Liberia Demographic and Health Survey 2013

Preliminary Report

Liberia Institute of Statistics and Geo-Information Services (LISGIS)
Monrovia, Liberia

Ministry of Health and Social Welfare
Monrovia, Liberia

National AIDS Control Program
Monrovia, Liberia

MEASURE DHS, ICF International
Calverton, Maryland, USA

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November 2013

The 2013 Liberia Demographic and Health Survey (LDHS) was implemented by the Liberia Institute of Statistics and Geo-Information Services (LISGIS) from 10 March to 19 July, 2013. The Ministry of Health and Social Welfare authorized the survey. Funding for the survey was provided by the United States Agency for International Development (USAID), the Global Fund, the United Nations Children's Fund (UNICEF), the United Nations Population Fund (UNFPA), and the Government of Liberia. ICF International supported the project through the MEASURE DHS project, a USAID-funded program providing support, technical assistance, and funding for population and health surveys in countries worldwide.

Additional information about the survey may be obtained from from Liberia Institute of Statistics and Geo-Information Services (LISGIS), Statistics House, Capitol Hill, P.O. Box 629, Monrovia, Liberia (Telephone +231-886-518885/886-583839; Web: www.lisgis.net or www.tlcafrica.com/lisgis/lisgis.htm).

Information about the DHS programme may be obtained from MEASURE DHS, ICF International, 11785 Beltsville Drive, Suite 300, Calverton, MD 20705, USA; Telephone: 301-572-0200, Fax: 301-572-0999, E-mail: reports@measuredhs.com, Internet: http://www.measuredhs.com.

CONTENTS

TABLES AND FIGURES

Page

I. INTRODUCTION

The 2013 Liberia Demographic and Health Survey (2013 LDHS) was implemented by the Liberia Institute of Statistics and Geo-Information Services (LISGIS). Data collection took place from 10 March to 19 July 2013. The survey was conducted under the aegis of the Ministry of Health and Social Welfare (MOHSW). ICF International provided technical assistance through the USAID-funded MEASURE DHS project, which provides support and technical assistance for the implementation of population and health surveys in countries worldwide. Other agencies and organizations that facilitated the successful implementation of the survey through technical or financial support were the National AIDS Control Program (NACP), the National Malaria Control Program (NMCP), the Global Fund, the United Nations Children's Fund (UNICEF), the United Nations Population Fund (UNFPA), the United Nations Development Fund (UNDP), the World Health Organization (WHO), the Montserrado Regional Blood Bank, the National Reference Laboratory, and the Government of Liberia.

This preliminary report presents a first look at selected findings of the 2013 LDHS. A comprehensive analysis of the data will be presented in a final report to be published in 2014. While considered provisional, the results presented here are not expected to differ significantly from those in the final report.

A. Survey Objectives

The primary objective of the 2013 LDHS project is to provide up-to-date estimates of basic demographic and health indicators. Specifically, the LDHS collected information on fertility levels, marriage, sexual activity, fertility preferences, awareness and use of family planning methods, breastfeeding practices, nutrition, childhood and maternal mortality, maternal and child health, and awareness and behavior regarding HIV/AIDS and other sexually transmitted infections (STIs). In addition, the 2013 LDHS provides estimates on HIV prevalence among adult Liberians. The 2013 LDHS is a follow-up to the 2007 LDHS, the 1999-2000 LDHS, and the 1986 LDHS. A subset of the indicators presented in the 2013 LDHS overlap with indicators produced as part of the 2009 and 2011 Liberia Malaria Indicator Surveys (LMIS).

II. SURVEY IMPLEMENTATION

A. Sample Design

The sampling frame used for the 2013 LDHS was developed by the Liberia Institute of Statistics and Geo-Information Services (LISGIS) after the 2008 National Population and Housing Census (NPHC). The sampling frame is similar to that used for the 2009 and 2011 Liberia Malaria Indicator Surveys (LMIS), except that the classification of localities as urban or rural was updated through the application of standardized definitions. The sampling frame excluded nomadic and institutional populations such as persons in hotels, barracks, and prisons. Notably, the sampling frame for the 2013 LDHS differs markedly from that used for the 2007 LDHS, which was based on the 1984 National Population and Housing Census.

The 2013 LDHS followed a two-stage sample design and was designed to allow estimates of key indicators for five regional groups[1], Greater Monrovia, and each of Liberia's 15 counties. The first stage involved selecting sample points (clusters) consisting of enumeration areas delineated for the 2008 NPHC. A total of 322 clusters were selected. To allow for estimates in Greater Monrovia and Montserrado County as a whole, 44 sample points were selected in Montserrado County; 16-26 sample points were selected in each of the other 14 counties.

The second stage of selection involved the systemic sampling of households. A household listing operation was undertaken in all the selected areas prior to the fieldwork. From these lists, households to be included in the survey were selected. Approximately, 30 households were selected from each sample point for a total sample size of 9,677 households. Because of the approximately equal sample sizes in each region, the sample is not self-weighting at the national level and weighting factors have been added to the data file so that the results will be proportional at the national level.

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. In half of the households, all men 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. In the subsample of households selected for male survey, blood samples were collected for laboratory testing of HIV from eligible women and men who consented; in this same subsample of households, height and weight information was collected from eligible women, men, and children 0-59 months.

[1]The regional groups are as follows: North Western (Bomi, Grand Cape Mount, and Gbarpolu), South Central (Montserrado, Margibi, and Grand Bassa), South Eastern A (River Cess, Sinoe, and Grand Gedeh), South Eastern B (River Gee, Grand Kru, and Maryland), and North Central (Bong, Nimba, and Lofa).

B. Questionnaires

Three questionnaires were used for the 2013 LDHS: the Household Questionnaire, Woman's Questionnaire, and Man's Questionnaire. These questionnaires are based on MEASURE DHS' standard Demographic and Health Survey questionnaires and were adapted to reflect the population and health issues relevant to Liberia. Input was solicited from various stakeholders representing government ministries and agencies, non-governmental organizations, and international donors.

Given that there are dozens of local languages in Liberia, most of which have no accepted written script and are not taught in the schools, and given that English is widely spoken, it was decided not to attempt to translate the questionnaires into vernaculars. However, many of the questions were 'broken down' into a simpler form of Liberian English that interviewers could use with respondents.

The Household Questionnaire was used to list all the usual members and visitors of selected households. Some basic demographic information was collected on the characteristics of each person listed including his or her age, sex, education, and relationship to the head of the household. For children under age 18, survival status of the parents was determined. The data on age and sex of household members obtained in the Household Questionnaire was used to identify women and men who were eligible for individual interview and HIV testing. The Household Questionnaire also collected information on characteristics of the household's dwelling unit, such as the source of water, type of toilet facilities, materials used for the floor of the house, ownership of various durable goods, ownership and use of mosquito nets, and information on household out-of-pocket health-related expenditures. The Household Questionnaire was also used to record height and weight measurements for children 0-59 months and eligible adults as well as to record whether or not eligible adults consented to HIV testing.

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

- Background characteristics (age, education, media exposure, etc.)
- Birth history and child mortality
- Knowledge and use of family planning methods
- Fertility preferences
- Prenatal, delivery, and postnatal care
- Breastfeeding and infant feeding practices
- Vaccinations and childhood illnesses
- Marriage and sexual activity
- Women's work and husband's background characteristics
- Malaria prevention and treatment
- Knowledge, awareness and behavior regarding AIDS and other sexually transmitted infections (STIs)
- Adult mortality, including maternal mortality

The Man's Questionnaire was administered to all men age 15-49 in the subsample of households selected for male survey in the 2013 LDHS sample. The Man's Questionnaire collected much of the same information found in the Woman's Questionnaire but was shorter because it did not contain a detailed reproductive history or questions on maternal and child health.

C. HIV Testing

The 2013 LDHS incorporated HIV testing, which required taking finger prick blood from adults age 15-49. Blood specimens were collected in the field and tested in the laboratory. Verbal consent for blood collection for HIV testing for adults was requested from each respondent following completion of the individual interview. The protocol for HIV testing was approved by the Liberia Institute for Biomedical Research, the Institutional Review Board of ICF International, and the Centers for Disease Control in Atlanta.

Blood specimens were collected by LDHS interviewers for laboratory testing of HIV from all women and men age 15-49 who consented to the test. The protocol for the blood specimen collection and analysis was based on the anonymous linked protocol developed by MEASURE DHS. This protocol allows for the merging of the HIV test results with the socio-demographic data collected in the individual questionnaires after all information that could potentially identify an individual is destroyed.

Interviewers explained the procedure, the confidentiality of the data, and the fact that the test results would not be made available to the respondent. If a respondent consented to the HIV testing, three to five blood spots from a finger prick were collected on a filter paper card to which a barcode label unique to the respondent was affixed. Respondents were asked whether they consented to having the laboratory store their blood sample for future unspecified testing. If the respondent did not consent to additional testing using their sample, it was indicated on the Household Questionnaire that the respondent refused additional tests using their specimen, and the words 'no additional testing' were written on the filter paper card. Each respondent, whether the individual consented to HIV testing or not, was given an informational brochure on HIV/AIDS and a list of nearby sites providing voluntary counselling and testing (VCT) services.

Each blood sample was given a barcode label, with a duplicate label attached to the Household Questionnaire. A third copy of the same barcode was affixed to the Dried Blood Spot (DBS) Transmittal Form to track the blood samples from the field to the laboratory. Blood samples were dried overnight and packaged for storage the following morning. Samples were periodically collected from the field, along with the completed questionnaires, and transported to LISGIS in Monrovia to be logged in and checked; blood samples were then transported to the Montserrado Regional Blood Bank in Monrovia.

At the Montserrado Regional Blood Bank, each blood sample was logged into the CSPro HIV Test Tracking System (CHTTS) database, given a laboratory number, and stored at -20˚C. Prior to the start of HIV testing, all samples were transferred to a -80˚C freezer at the National Reference Laboratory (NRL). The NRL is housed at the Liberia Institute for Biomedical Research (LIBR), and is where HIV testing is currently taking place. The HIV

testing protocol stipulates that testing of blood can only be conducted after the questionnaire data entry is completed, verified, and cleaned, and all unique identifiers are removed from the questionnaire file except the anonymous barcode number. As of this preliminary report, HIV testing had not been completed.

The testing algorithm calls for testing all samples on the first assay test, an ELISA, the Vironostika® HIV Ag/Ab (Biomérieux). A negative result is rendered negative. All positives are subjected to a second ELISA, the Enzygnost® HIV Integral II assay (Siemens). Positive samples on the second test are rendered positive. If the first and second tests are discordant, the two ELISAs are repeated. If the results remain discordant, a third confirmatory test, the Inno-Lia HIV I/II line immunoassay (Innogenetics), will be administered. The final result will be rendered positive if the line immunoassay confirms the result to be positive and rendered negative if the line immunoassay confirms it to be negative. If the line immunoassay results are indeterminate, the sample will be rendered indeterminate. The line immunoassay will also be used to determine the HIV type of all samples rendered positive.

Upon finalizing HIV testing, the HIV test results for the 2013 LDHS will be entered into a spreadsheet with a barcode as the unique identifier to the result. The barcode will be used to link the HIV test results with the data from the individual interviews. Data from the HIV results and linked demographic and health data will be published in the 2013 LDHS final report.

