

SIERRA LEONE  
DEMOGRAPHIC  
AND HEALTH  
SURVEY  
2008

**Preliminary  
Report**

**Statistics Sierra Leone**



This report summarizes the findings of the 2008 Sierra Leone Demographic and Health Survey (SLDHS) carried out by Statistics Sierra Leone (SSL) in collaboration with the Ministry of Health and Sanitation (MOHS). The Government of Sierra Leone provided financial assistance in terms of funding and in kind contribution of government staff time, office space, and logistical support. Additional funding for the survey was provided by the U.S. Agency for International Development (USAID), the United Nations Population Fund (UNFPA), the United Nations Development Program (UNDP), the United Nations Children’s Fund (UNICEF) and the Department for International Development (DFID). Logistical support was also received from the United Nations High Commissioner for Refugees (UNHCR). Macro International provided technical assistance and medical supplies and equipment for the survey through the MEASURE DHS program, which is funded by USAID and designed to assist developing countries to collect data on fertility, family planning, and maternal and child health. The UNFPA Country Support Team also provided some backstopping support. The opinions expressed in this report are those of the authors and do not necessarily reflect the views of the donor organizations.

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## ACKNOWLEDGMENTS

The 2008 Sierra Leone Demographic and Health survey represents the continued efforts in Sierra Leone to obtain reliable and accurate data on fertility behaviour, contraceptive practice, and other reproductive health issues. The survey results are critical and timely as additional information is provided relating to child survival and knowledge regarding HIV/AIDS. Such wealth of information will no doubt be tremendously useful in charting future directions for the population and health programmes including monitoring, evaluation, and research.

The 2008 SLDHS overwhelmingly received active support from a large number of institutions and individuals who were instrumental in the implementation and its overall success. The support and active involvement of the officials of the Ministry of Health and sanitation are greatly acknowledged.

As a result of the adequate funding provided by Sierra Leone Government, UNFPA, UNDP, DFID, WHO, UNICEF USAID and technical support by Macro, a huge success was recorded and achieved.

I wish to acknowledge with much gratitude the tremendous support received from the Senior Management and staff of Statistics Sierra Leone, and in particular the Demographic and Social Statistics Division, Geographic Information System Division and the Data Processing Division. The unflinching support and leadership role provided by the resident DHS Consultant, during the implementation period of the survey, is worth mentioning. All the field staff who were engaged in data collection, and all the data processing staff, and coordinators, worked tirelessly and their efforts are hereby acknowledged.

Finally, my appreciation goes to all the households, men and women who were selected and who responded very well during the survey. Without their participation and support, this project would have been a failure. Their cooperation is therefore greatly appreciated.

Mr. David O. Carew  
Minister of Finance and Economic Development  
Ministerial Building  
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## PREFACE

One of the mandates of Statistics Sierra Leone (SSL) is to collect, collate, process, analyse, publish and disseminate population census and survey data at all levels. Statistics Sierra Leone has additional mandate to be the focal point for policy formulation and coordination of population activities in the country. By this mandate, Statistics Sierra Leone occupies the leadership position in the population sector and the major provider of information on the Sierra Leone population. The successful conduct of the 2008 Sierra Leone Demographic and Health Survey (SLDHS) and the production of the Preliminary Report, within a very short time frame, undoubtedly underscores Statistics Sierra Leone's leadership role.

The compilation of the report has been borne out of the need to meet the immediate yearnings of policy makers, programme implementers, and researchers, who require timely data for their day-to-day operations.

This preliminary report is a prelude to the final report, which will be published early in 2009. The report will contain more information on Demographic, Health and Social indicators that will enable us measure progress in the Sierra Leone Society. While considered provisional, the results here are not expected to differ significantly from those to be presented in the final report.

I commend the following for funding the survey:

1. Government of Sierra Leone
2. UNFPA
3. UNDP
4. UNICEF
5. USAID
6. UNHCR
7. DFID
8. WFP
9. WHO

It is my sincere hope that the end users will thoroughly acquaint themselves with this report and offer some feed back for the final report.

Dr. Richard Konteh  
Deputy Minister of Finance and Economic Development  
Youyi Building  
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## FOREWARD

It is generally acknowledged that meaningful development for any Nation can be achieved only when the Statistical information needed for the formulation of policies is readily available and properly documented.

Statistics Sierra Leone (SSL), being the agency charged with the responsibility of demographic data collection and analysis, has been relentless in the efforts to obtain reliable and up-to-date data for the country.

The Demographic and Health Survey (DHS) is an internationally acknowledged survey designed to obtain information on health issues that affect the management and development of the population. Although the objectives of the 2008 Sierra Leone Demographic and Health Survey (SLDHS) focus on the specific issues and trends that are peculiar to the Sierra Leone situation, the survey was designed in conformity with international standards.

The 2008 SLDHS, which is the first DHS conducted in Sierra Leone, is specifically aimed at obtaining and providing information on general fertility and fertility preferences, use and knowledge of family planning methods, maternal and childhood health, maternal and childhood mortality, breast feeding practices, nutrition, HIV/AIDS and other health issues.

Although the 2008 SLDHS estimates the national total fertility rate (TFR), at 5.1 children which is still relatively high compared to the desired targets, the reported increase in the knowledge of other health issues among the population offers a ray of hope.

The 2008 SLDHS was funded by the Sierra Leone government, UNFPA, UNDP, UNICEF, DFID, WHO, USAID, UNHCR while MACRO INTERNATIONAL, UNFPA Country Support Team provided technical backstopping. The Ministry of Health and Sanitation and other stake holders also assisted in various ways to ensure the overall success of the project. The efforts of all these organizations are deeply appreciated by Statistics Sierra Leone. It is hoped that users at all levels will find the report useful.

Information about the DHS program may be obtained from MEASURE DHS, Macro International Inc., 11785 Beltsville Drive, Suite 300, Calverton, MD 20705, U.S.A. (Telephone: 1-301-572-0200; Fax: 1-301-572-0999; e-mail: [reports@macrointernational.com](mailto:reports@macrointernational.com)).

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## I. BACKGROUND

The 2008 Sierra Leone Demographic and Health Survey (SLDHS) is a nationally representative sample survey designed to provide information on population and health issues in Sierra Leone. This is the first Demographic and Health Survey conducted in Sierra Leone. The SLDHS was carried out by Statistics Sierra Leone (SSL) in collaboration with the Ministry of Health and Sanitation. The 2008 SLDHS was funded by the Sierra Leone government, UNFPA, UNDP, UNICEF, DFID, WHO, USAID, UNHCR. Macro International Inc. provided technical support for the survey through the MEASURE DHS project. MEASURE DHS is sponsored by the United States Agency for International Development (USAID) to assist countries worldwide in obtaining information on key population and health indicators.

The purpose of the SLDHS is to collect national- and regional-level data on fertility and contraceptive use, marriage and sexual activity, fertility preferences, breastfeeding practices, nutritional status of women and young children, childhood and maternal mortality, maternal and child health, female genital cutting, awareness and behaviour regarding HIV/AIDS and other sexually transmitted infections, adult health and other issues. The survey obtained detailed information on these topics from women of reproductive age and, for certain topics, from men as well. Data collection, processing and editing lasted from mid-April to late November 2008, using a nationally representative sample of 7,758 households.

The 2008 SLDHS was designed to provide data monitoring the population and health situation in Sierra Leone. The survey findings provide estimates for a variety of demographic and health indicators. The 2008 SLDHS results are intended to provide the information needed to improve existing programmes and design new strategies for improving the health of the people of Sierra Leone. The 2008 SLDHS also contributes to the growing international database of demographic and health indicators.

This preliminary report presents the results of selected key indicators from the 2008 SLDHS. A comprehensive report of the findings of the survey will be published in 2009. While considered provisional, the results here are not expected to differ significantly from those to be presented in the final report.

## II. SURVEY IMPLEMENTATION

### 2.1 Sample Design

The SLDHS sample was designed to provide most of the indicators for the country as a whole, for urban and rural areas separately, and for each of four regions that were formed by grouping the 14 districts. The regional groups are as follows:

Eastern: Kailahun, Kenema, Kono districts  
Northern: Bombali, Kambia, Koinadugu, Port Loko, Tonkolili districts  
Southern: Bo, Bonthe, Moyamba, Pujehun districts  
Western: Western Area Urban and Western Area Rural districts

A representative probability sample of households was selected for the 2008 SLDHS sample. The sample was selected in two stages. In the first stage, 353 clusters were selected from a list of enumeration areas in the master sample frame that was designed for the 2004 Sierra Leone Population and Housing Census (SSL, 2006). In the second stage, a complete listing of households was carried out in each selected cluster. Twenty-two households were then systematically selected from each cluster for participation in the survey. This design resulted in a final sample of 7,758 households.

All women age 15-49 who were either permanent residents of the households or visitors present in the household on the night before the survey were eligible to be interviewed. In addition, all men age 15-59 in half of the households selected for the survey were eligible to be interviewed if they were either permanent residents or visitors present in the household on the night before the survey. Height and weight measurements of female respondents and children under the age of five years were done only in the households selected for the male survey. Eligible adults and children age 6 to 59 months in the households selected for the male survey were tested for anaemia, and women and men were also asked to provide blood samples for HIV testing. The blood samples were dried and transported to the National Reference Laboratory of the Ministry of Health and Sanitation at Lakka where they were deposited and then tested for the Human Immunodeficiency Virus (HIV).

### 2.2 Questionnaires

Three types of questionnaires were administered for the 2008 SLDHS: Household questionnaire, Women's questionnaire and Men's questionnaire. The contents of these questionnaires were based on the model questionnaires developed by the MEASURE DHS programme for use in countries with low levels of contraceptive use. SSL in collaboration with other stakeholders and Macro staff held a series of meetings to adapt the questionnaires to suit the situation in Sierra Leone and as such modified the DHS model questionnaires to reflect relevant issues in population, family planning, HIV/AIDS, and other health issues in Sierra Leone. Given that there are dozens of local languages in Sierra Leone, 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' to generate a list of key words and translated into the main languages using Roman script. A list with the key words was provided to each interviewer with suggestions for using it during data collection to standardize the translation; this aspect was emphasized during the main training. The household and individual questionnaires were pretested in February 2008.

The household questionnaire was used to list all the usual members and visitors in the selected households. Some basic information was collected on the characteristics of each person listed, including age, sex, education, and relationship to the head of household. The main purpose of the household questionnaire was to identify women and men who were eligible for the individual interview. 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 and roof, ownership of various durable goods and ownership and use of mosquito nets. In addition, this questionnaire was also used to record height and weight measurements of women age 15-49 and children under the age of 5 years, and women's and men's consent to volunteer to give blood samples. The HIV and anaemia testing procedures are described in detail in the next section.

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

- Background characteristics (education, residential history, media exposure, etc.)
- Reproductive history and child mortality
- Knowledge and use of family planning methods
- Fertility preferences
- Antenatal and delivery care
- Breastfeeding and infant feeding practices
- Vaccinations and childhood illnesses
- Marriage and sexual activity
- Woman's work and husband's background characteristics
- Infant and child feeding practices
- Awareness and behaviour about AIDS and other sexually transmitted infections(STIs)
- Other health issues
- Female genital cutting
- Adult mortality including maternal mortality

The Men's questionnaire was administered to all men age 15-59 living in every second household in the 2008 SLDHS sample. The Men's questionnaire collected much the same information found in the Women's questionnaire, but was shorter because it did not contain questions on reproductive history or maternal and child health nutrition.

## **2.3 Anaemia and HIV Testing**

### **2.3.1 Haemoglobin Testing**

Haemoglobin testing is the primary method of anaemia diagnosis. Reliable measures are obtained using the HemoCue system (Hb 201+). In half of households selected for the 2008 SLDHS survey, men age 15-59, women age 15-49 and children age 6 to 59 months were tested for anaemia. A consent statement was read to all eligible respondents or to the parent or responsible adult for children and young women age 15-17. This statement explained the purpose of the test, informed them that the results would be made available as soon as the test was completed, and requested permission for the test to be carried out.

Before taking any blood, the finger was wiped with an alcohol swab and allowed to air dry. Then, the palm side of the end of a finger was punctured with a sterile, nonreusable, self-retractable lancet. A drop<sup>1</sup> of blood was collected in a HemoCue microcuvette, which also serves as a measuring device, and placed in a HemoCue photometer where the results are displayed. An informative brochure was given to each household explaining what anaemia is, the symptoms, and measures people can take to prevent anaemia. Each person whose haemoglobin level was lower than the recommended cut-off point was given a written referral recommending immediate follow up with a health professional.

### **2.3.2 HIV Testing**

All eligible women age 15-49 and men age 15-59 (in every second household) who were interviewed were asked to voluntarily provide three drops of blood for HIV testing. The protocol for the blood specimen collection and analysis was based on the anonymous linked protocol developed by DHS and approved by Macro International's Institutional Review Board. The protocol for the SLDHS was also reviewed and approved by the Sierra Leone National Ethics Committee on Bio-Medical Research. The protocol allows for the merging of the HIV results with the socio-demographic data collected in the individual questionnaires, provided that the information that could potentially identify an individual is destroyed before the linking is effected. This requires that identification codes be deleted from the data file and that the back page of the Household Questionnaire that contains the bar code labels and names of respondents be destroyed prior to merging the HIV results with the individual data file.

For the purposes of blood sample collection, in order to obtain informed consent for blood taking for HIV testing, interviewers explained the procedures, the confidentiality of the data, the fact that test results could not be linked or made available to the subject, and informed respondents how they could establish their status through VCT services. Interviewers then collected a dried blood spot sample on a filter paper card from a finger prick using a single-use, spring-loaded, sterile lancet. Each blood sample was given a bar code label, with a duplicate label attached to the Household questionnaire on the line showing consent for that respondent. A third copy of the same bar code label was affixed to a Blood Sample Transmittal Form in order to track the blood samples from the field to the laboratory. Filter papers were dried overnight in a plastic drying box, after which they were packed in individual ziploc bags with desiccants and a humidity indicator card and placed in a larger airtight bag for each sample point. Blood samples were periodically collected in the field along with the completed questionnaires and transported to SSL headquarters in Freetown for logging in, after which they were taken to the National Reference Laboratory of the Ministry of Health and Sanitation at Lakka Hospital for HIV testing.

