPTED MEDICINE . 1 REFUSED . . . . 2 ⌐ OTHER . . . . 6 ⌐ (SKIP TO 130) ←

127	READ INFORMATION FOR MALARIA TREATMENT AND CONSENT STATEMENT TO PARENT/OTHER ADULT.	TREATMENT FIRST LINE: AMODIAQUINE(AS)+ARTESUNATE(AQ) Fixed Dose Combination

Weight*	Age	(AS-AQ) tablet content	Dosage
≥4.5kg < 9 kg.	6-11 months	25 mg AS + 67.5 mg AQ	1 tablet once a day for 3 days
≥9kg <18 kg.	1 - 5 years	50 mg AS + 135 mg AQ	1 tablet once a day for 3 days

ALSO TELL THE PARENT/OTHER 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 two days, you should take him/her to a health professional for treatment right away.
(SKIP TO 130)

128	CHECK 113: HEMOGLOBIN RESULT	BELOW 8.0 G/DL, SEVERE ANEMIA . . . 1 8.0 G/DL OR ABOVE . . . 2 ⌐ NOT PRESENT . . . . 3 ⌐ REFUSED . . . . 4 ⌐ OTHER . . . . 6 ⌐ (SKIP TO 130) ←	BELOW 8.0 G/DL, SEVERE ANEMIA . . . 1 8.0 G/DL OR ABOVE . . . 2 ⌐ NOT PRESENT . . . . 3 ⌐ REFUSED . . . . 4 ⌐ OTHER . . . . 6 ⌐ (SKIP TO 130) ←	BELOW 8.0 G/DL, SEVERE ANEMIA . . . 1 8.0 G/DL OR ABOVE . . . 2 ⌐ NOT PRESENT . . . . 3 ⌐ REFUSED . . . . 4 ⌐ OTHER . . . . 6 ⌐ (SKIP TO 130) ←
129	**SEVERE ANEMIA REFERRAL** RECORD THE RESULT OF THE ANEMIA TEST ON THE REFERRAL FORM.	The anemia test shows that (NAME OF CHILD) has severe anemia. Your child is very ill and must be taken to a health facility immediately.		
130	GO BACK TO 103 IN NEXT COLUMN OF THIS QUESTIONNAIRE OR IN THE FIRST COLUMN OF THE NEXT PAGE; IF NO MORE CHILDREN, END INTERVIEW.			

101	CHECK COLUMN 9 IN HOUSEHOLD QUESTIONNAIRE. RECORD THE LINE NUMBER AND NAME FOR ALL ELIGIBLE CHILDREN 0-5 YEARS IN QUESTION 102; IF MORE THAN SIX CHILDREN, USE ADDITIONAL QUESTIONNAIRE(S).			
		CHILD 4	CHILD 5	CHILD 6
102	CHECK HOUSEHOLD QUESTIONNAIRE: LINE NUMBER FROM COLUMN 9. NAME FROM COLUMN 2.	LINE NUMBER . . . . ☐☐ NAME _____	LINE NUMBER . . . . ☐☐ NAME _____	LINE NUMBER . . . . ☐☐ NAME _____