D. Pretest

Six women and nine men participated in a training to pretest the LDHS survey protocol over a three week period in August and September 2012. Most participants had worked in various LDHS survey activities previously including the 2007 LDHS or were employed by LISGIS. Ten days of classroom instruction were provided. Trainers were staff from LISGIS and MEASURE DHS. Additionally, pretest field practice took place over four days in both rural and urban locations. Following field practice, a debriefing session was held with the pretest field staff, and modifications to the questionnaires were made based on lessons drawn from the exercise.

E. Training of Field Staff

The field staff main training took place over four weeks (11 February to 9 March 2013). The training was conducted following MEASURE DHS training procedures, including class presentations, mock interviews, tests, and field practice. Out of a total of approximately 120 persons who were recruited and attended the main training, 65 women and 31 men were selected to carry out field work. Among this group, 16 persons were selected as team supervisors and 16 persons were selected as field editors; all others served as interviewers. Team supervisors and field editors were provided with additional training in methods of field editing, data quality control procedures, and fieldwork coordination.

F. Fieldwork

Data collection was carried out by 16 field teams, each consisting of one team supervisor, one field editor, three female interviewers, one male interviewer, and one driver. On each team, one of the female interviewers and the male interviewer were also tasked with biomarker collection (conducting height and weight measurements and blood collection for HIV testing from eligible respondents). Five senior staff members from LISGIS and a senior staff member from NACP coordinated and supervised the fieldwork activities. Data collection took place over a four-month period from 10 March to 19 July 2013.

G. Data Processing

All questionnaires for the LDHS were returned to the LISGIS central office in Monrovia for data processing, which consisted of office editing, coding of open-ended questions, data entry, and editing computer-identified errors. The data were processed by a team of 12 data entry clerks, two data editors, one data entry supervisor, and two administrators of questionnaires; the latter checked that the clusters were completed according to the sample selection and that all members of the household eligible for individual interview were identified. Secondary editing was led by an LDHS coordinator. Several LISGIS staff took on the responsibility of receiving the blood samples from the field and checking them before sending them to the Montserrado Regional Blood Bank for storage. Data entry and editing were accomplished using CSPro software. The process of office editing and data entry was initiated mid-April 2013 and completed in late-August 2013.

III. PRELIMINARY FINDINGS

A. Response Rates

Table 1 shows response rates for the 2013 LDHS. A total of 9,677 households were selected for the sample, of which 9,386 were occupied. Of the occupied households, 9,333 were successfully interviewed, yielding a response rate of 99 percent.

In the interviewed households, 9,462 eligible women were identified for individual interview; of these, complete interviews were conducted with 9,239 women, yielding a response rate of 98 percent. In the subsample of households selected for male survey, 4,318 eligible men were identified and 4,118 were successfully interviewed, yielding a response rate of 95 percent. The lower response rate for men was likely due to their more frequent and longer absences from the household.

Table 1 Results of the household and individual interviews

Number of households, number of interviews, and response rates, according to residence (unweighted), Liberia 2013

	Residence		
Result	Urban	Rural	Total
Household interviews			
Households selected	3,576	6,101	9,677
Households occupied	3,468	5,918	9,386
Households interviewed	3,450	5,883	9,333
Household response rate[1]	99.5	99.4	99.4
Interviews with women age 15-49			
Number of eligible women	3,808	5,654	9,462
Number of eligible women interviewed	3,723	5,516	9,239
Eligible women response rate[2]	97.8	97.6	97.6
Interviews with men age 15-49			
Number of eligible men	1,680	2,638	4,318
Number of eligible men interviewed	1,591	2,527	4,118
Eligible men response rate[2]	94.7	95.8	95.4

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

B. Characteristics of the Respondents

Table 2 shows the weighted and unweighted numbers and the weighted percent distributions of women and men age 15-49 interviewed in the 2013 LDHS, by background characteristics. More than half of respondents age 15-49 were under age 30, reflecting the young age structure of the population. Nearly one in three women has never married compared with 43 percent of men. Women are more often married or living together (i.e., in union) than men (58 percent and 54 percent, respectively). About 6 in 10 respondents live in the urban areas; over one-third of respondents reside in Greater Monrovia.

With respect to educational status, 33 percent of women and 13 percent of men reported that they had never attended school. Thirty-one percent of women and 29 percent of men have attended primary school without continuing to secondary education. Thirty-six percent of women and fifty-eight percent of men have attended secondary school or a higher level of education.

Table 2 Background characteristics of respondents

Percent distribution of women and men age 15-49 by selected background characteristics, Liberia 2013

Background characteristic	Women			Men		
	Weighted percent	Weighted number	Unweighted number	Weighted percent	Weighted number	Unweighted number
Age						
15-19	22.5	2,080	1,915	21.6	890	847
20-24	17.8	1,642	1,584	16.9	696	645
25-29	17.4	1,611	1,585	16.3	673	640
30-34	13.0	1,199	1,244	14.0	575	603
35-39	12.8	1,179	1,203	11.4	469	544
40-44	8.8	812	901	11.7	482	490
45-49	7.7	716	807	8.1	332	349
Religion						
Christian	86.0	7,945	7,851	82.3	3,387	3,359
Muslim	10.8	1,001	1,095	12.9	529	545
Traditional religion	0.5	42	36	1.3	54	71
No religion	2.5	227	238	3.2	130	127
Other/missing	0.3	23	18	0.4	16	15
Marital status						
Never married	31.0	2,867	2,405	42.5	1,749	1,591
Married	27.9	2,579	3,062	30.2	1,245	1,428
Living together	30.4	2,806	2,813	23.6	973	934
Divorced/separated	7.9	734	719	3.1	126	148
Widowed	2.7	253	240	0.6	25	17
Residence						
Urban	61.0	5,633	3,723	58.6	2,413	1,591
Greater Monrovia	36.4	3,361	1,154	34.8	1,433	463
Other Urban	24.6	2,272	2,569	23.8	980	1,128
Rural	39.0	3,606	5,516	41.4	1,705	2,527
Region						
North Western	9.1	837	1,553	8.9	367	667
South Central	52.5	4,854	2,759	52.2	2,149	1,193
South Eastern A	5.2	483	1,367	6.2	254	697
South Eastern B	6.2	577	1,432	7.0	288	663
North Central	26.9	2,488	2,128	25.7	1,060	898
County						
Bomi	2.6	244	456	2.4	97	163
Bong	9.7	894	630	9.5	389	271
Gbarpolu	2.0	182	482	2.3	94	240
Grand Bassa	4.7	434	505	4.9	204	227
Grand Cape Mount	4.5	412	615	4.3	176	264
Grand Gedeh	1.8	167	448	2.0	82	214
Grand Kru	2.3	217	450	2.7	110	227
Lofa	4.8	447	629	5.3	219	294
Margibi	8.1	744	720	8.8	364	338
Maryland	2.8	257	559	3.0	123	251
Montserrado	39.8	3,675	1,534	38.4	1,582	628
Nimba	12.4	1,147	869	11.0	451	333
River Cess	1.5	135	459	1.6	64	214
River Gee	1.1	103	423	1.3	55	185
Sinoe	2.0	182	460	2.6	108	269
Education						
No education	33.2	3,066	3,679	12.9	533	599
Primary	31.1	2,875	3,195	29.2	1,202	1,404
Secondary and higher	35.7	3,298	2,365	57.9	2,383	2,115
Total 15-49	100.0	9,239	9,239	100.0	4,118	4,118

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

C. Fertility

To generate data on fertility, all women who were interviewed were asked to report the total number of sons and daughters to whom they had ever given birth in their lifetime. To ensure all information was reported, women were asked separately about children still living at home, those living elsewhere, and those who had died. A complete birth history was then

obtained, including information on sex, date of birth, and survival status of each child; age at death for dead children was also recorded.

Table 3 shows age-specific fertility rates of women by five-year age groups for the three-year period preceding the survey. Age-specific and total fertility rates were calculated directly from the birth history data. The sum of age-specific fertility rates (known as the total fertility rate, or TFR) is a summary measure of the level of fertility. It can be interpreted as the number of children a woman would have by the end of her childbearing years if she were to pass through those years bearing children at the current observed age-specific rates. If fertility were to remain constant at current levels, a Liberian woman would bear an average of 4.7 children in her lifetime. This represents a decrease of 0.5 children in the 5 years since the 2007 LDHS, when the TFR was 5.2 births per woman. Fertility is significantly higher among rural women than among urban women; rural women will give birth to nearly two more children during their reproductive years than urban women (6.1 and 3.8, respectively).

Table 3 Current Fertility

Age-specific and total fertility rate, the general fertility rate, and the crude birth rate for the three years preceding the survey, by residence, Liberia 2013

	Residence				
	Urban				
Age group	Greater Monrovia	Other urban	Total urban	Rural	Total
15-19	92	164	121	206	149
20-24	150	244	188	285	222
25-29	135	213	164	253	200
30-34	131	156	140	230	177
35-39	104	116	109	165	133
40-44	20	53	36	66	50
45-49	9	13	11	17	14
TFR (15-49)	3.2	4.8	3.8	6.1	4.7
GFR	116	174	139	214	168
CBR	28.4	34.3	31.1	38.5	34.4

Notes: Age-specific fertility rates are per 1,000 women. Rates for age group 45-49 may be slightly biased due to truncation. Rates are for the period 1-36 months prior to interview.
TFR: Total fertility rate expressed per woman
GFR: General fertility rate expressed per 1,000 women age 15-44
CBR: Crude birth rate, expressed per 1,000 population

D. Fertility Preferences

Information on fertility preferences is used to assess the potential demand for family planning services for the purposes of spacing or limiting future childbearing. To elicit information on fertility preferences, several questions were asked of women (pregnant or not) on whether they want to have another child, and if so, how soon.

Table 4 shows that 21 percent of women want to have another child soon (within the next two years) and 39 percent want to have another child later (in two or more years). Thirty percent of women want no more children.

Fertility preference is closely related to the number of living children. Seven out of ten women with no living children (71 percent) want a child soon, compared with only 10 percent of women with six or more children. The more children a woman has, the higher the likelihood that she does not want another child.

Table 4 Fertility preferences by number of living children

Percent distribution of currently married women age 15-49 by desire for children, according to number of living children, Liberia 2013

	Number of living children[1]							
Desire for children	0	1	2	3	4	5	6+	Total
Have another soon[2]	70.7	30.5	24.2	18.7	14.4	9.3	10.0	20.5
Have another later[3]	18.1	57.0	54.5	49.0	32.4	23.9	13.6	39.2
Have another, undecided when	5.1	7.1	6.0	3.4	2.5	0.4	0.4	3.6
Undecided	0.6	3.1	3.4	5.1	4.6	4.5	4.0	4.0
Want no more	0.1	1.4	11.0	20.5	41.9	58.1	66.5	29.6
Sterilized[4]	0.0	0.0	0.0	0.0	1.1	0.0	0.6	0.3
Declared infecund	5.4	0.9	0.7	3.3	3.0	3.8	4.5	2.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of women	207	836	1,100	969	787	634	851	5,386

Note: Total includes 7 cases with information missing on the desire for children.
[1] The number of living children includes current pregnancy.
[2] Wants next birth within 2 years.
[3] Wants to delay next birth for 2 or more years.
[4] Includes both female and male sterilization.

E. Family Planning

Family planning refers to a conscious effort by a couple to limit or space the number of children they want to have through the use of contraceptive methods. Contraceptive methods are classified as modern or traditional methods. Modern methods include female sterilization, male sterilization, the pill, the intrauterine device (IUD), injectables, implants, male condom, female condom, and lactational amenorrhoea method (LAM). Methods such as rhythm, withdrawal, and folk methods are grouped as traditional.