At the laboratory, the bar code labels on the dried blood spot samples were scanned into the computer using a program specially developed by Macro that pre-assigns to each sample a sequential number for ease in tracking. The blood spots were kept refrigerated or frozen depending on how long it would be until they could be tested. After the samples were allowed to attain room temperature, a circle (a completely filled and well saturated spot without blood clot) of at least 6.3 mm in diameter was taken from each filter paper using a hole punch. Each blot was placed into its pre-assigned well in the elution plate that contained 200 µl of phosphate buffered saline (PBS, pH 7.3-7.4) and left in the refrigerator overnight at 2-8° C. These eluates were then diluted and tested with Vironostika HIV Uniform II Plus O (BioMerieux). All positive samples and 10 percent of negative samples were then tested with Murex HIV 1.2.O test kit (Abbott). Finally, any discordant samples were tested on Western Blot 2.2 (Abbott) to resolve the discrepancies.

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<sup>1</sup>From consented adults the blood was first collected for the HIV test, followed by the anaemia test.

Prior to the survey, the National Reference Laboratory (NRL) had some experience using its ELISA machine for testing for HIV. Macro supplied the NRL staff with necessary equipment and reagents. Macro consultants visited and worked with NRL staff and trained seven laboratory technicians in how to run the various tests and use the software.

Although the plan is to eventually merge the HIV test results with the individual questionnaire records, this step cannot be carried out until the bar codes on the questionnaires have been destroyed and the cluster numbers scrambled, which will take some time. Consequently, for this preliminary report, the HIV prevalence results are available only by age, sex, residence, region and education.

## **2.4 Training of Field Staff**

Two hundred qualified candidates were recruited for training by Statistics Sierra Leone to serve as supervisors, field editors, interviewers, bio-marker technicians and quality control personnel. Efforts were made to recruit high-calibre personnel nationwide to ensure appropriate linguistic and cultural diversity. The main survey training was conducted by SSL during a four-week period from 17 March to 15 April, 2008. The training was conducted by senior DHS staff from the SSL who participated in the pretest, with support from UNFPA, UNICEF, the Ministry of Health and Sanitation, and Macro international. Training consisted mainly of lectures, demonstrations, practice interviewing in small groups and examinations. The last week of training consisted largely of instructions on how to take anthropometric measurements and procedures for anaemia and HIV testing (how to administer informed consent, how to take blood spot samples, how to dry the filter papers, and how to pack them up the next morning). During the final week of training, participants had two days of field practice. The final day of training consisted of a session with the team supervisors and field editors to train them on how to supervise fieldwork and how to edit completed questionnaires.

## **2.5 Main Fieldwork (Data Collection)**

Fieldwork for the 2008 SLDHS took place over a two-month period from the end of April to the end of June, 2008. Twenty-four teams carried out the data collection. Each team consisted of a team supervisor, one field editor, one bio-marker technician, two female interviewers and one male interviewer.

Senior DHS technical staff visited teams regularly to review the work and monitor data quality. Eight SSL staff and members of the Technical Committee coordinated fieldwork activities and visited the teams at regular intervals to monitor the work. The SSL Director in charge of the project, Macro staff and the DHS resident consultant also monitored fieldwork in addition to SSL top management and the UN interagency team.

## **2.6 Data Processing**

The processing of the SLDHS results began shortly after fieldwork commenced. Completed questionnaires were returned regularly from the field to SSL headquarters in Freetown, where they were entered and edited by data processing personnel recruited and trained for this task. The data processing personnel included two supervisors, five office editors, fifteen data entry editors, twenty three data entry operators and four secondary editors. Data were entered using the CSPro computer package. All data were entered twice (100 percent verification). The concurrent processing of data was a distinct advantage for data quality, since SSL was able to advise field teams of errors detected during data entry. The data entry and editing phase of the survey was completed in October 2008.

### III. RESULTS OF THE SURVEY INTERVIEWS

#### 3.1 Response Rates

Table 1 shows response rates for the 2008 SLDHS. A total of 7,758 households were selected in the sample, of which 7,461 were found occupied at the time of the fieldwork. The shortfall is largely due to households that were away for an extended period of time and structures that were found to be vacant or destroyed. Of the existing households, 7,284 were successfully interviewed, yielding a household response rate of 98 percent.

In the households interviewed in the survey, a total of 7,845 eligible women were identified, of whom 7,374 were successfully interviewed yielding a response rate of 94 percent. With regard to the male survey results, 3,541 eligible men were identified, of whom 3,280 were successfully interviewed, yielding a response rate of 93 percent. The response rates are lower in the urban than rural sample, especially for men.

The principal reason for non-response among both eligible men and women was the failure to find individuals at home despite repeated visits to the household, followed by refusal to be interviewed. The substantially lower response rate for men reflects the more frequent and longer absence of men from the households.

#### 3.2 Characteristics of Respondents

The distribution of women age 15-49 and men age 15-59 years by background characteristics are shown in Table 2. The weighted and unweighted numbers are also shown. Unweighted numbers indicate the number of individuals actually interviewed in the particular category, while weighted numbers show the results so that they are in proportion to the national level.

Table 2 shows that the proportions of both women and men generally decline with increasing age, reflecting the comparatively young age structure of the Sierra Leonean population. The proportion of women age 25-29 is notably larger than the proportion of men the same age (22 and 14 percent, respectively).

Seventy-five percent of women are married or living in an informal marital union, compared with 63 percent of men. Because men marry later in life than women, over one-third of surveyed men (33 percent) have never married, compared with 19 percent of the women. On the other hand, women are slightly more likely than men to be widowed (3 and 1 percent, respectively), and about 3 percent of respondents are divorced or separated.

Result	Residence		Total
	Urban	Rural	
<b>Household interviews</b>			
Households selected	3,184	4,574	7,758
Households occupied	3,068	4,393	7,461
Households interviewed	2,956	4,328	7,284
Household response rate	96.3	98.5	97.6
<b>Individual interviews: women</b>			
Number of eligible women	3,385	4,460	7,845
Number of eligible women interviewed	3,160	4,214	7,374
Eligible women response rate	93.4	94.5	94.0
<b>Individual interviews: men</b>			
Number of eligible men	1,559	1,982	3,541
Number of eligible men interviewed	1,403	1,877	3,280
Eligible men response rate	90.0	94.7	92.6

Table 2 Background characteristics of respondents

Percent distribution of women and men by background characteristics, Sierra Leone 2008

Background characteristic	Weighted percent of women	Number of women		Weighted percent of men	Number of men	
		Weighted number	Unweighted number		Weighted number	Unweighted number
<b>Age</b>						
15-19	16.2	1,198	1,263	16.0	526	549
20-24	16.1	1,186	1,195	12.3	403	414
25-29	22.3	1,643	1,578	13.6	446	440
30-34	14.1	1,043	1,066	11.4	373	380
35-39	15.3	1,131	1,094	16.0	525	512
40-44	8.8	652	658	10.2	336	337
45-49	7.0	520	520	10.2	335	329
50-54	na	na	na	5.8	189	181
55-59	na	na	na	4.5	147	138
<b>Marital status</b>						
Never married	19.0	1,399	1,531	33.3	1,093	1,129
Married	65.0	4,794	4,677	58.1	1,907	1,851
Living together	9.9	732	696	5.2	169	182
Divorced/separated	3.5	256	269	2.8	93	99
Widowed	2.6	194	201	0.5	17	19
<b>Residence</b>						
Urban	36.0	2,655	3,160	37.2	1,221	1,403
Rural	64.0	4,719	4,214	62.8	2,059	1,877
<b>Region</b>						
Eastern	18.0	1,325	1,759	18.7	615	818
Northern	40.7	3,001	2,165	38.5	1,264	904
Southern	20.9	1,542	1,835	21.8	714	857
Western	20.4	1,506	1,615	21.0	688	701
<b>Education</b>						
No education	65.9	4,860	4,609	50.1	1,643	1,535
Primary	13.0	960	1,004	13.8	452	476
Junior secondary	12.3	905	1,007	16.0	524	548
Senior secondary	6.3	467	551	15.1	496	532
Vocational/commercial/ nursing/technical/teaching	2.0	145	159	3.3	108	112
Higher	0.5	36	44	1.8	58	77
<b>Religion</b>						
Christian	22.0	1,625	1,933	21.4	703	811
Islam	76.8	5,665	5,370	78.1	2,560	2,450
Other	1.2	83	71	0.5	16	19
<b>Ethnic group</b>						
Temne	34.8	2,564	2,096	35.8	1,175	949
Mende	31.6	2,331	2,721	31.1	1,020	1,205
Kriole	1.6	119	151	1.8	58	69
Mandingo	1.8	131	169	2.2	73	88
Loko	2.3	168	177	2.1	68	68
Sherbro	1.4	103	138	1.0	32	44
Limba	8.1	594	556	6.8	224	216
Kono	4.9	359	435	4.6	150	187
Other Sierra Leone	12.9	952	874	13.8	453	430
Other non Sierra Leone	0.6	44	48	0.7	24	20
Total	100.0	7,374	7,374	100.0	3,280	3,280

Note: Education categories refer to the highest level of education attended, whether or not that level was completed. Total includes 9 women with information missed on ethnic group  
na = Not applicable

The survey shows that six in ten women and men live in rural areas. About 40 percent of the respondents are in the Northern Region, while the other regions each account for about 20 percent of respondents.

Men are more likely than women to be educated. For example, 66 percent of women have never been to school, compared with 50 percent of men. Likewise, men are twice as likely as women to have attended senior secondary school (15 and 6 percent, respectively).

Temne and Mende are the largest ethnic groups in Sierra Leone, where approximately 35 percent of respondents are Temne and about 31 percent are Mende. Nearly eight percent of respondents are Limba and 5 percent are Kono. About 2 percent each are Kriole, Mandingo and Loko. About 15 percent of the population belongs to other ethnic groups. Slightly more than seven in ten respondents are Muslims, while about two in ten are Christian.

### 3.3 Fertility

Fertility data were collected in the survey by asking each of the women interviewed for a history of her live births. Information obtained on each of the woman’s births included the month and year of the birth. These data are used to calculate two of the most widely used measures of current fertility, the total fertility rate (TFR) and its component age-specific fertility rates.

As indicated in Table 3, the total fertility rate is 5.1. This means that on average, a Sierra Leonean woman who is at the beginning of her childbearing years will give birth to 5.1 children by the end of her reproductive period, if fertility levels remain constant at the level observed in the three-year period before the survey (roughly 2006-2008).

As expected, rural women have two more children than their counterparts in urban areas. The TFR in rural areas (5.8 births) is considerably higher than the rate in urban areas (3.8 births). The results also show that the rates of childbearing are higher in rural areas for all age groups of women (Figure 1). Although the fertility level peaks at age group 20-24 years for rural areas, women in urban areas reach their peak in childbearing five years later at age 25-29 years. This could suggest that births are being delayed in the urban areas, probably due to more extensive use of family planning methods. The greatest absolute urban-rural difference in ASFR (91 births per woman) is in the 15-19 age group, followed by the 35-39 age group (68 births per woman).

Table 3 Current fertility

Age-specific and cumulative fertility rates and the crude birth rate for the three years preceding the survey, by urban-rural residence, Sierra Leone 2008

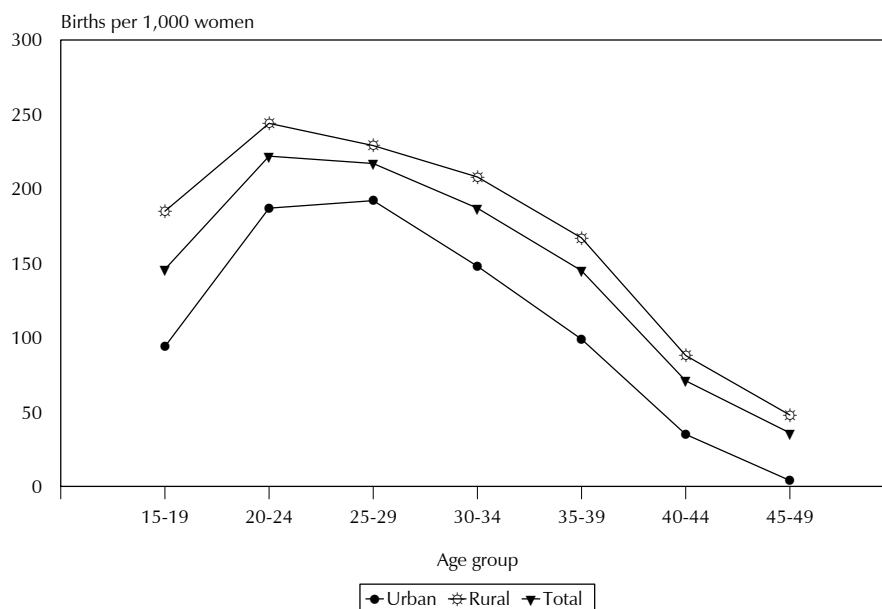
Age group	Residence		Total
	Urban	Rural	
15-19	94	185	146
20-24	187	244	222
25-29	192	229	217
30-34	148	208	187
35-39	99	167	145
40-44	35	88	71
45-49	4	48	36
TFR	3.8	5.8	5.1
CBR	27.3	33.4	31.5

Note: Rates for age group 45-49 may be slightly biased due to truncation.