103	IF MOTHER INTERVIEWED: COPY CHILD'S DATE OF BIRTH (DAY, MONTH, AND YEAR) FROM BIRTH HISTORY. IF MOTHER NOT INTERVIEWED ASK: What is (NAME)'s date of birth?	DAY . . . . ☐☐ MONTH . . . . ☐☐ YEAR . . . ☐☐☐☐	DAY . . . . ☐☐ MONTH . . . . ☐☐ YEAR . . . ☐☐☐☐	DAY . . . . ☐☐ MONTH . . . . ☐☐ YEAR . . . ☐☐☐☐
104	CHECK 103: CHILD BORN IN 2011-2016?	YES . . . . 1 NO . . . . 2⌐ (SKIP TO 130) ←	YES . . . . 1 NO . . . . 2⌐ (SKIP TO 130) ←	YES . . . . 1 NO . . . . 2⌐ (SKIP TO 130) ←
105	CHECK 103: CHILD AGE 0-5 MONTHS, I.E., WAS CHILD BORN IN MONTH OF INTERVIEW OR 5 PREVIOUS MONTHS?	0-5 MONTHS . . . . 1⌐ (SKIP TO 130) ← OLDER 2	0-5 MONTHS . . . . 1⌐ (SKIP TO 130) ← OLDER 2	0-5 MONTHS . . . . 1⌐ (SKIP TO 130) ← OLDER 2
106	CHECK HOUSEHOLD QUESTIONNAIRE: LINE NUMBER OF PARENT/OTHER ADULT RESPONSIBLE FOR THE CHILD FROM COLUMN 1 AND NAME FROM COLUMN 2.	LINE NUMBER . . . . ☐☐ (RECORD '00' IF NOT LISTED) NAME _____	LINE NUMBER . . . . ☐☐ (RECORD '00' IF NOT LISTED) NAME _____	LINE NUMBER . . . . ☐☐ (RECORD '00' IF NOT LISTED) NAME _____
107	ASK CONSENT FOR ANEMIA TEST FROM PARENT/OTHER ADULT.	As part of this survey, we are asking children all over the country to take an anemia test. Anemia is a serious health problem that usually results from poor nutrition, infection, or chronic disease. This survey will assist the government to develop programs to prevent and treat anemia. We ask that all children born in 2011 or later take part in anemia testing in this survey and give a few drops of blood from a finger or heel. The equipment used to take the blood is clean and completely safe. It has never been used before and will be thrown away after each test. The blood will be tested for anemia immediately, and the result will be told to you right away. The result will be kept strictly confidential and will not be shared with anyone other than members of our survey team. Do you have any questions? You can say yes or no. It is up to you to decide. Will you allow (NAME OF CHILD) to participate in the anemia test?		
108	CIRCLE THE CODE AND SIGN YOUR NAME.	GRANTED . . . . 1⌐ _____ (SIGN) ← REFUSED . . . . 2⌐ NOT PRESENT/OTHER . 3	GRANTED . . . . 1⌐ _____ (SIGN) ← REFUSED . . . . 2⌐ NOT PRESENT/OTHER . 3	GRANTED . . . . 1⌐ _____ (SIGN) ← REFUSED . . . . 2⌐ NOT PRESENT/OTHER . 3