Table 5 shows the percent distribution of currently married women by the contraceptive method currently being used. Overall, 20 percent of currently married women are currently using a method of family planning, and nearly all use is a modern method; only 1 percent of currently married women are using a traditional method. The most popular methods are the injectables (used by 11 percent of currently married women) and the pill (used by 5 percent of currently married women). Less than 1 percent of currently married women have been sterilized, 2 percent reported using implants and less than 1 percent are using male condoms. The contraceptive prevalence rate (CPR) increases with age, reaching a peak at age 25-29 years (25 percent), and then declines to 8 percent among women 45-49 years.

There are large differences in levels of contraceptive use by county. While use of modern methods is 20 percent or greater in Gbarpolu, Maryland, Montserrado, River Cess, River Gee, and Sinoe, the corresponding rate in Grand Bassa, Lofa, and Nimba is below 10 percent. Contraceptive use increases with educational attainment and is higher among women with living children than those without living children. Six percent of women who have no children are currently using family planning, compared with 21 percent of women with one or more living children.

The CPR in Liberia observed in the 2013 LDHS is greater than that reported in the 2007 LDHS (20 percent compared to 13 percent).

Table 5 Current use of contraception by background characteristics

Percent distribution of currently married women age 15-49 by contraceptive method currently used, according to background characteristics, Liberia 2013

Background characteristic	Any method	Any modern method	Modern method						Any tradi-tional method	Traditional method			Not currently using	Total	Number of women
			Female sterili-zation	Pill	Inject-ables	Implants	Male condom	Other		Rhythm	With-drawal	Other			
Age															
15-19	13.2	13.2	0.0	2.0	10.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	86.8	100.0	299
20-24	23.1	22.5	0.0	5.9	14.6	1.8	0.2	0.0	0.6	0.6	0.0	0.0	76.9	100.0	862
25-29	24.9	22.9	0.1	4.3	14.5	3.1	0.9	0.1	2.0	1.8	0.2	0.0	75.1	100.0	1,168
30-34	22.8	22.5	0.0	6.8	12.6	2.2	0.8	0.1	0.3	0.3	0.0	0.0	77.2	100.0	957
35-39	21.2	20.3	0.4	6.5	10.1	2.6	0.2	0.5	0.9	0.9	0.0	0.0	78.8	100.0	924
40-44	16.8	14.7	0.6	4.9	7.8	1.2	0.1	0.1	2.1	2.0	0.0	0.1	83.2	100.0	619
45-49	7.6	6.2	1.2	1.2	2.4	0.8	0.3	0.2	1.5	1.5	0.0	0.0	92.4	100.0	557
Residence															
Urban	23.2	21.6	0.2	4.9	12.8	2.8	0.6	0.2	1.6	1.6	0.0	0.0	76.8	100.0	2,898
Greater Monrovia	27.5	25.1	0.2	5.1	15.4	3.4	0.8	0.3	2.4	2.4	0.0	0.0	72.5	100.0	1,614
Other Urban	17.7	17.1	0.3	4.7	9.5	2.1	0.4	0.1	0.7	0.7	0.0	0.0	82.3	100.0	1,283
Rural	16.8	16.3	0.3	5.1	9.4	1.1	0.2	0.1	0.5	0.4	0.1	0.1	83.2	100.0	2,488
Region															
North Western	20.6	20.0	0.0	6.2	12.7	0.8	0.1	0.2	0.6	0.3	0.1	0.2	79.4	100.0	580
South Central	24.2	22.4	0.2	4.7	13.7	2.8	0.6	0.3	1.8	1.8	0.0	0.0	75.8	100.0	2,481
South Eastern A	20.5	20.5	0.2	5.9	12.7	1.4	0.2	0.1	0.0	0.0	0.0	0.0	79.5	100.0	348
South Eastern B	22.4	22.3	0.0	7.1	12.9	1.8	0.5	0.1	0.1	0.1	0.0	0.0	77.6	100.0	358
North Central	13.6	12.8	0.5	4.4	6.1	1.5	0.3	0.0	0.8	0.6	0.1	0.0	86.4	100.0	1,619
County															
Bomi	19.1	18.0	0.0	2.7	13.8	1.3	0.2	0.0	1.1	1.1	0.0	0.0	80.9	100.0	145
Bong	19.9	18.3	1.1	7.0	7.9	1.9	0.4	0.0	1.6	1.3	0.3	0.0	80.1	100.0	635
Gbarpolu	25.2	23.8	0.0	8.3	13.4	1.2	0.0	0.8	1.4	0.0	0.3	1.1	74.8	100.0	123
Grand Bassa	8.4	8.2	0.0	1.3	6.5	0.5	0.0	0.0	0.2	0.2	0.0	0.0	91.6	100.0	294
Grand Cape Mount	19.4	19.4	0.0	7.0	11.9	0.5	0.0	0.0	0.0	0.0	0.0	0.0	80.6	100.0	312
Grand Gedeh	17.9	17.9	0.2	4.5	10.4	2.0	0.6	0.3	0.0	0.0	0.0	0.0	82.1	100.0	113
Grand Kru	17.6	17.6	0.0	3.8	12.2	1.6	0.0	0.0	0.0	0.0	0.0	0.0	82.4	100.0	135
Lofa	10.0	9.4	0.0	5.4	3.5	0.6	0.0	0.0	0.5	0.5	0.0	0.0	90.0	100.0	291
Margibi	19.5	18.8	0.4	5.5	11.0	1.1	0.5	0.3	0.6	0.6	0.0	0.0	80.5	100.0	407
Maryland	22.7	22.7	0.0	9.6	10.8	1.2	1.2	0.0	0.0	0.0	0.0	0.0	77.3	100.0	148
Montserrado	27.8	25.5	0.2	5.1	15.6	3.6	0.8	0.3	2.3	2.3	0.0	0.0	72.2	100.0	1,780
Nimba	9.3	9.2	0.2	1.7	5.5	1.5	0.3	0.0	0.1	0.1	0.0	0.0	90.7	100.0	694
River Cess	20.0	20.0	0.4	6.3	13.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	80.0	100.0	100
River Gee	30.6	29.9	0.0	8.0	18.4	3.2	0.0	0.3	0.7	0.7	0.0	0.0	69.4	100.0	74
Sinoe	23.0	23.0	0.0	6.8	14.4	1.8	0.0	0.0	0.0	0.0	0.0	0.0	77.0	100.0	135
Education															
No education	15.3	14.7	0.1	4.7	8.6	0.9	0.1	0.3	0.6	0.5	0.1	0.0	84.7	100.0	2,417
Primary	19.7	18.1	0.5	6.0	9.8	1.5	0.2	0.1	1.6	1.5	0.0	0.0	80.3	100.0	1,446
Secondary and higher	28.6	27.1	0.3	4.5	16.7	4.4	1.1	0.0	1.6	1.6	0.0	0.0	71.4	100.0	1,523
Number of living Children															
0	6.4	5.5	0.0	1.4	4.0	0.1	0.0	0.0	0.9	0.9	0.0	0.0	93.6	100.0	300
1-2	21.0	19.8	0.0	4.6	12.5	2.0	0.7	0.0	1.2	1.1	0.0	0.0	79.0	100.0	1,973
3-4	21.3	20.2	0.6	4.9	11.5	2.7	0.4	0.1	1.1	0.9	0.1	0.0	78.7	100.0	1,688
5+	20.9	19.7	0.4	6.4	10.5	1.7	0.2	0.5	1.2	1.1	0.0	0.0	79.1	100.0	1,424
Total	20.2	19.1	0.3	5.0	11.2	2.1	0.4	0.2	1.1	1.1	0.0	0.0	79.8	100.0	5,386

Note: If more than one method is used, only the most effective method is considered in this tabulation. Users of IUD, cycle beads/standard days, and lactational amenorrhoea method (LAM) are included in any method, any modern method, and other modern categories.

F. Early Childhood Mortality

Infant and child mortality rates are basic indicators of a country's socioeconomic situation and quality of life (UNDP, 2007). Estimates of childhood mortality are based on information collected in the birth history section of the questionnaire administered to individual women. The section begins with questions about the aggregate childbearing experience of respondents (i.e., the number of sons and daughters who live with the mother, the number who live elsewhere, and the number who have died). Table 6 presents estimates for three successive five-year periods prior to the 2013 LDHS. The rates are estimated directly from the information in the birth history on a child's birth date, survivorship status,

and age at death for children who died. This information is used to directly estimate the following five mortality rates:

Neonatal mortality:	the probability of dying within the first month of life
Postneonatal mortality:	the difference between infant and neonatal mortality
Infant mortality:	the probability of dying before the first birthday
Child mortality:	the probability of dying between the first and fifth birthday
Under-5 mortality:	the probability of dying between birth and the fifth birthday

All rates are expressed per 1,000 live births, except for child mortality, which is expressed per 1,000 children surviving to 12 months of age.

As shown in Table 6, for the five years immediately preceding the survey (2008–2013), the infant mortality rate was 54 deaths per 1,000 live births. The estimate of child mortality is 42 deaths per 1,000 children surviving to 12 months of age, while the overall under-5 mortality rate for the same period is 94 deaths per 1,000 live births. Fifty-seven percent of all deaths to children under five in Liberia take place before a child's first birthday, with 28 percent occurring during the first month of life. The 2013 LDHS documents a pattern of decreasing under-5 mortality during the fifteen years prior to the survey.

Table 6 Early childhood mortality rates

Neonatal, postneonatal, infant, child and under-5 mortality rates for five year periods preceding the survey, Liberia 2013

Years preceding the survey	Neonatal mortality (NN)	Post-neonatal mortality (PNN)	Infant mortality ($_1q_0$)	Child mortality ($_4q_1$)	Under-5 mortality ($_5q_0$)
0-4	26	28	54	42	94
5-9	41	44	84	52	132
10-14	43	70	113	81	185

G. Maternal Care

Proper care during pregnancy and delivery is important for the health of both the mother and the baby, and is the fifth Millennium Development Goal (MDG). In the 2013 LDHS, women who had given birth in the five years preceding the survey were asked a number of questions about maternal care. Mothers were asked whether they had obtained prenatal care during the pregnancy for their most recent live birth in the five years preceding the survey, and whether they had received tetanus toxoid injections while pregnant. For each live birth over the same period, the mothers were also asked what type of assistance they received at the time of delivery. Table 7 summarizes information on the coverage of these maternal health services.

Prenatal Care

Prenatal care from a trained provider is important to monitor the pregnancy and reduce morbidity and mortality risks for the mother and child during pregnancy and delivery.

The 2013 LDHS results show that 96 percent of women who gave birth in the five years preceding the survey received prenatal care from a skilled provider at least once for their last birth. Urban women were somewhat more likely than rural women to have received ANC from a skilled provider (98 percent and 93 percent, respectively). The percentage of women who received prenatal care from a skilled provider has increased from 79 percent in 2007.

Tetanus Toxoid

Tetanus toxoid injections are given during pregnancy to prevent neonatal tetanus, a major cause of early infant death in many developing countries, often due to failure to observe hygienic procedures during delivery. Table 7 indicates that 88 percent of last births were protected against neonatal tetanus. The percentage of births protected from tetanus varies widely by county. Births to mothers from Montserrado (94 percent) are the most likely to be protected against neonatal tetanus; births to mothers from Grand Kru are the least likely to be protected (59 percent). Nationally, protection against neonatal tetanus has increased from 78 percent in 2007.