TFR: Total fertility rate for ages 15-49, expressed per woman

CBR: Crude birth rate, expressed per 1,000 population

**Figure 1 Age-Specific Fertility Rates by Urban-Rural Residence**



SLDHS 2008

### 3.4 Family Planning

The 2008 SLDHS collected information on knowledge and use of contraception. To obtain these data, respondents were first asked to name all of the methods that they had heard about. For methods not mentioned spontaneously, a description of the method was read and the respondents were asked if they had heard of the method. For each method named or recognized, respondents were asked if they had ever used the method. Finally, women were asked if they (or their partner) were currently using a method. For analytical purposes, contraceptive methods are grouped into two types in the table: modern and traditional. Modern methods include female sterilization, the pill, IUD, injectables, male condom, and lactational amenorrhoea method (LAM). Traditional methods include periodic abstinence, withdrawal, and folk methods.

Table 4 shows the level and key differentials in the current use of contraception by method among currently married women age 15-49. The 2008 SLDHS found that only 8 percent of currently married women are using some method of contraception. The majority of contraceptive users rely on a modern method (7 percent). The most commonly used method is injectables (3 percent), followed by the pill (2 percent), folk methods (1 percent), and male condom (less than 1 percent).

Contraceptive use increases with age, peaking at 12 percent among women in the 40-44 age group and then falling to 7 percent among women age 45-49. In general, women do not begin to use contraception until they have had at least one child.

There is a substantial difference in the use of contraception among married women in urban and rural areas (16 and 5 percent, respectively); urban women are markedly more likely to be using a modern method than rural women (14 and 4 percent, respectively). There is considerable variation in contraceptive use by region. Women in the Northern Region are the least likely to use a modern method of contraception (3 percent), while those in the Western Region are most likely to use modern methods (19 percent).

Table 4 Current use of contraception

Percent distribution of currently married women by contraceptive method currently used, according to background characteristics, Sierra Leone 2008

Background characteristic	Any method	Any modern method	Modern method						Any traditional method	Traditional method			Not currently using	Total	Number of women
			Female sterilization	Pill	IUD	Injectables	Male condom	LAM		Periodic abstinence	Withdrawal	Folk method			
<b>Age</b>															
15-19	1.2	1.2	0.0	1.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	98.8	100.0	359
20-24	5.5	4.8	0.0	1.7	0.1	1.5	0.6	0.8	0.7	0.2	0.0	0.5	94.5	100.0	812
25-29	7.7	6.8	0.0	2.1	0.2	2.7	0.8	1.0	0.8	0.1	0.0	0.7	92.3	100.0	1,429
30-34	9.8	7.7	0.0	3.5	0.2	2.9	0.4	0.6	2.1	0.2	0.2	1.7	90.2	100.0	899
35-39	10.9	9.2	0.0	3.3	0.3	4.8	0.4	0.5	1.6	0.4	0.0	1.2	89.1	100.0	1,022
40-44	11.7	8.8	0.0	2.7	0.7	3.9	0.9	0.6	2.9	0.2	0.0	2.7	88.3	100.0	572
45-49	6.6	4.1	0.2	0.3	0.2	2.6	0.5	0.4	2.4	0.0	0.0	2.4	93.4	100.0	431
<b>Residence</b>															
Urban	16.2	14.2	0.0	5.6	0.7	5.6	1.5	0.8	2.0	0.7	0.1	1.2	83.8	100.0	1,561
Rural	5.0	3.8	0.0	1.1	0.1	1.8	0.2	0.6	1.2	0.0	0.0	1.2	95.0	100.0	3,965
<b>Region</b>															
Eastern	6.2	5.4	0.1	2.7	0.0	1.8	0.4	0.3	0.8	0.1	0.1	0.6	93.8	100.0	1,028
Northern	4.4	3.1	0.0	0.7	0.1	1.9	0.4	0.0	1.3	0.0	0.0	1.3	95.6	100.0	2,434
Southern	8.4	6.8	0.0	2.4	0.1	2.3	0.1	1.9	1.6	0.1	0.0	1.5	91.6	100.0	1,206
Western	21.2	18.6	0.0	6.6	1.1	7.7	2.1	1.1	2.5	0.9	0.1	1.5	78.8	100.0	858
<b>Education</b>															
No education	5.7	4.4	0.0	1.3	0.1	2.3	0.2	0.5	1.3	0.0	0.0	1.3	94.3	100.0	4,280
Primary	10.8	9.5	0.0	4.2	0.0	3.4	0.3	1.5	1.4	0.1	0.0	1.3	89.2	100.0	601
Secondary	21.8	19.4	0.0	7.4	1.1	6.3	3.3	1.3	2.4	1.0	0.4	1.0	78.2	100.0	560
More than secondary	25.5	20.2	0.0	9.4	2.2	4.3	4.3	0.0	5.3	5.3	0.0	0.0	74.5	100.0	84
<b>Number of living children</b>															
0	1.8	1.4	0.0	1.3	0.0	0.1	0.0	0.0	0.4	0.2	0.0	0.2	98.2	100.0	516
1-2	6.9	6.1	0.0	2.6	0.2	1.6	0.8	0.8	0.8	0.3	0.1	0.4	93.1	100.0	2,136
3-4	9.2	7.9	0.0	2.8	0.5	3.5	0.5	0.6	1.3	0.2	0.1	1.1	90.8	100.0	1,793
5+	12.3	8.7	0.0	1.7	0.1	5.7	0.5	0.7	3.6	0.0	0.0	3.5	87.7	100.0	1,080
Total	8.2	6.7	0.0	2.3	0.2	2.9	0.6	0.7	1.5	0.2	0.0	1.2	91.8	100.0	5,525

Note: If more than one method is used, only the most effective method is considered in this tabulation.  
LAM = Lactational amenorrhoea method

As expected, contraceptive use, particularly the use of modern methods, increases with educational attainment. Women with higher than secondary education are twice as likely to use a modern method as women with primary education (20 percent compared with 10 percent), and are five times as likely to use a modern method as women with no education (4 percent).

The survey results indicate a slight increase in contraceptive use over the past three years. The contraceptive prevalence rate has increased from 5 percent among currently married women age 15-49 in the 2005 MICS to 8 percent in the 2008 SLDHS. The increase is mainly due to a greater use of modern methods (4 percent in the 2005 MICS compared with 7 percent in the 2008 SLDHS) (SSC/UNICEF, 2007).

### 3.5 Fertility Preferences

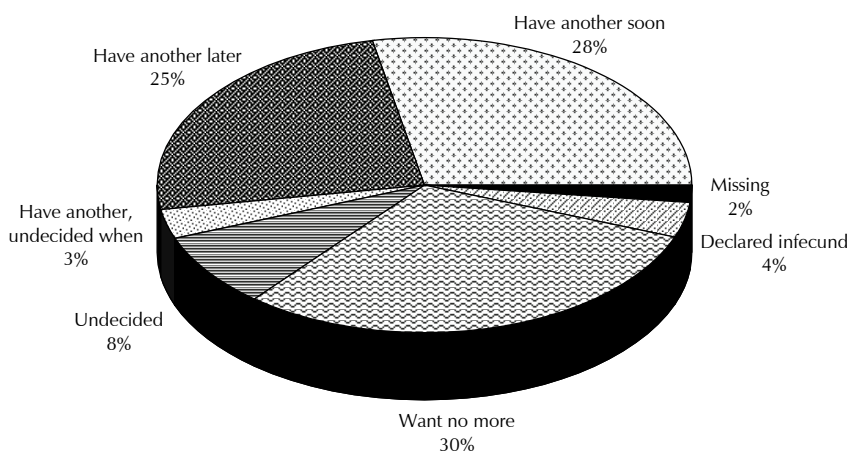
Several questions were asked in the survey concerning women's fertility preferences. These questions included: a) whether the respondent wanted another child, and b) if so, when she would like to have the next child. The answers to these questions allow for the estimation of the potential demand for family planning services either to limit or space births.

Table 5 and Figure 2 show there is considerable desire among Sierra Leonean women to control the timing and number of births. Among currently married women, 25 percent would like to wait for two years or more for the next birth and almost one-third (30 percent) do not want to have another child. Twenty-eight percent of married women would like to have a child soon (within two years). The remaining women are uncertain about their fertility desires or unable to get pregnant (infecund).

Desire for children	Number of living children <sup>1</sup>							Total
	0	1	2	3	4	5	6+	
Have another soon <sup>2</sup>	74.1	46.1	32.3	24.4	15.3	6.5	3.3	28.0
Have another later <sup>3</sup>	5.4	34.8	35.5	29.3	20.3	13.0	6.4	24.5
Have another, undecided when	1.6	5.0	4.2	3.6	2.6	1.3	1.0	3.2
Undecided	7.4	6.0	9.5	8.3	11.1	8.4	6.7	8.3
Want no more	2.1	4.2	13.5	29.2	45.2	62.8	76.5	30.3
Sterilized <sup>4</sup>	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Declare infecund	6.2	2.8	3.4	2.8	4.2	5.3	3.9	3.8
Missing	3.1	1.0	1.6	2.4	1.2	2.7	2.1	1.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of women	395	971	1,171	1,011	849	530	598	5,525

<sup>1</sup> Includes current pregnancy. For pregnant women the desire for children refers to a subsequent child, not the child currently being expected.  
<sup>2</sup> Wants next birth within 2 years  
<sup>3</sup> Wants to delay next birth for 2 or more years  
<sup>4</sup> Includes both male and female sterilization

**Figure 2 Fertility Preferences among Married Women**



Note: Figures may not add to 100 because of rounding.

SLDHS 2008

Fertility preferences are closely related to the number of living children a woman has. The vast majority of currently married women without a child (74 percent) would like to have one soon. Women show greater interest in controlling the pace of childbearing once they have a child. One-third of women with one child want to delay their next birth. Interest in controlling the number of births grows rapidly as the number of children increases; the proportion wanting no more children rises from 2 percent among married women with one child to 77 percent of women with six or more children.

The National Population Policy suggests a maximum family size of four children (Ministry of Development, 1993). The 2008 SLDHS results indicate that 45 percent of married women already having four children want no more children. Implicitly, 55 percent of married women would want more children in the future. These patterns could guide the implementation of family planning and similar fertility control programmes.

### 3.6 Infant and Child Mortality

The infant and under-five mortality rates serve as a major indicator of a country's progress regarding the status of the quality of life. One of the Millennium Development Goals (MDGs) is to reduce infant and under-five mortality. This section presents estimates of the levels and trends in infant and child mortality.

The mortality rates were estimated from data collected in the birth history section of the Women's questionnaire. In the absence of a complete vital registration system, this information is regarded as being capable of providing reliable estimates of child mortality.

The mortality rates represented are age-specific since the mortality pattern of children changes with age. The child mortality rates represented are defined as follows:

- Neonatal mortality (NN): the probability of dying within the first month of life
- Post-neonatal mortality (PNN): the difference between infant and neonatal mortality
- Infant mortality ( ${}_1q_0$ ): the probability of dying during the first year of life
- Child mortality ( ${}_4q_1$ ): the probability of dying between exact age one and five
- Under-five mortality ( ${}_5q_0$ ): the probability of dying between birth and exact age five.

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.

Table 6 presents infant and under-five mortality rates from the 2008 SLDHS for the three five-year periods before the survey. The level of under-five mortality was 140 deaths per 1,000 births during the five-year period before the survey, implying that almost 1 in every 7 children born in Sierra Leone during the period died before reaching their fifth birthday. The infant mortality rate recorded in the survey was 89 deaths per 1,000 live births.

Years preceding the survey	Neonatal mortality (NN)	Postneonatal mortality <sup>1</sup> (PNN)	Infant mortality ( ${}_1q_0$ )	Child mortality ( ${}_4q_1$ )	Under-five mortality ( ${}_5q_0$ )
0-4	36	53	89	56	140
5-9	61	71	132	73	195
10-14	51	70	120	80	190

<sup>1</sup> Computed as the difference between the infant and neonatal mortality rates

The data imply that there has been a progressive decline in childhood mortality over the past decade in Sierra Leone. For example, under-five mortality decreased from 190 deaths per 1,000 births 10-14 years before the survey to 140 for the 5-year period before the survey.

### 3.7 Maternal Care

Proper care during pregnancy and delivery are important for the health of both the mother and the baby. High quality and comprehensive coverage of maternal health care is the basis of a functional public health system and also a prerequisite for achieving the related Millennium Development Goals. In the SLDHS, women who had given birth in the five years preceding the survey were asked a number of questions about maternal and child health care. For the last live birth in that period, mothers were asked whether they had obtained antenatal care during the pregnancy and whether they had received tetanus toxoid injections while pregnant. For each birth in the same period, mothers were also asked what type of assistance they received at the time of delivery. Table 7 presents the results of key maternity care indicators.

Table 7 Maternal care indicators						
Percentage of women who had a live birth in the five years preceding the survey who received antenatal care from a health professional for the last live birth and whose last live birth was protected against neonatal tetanus, and among all live births in the five years before the survey, percentage delivered by a health professional and percentage delivered in a health facility, by background characteristics, Sierra Leone 2008						
Background characteristic	Percentage with antenatal care from a health professional <sup>1</sup>	Percentage whose last live birth was protected against neonatal tetanus <sup>2</sup>	Number of women	Percentage delivered by a health professional <sup>1</sup>	Percentage delivered in a health facility	Number of births
<b>Mother's age at birth</b>						
<20	88.3	77.5	669	44.8	26.9	977
20-34	86.8	78.2	2,780	43.1	24.8	4,002
35-49	85.8	79.9	654	36.6	20.8	832
<b>Residence</b>						
Urban	93.9	87.0	1,183	66.9	39.5	1,585
Rural	84.1	74.9	2,920	33.2	19.0	4,226
<b>Region</b>						
Eastern	89.6	87.0	809	50.1	28.5	1,170
Northern	81.9	68.4	1,869	27.4	15.5	2,623
Southern	90.3	86.4	783	53.2	33.6	1,187
Western	94.1	86.6	642	63.7	35.2	831
<b>Mother's education</b>						
No education	84.5	75.3	3,051	35.7	19.9	4,443
Primary	92.7	85.4	515	55.9	33.7	713
Secondary	94.6	88.4	482	70.9	43.9	592
More than secondary	98.5	92.5	55	94.4	70.7	63
Total	86.9	78.4	4,103	42.4	24.6	5,811
<sup>1</sup> Doctor, nurse, midwife, or MCH aid <sup>2</sup> Includes mothers with two injections during the pregnancy for the 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 prior to the last live birth						

#### 3.7.1 Antenatal Care

Almost nine in ten mothers (87 percent) reported seeing a health professional—a doctor, nurse, midwife and MCH aid<sup>2</sup>— at least once for antenatal care for the most recent birth in the five-year period before the survey.