		CHILD 4	CHILD 5	CHILD 6
	CHECK HOUSEHOLD QUESTIONNAIRE: LINE NUMBER FROM COLUMN 9. NAME FROM COLUMN 2.	LINE NUMBER . . . . ☐☐ NAME _____	LINE NUMBER . . . . ☐☐ NAME _____	LINE NUMBER . . . . ☐☐ NAME _____
109	ASK CONSENT FOR MALARIA TEST FROM PARENT/OTHER ADULT.	As part of this survey, we are asking children all over the country to take a test to see if they have malaria. Malaria is a serious illness caused by a parasite transmitted by a mosquito bite. This survey will assist the government to develop programs to prevent malaria. ⟨⟩		
		We ask that all children born in 2011 or later take part in malaria testing in this survey and give a few drops of blood from a finger or heel. One blood drop will be tested for malaria immediately, and the result will be told to you right away. All results will be kept strictly confidential and will not be shared with anyone other than members of our survey team.		
		Do you have any questions? You can say yes or no. It is up to you to decide. Will you allow (NAME OF CHILD) to participate in the malaria test?		
110	CIRCLE THE CODE, SIGN YOUR NAME, AND ENTER YOUR BIOMARKER WORKER NUMBER.	GRANTED . . . . 1 REFUSED . . . . 2 (SIGN AND ENTER YOUR BIOMARKER WORKER NUMBER) ☐☐☐☐ NOT PRESENT/OTHER . 3	GRANTED . . . . 1 REFUSED . . . . 2 (SIGN AND ENTER YOUR BIOMARKER WORKER NUMBER) ☐☐☐☐ NOT PRESENT/OTHER . 3	GRANTED . . . . 1 REFUSED . . . . 2 (SIGN AND ENTER YOUR BIOMARKER WORKER NUMBER) ☐☐☐☐ NOT PRESENT/OTHER . 3
111	PREPARE EQUIPMENT AND SUPPLIES ONLY FOR THE TEST(S) FOR WHICH CONSENT HAS BEEN OBTAINED AND PROCEED WITH THE TEST(S).			
113	RECORD HEMOGLOBIN LEVEL HERE AND IN THE ANEMIA AND MALARIA PAMPHLET.	G/DL . . . . . ☐☐.☐ NOT PRESENT . . . . . 994 REFUSED . . . . .995 OTHER 996	G/DL . . . . . ☐☐.☐ NOT PRESENT . . . . . 994 REFUSED . . . . .995 OTHER 996	G/DL . . . . . ☐☐.☐ NOT PRESENT . . . . . 994 REFUSED . . . . .995 OTHER 996
114	CIRCLE THE CODE FOR THE MALARIA RDT.	TESTED . . . . 1 NOT PRESENT . . . . 2 REFUSED . . . . 3 OTHER . . . . 6 (SKIP TO 116)	TESTED . . . . 1 NOT PRESENT . . . . 2 REFUSED . . . . 3 OTHER . . . . 6 (SKIP TO 116)	TESTED . . . . 1 NOT PRESENT . . . . 2 REFUSED . . . . 3 OTHER . . . . 6 (SKIP TO 116)
115	RECORD THE RESULT OF THE MALARIA RDT HERE AND IN THE ANEMIA AND MALARIA PAMPHLET.	POSITIVE . . . . 1 (SKIP TO 118) NEGATIVE . . . . 2 OTHER 6	POSITIVE . . . . 1 (SKIP TO 118) NEGATIVE . . . . 2 OTHER 6	POSITIVE . . . . 1 (SKIP TO 118) NEGATIVE . . . . 2 OTHER 6

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

		CHILD 4	CHILD 5	CHILD 6
	CHECK HOUSEHOLD QUESTIONNAIRE: LINE NUMBER FROM COLUMN 9. NAME FROM COLUMN 2.	LINE NUMBER .... ☐☐ NAME _____	LINE NUMBER .... ☐☐ NAME _____	LINE NUMBER .... ☐☐ NAME _____
122	**SEVERE MALARIA REFERRAL** RECORD THE RESULT OF THE MALARIA RDT ON THE REFERRAL FORM.	The malaria test shows that (NAME OF CHILD) has malaria. Your child also has symptoms of severe malaria. The malaria treatment I have will not help your child, and I cannot give you the medication. Your child is very ill and must be taked to a health facility right away. (SKIP TO 128)		
123	ALREADY TAKING ACT MEDICATION REFERRAL STATEMENT	You have told me that (NAME OF CHILD) had already received ACT for malaria. Therefore, I cannot give you additional ACT. However, the test shows that he/she has malaria. If your child has a fever for two days after the last dose of ACT, you should take the child to the nearest health facility for further examination. (SKIP TO 130)		
124	READ INFORMATION FOR MALARIA TREATMENT AND CONSENT STATEMENT TO PARENT/OTHER	The malaria test shows that your child has malaria. We can give you free medicine. The medicine is called Artesunate and Amodiaquine (AS-AQ) Fixed Dose Combination. AS-AQ is very effective and in a few days it should get rid of the fever and other symptoms. You do not have to give the child the medicine. This is up to you. Please tell me whether you accept the medicine or not.		
125	CIRCLE THE APPROPRIATE CODE AND SIGN YOUR NAME.	ACCEPTED MEDICINE . 1 ⌐ _____ (SIGN) ← REFUSED .... 2 ⌐ OTHER 6	ACCEPTED MEDICINE . 1 ⌐ _____ (SIGN) ← REFUSED .... 2 ⌐ OTHER 6	ACCEPTED MEDICINE . 1 ⌐ _____ (SIGN) ← REFUSED .... 2 ⌐ OTHER 6
126	CHECK 125: MEDICATION ACCEPTED	ACCEPTED MEDICINE . 1 REFUSED .... 2 ⌐ OTHER .... 6 ⌐ (SKIP TO 130) ←	ACCEPTED MEDICINE . 1 REFUSED .... 2 ⌐ OTHER .... 6 ⌐ (SKIP TO 130) ←	ACCEPTED MEDICINE . 1 REFUSED .... 2 ⌐ OTHER .... 6 ⌐ (SKIP TO 130) ←
127	READ INFORMATION FOR MALARIA TREATMENT AND CONSENT STATEMENT TO PARENT/OTHER ADULT.	**TREATMENT FIRST LINE: AMODIAQUINE(AS)+ARTESUNATE(AQ) Fixed Dose Combination** (see sub-table below)		