Delivery Care

Access to proper medical attention and hygienic conditions during delivery can reduce the risk of complications and infections that may lead to death or serious illness for the mother and/or baby (Van Lerberghe, W., and V. De Brouwere, 2001; WHO, 2006). Table 7 shows that 61 percent of women reported that their last live birth in the five years preceding the survey was delivered by a skilled provider. Fifty-six percent of births were delivered in a health facility, a level much greater than that reported in the 2007 LDHS (37 percent).

Seventy-three percent of births to urban mothers were attended to by a skilled provider and 66 percent were delivered in a health facility, compared with 50 percent and 46 percent, respectively, of births to rural women. Among urban women, those residing in Monrovia were more likely than those living in other urban areas to be attended to by a skilled provider (84 percent compared with 62 percent) and to deliver in the health facility (76 percent compared with 56 percent).

Mothers' educational status is highly correlated on whether delivery is assisted by a skilled provider and whether the birth is delivered in a health facility. For example, 49 percent of births to mothers with no education were attended to by a skilled provider and 45 percent were delivered in a health facility compared with 78 percent and 72 percent, respectively, of births to mothers with secondary and higher education.

Table 7 Maternal care indicators

Among women age 15-49 who had a live birth in the five years preceding the survey, the percentage who received prenatal care from a skilled provider for the last live birth and the percentage whose last live birth was protected against neonatal tetanus, and among all live births in the five years before the survey, the percentage delivered by a skilled provider and the percentage delivered in a health facility, by background characteristics, Liberia 2013

Background characteristic	Percentage with prenatal care from a skilled provider[1]	Percentage whose last live birth was protected against neonatal tetanus[2]	Number of women	Percentage delivered by a skilled provider[1]	Percentage delivered in a health facility	Number of births
Mother's age at birth						
<20	96.7	85.9	971	65.0	60.1	1,358
20-34	96.0	89.1	3,031	59.8	54.3	4,217
35-49	94.6	85.5	768	61.3	56.4	927
Residence						
Urban	98.0	92.3	2,555	72.7	66.2	3,241
Greater Monrovia	98.9	93.8	1,332	83.9	76.1	1,621
Other Urban	97.1	90.8	1,223	61.5	56.2	1,620
Rural	93.4	82.7	2,215	49.6	45.5	3,261
Region						
North Western	94.8	87.8	496	51.9	47.0	731
South Central	97.7	90.6	2,103	71.3	64.8	2,668
South Eastern A	92.7	79.0	328	65.3	59.2	492
South Eastern B	90.1	69.4	352	56.7	52.6	529
North Central	95.8	90.2	1,491	51.4	47.4	2,082
County						
Bomi	91.3	91.3	128	69.0	64.1	177
Bong	95.3	86.4	559	44.5	34.6	792
Gbarpolu	94.9	76.8	112	51.9	47.7	161
Grand Bassa	92.4	73.5	267	41.9	40.2	366
Grand Cape Mount	96.4	90.9	256	44.2	39.0	392
Grand Gedeh	95.3	84.8	112	73.4	69.2	157
Grand Kru	86.3	58.7	147	57.9	51.1	235
Lofa	90.8	92.3	262	71.8	75.6	342
Margibi	97.4	91.1	349	56.9	51.3	478
Maryland	92.1	79.5	141	54.8	54.3	196
Montserrado	98.7	93.6	1,487	81.0	73.3	1,824
Nimba	98.3	92.7	670	49.8	48.0	949
River Cess	96.8	89.1	92	63.4	58.8	147
River Gee	94.8	71.5	63	57.5	52.7	97
Sinoe	87.2	66.3	124	60.2	51.3	189
Mother's education						
No education	93.3	84.0	1,862	49.3	45.3	2,713
Primary	96.8	88.3	1,428	61.8	55.7	1,983
Secondary and higher	98.3	92.3	1,479	78.1	71.7	1,807
Total	95.9	87.8	4,769	61.1	55.8	6,502

[1] Skilled provider includes doctor, nurse, midwife, or physician assistant.
[2] Includes mothers with two injections during the pregnancy of her last live birth, or two or more injections (the last within 3 years of the last live birth), or three or more injections (the last within 5 years of the last live birth), or four or more injections (the last within ten years of the last live birth), or five or more injections at any time prior to the last live birth.

H. Child Health and Nutrition

The 2013 LDHS collected data on a number of key child health indicators, including vaccinations of young children, infant feeding practices, and treatment practices when a child is ill.

Vaccination of Children

According to the World Health Organization (WHO), a child is considered fully vaccinated if he or she has received a BCG vaccination against tuberculosis; three doses of DPT vaccine to prevent diphtheria, pertussis, and tetanus (DPT); at least three doses of polio vaccine; and one dose of measles vaccine. These vaccinations should be received during the first year of life. The 2013 LDHS collected information on the coverage for these vaccinations among all children born in the five years preceding the survey. In Liberia, since 2008, three doses of pentavalent vaccine (DPT-HepB-Hib) are given in place of the three doses of DPT vaccine. BCG vaccine should be given at birth, polio vaccines should be given at birth and at approximately 6, 10, and 14 weeks of age. Pentavalent vaccine should also be given at approximately 6, 10, and 14 weeks of age. Measles vaccine and yellow fever vaccine should be given at or soon after the child reaches nine months of age. It is also recommended that the vaccinations be recorded on a health card that is given to the parents or guardians.

In the 2013 LDHS, information on vaccination coverage was obtained in two ways—from health cards and from mothers' verbal reports. All mothers were asked to show the interviewer the health cards where vaccination dates are recorded for all children born since January 2008. If the card was available, the interviewer then recorded from the cards the dates of each vaccination received into the questionnaire. The mother was then asked whether the child had received other vaccinations that were not recorded on the card, and if so, they too were recorded. If a child never received a health card, or if the mother was unable to show the card to the interviewer, the child's vaccination information was based on the mother's recall. The mother was asked to recall whether the child had received BCG, polio, pentavalent, measles, and yellow fever vaccines. If she indicated that the child had received the polio or pentavalent vaccines, she was asked about the number of doses that the child received. The results presented here are based on both health card information and, for those children without a card, information provided by the mother.

Table 8 pertains to children age 12-23 months, the age by which they should have received all vaccinations. Fifty-eight percent of these children have a vaccination card, and, overall, 55 percent have received all basic vaccinations. Basic vaccination coverage has increased by 21 percentage points since the 2007 LDHS estimate (34 percent). Ninety-four percent of children received BCG, 91 percent received the first dose of pentavalent, and 96 percent received polio 1. Seven in ten children completed the required three doses of the pentavalent and polio vaccines. Coverage of vaccination against measles is 74 percent and against yellow fever is 73 percent. Overall, 2 percent of children in Liberia have not received any vaccinations. This represents an improvement from 2007 LDHS in which 13 percent of children were reported to have not received any vaccinations.

Children in urban areas are more likely than rural children to have received all basic vaccinations (60 percent compared with 49 percent, respectively). By county, children with full vaccination coverage range from a high of 74 percent in Grand Cape Mount to a low of 33 percent in River Cess.

Table 8 Vaccinations by background characteristics

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), and percentage with a vaccination card, by background characteristics, Liberia 2013

Background characteristic	BCG	DPT/Pentavalent 1	DPT/Pentavalent 2	DPT/Pentavalent 3	Polio 0[1]	Polio 1	Polio 2	Polio 3	Measles	Yellow fever	All basic vaccinations[2]	No vaccinations	Percentage with a vaccination card	Number of children
Sex														
Male	93.1	90.1	82.9	69.2	79.2	94.9	85.9	68.8	73.8	72.4	52.9	2.2	55.6	658
Female	94.7	92.7	81.2	73.8	81.7	96.9	87.5	71.1	74.6	73.2	56.8	0.8	61.3	614
Residence														
Urban	96.7	94.8	85.6	75.7	85.3	97.8	88.5	71.4	77.6	76.7	59.7	0.8	56.3	675
Greater Monrovia	100.0	98.8	86.2	80.0	89.0	99.3	87.8	71.5	78.8	78.6	60.2	0.0	51.1	337
Other Urban	93.4	90.9	85.1	71.3	81.6	96.3	89.2	71.4	76.3	74.9	59.1	1.7	61.6	338
Rural	90.7	87.4	78.1	66.6	74.9	93.7	84.6	68.2	70.4	68.3	49.4	2.3	60.7	597
Region														
North Western	94.5	93.5	89.5	81.5	85.5	99.6	94.7	84.4	81.5	78.4	68.3	0.4	74.4	135
South Central	97.9	95.0	83.6	76.8	83.4	97.2	86.9	71.1	77.2	76.5	58.1	0.6	52.3	543
South Eastern A	89.4	88.0	77.9	58.6	72.4	93.9	83.6	60.0	66.7	67.3	37.6	2.8	49.6	85
South Eastern B	78.9	74.9	59.7	52.0	64.0	88.3	75.4	56.7	60.0	57.5	39.7	6.7	45.7	92
North Central	92.6	90.2	83.5	68.1	80.0	95.0	86.9	68.6	72.6	70.6	53.0	1.7	65.8	417
County														
Bomi	98.4	98.4	98.4	90.6	93.9	98.4	96.5	84.5	85.3	83.5	72.7	1.6	63.4	31
Bong	88.9	84.9	72.9	62.1	77.0	90.0	80.0	67.2	68.6	64.5	50.4	3.2	65.3	158
Gbarpolu	86.0	86.7	74.5	62.9	67.7	100.0	91.7	75.9	74.2	71.5	52.2	0.0	63.1	32
Grand Bassa	91.7	80.8	57.9	53.2	63.2	92.5	74.8	58.5	66.4	59.7	38.9	2.0	45.6	64
Grand Cape Mount	96.5	94.4	92.3	85.8	89.8	100.0	95.2	88.1	83.1	79.3	73.6	0.0	84.3	71
Grand Gedeh	92.4	93.4	87.1	62.0	85.7	96.4	85.8	61.2	79.0	81.3	44.0	2.1	44.8	26
Grand Kru	74.8	69.0	47.5	42.2	60.4	84.0	65.6	49.1	56.4	52.4	37.5	8.4	37.2	35
Lofa	98.9	96.4	94.6	80.9	92.9	98.5	92.1	77.1	80.0	77.2	63.7	0.0	76.0	67
Margibi	94.8	92.2	88.4	79.3	78.8	94.3	91.3	75.4	76.8	79.5	60.0	2.0	52.4	98
Maryland	83.5	79.0	66.5	58.4	62.8	92.8	81.2	62.2	62.7	59.8	40.3	3.7	46.4	40
Montserrado	99.8	98.1	86.7	80.1	88.0	98.8	87.8	72.2	79.1	78.5	60.9	0.0	53.3	380
Nimba	93.4	92.5	88.4	68.5	77.9	97.9	90.9	66.8	73.3	73.3	51.5	1.1	62.6	192
River Cess	92.4	95.2	80.9	60.6	70.7	98.6	91.7	64.9	57.4	58.0	33.1	1.0	60.2	27
River Gee	76.7	77.3	68.2	56.7	73.8	86.8	81.6	59.5	60.8	62.4	42.5	10.2	60.7	18
Sinoe	84.7	77.6	68.1	54.1	63.2	88.0	75.2	55.1	64.5	63.9	36.3	4.9	44.5	32
Mother's education														
No education	89.5	88.0	77.9	67.9	73.7	93.0	83.3	69.8	66.6	65.3	51.2	2.8	60.9	470
Primary	94.2	89.8	77.6	65.5	79.0	96.6	85.5	63.8	71.1	68.1	47.6	1.4	56.3	403
Secondary and higher	98.7	96.8	91.6	81.5	89.6	98.5	91.8	76.2	86.1	86.2	66.3	0.2	57.5	399
Total	93.9	91.3	82.1	71.4	80.4	95.9	86.7	69.9	74.2	72.8	54.8	1.5	58.4	1,272

[1] Polio 0 is the polio vaccination given at birth.
[2] BCG, measles and three doses each of DPT/Pentavalent and polio vaccine, excluding polio vaccine given at birth and yellow fever.