<sup>2</sup> MCH aid (MCHA) is a health professional but is not a skilled birth attendant. There are plans discussed by the Ministry of Health and Sanitation to upgrade the MCHAs to auxiliary midwives who will be able to perform the signal functions that address obstetric complications.

Overall, antenatal coverage is uniformly high and does not vary significantly by background characteristics. Nevertheless, coverage is higher in urban areas (94 percent) than in rural areas (84 percent). Across regions, the proportion of mothers reporting they received antenatal care from a health professional is lowest in the Northern Region (82 percent) and highest in the Western Region (94 percent). As the mother's educational level rises, so does the likelihood that she will see a health professional for care during pregnancy. In fact, the antenatal care coverage rises from 84 percent among women with no education to almost universal (99 percent) among those with higher than secondary education.

### **3.7.2 Tetanus Toxoid Coverage**

Tetanus toxoid injections are given during pregnancy to prevent neonatal tetanus which continues to be an important cause of infant deaths. At least two booster doses of Tetanus Toxoid injections should be given during pregnancy to prevent neonatal tetanus. Table 7 indicates that tetanus toxoid coverage is high among pregnant women in Sierra Leone, with about eight in ten babies fully protected against neonatal tetanus. The pattern of differences by background characteristics follows that for antenatal care, with children born to urban mothers (87 percent), in the Eastern and Western Regions (87 percent, each) and to better educated mothers being much more likely than other children to be protected against tetanus.

### **3.7.3 Delivery Care**

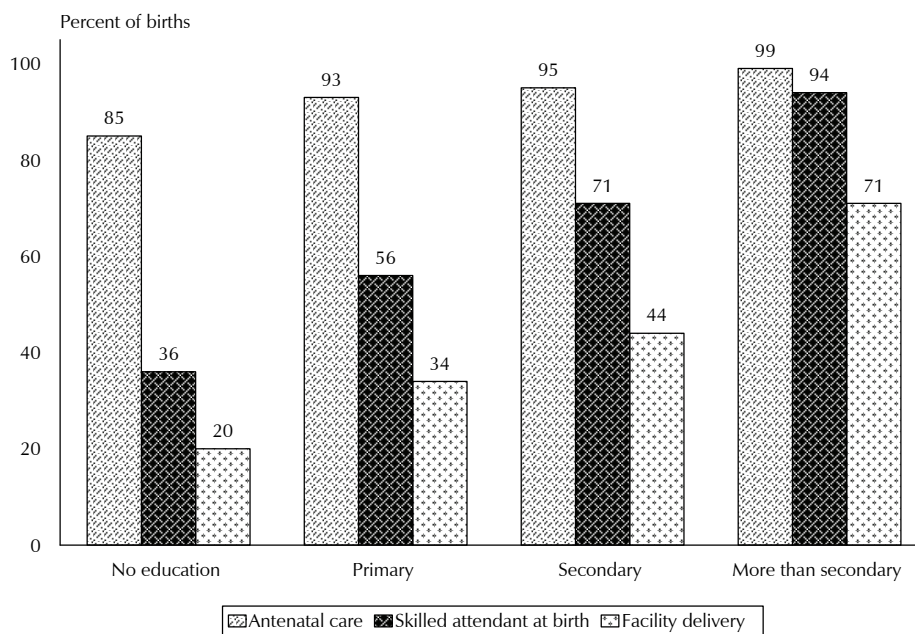
The proportion of deliveries with skilled attendants is a partial measure of skilled care at delivery. Skilled care at delivery is not equal to just skilled attendants, but also crucial is the supportive environment. Universal access implies skilled care for normal and complicated deliveries, supporting the case for deliveries to be conducted in primary level facilities with teams of community midwives. Because all pregnancies are at risk of unpredictable obstetric complications, who conducts the delivery and where are therefore very important for the management of the well-being of pregnant women during pregnancy, labour, and the post-partum period, as well as for the foetus or newborn.

Proper medical attention and hygienic conditions during delivery can reduce the risk of complications and infections that could cause the death or serious illness of the mother and/or the baby. Table 7 shows that less than half of births in Sierra Leone (42 percent) are delivered by a health professional. Even fewer deliveries (25 percent) take place in health facilities. These two indicators are directly related to the quality of maternal care and, if improved, will bring about a reduction in maternal mortality.

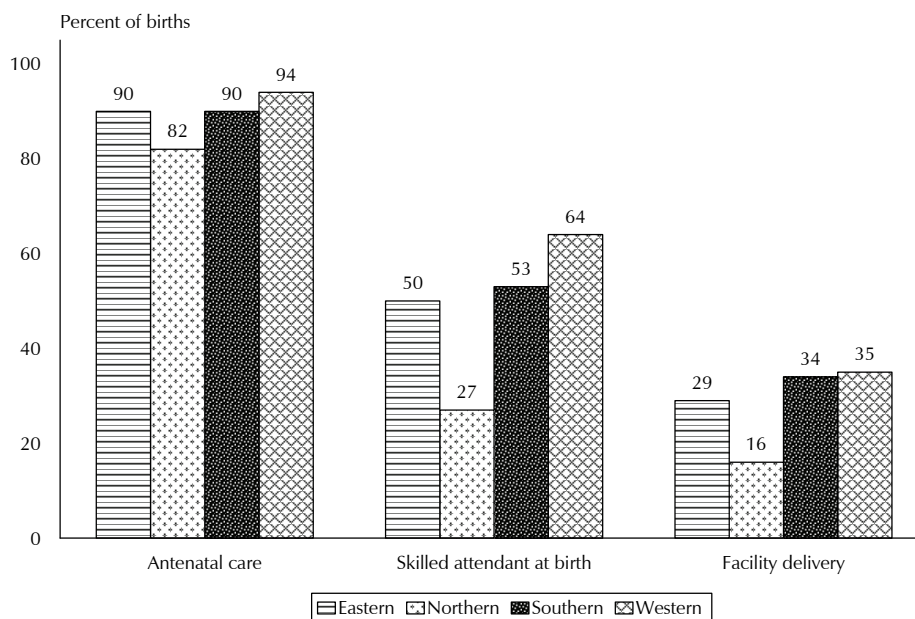
The differentials in delivery care coverage are large. Rural women and less educated women are less likely than others to receive medical assistance during delivery and to deliver in a health facility. For example, urban mothers (67 percent) are more than twice as likely as rural mothers (33 percent) to have a medically assisted delivery. The likelihood of a medically assisted delivery increases substantially with the mother's educational level, from 36 percent among mothers with no education to 94 percent among mothers with more than secondary schooling (Figure 3).

Mothers in the Northern Region are markedly less likely than those in other regions to receive medical assistance during delivery and to deliver in health facilities (Figure 4).

**Figure 3 Maternal Health Services by Education**



**Figure 4 Coverage of Maternal Health Services by Region**



## 3.8 Child Health and Nutrition

### 3.8.1 Vaccination of Children

According to the World Health Organization, 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. In Sierra Leone, the DPT vaccine is given as part of the pentavalent (five-component) DTP-HepB+Hib formulation: diphtheria, pertussis, and tetanus (DPT), hepatitis B and Haemophilus influenzae type b conjugate vaccines. The 2008 SLDHS collected information on the coverage for these vaccinations among all children born in the five years preceding the survey. The 2008 SLDHS did not collect data on Yellow Fever (YF) vaccination, although YF vaccine is given at 9 months of age according to the MOH vaccination schedule.

The 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 used for the child's immunization. If the card was available, the interviewer copied the dates of each vaccination received. If a vaccination was not recorded on the card as being given, the mother was asked to recall whether that particular vaccination had been given. If the mother was not able to present a card for a child at all, she was further asked to recall whether the child had received BCG, DPT, polio, and measles. If she indicated that the child had received the DPT or polio vaccines, she was asked the number of doses that the child received.

Table 8 presents information on vaccination coverage for children age 12-23 months, who should be fully vaccinated against the six preventable childhood illnesses. The results are based both on the health card record and information provided by the mother. The table shows that health cards were available for sixty percent of the children in this age group.

Background characteristic	BCG	DPT			Polio <sup>1</sup>				Measles	All <sup>2</sup>	No vaccinations	Percentage with a vaccination card seen	Number of children
		1	2	3	0	1	2	3					
<b>Sex</b>													
Male	84.8	78.5	71.0	60.6	73.0	77.5	69.2	49.2	58.8	39.0	13.8	60.9	526
Female	79.3	75.2	70.6	59.9	70.5	73.8	68.6	50.1	60.7	40.7	17.3	59.1	535
<b>Residence</b>													
Urban	89.0	83.3	78.7	69.8	81.8	84.7	78.7	53.4	64.5	40.4	10.4	58.3	269
Rural	79.7	74.6	68.0	57.0	68.4	72.5	65.5	48.4	58.1	39.6	17.3	60.6	791
<b>Region</b>													
Eastern	88.7	85.1	75.9	66.5	81.4	84.3	74.5	56.7	63.2	47.4	10.1	66.9	225
Northern	75.2	69.1	62.5	49.1	62.0	64.4	57.8	42.1	51.7	33.1	21.4	56.9	473
Southern	82.6	77.6	74.7	67.7	74.1	81.4	76.0	58.2	66.3	45.2	15.2	63.1	227
Western	93.8	88.7	84.5	76.7	85.8	90.9	86.3	49.9	71.1	41.6	5.0	54.1	135
<b>Mother's education</b>													
No education	78.9	72.6	66.4	56.3	67.2	72.0	64.7	47.1	56.3	37.6	18.3	59.6	803
Primary	91.1	87.7	81.4	70.5	83.3	87.0	80.3	57.9	67.1	46.0	8.4	62.7	146
Secondary	92.5	92.5	87.8	74.2	88.9	85.9	83.1	53.9	73.2	44.4	6.1	58.5	104
More than secondary	*	*	*	*	*	*	*	*	*	*	*	*	7
Total	82.0	76.8	70.8	60.3	71.8	75.6	68.9	49.6	59.7	39.8	15.6	60.0	1,060

The majority of children (82 percent) have received vaccinations for BCG and the first doses of DPT and polio (77 and 76 percent, respectively). However, the proportions of children receiving the second and third doses of polio and DPT are substantially lower than the proportion who received the first doses of these vaccines. For example, 77 percent of children received the first dose of DPT compared with 60 percent who received the third dose. The dropout rate<sup>3</sup> between the first and third doses of DPT and polio is 17 percent and 26 percent, respectively. The proportion of children who received the measles vaccine is 60 percent. Sixteen percent of children have received no vaccinations at all.

Overall, the data show that just 40 percent of children age 12-23 months have received all the basic WHO-recommended vaccinations by the date of the interview. Girls are only slightly more likely than boys to have received all basic vaccines (41 and 39 percent, respectively). Although there is no difference between urban/rural coverage (40 percent, each), children living in the Eastern and Southern Regions are more likely than children in other regions to be fully immunized (47 and 45 percent, respectively). Children born to mothers with no education are the least likely to be fully immunized (38 percent) than children of mothers with other levels of education (44-46 percent).

### 3.8.2 Treatment of Childhood Illnesses

Acute respiratory illness, malaria, and dehydration caused by severe diarrhoea are major causes of childhood mortality in Sierra Leone. Prompt medical attention when a child has the symptoms of these illnesses is, therefore, crucial in reducing child deaths. To obtain information on how childhood illnesses are treated, the mothers of each child under five years of age were asked whether the child had experienced the following symptoms in the two weeks before the survey: cough with short, rapid breathing (symptoms of an acute respiratory infection), fever (symptom of malaria), and diarrhoea. Among children under five years, 25 percent were reported to have fever, 7 percent had a cough with short, rapid breathing, and 13 percent had diarrhoea in the two-week period preceding the survey (data not shown).

Table 9 shows that approximately four in ten children with ARI and fever were taken for treatment from a health provider. Less likely to be taken for treatment are rural children, children in the Eastern Region, and children whose mothers have less education. Female children are also slightly less likely to receive medical assistance than male children for ARI symptoms (43 and 49 percent, respectively), but not for fever.

Table 9 also looks at the treatment of diarrhoeal illness. The data indicate that less than half of the children who were ill with diarrhoea were taken to a health provider. Children under 6 months of age and those in the Eastern Region are less likely than other children to be taken for professional medical treatment when they have diarrhoea.

Oral rehydration therapy (ORT), which involves giving either oral rehydration solution from a packet or a home-made, sugar-salt solution, is a simple and effective response to diarrhoeal illness. Mothers reported that almost three in four of the children with diarrhoea were treated with some form of oral rehydration therapy (ORT), and two-thirds were given a solution prepared using a packet of oral rehydration salts (ORS). The use of ORT to treat diarrhoea is least common among children under six months and those age 24-35 months.