TREATMENT FIRST LINE: AMODIAQUINE(AS)+ARTESUNATE(AQ) Fixed Dose Combination

Weight*	Age	(AS)+(AQ) tablet content	Dosage
≥4.5kg < 9 kg.	6-11 months	25 mg AS + 67.5 mg AQ	1 tablet once a day for 3 days
≥9kg <18 kg.	1 - 5 years	50 mg AS + 135 mg AQ	1 tablet once a day for 3 days

ALSO TELL THE PARENT/OTHER 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 two days, you should take him/her to a health professional for treatment right away.
(SKIP TO 130)

		CHILD 4	CHILD 5	CHILD 6
128	CHECK 113: HEMOGLOBIN RESULT	BELOW 8.0 G/DL, SEVERE ANEMIA ... 1 8.0 G/DL OR ABOVE ... 2 ⌐ NOT PRESENT .... 3 ⌐ REFUSED .... 4 ⌐ OTHER .... 6 ⌐ (SKIP TO 130) ←	BELOW 8.0 G/DL, SEVERE ANEMIA ... 1 8.0 G/DL OR ABOVE ... 2 ⌐ NOT PRESENT .... 3 ⌐ REFUSED .... 4 ⌐ OTHER .... 6 ⌐ (SKIP TO 130) ←	BELOW 8.0 G/DL, SEVERE ANEMIA ... 1 8.0 G/DL OR ABOVE ... 2 ⌐ NOT PRESENT .... 3 ⌐ REFUSED .... 4 ⌐ OTHER .... 6 ⌐ (SKIP TO 130) ←
129	**SEVERE ANEMIA REFERRAL** RECORD THE RESULT OF THE ANEMIA TEST ON THE REFERRAL FORM.	The anemia test shows that (NAME OF CHILD) has severe anemia. Your child is very ill and must be taken to a health facility immediately.		
130	GO BACK TO 103 IN NEXT COLUMN OF THIS QUESTIONNAIRE OR IN THE FIRST COLUMN OF THE NEXT PAGE; IF NO MORE CHILDREN, END INTERVIEW.			

TO BE FILLED IN AFTER COMPLETING BIOMARKERS

BIOMARKER QUESTIONNAIRE

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SUPERVISOR'S OBSERVATIONS

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EDITOR'S OBSERVATIONS

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2016 LIBERIA MALARIA INDICATOR SURVEY
FIELDWORKER QUESTIONNAIRE
NATIONAL MALARIA CONTROL PROGRAM-MINISTRY OF HEALTH AND SOCIAL WELFARE
LIBERIA INSTITUTE OF STATISTICS AND GEO-INFORMATION SERVICES

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

INSTRUCTIONS

We are collecting information on the Libria MIS field staff. Please fill in the information below. The information will be part of the survey data files. Your name will not be in the data files; your information will remain anonymous. If there is any question you do not want to answer you may skip it and go to the next question.