Childhood Acute Respiratory Infection, Fever, and Diarrhea

Acute respiratory infection (ARI), fever, and dehydration from diarrhea are important contributing causes of childhood morbidity and mortality in developing countries (WHO, 2003). Prompt medical attention when a child has the symptoms of these illnesses is, therefore, crucial in reducing child deaths. In the 2013 LDHS, for each child under five, mothers were asked if the child had experienced an episode of diarrhea, a cough accompanied by short, rapid breathing (symptoms of ARI), or fever in the two weeks preceding the survey. Respondents were also asked if treatment was sought when the child was ill. Overall, 7 percent of children under five showed symptoms of ARI, 29 percent exhibited fever, and 22 percent experienced diarrhea in the two weeks preceding the survey (data not shown). It should be noted that the morbidity data collected are subjective because they are based on a mother's perception of illnesses without validation by medical personnel.

Table 9 shows that treatment from a health facility or provider was sought for 51 percent of the children with ARI symptoms and 58 percent of the children with fever symptoms. Treatment was sought from a health facility or health provider for 47 percent of children with diarrhea, and 62 percent of children with diarrhea received a rehydration solution from an oral rehydration salt (ORS) packet or a recommended home fluid. Male children were more likely than females to receive treatment from a health facility or health provider when they were sick with symptoms of ARI or fever, but not diarrhea.

Table 9 Treatment for acute respiratory infection, fever, and diarrhea

Among children under five who had symptoms of acute respiratory infection (ARI) or were sick with fever in the two weeks preceding the survey, the percentage for whom treatment was sought from a health facility or provider, and among children under five who were sick with diarrhea during the two weeks preceding the survey, the percentage for whom treatment was sought from a health facility or provider, the percentage given a solution made from oral rehydration salt (ORS) packets, and the percentage given any oral rehydration therapy (ORT) by background characteristics, Liberia 2013

	Children with symptoms of ARI[1]		Children with fever		Children with diarrhea			
Background characteristic	Percentage for whom treatment was sought from a health facility/ provider[2]	Number with ARI	Percentage for whom treatment was sought from a health facility/ provider[2]	Number with fever	Percentage for whom treatment was sought from a health facility/ provider	Percentage given solution from ORS packet	Percentage given any ORT[3]	Number with diarrhea
Age in months								
<6	(76.0)	34	67.2	113	55.2	16.8	18.1	59
6-11	54.2	76	58.7	278	54.1	59.1	59.8	209
12-23	50.9	104	61.9	429	45.5	62.3	62.8	407
24-35	46.5	61	52.0	309	43.4	63.7	65.8	267
36-47	53.0	65	56.1	327	46.7	60.8	62.9	231
48-59	32.2	56	53.3	273	43.5	67.7	68.3	157
Sex								
Male	56.5	211	58.8	938	47.0	58.2	59.6	682
Female	44.0	184	56.0	790	46.7	62.8	63.7	648
Residence								
Urban	49.4	164	61.7	793	47.7	57.2	57.9	607
Greater Monrovia	(38.2)	91	63.4	396	48.1	51.1	51.1	293
Other Urban	63.2	73	59.9	396	47.3	62.9	64.1	314
Rural	51.7	232	54.0	935	46.1	63.1	64.8	724
Region								
North Western	53.0	50	54.8	240	50.8	79.6	80.2	113
South Central	47.8	165	60.6	706	45.3	53.3	54.4	528
South Eastern A	55.5	45	58.7	144	46.2	54.1	55.4	127
South Eastern B	52.6	42	58.3	171	55.6	66.7	69.8	129
North Central	51.4	93	53.7	467	45.3	64.1	64.9	433
County								
Bomi	*	9	68.1	49	(69.4)	(69.9)	(69.9)	19
Bong	(58.2)	50	57.1	208	42.0	62.1	62.1	211
Gbarpolu	(30.0)	9	49.8	60	44.2	70.6	72.7	32
Grand Bassa	*	19	45.5	121	33.5	48.2	50.4	104
Grand Cape Mount	(56.0)	32	52.1	131	48.5	87.2	87.2	62
Grand Gedeh	(69.4)	11	62.8	42	46.4	55.3	55.3	32
Grand Kru	(41.6)	23	49.1	68	52.7	64.9	65.7	56
Lofa	*	14	59.6	65	54.0	73.4	75.6	44
Margibi	(49.6)	39	56.4	102	41.5	59.4	61.9	90
Maryland	*	9	60.4	66	55.1	70.4	73.9	45
Montserrado	(46.5)	107	65.3	483	50.0	53.2	53.7	335
Nimba	(38.7)	30	48.1	194	47.0	64.3	65.6	177
River Cess	58.0	17	49.0	44	44.9	51.3	51.9	45
River Gee	(73.2)	9	71.6	36	62.4	64.2	71.6	28
Sinoe	(44.5)	17	63.2	58	47.3	55.9	58.6	50
Mother's education								
No education	46.6	172	56.5	670	44.9	59.9	61.4	539
Primary	53.8	120	54.2	540	44.1	64.5	65.1	428
Secondary and higher	53.9	103	62.3	518	52.9	56.4	57.7	363
Total	50.7	396	57.5	1,728	46.8	60.4	61.6	1,330

Note: Figures in parentheses are based on 25-49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.
[1] Symptoms of ARI (cough accompanied by short, rapid breathing which was chest-related and/or by difficult breathing which was chest-related) is considered a proxy for pneumonia.
[2] Excludes pharmacy, shop, and traditional practitioner.
[3] ORT includes fluid prepared from oral rehydration salt (ORS) packets and recommended home fluids (RHF).

Infant and Young Child Feeding Practices

Breastfeeding is sufficient and beneficial for infant nutrition in the first six months of life. Breastfeeding immediately after birth also helps the uterus retract, hence reducing the mother's postpartum blood loss. Supplementing breast milk before the child is six months of age is discouraged because it may inhibit breastfeeding and expose the newborn infant to illness. At a later stage of the baby's development, breast milk should be supplemented by other liquids and eventually by solid or mushy food to provide adequate nourishment (PAHO, 2002).

The 2013 LDHS collected data on infant and young child feeding (IYCF) practices for all children born in the two years preceding the survey. As shown in Table 10, 55 percent of children under six months are exclusively breastfed. This represents a sizeable increase over 2007 LDHS, when 29 percent of children under the age of six months were exclusively breastfed. In addition to breast milk, 28 percent of infants under six months are given plain water only, while 3 percent are given non-milk liquids and juice, and 6 percent are given milk other than breast milk. Furthermore, 7 percent of infants under six months are given complementary foods. By age 6-9 months, 48 percent of infants are given complementary foods. Seventeen percent of infants under six months are fed using a bottle with a nipple, a practice that is discouraged because of the risk of illness to the child.

Table 10 Breastfeeding status by age

Percent distribution of youngest children under two years who are living with their mother, by breastfeeding status and the percentage currently breastfeeding; and the percentage of all children under two years using a bottle with a nipple, according to age in months, Liberia 2013

	Percent distribution of youngest children under two living with their mother by breastfeeding status										
Age in months	Not breast-feeding	Exclu-sively breastfed	Breast-feeding and consuming plain water only	Breast-feeding and consuming non-milk liquids[1]	Breast-feeding and consuming other milk	Breast-feeding and comple-mentary foods	Total	Percent-age currently breast-feeding	Number of youngest children under two years	Percent-age using a bottle with a nipple	Number of all children under two years
0-1	0.9	76.4	16.2	2.3	2.8	1.4	100.0	99.1	173	13.9	175
2-3	1.6	59.8	27.5	5.3	3.7	2.1	100.0	98.4	211	15.6	213
4-5	2.5	32.6	37.1	1.5	9.7	16.5	100.0	97.5	206	21.2	215
6-8	3.5	9.7	38.8	1.4	3.2	43.5	100.0	96.5	349	12.6	361
9-11	3.0	2.4	16.3	2.6	2.1	73.6	100.0	97.0	351	9.9	369
12-17	14.6	0.3	5.4	1.0	0.1	78.5	100.0	85.4	627	8.1	655
18-23	48.5	0.0	4.8	0.0	0.0	46.6	100.0	51.5	556	3.1	617
0-3	1.3	67.3	22.4	3.9	3.3	1.8	100.0	98.7	384	14.9	388
0-5	1.7	55.2	27.5	3.1	5.5	6.9	100.0	98.3	590	17.1	603
6-9	3.6	9.1	34.6	2.0	2.5	48.3	100.0	96.4	449	11.3	467
12-15	12.5	0.5	6.9	1.3	0.1	78.6	100.0	87.5	427	9.3	442
12-23	30.5	0.2	5.2	0.5	0.0	63.5	100.0	69.5	1,184	5.6	1,272
20-23	55.8	0.1	2.7	0.0	0.0	41.5	100.0	44.2	366	3.8	408

Note: Breastfeeding status refers to a "24-hour" period (yesterday and last night). Children who are classified as breastfeeding and consuming plain water only consumed no liquid or solid supplements. The categories of not breastfeeding, exclusively breastfed, breastfeeding and consuming plain water, non-milk liquids, other milk, and complementary foods (solids and semi-solids) are hierarchical and mutually exclusive, and their percentages add to 100 percent. Thus children who receive breast milk and non-milk liquids and who do not receive other milk and who do not receive complementary foods are classified in the non-milk liquid category even though they may also get plain water. Any children who get complementary food are classified in that category as long as they are breastfeeding as well.

[1] Non-milk liquids include juice, juice drinks, clear broth or other liquids.

Nutritional Status of Children

Anthropometric indicators for young children were collected in the 2013 LDHS to provide outcome measures of nutritional status. As recommended by the WHO, evaluation of nutritional status in this report is based on the comparison of three indices for the children in this survey with indices reported for a reference population of well-nourished children (WHO Multicentre Growth Reference Study Group, 2006). The three indices are expressed as standard deviation units from the median for the reference group. Children who fall below minus two standard deviations (-2 SD) from the median of the reference population are regarded as moderately malnourished, while those who fall below minus three standard deviations (-3 SD) from the median of the reference population are considered severely malnourished. Marked differences, especially with regard to height-for-age and weight-for-age are often seen between different subgroups of children within a country.

Table 11 shows nutritional status for children under five, according to the three anthropometric indices, by background characteristics. Height-for-age is the measure of linear growth. A child who is below minus two standard deviations from the reference mean for height-for-age is considered short for his/her age, or stunted, a condition reflecting the cumulative effect of chronic malnutrition. The percentage of Liberian children who are stunted (below -2 SD) is 32 percent. Stunting increases with age, peaking at 42 percent of children 36-47 months in age. Results show a higher proportion of males (34 percent) than females (29 percent) are stunted. Stunting is lower in Greater Monrovia (27 percent) than in other urban areas or rural areas (33 percent, each). Severe stunting (below -3 SD) decreases as level of mother's education increases, from a high of 14 percent among children of mothers with no education to a low of 9 percent among children of mothers with more than secondary education.