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<sup>3</sup> Dropout rate = (Dose 1 – Dose 3) \* 100 / Dose 1

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

Among children under five years who were sick with a cough accompanied by short, rapid breathing or with difficulty breathing due to chest congestion (symptoms of acute respiratory infection—ARI) or with fever in the two weeks preceding the survey, percentage for whom treatment was sought from a health facility or provider, and among children under five years who were sick with diarrhoea during the two weeks preceding the survey, percentage for whom treatment was sought from a health facility or provider, percentage given a solution made from oral rehydration salt (ORS) packets or given prepackaged ORS liquids, and percentage given any oral rehydration therapy (ORT) by background characteristics, Sierra Leone 2008

Background characteristic	Children with symptoms of ARI		Children with fever		Children with diarrhoea			
	Percentage for whom treatment was sought from a health facility/provider <sup>1</sup>	Number with ARI	Percentage for whom treatment was sought from a health facility/provider <sup>1</sup>	Number with fever	Percentage for whom treatment was sought from a health facility/provider <sup>1</sup>	Percentage given solution from ORS packet	Percentage given any ORT <sup>2</sup>	Number with diarrhoea
<b>Age in months</b>								
<6	(45.3)	40	41.6	145	(33.4)	(67.5)	(69.0)	54
6-11	(55.8)	42	53.3	215	42.5	68.2	71.4	115
12-23	44.5	85	42.0	308	52.5	67.8	72.2	175
24-35	37.9	63	43.7	242	47.4	61.2	69.2	148
36-47	44.3	63	40.0	201	52.8	78.7	85.2	115
48-59	(52.9)	44	39.7	172	40.9	65.3	72.3	69
<b>Sex</b>								
Male	48.5	169	44.0	652	47.2	66.0	73.8	349
Female	43.1	167	43.0	631	46.8	70.1	72.9	326
<b>Residence</b>								
Urban	49.8	56	48.5	352	48.2	78.4	79.1	153
Rural	45.0	281	41.7	931	46.7	65.0	71.7	523
<b>Region</b>								
Eastern	23.4	48	27.1	246	33.5	62.5	68.0	121
Northern	41.4	190	41.4	569	47.9	67.0	74.0	371
Southern	71.2	75	57.9	254	58.4	68.8	71.9	105
Western	(45.5)	24	51.0	214	48.6	79.8	80.8	79
<b>Mother's education</b>								
No education	42.2	256	39.8	936	44.1	65.3	72.1	513
Primary	(54.0)	46	50.6	176	56.5	82.9	84.6	95
Secondary	(61.0)	34	56.2	152	56.4	68.8	68.8	63
More than secondary	*	1	*	19	*	*	*	5
Total	45.8	337	43.5	1,283	47.0	68.0	73.4	676

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

<sup>1</sup> Excludes pharmacy, shop, and traditional practitioner

<sup>2</sup> Includes ORS from packets and recommended home fluid

### 3.8.3 Malaria Indicators

Malaria is a leading cause of sickness and death of children under age five years in Sierra Leone. Most of the children with anaemia have had several episodes of malaria. It is a common cause of school absenteeism. One of strongest weapons in the fight against malaria is the use of insecticide-treated mosquito nets (ITNs) while sleeping. Preventive measures especially the use of ITNs has been vigorously promoted in Sierra Leone in the past few years. In the two years preceding the survey, over 1 million mosquito nets were distributed country-wide to pregnant women and children under age five in clinics.

In the 2008 SL DHS, data were collected from households on ownership of mosquito nets and treatment of the nets. The data show that 40 percent of Sierra Leonean households own a mosquito net, with about equal proportions in urban and rural areas (Table 10). Slightly fewer households (37 percent) own at least one insecticide-treated net. Twenty-six percent of children under five years and 28 percent of pregnant women age 15-49 reported sleeping under an ITN the night before the interview.

Table 10. 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, Sierra Leone 2008

Malaria indicators	Urban		Rural		Total	
	Percentage	Number	Percentage	Number	Percentage	Number
<b>Mosquito nets</b>						
Percentage of household with at least one mosquito net (treated or untreated)	38.5	2,469	40.0	4,815	39.5	7,284
Percentage of households with at least one insecticide-treated net (ITN) <sup>1</sup>	36.5	2,469	36.7	4,815	36.6	7,284
Percentage of children under five years of age who slept under a mosquito net (treated or untreated) the night before the survey	31.0	1,772	27.0	4,799	28.0	6,571
Percentage of children under five years of age who slept under an insecticide-treated net (ITN) the night before the interview <sup>1</sup>	30.0	1,772	24.3	4,799	25.9	6,571
Percentage of pregnant women age 15-49 who slept under a mosquito net (treated or untreated) the night before the interview	22.5	173	31.8	442	29.2	615
Percentage of pregnant women age 15-49 who slept under an insecticide-treated net (ITN) the night before the interview <sup>1</sup>	22.1	173	29.9	442	27.7	615
<b>Preventive malaria treatment during pregnancy</b>						
Percentage of last births in the five years preceding the survey for which the mother took antimalarial drugs for prevention during the pregnancy	60.6	1,184	45.8	2,919	50.1	4,103
Percentage of last births in the five years preceding the survey for which the mother got intermittent preventive treatment (IPT) during an antenatal visit <sup>2</sup>	14.1	1,184	10.9	2,919	11.8	4,103
<b>Treatment of fever</b>						
Among children under age five years with fever in the two weeks preceding the survey, percentage who took antimalarial drugs	35.2	349	28.2	934	30.1	1,283
Among children under age five years with fever in the two weeks preceding the survey, percentage who took antimalarial drugs the same day/next day after developing fever	17.6	349	14.2	934	15.1	1,283

<sup>1</sup> An insecticide-treated net (ITN) is a permanent net that does not require any treatment, a pretreated net obtained within the past 12 months or a net that has been soaked with insecticide within the past 12 months.

<sup>2</sup> Intermittent preventive treatment (IPT) is preventive treatment with at least two doses of SP/Fansidar during antenatal visits.

Pregnant women who carry the malaria parasite may be at risk of serious problems that can jeopardize their own health, and that of the foetus, and that increase the likelihood of pregnancy complications that may result in stillbirth, spontaneous abortion, and low birth weight. As a protective measure, the World Health Organization recommends that pregnant women receive intermittent preventive treatment (IPT) using two doses of sulfadoxine-pyrimethamine (SP/Fansidar) during the second and early in the third trimester of pregnancy. Appropriate treatment of malaria is the use of recommended drugs including Artesunate-Amodiaquine (ACT) and Quinine.

Table 10 also shows that half of all women who gave birth in the five years preceding the survey said they took antimalarial medicine during the pregnancy for the most recent birth, although only 12 percent said they took SP (Fansidar), the drug recommended for preventive treatment during pregnancy. Three in ten children who had a fever in the two weeks before the survey were reported to have taken an antimalarial medicine. Rural children who had fever are slightly less likely than urban children to receive antimalarial medicine (28 and 35 percent, respectively). Similarly, rural children are less likely than urban children to start medication on the same day after developing fever (14 and 18 percent, respectively).

### 3.8.4 Breastfeeding

Breastfeeding practices and introduction of supplemental foods are important determinants of the nutritional status of children, particularly those under the age of two years. With improved nutritional status, the risk of mortality among children under five years can be reduced and their psycho-motor development enhanced. Breastfeeding enhances the early bonding and socialization experience of an infant. Virtually all mothers can breastfeed, provided they have accurate information, and the support of their family and the health care system.

Colostrum, the yellowish, sticky breast milk produced at the end of pregnancy, is recommended by WHO as the perfect food for the newborn, and feeding should be initiated within the first hour after birth. Exclusive breastfeeding is recommended during the first six months of a child's life because it limits exposure to disease agents as well as providing all of the nutrients that are required for a baby. Children who are exclusively breastfed receive only breast milk. As an infant grows, breast milk alone no longer provides sufficient nourishment and other liquids and foods need to be added to the child's diet. Supplementing breast milk before six months of age is unnecessary and discouraged because of the likelihood of contamination, which may result in the risk of diarrhoeal diseases.

Table 11 describes the infant feeding practices of Sierra Leonean mothers of children under three years of age. The table shows that breastfeeding is very common in Sierra Leone and that the duration of breastfeeding is long. Almost all (95 percent) of children under six months in Sierra Leone are breastfed and at age 12-15 months, a majority of children (82 percent) are still breastfed. By age 20-23 months, 50 percent of children have been weaned.

Table 11 Breastfeeding status by age

Among youngest children under three years living with their mother, percent distribution by breastfeeding status and the percentage currently breastfeeding; and among all children under three years, percentage using a bottle with a nipple, according to age in months, Sierra Leone 2008

Age in months	Breastfeeding and consuming							Percentage currently breastfeeding	Number of youngest children under three years	Percentage using a bottle with a nipple <sup>1</sup>	Number of all children under three years
	Not breast-feeding	Exclusively breastfed	Plain water only	Non-milk liquids/juice	Other milk	Complementary foods	Total				
0-1	4.9	22.3	22.1	29.2	6.2	15.3	100.0	95.1	162	15.8	173
2-3	4.2	11.5	20.4	35.5	5.5	23.0	100.0	95.8	244	18.4	269
4-5	6.6	3.4	9.4	21.0	4.8	54.9	100.0	93.4	236	14.4	250
6-8	5.3	0.0	9.5	10.5	2.4	72.4	100.0	94.7	317	18.8	340
9-11	9.3	1.0	4.4	7.9	0.6	76.7	100.0	90.7	281	11.1	295
12-17	20.3	0.9	2.3	2.4	0.5	73.5	100.0	79.7	616	7.2	658
18-23	46.2	0.7	1.1	1.3	0.0	50.7	100.0	53.8	352	5.4	402
24-35	80.0	0.5	0.0	0.4	0.0	19.1	100.0	20.0	673	3.9	939
0-3	4.5	15.8	21.1	33.0	5.8	19.9	100.0	95.5	407	17.4	442
0-5	5.2	11.2	16.8	28.6	5.4	32.8	100.0	94.8	642	16.3	692
6-9	5.4	0.0	8.7	10.9	2.1	72.9	100.0	94.6	402	17.1	430
12-15	18.1	1.0	2.4	2.6	0.6	75.3	100.0	81.9	437	8.4	468
12-23	29.7	0.8	1.9	2.0	0.3	65.2	100.0	70.3	968	6.5	1,060
20-23	49.8	0.5	0.8	0.9	0.0	48.0	100.0	50.2	225	4.6	259

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/juice, other milk, and complementary foods (solids and semi-solids) are hierarchical and mutually exclusive, and their percentages add to 100 percent. Any children who get complementary food are classified in that category as long as they are breastfeeding as well. A breastfeeding child who receives other milk but not complementary foods is classified in the Other Milk category. 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.

<sup>1</sup> Based on all children under three years

Exclusive breastfeeding, however, is not common and supplementary feeding begins early. Only 11 percent of children under 6 months are exclusively breastfed. In addition to breast milk, 5 percent are given other (non-breast) milk, 17 percent are given water, 29 percent are given other liquids, and 33 percent are given complementary food in the form of solid or mushy food. By age 6-9 months, more than nine in ten Sierra Leonean children are still being breastfed, and most breastfeeding children are receiving complementary foods in addition to breast milk.

Use of bottles with nipples is not widespread, which is encouraging since they can cause contamination: only 16 percent of the youngest infants (0 to 1 month) are fed with a bottle with a nipple. This proportion increases to 19 percent for children age 6 to 8 months before beginning to decline.

### **3.8.5 Nutritional Status of Children**

Malnutrition places children at increased risk of morbidity and mortality and has also been shown to be related to impaired mental development. Anthropometry provides one of the most important indicators of children's nutritional status. Height and weight measurements were obtained in every second household selected for the 2008 SLDHS sample for all children born in the five years before the 2008 SLDHS.

The height and weight data are used to compute three summary indices of nutritional status: height-for-age; weight-for-height; and weight-for-age. These three indices are expressed as standardized scores (z-scores) or standard deviation units from the median for the international reference population that was recently developed by the World Health Organization (WHO, 2006). Children who fall more than two standard deviations below the reference median are regarded as undernourished, while those who fall more than three standard deviations below the reference median are considered severely undernourished.

Table 12 shows the nutritional status among children under five years of age by selected background characteristics. Children whose height-for-age is below minus two standard deviations from the median of the reference population are considered stunted or short for their age. Stunting is the outcome of failure to receive adequate nutrition over an extended period and is also affected by recurrent or chronic illness. According to the 2008 SLDHS findings, 36 percent of Sierra Leonean children are stunted, with 21 percent being severely stunted. Stunting becomes more widespread among older children; one in three children age 12-17 months and older is stunted, and stunting peaks at 48 percent among children age 24-35 months. Stunting levels are slightly higher for boys than girls and markedly higher for rural children (39 percent) than for urban children (30 percent). The prevalence of stunting varies by region from 27 percent in the Western Region to 40 percent in the Northern Region. Children living in Moyamba (46 percent) and Port Loco (44 percent) districts are more likely to be short for their age than children from other districts. Children of mothers with some secondary or higher education are much less likely to be stunted than children whose mothers achieved only the primary level or never attended school.

Children whose weight-for-height is below minus two standard deviations from the median of the reference population are considered wasted (or thin). Wasting represents the failure to receive adequate nutrition in the period immediately before the survey and typically is the result of recent illness episodes, especially diarrhoea, or of a rapid deterioration in food supplies. Table 12 shows that 10 percent of Sierra Leonean children are wasted, with 4 percent severely wasted. Wasting levels are highest at ages below 6 months and at 9-11 months (15 percent, each), which is unusual since it is before the time the child is being weaned and thus more vulnerable to illness. Wasting is more common in the Southern Region than elsewhere. Children living in Bo, Kambia and Bonthe are more likely to be thin than children from other districts.