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
102	What county do you live in?	BOMI . . . . 01 BONG . . . . 02 GBARPOLU . . . . 03 GRAND BASSA . . . . 04 GRAND CAPE MOUNT . . . . 05 GRAND GEDEH . . . . 06 GRAND KRU . . . . 07 LOFA . . . . 08 MARGIBI . . . . 09 MARYLAND . . . . 10 MONTSERRADO . . . . 11 NIMBA . . . . 12 RIVER CESS . . . . 13 RIVER GEE . . . . 14 SINOE 15	
103	Do you live in a city, town, or rural area?	CITY . . . . 1 TOWN . . . . 2 RURAL 3	
104	How old are you? RECORD AGE IN COMPLETED YEARS.	AGE . . . . ☐☐	
105	Are you male or female?	MALE . . . . 1 FEMALE 2	
106	What is your current marital status?	CURRENTLY MARRIED . . . . 1 LIVING WITH A MAN/WOMAN . . . . 2 WIDOWED . . . . 3 DIVORCED . . . . 4 SEPARATED . . . . 5 NEVER MARRIED OR LIVED WITH A MAN/WOMAN 6	
107	How many living children do you have? INCLUDE ONLY CHILDREN WHO ARE YOUR BIOLOGICAL CHILDREN.	LIVING CHILDREN . . . . ☐☐	
108	Have you ever had a child who died?	YES . . . . 1 NO 2	
109	What is the highest level of school you attended: elementary, junior high, senior high, or higher?	ELEMENTARY SCHOOL . . . . 1 JUNIOR HIGH SCHOOL . . . . 2 SENIOR HIGH SCHOOL . . . . 3 HIGHER 4	
110	What is the highest GRADE you completed at that level? IF COMPLETED LESS THAN ONE YEAR AT THAT LEVEL, RECORD '00'.	GRADE . . . . ☐☐	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
111	What is your religion?	CHRISTIAN .... 01 MUSLIM .... 02 TRADITIONAL RELIGION .... 03 NO RELIGION .... 95 OTHER _____ 96 (SPECIFY)	
113	What languages can you speak? RECORD ALL LANGUAGES YOU CAN SPEAK.	BASSA .... A GBANDI .... B BELLE .... C DEY .... D GIO .... E GOLA .... F GREBO .... G KISSI .... H KPELLE .... I KRAHN .... J KRU .... K LORMA .... L MANDINGO .... M MANO .... N MENDE .... O SARPO .... P VAI .... Q NONE / ONLY ENGLISH .... R OTHER _____ X (SPECIFY)	
114	What is your mother tongue/native language (language spoken at home growing up)?	BASSA .... 01 GBANDI .... 02 BELLE .... 03 DEY .... 04 GIO .... 05 GOLA .... 06 GREBO .... 07 KISSI .... 08 KPELLE .... 09 KRAHN .... 10 KRU .... 11 LORMA .... 12 MANDINGO .... 13 MANO .... 14 MENDE .... 15 SARPO .... 16 VAI .... 17 NONE / ONLY ENGLISH .... 18 OTHER _____ 96 (SPECIFY)	
115	Have you ever worked on a MIS survey prior to this one?	YES .... 1 NO 2	
116	Have you ever worked on any other survey prior to this one (not an MIS)?	YES .... 1 NO 2	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
117	Were you already working for NMCP/MOH or LISGIS at the time you were employed to work on this MIS?	YES, NMCP . . . . 1 YES, MOH (not NMCP) . . . . 2 YES, LISGIS . . . . 3 NO 4	→ 119
118	Are you a permanent or temporary employee of NMCP/MOH or LISGIS?	PERMANENT . . . . 1 TEMPORARY 2	
119	If you have comments, please write them here.		