Weight-for-height describes current nutritional status. A child who is below minus two standard deviations from the reference mean for weight-for-height is considered too thin for his/her height, or wasted, a condition reflecting acute or recent nutritional deficit. Overall, 6 percent of children are wasted. Wasting is noticeably higher among children 6-17 months (10-15 percent) than other ages (3-8 percent). Wasting varies little by residence or mother's educational level, however, differences are observed by county.

Weight-for-age is a composite index of weight-for-height and height-for-age, and thus does not distinguish between acute malnutrition (wasting) and chronic malnutrition (stunting). A child can be underweight for his/her age because he or she is stunted, wasted, or both. Weight-for-age is an overall indicator of a population's nutritional health. Overall, 15 percent of all children are underweight, and 4 percent of children are severely underweight. A higher percentage of males are underweight compared with females (17 and 13 percent, respectively). Seventeen percent of rural children are underweight compared with 9 percent of children from Greater Monrovia and 18 percent of children from other urban areas. By county, large differences in the percentage of children who are underweight are observed. Children in Montserrado are the least likely to be underweight (9 percent); children in River Gee are the most likely to be underweight (25 percent).

Table 11 Nutritional status of children

Percentage of children under five classified as malnourished according to three anthropometric indices of nutritional status: height-for-age, weight-for-height, and weight-for-age, by background characteristics, Liberia 2013

Background characteristic	Height-for-age[1]			Weight-for-height				Weight-for-age				Number of children
	Percent-age below -3 SD	Percent-age below -2 SD[2]	Mean Z-score (SD)	Percent-age below -3 SD	Percent-age below -2 SD[2]	Percent-age above +2 SD	Mean Z-score (SD)	Percent-age below -3 SD	Percent-age below -2 SD[2]	Percent-age above +2 SD	Mean Z-Score (SD)	
Age in months												
<6	1.3	8.6	0.0	2.4	6.7	6.3	-0.1	0.6	5.7	2.6	-0.2	282
6-8	5.1	17.5	-0.1	3.6	15.3	2.4	-0.8	5.7	16.9	2.3	-0.8	208
9-11	7.0	19.6	-0.5	5.0	13.7	4.2	-0.6	5.8	22.9	3.3	-0.8	213
12-17	5.9	24.4	-0.9	4.2	10.4	1.8	-0.6	4.8	14.5	1.4	-0.9	362
18-23	15.1	34.6	-1.4	2.8	7.5	2.4	-0.3	4.8	19.4	1.7	-0.9	360
24-35	17.4	36.7	-1.6	1.5	4.6	1.0	0.0	6.5	16.1	0.5	-0.9	651
36-47	16.1	42.2	-1.7	0.8	2.5	2.3	0.1	4.1	15.0	0.3	-0.9	731
48-59	13.9	35.0	-1.5	0.9	2.6	4.3	0.0	3.0	12.9	0.0	-0.9	713
Sex												
Male	13.7	34.0	-1.3	2.4	6.4	2.6	-0.2	5.0	16.6	1.2	-0.9	1,886
Female	10.8	28.8	-1.1	1.6	5.6	3.2	-0.2	3.7	13.2	0.8	-0.8	1,634
Residence												
Urban	10.5	30.0	-1.1	2.0	5.9	3.0	-0.2	4.3	13.4	1.3	-0.8	1,791
Greater Monrovia	6.8	27.0	-0.9	1.0	5.5	3.7	-0.2	2.0	8.5	1.5	-0.6	885
Other Urban	14.2	32.9	-1.3	2.9	6.3	2.3	-0.2	6.5	18.2	1.2	-0.9	906
Rural	14.2	33.3	-1.4	2.1	6.1	2.8	-0.2	4.5	16.7	0.7	-0.9	1,729
Region												
North Western	10.8	29.0	-1.3	2.2	5.9	3.8	-0.1	2.7	13.3	0.4	-0.8	406
South Central	9.3	29.4	-1.0	2.3	6.6	3.0	-0.2	3.5	11.7	1.4	-0.7	1,447
South Eastern A	14.0	32.6	-1.3	1.7	7.1	2.5	-0.2	4.5	16.8	0.6	-0.9	237
South Eastern B	14.9	34.1	-1.3	1.9	4.2	3.1	-0.1	4.0	19.1	1.1	-0.8	248
North Central	15.7	34.5	-1.4	1.7	5.5	2.5	-0.2	6.2	18.6	0.8	-1.0	1,182
County												
Bomi	15.3	33.1	-1.4	3.4	8.8	6.5	-0.2	4.0	19.7	0.0	-0.9	110
Bong	14.6	34.7	-1.3	2.9	7.2	2.8	-0.2	6.2	17.4	1.2	-0.9	434
Gbarpolu	6.9	25.1	-1.0	4.8	6.5	1.7	-0.2	1.8	10.8	0.4	-0.8	92
Grand Bassa	17.5	38.1	-1.6	4.6	8.6	2.1	-0.3	8.4	19.7	1.3	-1.1	197
Grand Cape Mount	10.2	28.5	-1.3	0.4	4.1	3.2	0.0	2.4	11.0	0.7	-0.8	204
Grand Gedeh	13.4	31.4	-1.3	0.9	5.9	2.4	0.0	5.3	15.5	0.4	-0.8	80
Grand Kru	11.1	31.2	-1.2	1.7	3.6	2.0	-0.1	3.5	18.5	0.9	-0.8	100
Lofa	8.8	28.5	-1.1	2.4	6.8	4.6	-0.1	3.8	14.8	0.5	-0.8	189
Margibi	10.4	30.9	-1.1	2.7	5.4	1.7	-0.1	3.4	14.4	1.2	-0.7	262
Maryland	15.9	33.4	-1.3	1.9	3.3	3.3	0.0	3.9	17.3	1.1	-0.8	105
Montserrado	7.4	27.2	-0.9	1.8	6.5	3.5	-0.2	2.5	9.3	1.4	-0.7	988
Nimba	18.9	36.5	-1.6	0.5	3.9	1.6	-0.1	6.9	20.7	0.6	-1.1	559
River Cess	15.5	35.4	-1.5	2.0	8.6	1.5	-0.4	6.7	21.0	0.5	-1.1	69
River Gee	21.1	42.6	-1.7	2.2	7.8	5.0	-0.1	5.6	25.0	1.7	-1.0	43
Sinoe	13.4	31.5	-1.2	2.1	7.0	3.4	-0.2	1.9	14.6	0.9	-0.8	88
Mother's education[3]												
No education	14.1	32.9	-1.3	2.0	6.4	3.1	-0.2	5.0	16.0	1.0	-0.9	1,268
Primary	12.3	28.3	-1.2	1.7	5.9	2.6	-0.2	3.8	14.6	1.3	-0.8	881
Secondary and higher	8.6	28.8	-1.0	2.9	6.8	3.0	-0.2	4.1	14.0	0.9	-0.8	828
Mother's interview status												
Interviewed	12.0	30.1	-1.2	2.2	6.4	2.9	-0.2	4.3	15.0	1.0	-0.8	2,910
Not interviewed, but in household	13.6	43.0	-1.4	0.0	3.5	3.8	-0.1	6.2	17.8	0.4	-0.8	68
Not interviewed, not in household[4]	14.0	38.2	-1.3	1.3	4.1	2.7	0.0	4.5	15.0	0.9	-0.8	543
Total	12.3	31.6	-1.2	2.0	6.0	2.9	-0.2	4.4	15.0	1.0	-0.8	3,520

Note: Table is based on children who spent the night before the interview in the household. Each of the indices is expressed in standard deviation units (SD) from the median of the WHO Child Growth Standards adopted in 2006. Table is based on children with valid dates of birth (month and year) and valid measurement of both height and weight. Total includes 1 case with information missing on mother's interview status.

[1] Recumbent length is measured for children under age 2 and less than 85 cm; standing height is measured for all other children.

[2] Includes children who are below -3 standard deviations (SD) from the WHO Growth Standards population median.

[3] For women who are not interviewed, information is taken from the Household Questionnaire. Excludes children whose mothers are not listed in the Household Questionnaire.

[4] Includes children whose mothers are deceased.

I. Malaria

Malaria is one of the leading causes of death in developing countries (WHO, 2008). The 2013 LDHS collected data that are useful for assessing the implementation of malaria control strategies including the availability and use of mosquito nets by household members, the use of indoor residual spraying (IRS) against mosquitoes, and the prophylactic use of anti-malarial drugs by pregnant women. Data presented show the percentage of households possessing mosquito nets by net type, the percentage of households that received IRS, and the

percentages of children under age five and pregnant women who slept under a net the night before the survey. For women who gave birth in the two years preceding the survey, data also show the percentage who took any SP/Fansidar during pregnancy as part of prenatal care, and the percentage who took two or more doses of SP/Fansidar and received at least one dose from an prenatal care visit. Additionally, among children under five who experienced an episode of fever in the two weeks preceding the survey, information is provided on whether they were treated with antimalarial drugs, and the timeliness with which they received drug treatment (the same day or next day following onset of fever).

Ownership of Mosquito Nets

Significant advances have been made in the prevention of malaria through the use of insecticide-treated mosquito nets (ITN). Pyrethroids, the chemicals currently used in many countries including Liberia to treat mosquito nets, mimic the insecticidal compounds of natural pyrethrum. Synthetic pyrethroids have low mammalian toxicity; are repellents, highly toxic to mosquitoes, and odorless; and have low volatility with long persistence. Use of treated mosquito nets has been shown to significantly reduce malaria transmission.

Table 12 shows the percentages of households owning any mosquito nets (treated or untreated) and ITNs. Overall, 58 percent of households owned some type of mosquito net, and 55 percent of households had at least one ITN. Ownership of nets differs markedly by urban-rural residence, with 50 percent of urban households owning at least one ITN versus 61 percent of rural households. Households in Greater Monrovia were much less likely to own an ITN compared to other urban regions (40 percent and 64 percent, respectively).

Ownership of any type of mosquito nets has increased modestly from that reported in the 2011 Liberia Malaria Indicator Survey (LMIS) (from 51 percent to 58 percent). The percentage of households that owned at least one ITN increased from 50 percent in 2011 to 55 percent in 2013.

Use of Mosquito Nets

Table 12 also shows that only 40 percent of children under five slept under a mosquito net the night before the survey, and 38 percent slept under an ITN. Among those in households owning at least one ITN, 63 percent of children under five slept under an ITN the night before the survey; only minor differences were observed between children in urban and rural areas.

Overall, 40 percent of pregnant women age 15-49 slept under a mosquito net the night before the survey, and 37 percent slept und an ITN. Among pregnant women in households owning at least one ITN, 63 percent slept under an ITN the night before the survey; as with children under five, only minor differences were observed between urban and rural areas.

Indoor Residual Spraying

Indoor residual spraying (IRS) is the spraying of the interior walls and ceilings of a dwelling with long-lasting insecticide. It reduces the transmission of malaria by killing adult female mosquitoes when they rest on the walls of the dwelling after feeding.

Table 12 shows the percentage of households in which IRS has been carried out in the past 12 months. Overall, 11 percent of households report having received IRS in the past 12 months. Households in rural areas (14 percent) and in urban areas excluding Greater Monrovia (17 percent) were more likely to have received IRS than households in Greater Monrovia (2 percent). Overall, 44 percent of children and 43 percent of pregnant women had slept the night before the interview either under an ITN or in a household that had been received IRS in the past 12 months.