Table 12 Nutritional status of children

Percentage of children under five years classified as malnourished according to three anthropometric indices of nutritional status: height-for-age, weight-for-height, and weight-for-age, by background characteristics, Sierra Leone 2008

Background characteristic	Height-for-age		Weight-for-height			Weight-for-age			Number of children
	Percentage below - 3 SD	Percentage below - 2 SD <sup>1</sup>	Percentage below - 3 SD	Percentage below -2 SD <sup>1</sup>	Percentage above +2 SD	Percentage below - 3 SD	Percentage below -2 SD <sup>1</sup>	Percentage above +2 SD	
<b>Age in months</b>									
<6	6.5	13.6	4.8	15.3	12.0	4.5	14.2	10.0	240
6-8	11.2	20.5	4.6	10.8	11.0	6.2	13.8	4.3	146
9-11	8.6	18.4	9.6	14.9	8.2	6.3	17.3	3.0	140
12-17	19.8	32.7	5.3	11.9	5.9	7.7	20.9	3.9	341
18-23	20.7	37.6	2.4	8.3	4.8	4.6	18.5	3.3	196
24-35	26.0	47.5	3.1	8.8	9.8	5.5	20.7	5.1	486
36-47	24.7	39.6	5.0	10.2	9.7	9.1	23.6	2.1	626
48-59	23.1	43.0	2.9	7.6	6.6	8.1	25.5	0.7	589
<b>Sex</b>									
Male	22.5	38.6	4.6	9.9	8.4	7.9	23.6	3.4	1,341
Female	18.7	34.3	3.9	10.5	8.4	6.3	18.8	3.5	1,423
<b>Residence</b>									
Urban	13.9	29.7	5.4	11.3	10.3	6.7	15.7	4.4	750
Rural	23.0	38.9	3.8	9.8	7.7	7.2	23.1	3.2	2,014
<b>Region</b>									
Eastern	16.4	33.6	4.1	9.9	11.6	6.3	17.7	5.7	507
Northern	22.6	39.5	3.3	8.6	5.8	7.5	23.5	2.7	1,328
Southern	24.0	38.1	6.5	14.5	11.7	8.7	23.6	3.4	546
Western	14.0	26.9	4.4	9.9	8.6	4.5	13.9	3.4	383
<b>District</b>									
Kailahun	17.1	38.7	4.1	9.3	6.9	3.9	17.2	3.8	112
Kenema	20.3	36.6	2.8	9.1	5.3	7.8	20.2	1.5	203
Kono	11.9	27.3	5.4	11.1	20.9	6.1	15.4	11.2	192
Bombali	18.6	35.8	2.9	7.4	9.7	4.9	18.9	1.6	266
Kambia	17.1	35.4	7.2	15.2	7.6	10.0	29.1	4.3	229
Koinadugu	29.5	41.9	4.0	8.1	3.2	12.0	29.1	3.3	166
Port Loko	27.0	44.2	3.0	9.7	7.5	7.1	24.5	3.9	271
Tonkolili	22.5	40.2	1.3	5.0	2.2	6.1	20.4	1.3	397
Bo	25.9	39.9	6.7	16.3	7.4	9.5	29.9	0.8	259
Bonthe	22.2	35.0	7.9	14.1	17.3	7.7	18.3	8.4	89
Moyamba	33.0	45.9	4.8	12.6	30.2	7.1	19.2	6.3	80
Pujehun	15.3	30.9	6.2	12.0	4.1	8.8	16.7	3.6	118
Western Area Rural	14.0	28.7	3.3	7.5	2.6	2.5	19.3	1.3	98
Western Area Urban	14.1	26.3	4.8	10.8	10.6	5.1	12.0	4.2	284
<b>Mother's education<sup>2</sup></b>									
No education	21.1	38.0	4.5	10.8	8.0	8.1	23.1	3.7	1,807
Primary	21.4	31.1	6.3	10.1	12.3	3.0	14.2	2.4	253
Secondary	12.4	22.9	0.8	8.1	9.4	1.3	11.5	4.0	204
More than secondary	(0.0)	(18.2)	(0.0)	(5.0)	(5.0)	(0.0)	(4.4)	(7.0)	22
Total	20.6	36.4	4.2	10.2	8.4	7.1	21.1	3.5	2,764

Note: Table is based on children who stayed in the household the night before the interview. Each of the indices is expressed in standard deviation units (SD) from the median of WHO Child Growth Standards adopted in 2006. The indices in this table are NOT comparable to those based on the previously used NCHS/CDC/WHO standards. Table is based on children with valid dates of birth (month and year) and valid measurement of both height and weight. Total includes 14 children with information missed on mother's status. Figures in parentheses are based on 25 to 49 unweighted cases.

<sup>1</sup> Includes children who are below -3 standard deviations (SD) from the International Reference Population median

<sup>2</sup> For women who are not interviewed, information is taken from the Household Questionnaire. Excludes children whose mothers are not listed in the Household Questionnaire

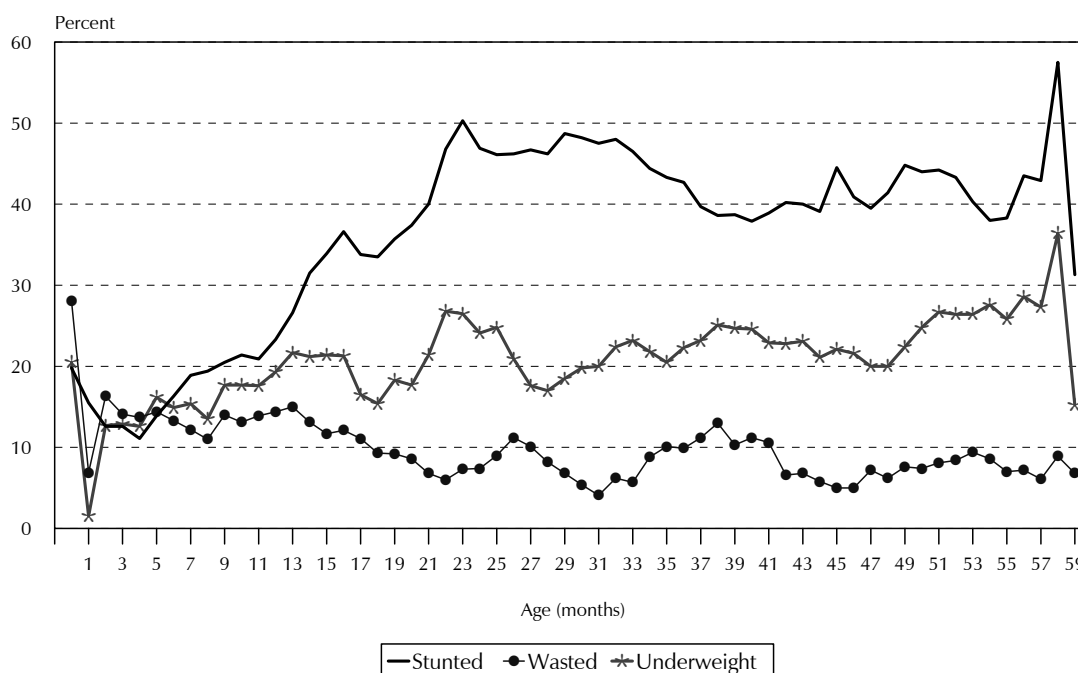
Table 12 highlights another major problem among young children in Sierra Leone: 8 percent are overweight. The highest proportion of overweight children is in age group below 9 months; 12 percent of children in that age group are overweight. Looking at regional patterns, the prevalence of overweight children ranges from 6 percent in the Northern Region to 12 percent each in the Eastern and Southern Regions. At the district level obesity is the highest among children living in Moyamba (30 percent), Kono (21 percent) and Bonthe (17 percent). Although variation by mother's education is not uniform, the highest proportions of overweight children are found among those whose mothers have primary education (12 percent).

Children whose weight-for-age is below minus two standard deviations (-2 SD) from the median of the reference population are considered underweight. The measure reflects the effects of both acute and chronic malnutrition. Almost one-fifth of Sierra Leonean children are underweight, with 7 percent classified as severely underweight.

Children living in rural areas are more likely to be underweight than urban children (23 percent and 16 percent, respectively). The proportion of underweight children ranges from 14 percent in the Western Region to 24 percent in each, the Northern and Southern Regions. About 30 percent of children are underweight in Bonthe, Kambia and Koinadugu districts. Children born to mothers with the lowest level of education are significantly more likely to be underweight. For example, the proportion of underweight children born to women with no education is 23 percent compared with 4 percent of underweight children born to women with more than secondary education.

The impact of weaning can be seen in younger children: the nutritional status of children deteriorates after 12 months of age, when children are usually gradually weaned; this is clearly shown in the underweight figures in Table 12 and Figure 5. Peak levels of low weight-for-age are found among children age 48-59 months.

**Figure 5 Nutritional Status of Children by Age**



Note: *Stunting* reflects chronic malnutrition; *wasting* reflects acute malnutrition; *underweight* reflects chronic or acute malnutrition or a combination of both. Plotted values are smoothed by a five-month moving average.

SLDHS 2008

Overall, nutritional statistics vary significantly by place of residence and mother's education. Rural children are more likely to be nutritionally disadvantaged in terms of stunting and undernutrition, but not wasting. Variation by region and district are striking, with Moyamba district having the highest proportions of stunted (46 percent) and obese (30 percent) children, while Bo district has the highest proportion of underweight children. Children whose mothers have no education are twice as likely to be underweight as children of mothers with at least some secondary education.

### 3.8.6 Anaemia

Anaemia is a major problem in Sierra Leone, especially among young children and pregnant women. Causes of anaemia are malaria—which is endemic in the country—as well as dietary deficiencies and parasitic infections. Determining anaemia levels among women and their children was an important component of the 2008 SLDHS because there was no adequate information about anaemia in the entire population.

Anaemia is a condition characterized by a reduction in the red blood cell volume and a decrease in the concentration of haemoglobin in the blood. Haemoglobin is necessary for transporting oxygen to tissues and organs in the body. About half of the global burden of anaemia is due solely to iron deficiency. Iron deficiency, in turn, is largely due to an inadequate dietary intake of bioavailable iron, increased iron requirements during rapid growth periods, such as pregnancy and infancy, and increased blood loss due to hookworm or schistosome infestation. Nutritional anaemia includes the anaemic burden due to deficiency in iron plus deficiencies in folate, vitamins B and B<sub>12</sub>, and certain trace elements involved with red blood cell production. Anaemia in children is associated with impaired mental and physical development and with increased mortality and morbidity. Anaemia can be a particularly serious problem for pregnant women, leading to premature delivery and low birth weight.

The 2008 SLDHS included anaemia testing of children 6-59 months old and women age 15-49 in every second household selected for the 2008 SLDHS sample. Anaemia levels were determined by measuring the level of haemoglobin in the blood, with a decreased concentration characterizing anaemia. For haemoglobin measurements, a drop of capillary blood was taken with a finger prick (using sterile, disposable instruments). Haemoglobin concentration was measured using the HemoCue photometer system. As described in section 2.3 Haemoglobin testing, trained personnel on each of the 2008 SLDHS interviewing team performed the testing procedures on eligible, consenting respondents.

Table 13 presents anaemia prevalence for children age 6-59 months. The results are based on tests of 2,653 children who were present at the time of testing, whose parents consented to their being tested, and whose haemoglobin results represented plausible data. In Table 13, children are classified into three groups according to the level of haemoglobin in their blood:<sup>4</sup>

- Mild: haemoglobin concentration 10.0-10.9 g/dl
- Moderate: haemoglobin concentration 7.0-9.9 g/dl
- Severe: haemoglobin concentration less than 7.0 g/dl

Overall, 76 percent of children age 6-59 months in Sierra Leone have some level of anaemia, including 28 percent of children who are mildly anaemic, 44 percent who are moderately anaemic, and 4 percent of children with severe anaemia. Children living in rural areas (77 percent) were somewhat more likely than urban children (73 percent) to be anaemic. Looking at regional patterns, children in the Northern Region (79 percent) were the most likely to have any anaemia or moderate anaemia. Children in the Western Region were the least likely to have severe anaemia.

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<sup>4</sup> The classification is based on criteria developed by WHO (DeMaeyer et al., 1989). Because haemoglobin levels vary by altitude, each child's result was adjusted based on altitude measurements taken in the sample cluster in which they were measured.

Table 13 Anaemia among children and women

Percentage of children age 6-59 months and women age 15-49 years classified as having anaemia, by background characteristics, Sierra Leone 2008

Background characteristic	Percentage with anaemia				Number
	Any anaemia	Mild anaemia	Moderate anaemia	Severe anaemia	
CHILDREN					
<b>Residence</b>					
Urban	72.7	30.0	40.6	2.0	734
Rural	77.1	27.8	45.0	4.2	1,919
<b>Region</b>					
Eastern	74.4	30.1	38.7	5.7	478
Northern	79.3	26.8	48.5	4.1	1,217
Southern	72.1	27.2	42.7	2.2	562
Western	72.2	33.2	37.4	1.7	396
Total	75.9	28.4	43.8	3.6	2,653
WOMEN					
<b>Residence</b>					
Urban	47.4	35.2	11.6	0.6	1,138
Rural	45.0	33.6	10.6	0.7	2,227
<b>Region</b>					
Eastern	43.1	32.4	9.9	0.8	530
Northern	45.5	35.0	9.7	0.8	1,397
Southern	43.9	30.8	12.5	0.6	774
Western	50.8	37.6	12.7	0.4	664
Total	45.8	34.1	11.0	0.7	3,365

Note: Table is based on children and women who stayed in the household the night before the interview. Prevalence is adjusted for altitude (for children and women) and smoking (for women) using CDC formulas (CDC, 1998). Women and children with <7.0 g/dl of haemoglobin have severe anaemia, women and children with 7.0-9.9 g/dl have moderate anaemia, and non-pregnant women with 10.0-11.9 g/dl and children and pregnant women with 10.0-10.9 g/dl have mild anaemia.