Intermittent Preventative Treatment (IPTp) during Pregnancy

Malaria during pregnancy is common among women living in countries such as Liberia that are malaria endemic. It is a contributory factor to low birth weight, infant mortality, maternal anemia, spontaneous abortion, and stillbirth. The NMCP recommends Intermittent Preventative Treatment (IPTp) with S/P Fansidar for pregnant women as a prophylactic measure during pregnancy. IPTp is defined as taking two or more doses of SP/Fansidar during pregnancy, and it is recommended that doses be received during a prenatal care visit.

Table 12 shows that 65 percent of women with a live birth in the two years preceding the survey reported taking at least one dose of SP/Fansidar during a prenatal care visit, and 48 percent reported taking two or more doses of SP/Fansidar at least one of which was received during a prenatal care visit. A higher proportion of women in urban areas received IPTp and received at least one dose during a prenatal care visit when compared with women in rural areas (51 percent versus 45 percent).

Treatment of Children with Fever

Fever is a major symptom of malaria in young children. Because malaria is endemic in Liberia, it is very important that children with fever be tested for malaria and, if positive, treated promptly. In the 2013 LDHS, for each child under five years of age, mothers were asked if the child had experienced an episode of fever in the two weeks preceding the survey, and if so, whether treatment and advice was sought. Information was also collected about the type and timing of the treatment given. For children with malaria, the first-line of treatment is artesunate amodiquine (ASAQ), an artemisinin-based combination therapy (ACT).

Among children with fever, 56 percent were given an antimalarial drug, and 43 percent were treated with the antimalarial the same day or the next day the fever was detected. One in four children (24 percent) was given ACT, and 17 percent of children received ACT the same day or the next day after the fever was detected.

It is noteworthy that 24 percent of children with fever reportedly received the antimalarial amodiaquine. In Liberia, ASAQ is colloquially referred to as amodiaquine, making it difficult to distinguish use of the single drug and the combination therapy. Thus, it is possible that some of the children who were reported to receive amodiaquine actually received ASAQ. If so, this would affect the estimate of children with fever who received ACT.

Table 12 Malaria indicators

Possession and use of mosquito nets, preventive malaria treatment during pregnancy, and treatment of children with fever using antimalarial drugs, by urban-rural residence, Liberia 2013

	Urban									
	Greater Monrovia		Other urban		Total urban		Rural		Total	
Malaria indicators	Percent-age	Number	Percent-age	Number	Percent-age	Number	Percent-age	Number	Percent-age	Number
Mosquito nets										
Percentage of households with at least one mosquito net (treated or untreated)	42.5	3,060	67.6	2,229	53.1	5,289	63.8	4,044	57.7	9,333
Percentage of households with at least one insecticide-treated net (ITN)[1]	39.5	3,060	63.7	2,229	49.7	5,289	61.1	4,044	54.6	9,333
Percentage of children under five who slept under a mosquito net (treated or untreated) last night	31.0	1,769	48.0	1,847	39.7	3,617	40.8	3,645	40.3	7,261
Percentage of children under five who slept under an ITN last night[1]	28.3	1,769	44.6	1,847	36.7	3,617	39.5	3,645	38.1	7,261
Percentage of children under five who slept under an ITN last night in households with an ITN[1]	62.5	802	64.9	1,270	64.0	2,072	62.5	2,302	63.2	4,375
Percentage of pregnant women age 15-49 who slept under a mosquito net (treated or untreated) last night	31.6	235	45.0	187	37.5	422	42.1	394	39.7	816
Percentage of pregnant women age 15-49 who slept under an ITN last night[1]	30.5	235	38.5	187	34.0	422	40.3	394	37.1	816
Percentage of pregnant women age 15-49 who slept under an ITN last night in households with an ITN[1]	(68.4)	105	57.6	125	62.5	230	63.8	249	63.2	479
Indoor residual insecticide spraying (IRS)										
Percentage of households sprayed with a residual insecticide in the past 12 months	1.8	3,060	17.1	2,229	8.2	5,289	13.9	4,044	10.7	9,333
Percentage of children under five who slept under an ITN last night or in a household sprayed with IRS in the past 12 months[1]	29.8	1,769	51.7	1,847	41.0	3,617	47.1	3,645	44.0	7,261
Percentage of pregnant women who slept under an ITN last night or in a household sprayed with IRS in the past 12 months[1]	30.5	235	48.9	187	38.6	422	48.5	394	43.4	816
Intermittent preventive treatment (IPTp) by women during pregnancy										
Percentage of last births in the two years preceding the survey for which the mother received any SP/Fansidar during a prenatal care visit	67.0	1,351	68.3	667	65.7	684	62.5	1,299	64.8	2,650
Percentage of last births in the two years preceding the survey for which the mother took 2+ doses of SP/Fansidar (IPTp) and received at least one dose during a prenatal care visit[2]	49.9	1,351	49.1	667	50.7	684	45.2	1,299	47.6	2,650
Among children under five with fever in the two weeks preceding the survey, percentage who took:										
Any antimalarial drug	57.3	793	51.7	396	62.9	396	54.4	935	55.7	1,728
ACT	20.6	793	15.7	396	25.5	396	26.7	935	23.9	1,728
Chloroquine	5.8	793	5.0	396	6.5	396	5.7	935	5.7	1,728
SP/Fansidar	3.2	793	3.6	396	2.8	396	2.9	935	3.1	1,728
Amodiaquine	27.3	793	26.1	396	28.5	396	20.3	935	23.5	1,728
Quinine	3.6	793	3.2	396	4.1	396	3.6	935	3.6	1,728
Other anti-malarial	0.0	793	0.0	396	0.0	396	0.4	935	0.2	1,728
Among children under five with fever in the two weeks preceding the survey, percentage who took antimalarial drugs the same day/next day after developing fever:										
Any antimalarial drug	45.9	793	39.2	396	52.6	396	39.9	935	42.7	1,728
ACT	14.9	793	10.7	396	19.1	396	18.2	935	16.7	1,728
Chloroquine	5.3	793	5.0	396	5.5	396	4.8	935	5.0	1,728
SP/Fansidar	3.2	793	3.6	396	2.8	396	2.3	935	2.7	1,728
Amodiaquine	22.8	793	19.5	396	26.0	396	16.1	935	19.1	1,728
Quinine	2.6	793	1.5	396	3.7	396	2.9	935	2.7	1,728
Other anti-malarial	0.0	793	0.0	396	0.0	396	0.3	935	0.1	1,728

Note: Figures in parentheses are based on 25-49 unweighted cases.
[1] An insecticide-treated net (ITN) is a permanent net that does not require any treatment or a net that has been soaked with insecticide within the past 12 months.

J. HIV/AIDS Awareness, Knowledge and Behavior

The 2013 LDHS included a series of questions that addressed respondents' knowledge about HIV and AIDS, their awareness of modes of HIV transmission, and behaviors that can prevent the spread of HIV.

Table 13 shows that HIV/AIDS awareness is nearly universal in Liberia; 97 percent of women and 96 percent of men have heard of AIDS. In general, awareness varies little by background characteristics except by urban-rural residence and education; those living in rural areas and those with no education being less likely to have heard of AIDS. In addition, women and men from Grand Kru and Lofa are less likely than those from other counties to have heard of AIDS.

Table 13 Knowledge of AIDS

Percentage of women and men age 15-49 who have heard of AIDS, by background characteristics, Liberia 2013

Background characteristic	Women		Men	
	Have heard of AIDS	Number of women	Have heard of AIDS	Number of men
Age				
15-24	97.1	3,722	92.8	1,587
15-19	96.8	2,080	89.3	890
20-24	97.4	1,642	97.4	696
25-29	97.9	1,611	97.0	673
30-39	97.5	2,378	98.8	1,044
40-49	96.9	1,528	98.6	814
Marital status				
Never married	97.6	2,867	92.7	1,749
Ever had sex	98.3	2,230	97.3	1,171
Never had sex	95.3	637	83.4	578
Married or living together	97.0	5,386	98.7	2,218
Divorced/separated/widowed	97.9	987	98.5	151
Residence				
Urban	99.1	5,633	97.5	2,413
Greater Monrovia	99.7	3,361	99.0	1,433
Other Urban	98.1	2,272	95.4	980
Rural	94.6	3,606	94.3	1,705
Region				
North Western	98.2	837	98.7	367
South Central	99.3	4,854	98.8	2,149
South Eastern A	94.0	483	94.2	254
South Eastern B	91.3	577	91.7	288
North Central	95.2	2,488	91.5	1,060
County				
Bomi	97.5	244	97.7	97
Bong	98.2	894	96.7	389
Gbarpolu	97.9	182	100.0	94
Grand Bassa	95.0	434	97.9	204
Grand Cape Mount	98.8	412	98.5	176
Grand Gedeh	97.3	167	97.4	82
Grand Kru	85.4	217	81.9	110
Lofa	83.9	447	76.9	219
Margibi	99.9	744	98.9	364
Maryland	96.8	257	97.6	123
Montserrado	99.7	3,675	99.0	1,582
Nimba	97.2	1,147	94.2	451
River Cess	93.5	135	97.2	64
River Gee	90.0	103	98.1	55
Sinoe	91.2	182	89.9	108
Education				
No education	94.9	3,066	92.1	533
Primary	97.0	2,875	92.3	1,202
Secondary and higher	99.9	3,298	99.0	2,383
Total	97.3	9,239	96.2	4,118

HIV/AIDS prevention programmes in Liberia focus their messages and efforts on three important aspects of behavior: using condoms; limiting the number of sexual partners/staying faithful to one partner; and delaying sexual debut in young persons (abstinence).

Table 14 shows that 75 percent of women and men age 15-49 know that consistent use of condoms is a means of preventing the spread of HIV. Seventy-nine percent of women and 78 percent of men know that limiting sexual intercourse to one faithful and uninfected partner can reduce the chances of contracting HIV. The proportion knowing both that using condoms and limiting sexual intercourse to one uninfected partner is 68 percent among women and men.

By marital status, women who have never been married and never had sex are least likely to know that using condoms and limiting sexual intercourse to one uninfected partner reduces the risk of HIV transmission (55 percent). Women who have never been married but have had sex are most likely to know that using condoms and limiting sexual intercourse to one uninfected partner reduces the risk of HIV transmission (72 percent). Among men, those who have never been married and never had sex are least likely to be aware that using condoms and limiting sexually intercourse to one uninfected partner reduces the risk of HIV transmission (36 percent). Men who have been married previously are most likely to be aware of HIV prevention methods (84 percent).

By residence, women living in Greater Monrovia are more likely to be knowledgeable about HIV prevention methods than their counterparts residing in other urban areas or rural areas. The same pattern is true for men. Knowledge varies across counties, with the lowest percentages in Grand Bassa for women (42 percent) and Lofa for men (41 percent). Better educated respondents are more knowledgeable of HIV prevention methods than other respondents.

Knowledge of HIV prevention methods has increased since 2007 among women. According to the 2007 LDHS, 44 percent of women knew that HIV could be prevented by using a condom and by limiting sexual partners; this compares with 68 percent in 2013. Among men, the percentage has remained stable (66 percent in 2007 compared with 68 percent in 2013).

Table 14 Knowledge of HIV prevention methods

Percentage of women and men age 15-49 who, in response to prompted questions, say that people can reduce the risk of getting the AIDS virus by using condoms every time they have sexual intercourse and by having one partner who is not infected and has no other partners, by background characteristics, Liberia 2013

Background characteristic	Percentage of women who say HIV can be prevented by:				Percentage of men who say HIV can be prevented by:			
	Using condoms[1]	Limiting sexual intercourse to one uninfected partner[2]	Using condoms and limiting sexual intercourse to one uninfected partner[1,2]	Number of women	Using condoms[1]	Limiting sexual intercourse to one uninfected partner[2]	Using condoms and limiting sexual intercourse to one uninfected partner[1,2]	Number of men
Age								
15-24	73.2	77.7	66.6	3,722	66.9	70.7	59.3	1,587
15-19	70.6	77.3	64.7	2,080	57.3	62.6	49.1	890
20-24	76.4	78.3	69.1	1,642	79.2	81.1	72.4	696
25-29	80.3	82.5	73.0	1,611	81.1	84.3	75.5	673
30-39	76.0	79.1	68.1	2,378	79.3	80.7	71.9	1,044
40-49	72.7	78.3	65.7	1,528	80.4	85.4	75.8	814
Marital status								
Never married	74.7	79.1	68.3	2,867	69.1	72.4	61.5	1,749
Ever had sex	77.9	81.9	72.2	2,230	82.2	81.6	74.0	1,171
Never had sex	63.6	69.3	54.5	637	42.8	53.7	36.3	578
Married or living together	74.9	78.8	67.6	5,386	78.6	82.6	72.8	2,218
Divorced/separated/widowed	77.2	79.9	69.1	987	91.4	85.1	84.3	151
Residence								
Urban	78.7	82.2	72.0	5,633	78.1	82.1	71.9	2,413
Greater Monrovia	81.4	84.5	75.0	3,361	80.6	86.1	75.5	1,433
Other Urban	74.7	78.8	67.4	2,272	74.3	76.3	66.5	980
Rural	69.4	74.1	61.7	3,606	70.8	73.0	63.5	1,705
Region								
North Western	72.5	72.7	61.7	837	87.5	87.3	82.7	367
South Central	79.1	82.6	72.8	4,854	77.1	81.4	70.7	2,149
South Eastern A	70.6	71.2	60.8	483	78.3	79.0	71.5	254
South Eastern B	64.9	73.2	59.1	577	66.0	68.6	58.4	288
North Central	71.2	77.0	64.2	2,488	68.2	71.5	60.7	1,060
County								
Bomi	80.0	90.9	78.8	244	85.7	83.4	77.3	97
Bong	78.5	86.5	72.2	894	69.8	72.0	62.4	389
Gbarpolu	69.8	72.6	59.1	182	86.9	89.6	84.4	94
Grand Bassa	52.6	56.7	42.0	434	58.2	63.3	49.0	204
Grand Cape Mount	69.2	61.9	52.8	412	88.8	88.1	84.7	176
Grand Gedeh	70.5	66.4	57.5	167	77.0	79.5	67.4	82
Grand Kru	56.3	69.1	50.9	217	49.2	55.8	44.7	110
Lofa	65.1	76.2	63.5	447	48.8	55.4	40.9	219
Margibi	85.8	91.6	81.7	744	83.7	84.6	75.6	364
Maryland	70.3	76.6	66.0	257	73.3	74.5	62.4	123
Montserrado	80.9	83.9	74.6	3,675	78.0	83.0	72.4	1,582
Nimba	67.9	70.0	58.1	1,147	76.2	78.8	68.8	451
River Cess	77.7	81.0	71.6	135	89.6	92.3	87.6	64
River Gee	69.4	73.3	59.2	103	83.2	80.9	76.9	55
Sinoe	65.3	68.3	56.0	182	72.5	70.6	65.0	108
Education								
No education	67.5	73.3	60.1	3,066	62.0	62.6	52.6	533
Primary	73.2	77.2	66.1	2,875	64.9	69.6	56.9	1,202
Secondary and higher	83.7	86.0	76.9	3,298	83.1	86.3	77.7	2,383
Total	75.1	79.0	68.0	9,239	75.0	78.3	68.4	4,118

[1] Using condoms every time they have sexual intercourse.
[2] Partner who has no other partners.

Information on sexual behavior is important in designing and monitoring intervention programs to control the spread of HIV. The 2013 LDHS included questions on respondents' sexual partners during the 12 months preceding the survey and during their lifetime. Information was also collected on the use of condoms at respondents' last sexual intercourse. These questions are sensitive, and it is recognized that some respondents may have been

reluctant to provide information on recent sexual behavior. Results are shown in Table 15.1 for women and Table 15.2 for men.

Overall, 7 percent of women reported that they had two or more partners in the past 12 months. Among women who had two or more partners in the past 12 months, 20 percent reported using a condom at the last sexual intercourse. Among all female respondents who have ever had sexual intercourse, the mean number of partners in their lifetime is 4.3.

Table 15.1 Multiple sexual partners in the past 12 months: Women

Among all women age 15-49, the percentage who had sexual intercourse with more than one sexual partner in the past 12 months; among those having more than one partner in the past 12 months, the percentage reporting that a condom was used at last intercourse; and the mean number of sexual partners during her lifetime for women who ever had sexual intercourse, by background characteristics, Liberia 2013

	All women		Among women who had 2+ partners in the past 12 months:		Among women who ever had sexual intercourse[1]:	
Background characteristic	Percentage who had 2+ partners in the past 12 months	Number of women	Percentage who reported using a condom during last sexual intercourse	Number of women	Mean number of sexual partners in lifetime	Number of women
Age						
15-24	8.6	3,722	25.6	320	3.3	3,063
15-19	8.6	2,080	27.1	179	2.6	1,449
20-24	8.6	1,642	23.6	142	4.0	1,614
25-29	7.2	1,611	14.2	116	5.0	1,580
30-39	5.1	2,378	14.8	121	5.0	2,321
40-49	2.6	1,528	(2.1)	39	4.7	1,467
Marital status						
Never married	9.7	2,867	27.3	279	3.8	2,198
Married/living together	4.5	5,386	6.0	241	4.3	5,280
Divorced/separated/widowed	7.8	987	34.6	77	5.7	954
Residence						
Urban	8.1	5,633	22.9	459	4.8	5,060
Greater Monrovia	9.3	3,361	27.5	313	4.8	2,982
Other Urban	6.4	2,272	13.2	146	4.7	2,079
Rural	3.8	3,606	8.6	138	3.7	3,372
Region						
North Western	3.6	837	10.9	30	3.7	761
South Central	7.9	4,854	26.2	383	4.5	4,317
South Eastern A	2.9	483	(16.5)	14	4.3	468
South Eastern B	3.9	577	16.6	23	3.0	539
North Central	5.9	2,488	5.2	148	4.5	2,347
County						
Bomi	2.9	244	*	7	2.8	227
Bong	6.0	894	(3.0)	54	3.2	846
Gbarpolu	5.4	182	(23.6)	10	5.6	167
Grand Bassa	3.9	434	*	17	3.7	413
Grand Cape Mount	3.2	412	*	13	3.4	367
Grand Gedeh	4.6	167	*	8	5.8	163
Grand Kru	2.6	217	*	6	3.0	207
Lofa	1.4	447	*	6	2.2	415
Margibi	3.5	744	(15.0)	26	3.7	637
Maryland	4.2	257	(26.8)	11	2.7	234
Montserrado	9.2	3,675	27.5	340	4.8	3,267
Nimba	7.6	1,147	6.1	87	6.4	1,086
River Cess	2.1	135	*	3	3.7	130
River Gee	6.0	103	*	6	3.6	98
Sinoe	1.9	182	*	3	3.5	175
Education						
No education	3.8	3,066	9.1	116	3.9	2,961
Primary	6.3	2,875	12.6	182	4.3	2,420
Secondary and higher	9.1	3,298	28.0	299	4.7	3,050
Total	6.5	9,239	19.6	597	4.3	8,432

Note: Figures in parentheses are based on 25-49 unweighted cases. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.
[1] Means are calculated excluding respondents who gave non-numeric responses.

Table 15.2 Multiple sexual partners in the past 12 months: Men

Among all men age 15-49, the percentage who had sexual intercourse with more than one sexual partner; among those having more than one partner in the past 12 months, the percentage reporting that a condom was used at last intercourse; and the mean number of sexual partners during his lifetime for men who ever had sexual intercourse, by background characteristics, Liberia 2013

	All men		Among men who had 2+ partners in the past 12 months:		Among men who ever had sexual intercourse[1]:	
Background characteristic	Percentage who had 2+ partners in the past 12 months	Number of men	Percentage who reported using a condom during last sexual intercourse	Number of men	Mean number of sexual partners in lifetime	Number of men
Age						
15-24	12.1	1,587	32.4	193	6.8	967
15-19	4.4	890	(21.6)	39	3.6	359
20-24	22.1	696	35.2	154	8.7	608
25-29	23.5	673	31.4	158	13.1	598
30-39	22.6	1,044	15.6	236	16.7	908
40-49	17.1	814	16.0	139	17.0	687
Marital status						
Never married	11.6	1,749	41.1	203	8.2	1,102
Married/living together	21.3	2,218	15.9	472	15.5	1,918
Divorced/separated/widowed	33.7	151	(25.6)	51	17.8	139
Type of union						
In polygynous union	69.7	126	5.9	88	19.1	106
Not in polygynous union	18.4	2,092	18.2	385	15.3	1,813
Not currently in union	13.4	1,900	38.0	254	9.2	1,241
Residence						
Urban	15.7	2,413	29.7	379	11.8	1,811
Greater Monrovia	13.2	1,433	30.6	189	9.6	1,083
Other Urban	19.4	980	28.8	190	15.1	728
Rural	20.4	1,705	16.9	347	14.7	1,349
Region						
North Western	16.1	367	16.3	59	13.6	284
South Central	16.6	2,149	27.6	357	11.6	1,664
South Eastern A	21.8	254	21.8	55	19.4	203
South Eastern B	20.9	288	21.2	60	11.5	229
North Central	18.4	1,060	19.8	195	14.8	780
County						
Bomi	12.3	97	*	12	5.9	63
Bong	23.2	389	22.4	90	16.4	255
Gbarpolu	10.5	94	(11.4)	10	11.8	71
Grand Bassa	27.4	204	23.9	56	16.0	176
Grand Cape Mount	21.1	176	15.4	37	17.7	150
Grand Gedeh	15.6	82	(27.6)	13	22.9	70
Grand Kru	21.5	110	19.3	24	8.4	79
Lofa	6.6	219	*	14	6.6	149
Margibi	18.7	364	24.3	68	15.7	284
Maryland	17.6	123	(27.4)	22	11.9	107
Montserrado	14.8	1,582	29.4	233	10.0	1,203
Nimba	19.9	451	15.6	90	17.0	376
River Cess	29.5	64	21.1	19	16.0	55
River Gee	27.4	55	15.1	15	15.9	43
Sinoe	21.8	108	19.3	24	18.5	78
Education						
No education	17.7	533	11.8	95	13.6	433
Primary	14.1	1,202	16.2	170	12.9	771
Secondary and higher	19.4	2,383	28.7	462	13.0	1,955
Total	17.6	4,118	23.6	726	13.1	3,160

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

[1] Means are calculated excluding respondents who gave non-numeric responses.

Overall, 18 percent of men age 15-49 reported that they had two or more partners in the past 12 months. Among men who had two or more partners in the past 12 months, 24 percent reported using a condom at the last sexual intercourse. Among all male respondents age 15-49 who have ever had sexual intercourse, the mean number of partners in their lifetime is 13.1, more than three times that of women.

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