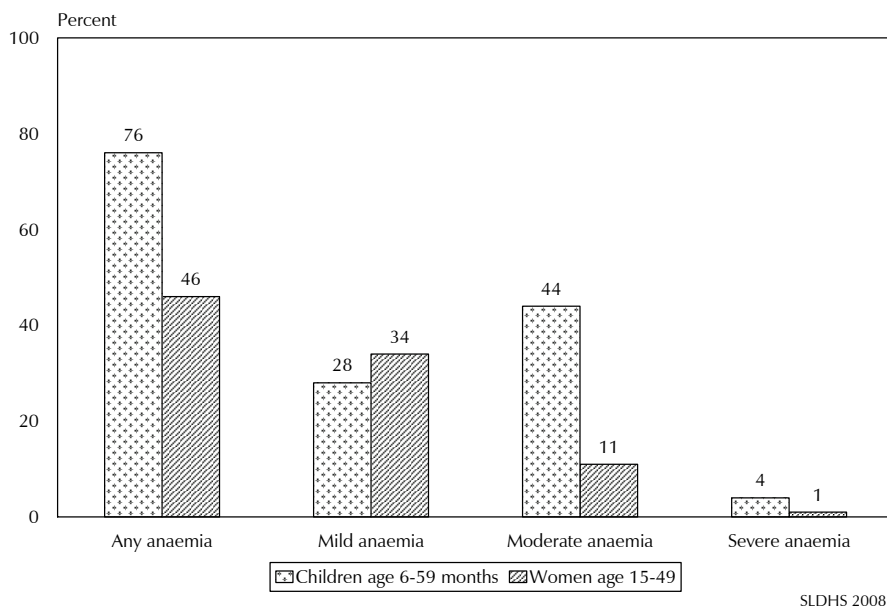
The World Health Organization considers the level of anaemia observed among young children in Sierra Leone to be a major-level public health concern.<sup>5</sup> Compared with estimates from recent Demographic and Health Surveys conducted in the region, the prevalence of any anaemia among children in Sierra Leone (76 percent) is similar to that in Guinea (76 percent in 2005) and Ghana (76 percent in 2003), but lower than the prevalence in Mali (81 percent in 2006) or Senegal (83 percent in 2005) (CPS/MS, DNSI/MEIC [Mali] and Macro International Inc., 2007; DNS [Guinée] and ORC Macro, 2006; Ndiaye et al., 2006; CRDH [Sénégal] and ORC Macro, 2005; GSS, NMIMR [Ghana], and ORC Macro, 2004).

Table 13 also shows the prevalence of anaemia in women age 15-49. Anaemia is less prevalent among women than children, 46 percent of women in Sierra Leone have some level of anaemia (Figure 6).

The great majority of women are mildly anaemic (34 percent), while 11 percent are moderately anaemic, and less than 1 percent was found to be severely anaemic. Prevalence of any anaemia in women is the highest in the Western Region (51 percent). In all other regions the level of any anaemia lies within the 43-46 percent range.

<sup>5</sup> WHO considers anaemia prevalence of over 40 percent in a population as a major public health problem, from 20-40 percent is considered a medium-level public health problem, and 5-19.9 percent is a mild public health problem (World Health Organization, 2001).

**Figure 6 Anaemia among Children and Women**



Compared with estimates from recent Demographic and Health Surveys, the prevalence of any anaemia among women age 15-49 in Sierra Leone (46 percent) is similar to the prevalence in Ghana (45 percent in 2003), but lower than in Guinea (53 percent in 2005), Senegal (59 percent in 2005) or Mali (69 percent in 2006) (CPS/MS, DNSI/MEIC [Mali] and Macro International Inc., 2007; DNS [Guinée] and ORC Macro, 2006; Ndiaye et al., 2006; CRDH [Sénégal] and ORC Macro, 2005; GSS, NMIMR [Ghana], and ORC Macro, 2004).

### 3.9 HIV/AIDS: Knowledge, Prevalence, and Coverage

Acquired Immune Deficiency Syndrome (AIDS) is a public health threat in Sierra Leone. The 2008 SLDHS included a series of questions asking respondents' about their knowledge of AIDS and their awareness of modes of transmission of the human immunodeficiency virus (HIV) that causes AIDS. In addition, respondents who have heard of HIV/AIDS were asked if they knew of behaviours that can prevent the spread of HIV. Table 14 presents the results of these questions.

#### 3.9.1 Awareness of AIDS

Overall, men are somewhat more aware of AIDS than women (83 percent and 69 percent, respectively). Among women, knowledge of AIDS exceeds 90 percent only among those with secondary or higher education and those living in the Western region. Women age 15-24 and especially those in their early 20s are more likely than older women to have heard about AIDS. Rural women are significantly less aware of AIDS than urban women (59 and 87 percent, respectively). Knowledge is slightly lower among currently married/in union women and those who have never had sex. Women living in the Northern Region have the least knowledge of AIDS (57 percent).

Table 14 Knowledge of AIDS				
Percentage of women and men age 15-49 who have heard of AIDS by background characteristics, Sierra Leone 2008				
Background characteristic	Women		Men	
	Has heard of AIDS	Number of women	Has heard of AIDS	Number of men
<b>Age</b>				
15-24	72.7	2,384	81.2	929
15-19	70.7	1,198	77.8	526
20-24	74.7	1,186	85.7	403
25-29	68.9	1,643	85.0	446
30-39	67.2	2,175	81.2	899
40-49	67.5	1,172	86.3	671
<b>Marital status</b>				
Never married	82.2	1,399	80.5	1,085
Ever had sex	88.6	924	87.6	702
Never had sex	69.9	475	67.3	383
Married/living together	65.3	5,525	83.9	1,767
Divorced/separated/ widowed	79.6	450	94.0	92
<b>Residence</b>				
Urban	87.4	2,655	94.5	1,123
Rural	59.3	4,719	75.8	1,822
<b>Region</b>				
Eastern	69.6	1,325	88.1	557
Northern	58.6	3,001	78.7	1,131
Southern	65.3	1,542	70.9	617
Western	94.9	1,506	97.6	639
<b>Education</b>				
No education	59.7	4,860	73.9	1,426
Primary	79.3	960	79.0	414
Secondary	93.0	1,372	95.4	953
More than secondary	98.9	182	100.0	151
Total 15-49	69.4	7,374	82.9	2,944
Men 50-59	na	na	75.7	336
Total 15-59	na	na	82.2	3,280
na = Not applicable				

As with women, rural and least educated men, and those who have never had sex, are less likely than other men to have heard of AIDS. However, unlike in women, knowledge is slightly lower among the youngest men and men in their 30s. In general, men in their 20s and 40s are more aware about AIDS than men from other age groups. The Southern Region has the lowest proportion of men who have heard of AIDS (71 percent).

Current results for level of awareness of AIDS among women (69 percent) show only a slight improvement over results from the MICS survey conducted in 2005 (67 percent).

### 3.9.2 Awareness of Prevention Methods

AIDS prevention programmes focus their messages and efforts on three important aspects of behaviour: condom use, limiting the number of sexual partners or staying faithful to one partner, and delaying first sexual intercourse in young persons (i.e., abstinence). Table 15 shows the percentage of women and men who, in response to prompted questions, give positive responses to specific ways to avoid AIDS.

Table 15 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, by having one uninfected sex partner who has no other partners, and by abstaining from sexual intercourse, by background characteristics, Sierra Leone 2008										
Background characteristic	Women					Men				
	Percentage who say HIV can be prevented by					Percentage who say HIV can be prevented by				
	Using condoms <sup>1</sup>	Limiting sexual intercourse to one uninfected partner <sup>2</sup>	Using condoms, and limiting sexual intercourse to one uninfected partner <sup>1,2</sup>	Abstaining from sexual intercourse	Number of women	Using condoms <sup>1</sup>	Limiting sexual intercourse to one uninfected partner <sup>2</sup>	Using condoms, and limiting sexual intercourse to one uninfected partner <sup>1,2</sup>	Abstaining from sexual intercourse	Number of men
<b>Age</b>										
15-24	47.4	51.0	41.3	43.4	2,384	64.2	65.8	57.2	59.9	929
15-19	44.4	48.6	38.5	41.2	1,198	60.5	62.2	54.0	57.7	526
20-24	50.4	53.4	44.3	45.6	1,186	69.0	70.4	61.4	62.7	403
25-29	42.0	48.7	37.1	38.6	1,643	61.8	69.2	56.0	57.3	446
30-39	42.3	45.7	37.1	38.8	2,175	58.3	63.9	52.9	54.0	899
40-49	38.3	45.8	33.7	39.0	1,172	65.1	69.4	59.2	59.5	671
<b>Marital status</b>										
Never married	59.2	61.5	52.7	52.9	1,399	63.1	65.6	56.6	58.9	1,085
Ever had sex	66.9	67.8	59.2	57.8	924	69.7	73.0	63.3	64.0	702
Never had sex	44.3	49.3	40.1	43.4	475	51.1	52.1	44.3	49.7	383
Married/living together	38.9	44.0	33.7	36.9	5,525	61.1	66.5	55.3	56.8	1,767
Divorced/separated/widowed	47.0	56.3	43.5	41.8	450	73.6	76.9	66.8	57.7	92
<b>Residence</b>										
Urban	61.7	65.8	54.6	52.6	2,655	75.3	79.2	68.3	69.2	1,123
Rural	32.8	38.2	28.6	33.3	4,719	54.2	58.8	48.7	50.4	1,822
<b>Region</b>										
Eastern	36.9	38.8	28.4	34.5	1,325	62.7	66.4	55.0	57.0	557
Northern	37.7	41.5	33.1	35.6	3,001	60.9	64.6	55.1	54.6	1,131
Southern	34.4	40.7	31.1	35.6	1,542	50.3	53.0	44.7	49.4	617
Western	68.8	77.0	62.9	59.4	1,506	75.7	83.3	70.1	71.4	639
<b>Education</b>										
No education	31.8	37.2	27.6	31.7	4,860	50.6	55.1	44.4	47.5	1,426
Primary	52.2	58.4	44.5	49.2	960	54.9	60.0	48.4	49.9	414
Secondary	71.4	74.2	63.9	59.6	1,372	79.2	82.9	73.5	73.1	953
More than secondary	89.5	88.8	84.7	76.1	182	85.1	89.8	79.4	76.6	151
Total 15-49	43.2	48.1	37.9	40.3	7,374	62.2	66.5	56.2	57.6	2,944
Men 50-59	na	na	na	na	na	50.9	57.0	45.0	51.8	336
Total 15-59	na	na	na	na	na	61.1	65.6	55.0	57.0	3,280

na = Not applicable

<sup>1</sup> Using condoms every time they have sexual intercourse

<sup>2</sup> Partner who has no other partners

Table 15 shows that 43 percent of women and 62 percent of men know that consistent use of condoms is a means of preventing the spread of HIV. About half of women and two-thirds of men know that limiting sexual intercourse to one faithful and uninfected partner can reduce the chances of contracting HIV. Just 40 percent of women and 58 percent of men age 15-49 know that abstinence is a way of reducing the chances of getting HIV. Approximately the same proportions of respondents (38 percent of women and 56 percent of men) said that people can reduce the chances of getting the AIDS virus by using condoms and limiting sex to one uninfected partner.

Surprisingly, older, currently married/in union and those women who have never had sex are less likely than other women to know ways to avoid getting the AIDS virus. Urban women and women living in the Western Region are more likely to be aware of safe sexual practices than other women. There is a strong positive relationship between respondent's education and her knowledge of ways to prevent HIV. For example, 28 percent of women with no education say that the risk of getting the AIDS virus can be reduced by using condoms and limiting sex to one uninfected partner, compared with 85 percent of women with higher than secondary education.

Men are more aware than women of ways to avoid AIDS. Among men, the most frequently recognized way of avoiding AIDS is by limiting sex to one partner who has not been infected with AIDS (67 percent), followed by use of condoms (62 percent). The two other ways of AIDS prevention, abstaining from sex, and using condoms and limiting sex to one uninfected partner, are recognized by slightly over half of men (56 and 58 percent, respectively).

As is the pattern among women, the least educated men and those who have never had sex are less likely than other men to know ways to avoid getting the AIDS virus. Oddly enough, men in their 30s are also less aware about safe sex compared with younger or older men. There are noticeable variations by residence. As with women, urban men and men from the Western Region are more likely to be aware of safe sexual practices than rural men or men from other regions. Only 45 percent of men from the Southern Region cited using condoms and limiting sex to one uninfected partner as a way to avoid contracting HIV compared with 70 percent of men from the Western Region.

### **3.9.3 Higher-Risk Sexual Intercourse**

Respondents were also asked some detailed questions about their sexual behaviour, including the number of partners they had had in the 12 months preceding the survey and whether they had sex with someone who was not a spouse or cohabiting partner (higher-risk sex). Women and men were also asked about condom use. Results are shown in Table 16.1 for women and Table 16.2 for men.

Results show that only five percent of women who had sex in the 12 months before the survey report having more than one sexual partner in that time period. This is considerably lower than the level of 21 percent among men. Similarly, only 21 percent of women, compared with 44 percent of men, report that they had sex in the previous 12 months with someone who was not a spouse or marital partner. Among those having higher-risk sex, only 7 percent of women and 22 percent of men say they used a condom at the last such sexual encounter.

Among women, the proportion with two or more partners in the past 12 months is higher among younger women, those who have never married or are widowed, divorced or separated, those in urban areas, especially in the Southern Region, and among the better educated women. In contrast, men age 15-19 are less likely to have two or more partners in the past year than older men. This practice is more common among those with more education and living in the Eastern and Western Regions.

Table 16.1 Multiple sexual partners and higher-risk sexual intercourse in the past 12 months: Women

Among women age 15-49 who had sexual intercourse in the past 12 months, the percentage who had intercourse with more than one partner and the percentage who had higher-risk sexual intercourse in the past 12 months, and among those having higher-risk intercourse in the past 12 months, percentage reporting that a condom was used at last higher-risk intercourse, and mean number of sexual partners during her lifetime for women who ever had sexual intercourse, by background characteristics, Sierra Leone 2008

Background characteristic	Among women who had sexual intercourse in past 12 months:			Among women who had higher-risk intercourse in past 12 months:	
	Percentage who had 2+ partners in past 12 months	Percentage who had higher-risk intercourse in past 12 months <sup>1</sup>	Number of women	Percentage who reported using a condom at last higher-risk intercourse <sup>1</sup>	Number of women
<b>Age</b>					
15-24	6.4	42.6	1,486	9.6	633
15-19	7.0	56.1	631	7.6	354
20-24	5.9	32.7	856	12.0	280
25-29	4.9	15.1	1,218	6.1	184
30-39	4.2	11.8	1,632	3.6	193
40-49	4.0	8.9	860	2.7	76
<b>Marital status</b>					
Never married	10.8	95.9	778	8.5	746
Married/living together	3.8	4.1	4,185	7.2	172
Divorced/separated/widowed	5.6	72.5	234	3.1	169
<b>Residence</b>					
Urban	6.1	36.9	1,934	8.5	714
Rural	4.3	11.4	3,262	5.3	373
<b>Region</b>					
Eastern	6.0	18.3	991	7.2	182
Northern	2.6	13.8	1,953	5.5	270
Southern	8.6	19.2	1,134	7.3	217
Western	4.4	37.4	1,119	8.9	418
<b>Education</b>					
No education	3.9	9.4	3,458	3.3	323
Primary	6.5	28.9	626	6.3	181
Secondary	7.3	51.6	953	9.6	491
More than secondary	6.9	57.2	160	12.4	91
Total	5.0	20.9	5,197	7.4	1,087

<sup>1</sup> Sexual intercourse with a non-marital, non-cohabiting partner

As expected, higher-risk sex is more common among women and men who are young and who have never married, as well as among urban respondents, those in the Western Region, and those with more education. Nearly one-fourth (24 percent) of currently married men had sex with someone other than their wife or partner.

Comparison of the SLDHS results with those of the 2005 MICS indicates a slight increase in the proportion of young women who had sex with more than one partner in the year before the survey (6 percent in the 2008 SLDHS compared with 4 percent in the 2005 MICS).

Table 16.2 Multiple sexual partners and higher-risk sexual intercourse in the past 12 months:  
Men

Among men age 15-49 who had sexual intercourse in the past 12 months, the percentage who had intercourse with more than one partner and the percentage who had higher-risk sexual intercourse in the past 12 months, and among those having higher-risk intercourse in the past 12 months, percentage reporting that a condom was used at last higher-risk intercourse, and mean number of sexual partners during his lifetime for men who ever had sexual intercourse, by background characteristics, Sierra Leone 2008

Background characteristic	Among men who had sexual intercourse in past 12 months:			Among men who had higher-risk intercourse in past 12 months:	
	Percentage who had 2+ partners in past 12 months	Percentage who had higher-risk intercourse in past 12 months <sup>1</sup>	Number of men	Percentage who reported using a condom at last higher-risk intercourse <sup>1</sup>	Number of men
<b>Age</b>					
15-24	19.8	81.5	493	21.7	402
15-19	13.4	89.0	192	14.3	171
20-24	23.9	76.7	301	27.1	231
25-29	22.6	52.3	371	24.0	194
30-39	21.8	30.9	786	20.7	243
40-49	21.6	23.8	570	21.0	136
<b>Marital status</b>					
Never married	19.7	88.9	612	22.9	544
Married/living together	22.4	24.1	1,530	19.9	368
Divorced/separated/ widowed	17.0	79.6	79	23.2	63
<b>Residence</b>					
Urban	22.1	57.0	844	34.5	481
Rural	21.0	35.9	1,377	9.4	494
<b>Region</b>					
Eastern	28.1	44.2	427	13.1	189
Northern	16.4	35.3	808	11.6	285
Southern	19.7	42.7	481	17.2	205
Western	25.5	58.6	505	40.3	296
<b>Education</b>					
No education	19.6	32.1	1,138	9.2	366
Primary	23.3	47.8	267	16.7	128
Secondary	23.4	60.8	691	30.0	420
More than secondary	23.4	49.4	125	50.7	62
Total 15-49	21.4	43.9	2,221	21.8	975
Men 50-59	25.9	13.8	281	(10.5)	39
Total 15-59	21.9	40.5	2,502	21.4	1,014

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

<sup>1</sup> Sexual intercourse with a non-marital, non-cohabiting partner

### **3.9.4 Condom Use during the last Higher-Risk Sexual Intercourse**

Condom use is one aspect of AIDS prevention initiatives. The correct and consistent use of latex condoms during sexual intercourse—vaginal, anal, or oral—can greatly reduce a person’s risk of acquiring or transmitting most STDs, including HIV infection. It is against this background that information on condom use was collected in the 2008 SLDHS. Tables 16.1 and 16.2 present information on condom use among women and men during the last higher-risk intercourse with someone who was not a spouse or cohabiting partner. The data are based on respondents who were sexually active during the year preceding the survey and who had higher-risk sexual intercourse. Overall, 7 percent of women and 22 percent of men reported that a condom was used during their last higher-risk sexual intercourse, indicating that men are 3 times as likely to practice safe sex as women.

The results indicate that condom use was higher among respondents in urban areas, in the Western Region and also among those who attended school. For example, just 9 percent of men with no education used a condom during their last higher-risk sexual encounter, compared with 51 percent of men with more than secondary education. Among females, condom use with higher-risk sex was higher among young women than adults and among those who have never married than those of another marital status.

The SLDHS results reveal that while the proportion of young women engaging in higher-risk sex has not changed (43 percent in both the 2008 SLDHS and the 2005 MICS), the proportion using condoms during their last higher-risk sex has decreased from 20 percent in the 2005 MICS to 10 percent in the 2008 SLDHS.

### **3.9.5 HIV Coverage Rates**

As mentioned in the introduction, the 2008 SLDHS included an HIV testing component. All women age 15-49 and men age 15-59 who were eligible for the interview in households selected for the male survey were asked if they would consent to give a few drops of blood from a finger prick for HIV testing. Initial findings from this module of the survey are presented below. A more detailed analysis of the results will be included in the final report.

Eighty-six percent of eligible respondents in the 2008 SLDHS provided blood samples for HIV testing (Table 17). Women were more likely to give blood samples for HIV testing than men (88 percent versus 85 percent).<sup>6</sup> Rural respondents were more likely to have been tested than those in urban areas (89 percent versus 83 percent).

Among both women and men, refusal to be tested accounts for a large proportion of the cases not tested. Only a small number of respondents were interviewed but absent at the time of the blood collection. The “other” category includes some cases in which the blood samples could not be tested or two samples had the same bar code.

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<sup>6</sup> A small number of respondents gave blood but were not interviewed.

Table 17 Coverage of HIV testing			
Percent distribution of de facto women 15-49 and men age 15-59 eligible for HIV testing by testing status, according to residence (unweighted), Sierra Leone 2008			
Sex/Test result	Residence		Total
	Urban	Rural	
<b>Women 15-49</b>			
DBS tested and interviewed	85.8	89.0	87.7
DBS tested and not interviewed	1.8	1.9	1.8
Refused to provide blood and interviewed	5.7	4.1	4.7
Refused to provide blood and not interviewed	2.0	1.2	1.6
Absent at the time of blood collection and interviewed	0.2	0.2	0.2
Absent at the time of blood collection and not interviewed	0.6	0.7	0.7
Other interviewed	2.2	1.2	1.6
Other not interviewed	1.7	1.7	1.7
Total	100.0	100.0	100.0
Number	1,663	2,291	3,954
<b>Men 15-59</b>			
DBS tested and interviewed	80.0	88.9	85.0
DBS tested and not interviewed	2.4	1.2	1.7
Refused to provide blood and interviewed	7.5	3.8	5.5
Refused to provide blood and not interviewed	3.1	1.1	2.0
Absent at the time of blood collection and interviewed	0.1	0.2	0.1
Absent at the time of blood collection and not interviewed	1.2	0.8	1.0
Other interviewed	2.4	1.8	2.1
Other not interviewed	3.3	2.2	2.7
Total	100.0	100.0	100.0
Number	1,559	1,982	3,541
<b>Total</b>			
DBS tested and interviewed	83.0	89.0	86.4
DBS tested and not interviewed	2.1	1.5	1.8
Refused to provide blood and interviewed	6.5	4.0	5.1
Refused to provide blood and not interviewed	2.5	1.2	1.8
Absent at the time of blood collection and interviewed	0.2	0.2	0.2
Absent at the time of blood collection and not interviewed	0.9	0.8	0.8
Other interviewed	2.3	1.5	1.8
Other not interviewed	2.5	2.0	2.2
Total	100.0	100.0	100.0
Number	3,222	4,273	7,495

### 3.9.6 HIV Prevalence Rates

Table 18 and Figure 7 present the findings from the HIV testing. The table shows that less than two percent (1.5 percent) of the respondents tested were found to be HIV positive. Women (1.7 percent) are slightly more likely to be HIV positive than men (1.2 percent). Among all respondents tested, the proportion that are HIV positive tends to rise with age from less than 1 percent among those age 15-19 to 2 percent in the 25-34 age group, before falling slightly among those in their late 30s and in 40s. Overall, the age pattern of HIV infection is similar for men and women from 15 years to 39 years, after which it peaks again at age 40-44 for women before falling.

Table 18 HIV prevalence

Percentage HIV positive among women and men age 15-49 who were tested, by background characteristics, Sierra Leone 2008

Background characteristic	Women 15-49		Men 15-49		Total	
	Percentage HIV positive <sup>1</sup>	Number	Percentage HIV positive <sup>1</sup>	Number	Percentage HIV positive <sup>1</sup>	Number
<b>Age</b>						
15-19	1.3	529	0.0	487	0.7	1,016
20-24	1.5	561	1.3	365	1.4	926
25-29	2.2	771	1.5	407	2.0	1,178
30-34	2.4	470	1.8	352	2.1	822
35-39	1.2	568	1.4	499	1.3	1,067
40-44	2.1	308	0.9	309	1.5	617
45-49	1.0	241	2.1	306	1.6	547
<b>Residence</b>						
Urban	2.7	1,205	2.2	1,040	2.5	2,245
Rural	1.2	2,243	0.6	1,686	1.0	3,929
<b>Region</b>						
Eastern	1.6	601	1.1	510	1.4	1,111
Northern	1.4	1,433	0.9	1,055	1.2	2,488
Southern	1.1	733	0.5	569	0.8	1,302
Western	3.1	682	2.6	592	2.9	1,274
<b>Education</b>						
No education	1.6	2,341	1.1	1,316	1.4	3,657
Primary	2.0	423	0.8	386	1.4	810
Secondary	2.0	618	1.4	893	1.6	1,511
More than secondary	3.4	66	2.2	130	2.6	195
Total	1.7	3,448	1.2	2,726	1.5	6,174

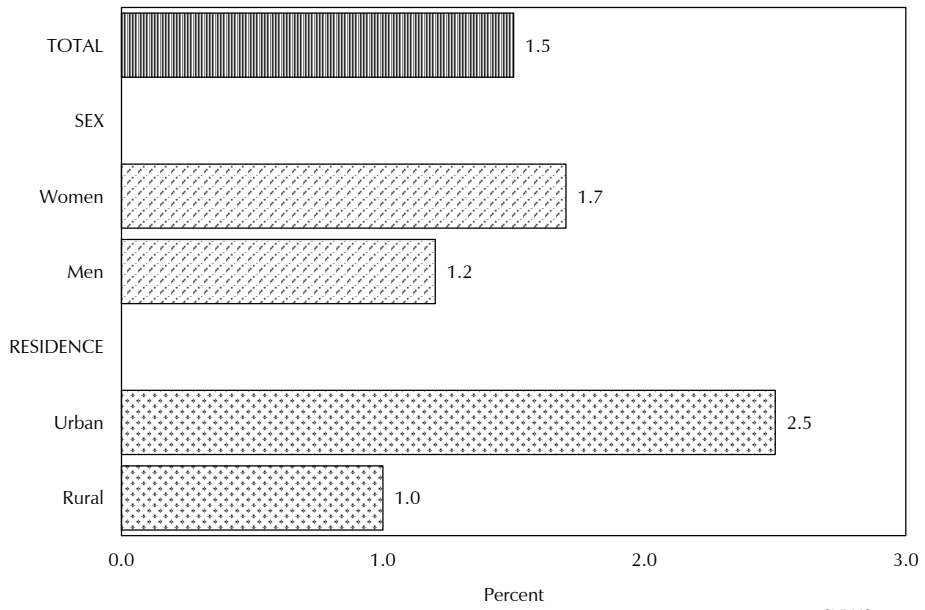
<sup>1</sup> HIV positive refers to persons infected with HIV-1 and/or HIV-2 without differentiation.

Figure 7 shows that HIV prevalence is more than two times higher in urban areas than in rural areas (2.5 percent and 1 percent, respectively). The Western Region is the only one with a prevalence level above the national average (3 percent). The lowest level is found in the Southern Region (less than 1 percent). There is a small but steady increase in HIV prevalence with increasing education for both women and men.

The HIV prevalence rate derived from the 2005 Sierra Leone sero-prevalence survey is 1.54 percent (SSL and NAS, 2005), the same as the rate derived from the 2008 SLDHS (1.5 percent among respondents age 15-49).

The 2008 LDHS confirms that Sierra Leone has a low-level HIV epidemic and provides useful information on the distribution of HIV in the population. Further analysis in the final report of the 2008 SLDHS will provide additional information on the links between behaviour, knowledge, and HIV infection in Sierra Leone.

**Figure 7 HIV Prevalence by Sex and Residence**



SLDHS 2008

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