

# Sierra Leone - Demographic and Health Survey 2008

**Statistics Sierra Leone (SSL), Ministry of Health and Sanitation (MOHS)**

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## Identification

### SURVEY ID NUMBER

SLE\_2008\_DHS\_v01\_M

### TITLE

Demographic and Health Survey 2008

### ABBREVIATION OR ACRONYM

DHS 2008

### COUNTRY

Name	Country code
Sierra Leone	SLE

### STUDY TYPE

Demographic and Health Survey (standard) - DHS V

### SERIES INFORMATION

The 2008 Sierra Leone Demographic and Health Survey (SLDHS) is the first DHS survey to be held in Sierra Leone.

### ABSTRACT

The 2008 Sierra Leone Demographic and Health Survey (SLDHS) is the first DHS survey to be held in Sierra Leone. Teams visited 353 sample points across Sierra Leone and collected data from a nationally representative sample of 7,374 women age 15-49 and 3,280 men age 15-59. The primary purpose of the 2008 SLDHS is to provide policy-makers and planners with detailed information on Demography and health.

This is the first Demographic and Health Survey conducted in Sierra Leone and 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, USAID, and The World Bank. WHO, WFP and UNHCR provided logistical support. ICF Macro, an ICF International Company, 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 adult 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. The 2008 SLDHS was carried out from late April 2008 to late June 2008, using a nationally representative sample of 7,758 households.

The survey results are intended to assist policymakers and planners in assessing the current health and population programmes and in designing new strategies for improving reproductive health and health services in Sierra Leone.

### MAIN RESULTS

#### FERTILITY

Survey results indicate that there has been little or no decline in the total fertility rate over the past two decades, from 5.7 children per woman in 1980-85 to 5.1 children per woman for the three years preceding the 2008 SLDHS (approximately 2004-07). Fertility is lower in urban areas than in rural areas (3.8 and 5.8 children per woman, respectively). Regional variations in fertility are marked, ranging from 3.4 births per woman in the Western Region (where the capital, Freetown, is located) to almost six births per woman in the Northern and Eastern regions. Women with no education give birth to almost twice as many children as women who have been to secondary school (5.8 births, compared with 3.1 births). Fertility is also closely associated with household wealth, ranging from 3.2 births among women in the highest wealth quintile to 6.3 births among women in the lowest wealth quintile, a difference of more than three births. Research has demonstrated that children born too close to a previous birth are at increased risk of dying. In Sierra Leone, only 18 percent of births occur within 24 months of a previous birth. The interval between births is relatively long; the median interval is 36 months.

#### FAMILY PLANNING

The vast majority of Sierra Leonean women and men know of at least one method of contraception. Contraceptive pills and injectables are known to about 60 percent of currently married women and 49 percent of married men. Male condoms are known to 58 percent of married women and 80 percent of men. A higher proportion of respondents reported knowing a modern method of family planning than a traditional method.

About one in five (21 percent) currently married women has used a contraceptive method at some time-19 percent have used a modern method and 6 percent have used a traditional method. However, only about one in twelve currently married women (8 percent) is currently using a contraceptive method. Modern methods account for almost all contraceptive use, with 7 percent of married women reporting use of a modern method, compared with only 1 percent using a traditional method. Injectables and the pill are the most widely used methods (3 and 2 percent of married women, respectively), followed by LAM and male condoms (less than 1 percent each).

## CHILD HEALTH

Examination of levels of infant and child mortality is essential for assessing population and health policies and programmes. Infant and child mortality rates are also used as indices reflecting levels of poverty and deprivation in a population. The 2008 survey data show that over the past 15 years, infant and under-five mortality have decreased by 26 percent. Still, one in seven Sierra Leonean children dies before reaching age five. For the most recent five-year period before the survey (approximately calendar years 2003 to 2008), the infant mortality rate was 89 deaths per 1,000 live births and the under-five mortality rate was 140 deaths per 1,000 live births. The neonatal mortality rate was 36 deaths per 1,000 live births and the post-neonatal mortality rate was 53 deaths per 1,000 live births. The child mortality rate was 56 deaths per 1,000 children surviving to age one year.

Mortality rates at all ages of childhood show a strong relationship with the length of the preceding birth interval. Under-five mortality is three times higher among children born less than two years after a preceding sibling (252 deaths per 1,000 births) than among children born four or more years after a previous child (deaths 81 per 1,000 births).

## MATERNAL HEALTH

Almost nine in ten mothers (87 percent) in Sierra Leone receive antenatal care from a health professional (doctor, nurse, midwife, or MCH aid). Only 5 percent of mothers receive antenatal care from a traditional midwife or a community health worker; 7 percent of mothers do not receive any antenatal care.

In Sierra Leone, over half of mothers have four or more antenatal care (ANC) visits, about 20 percent have one to three ANC visits, and only 7 percent have no antenatal care at all. The survey shows that not all women in Sierra Leone receive antenatal care services early in pregnancy. Only 30 percent of mothers obtain antenatal care in the first three months of pregnancy, 41 percent make their first visit in the fourth or fifth month, and 17 percent in have their first visit in the sixth or seventh month. Only 1 percent of women have their first ANC visit in their eighth month of pregnancy or later.

## BREASTFEEDING AND NUTRITION

Poor nutritional status is one of the most important health and welfare problems facing Sierra Leone today and particularly afflicts women and children. The data show that 36 percent of children under five are stunted (too short for their age) and 10 percent of children under five are wasted (too thin for their height). Overall, 21 percent of children are underweight, which may reflect stunting, wasting, or both. For women, at the national level 11 percent of women are considered to be thin (body mass index <18.5); however, only 4 percent of women are considered severely thin. At the other end of a spectrum, 20 percent of women age 15-49 are considered to be overweight (body mass index 25.0-29.9) and 9 percent are considered obese (body mass index ≥30.0).

## HIV/AIDS

The HIV/AIDS pandemic is one of the most serious health concerns in the world today because of its high case-fatality rate and the lack of a cure. Awareness of AIDS is relatively high among Sierra Leonean adults age 15-49, with 69 percent of women and 83 percent of men saying that they have heard about AIDS. Nevertheless, only 14 percent of women and 25 percent of men are classified as having 'comprehensive knowledge' about AIDS, i.e., knowing that consistent use of condoms during sexual intercourse and having just one faithful, HIV-negative partner can reduce the chances of getting HIV/AIDS, knowing that a healthy-looking person can have HIV (the virus that causes AIDS), and knowing that HIV cannot be transmitted by sharing food/utensils with someone who has HIV/AIDS, or by mosquito bites.

Such a low level of knowledge about HIV/AIDS implies that a concerted effort is needed to address misconceptions about the transmission of HIV in Sierra Leone. Comprehensive knowledge is substantially lower among respondents with no education and those who live in the poorest households. Programmes could be targeted to populations in rural areas, and especially women in the Northern and Southern regions and men in the Eastern Region, where comprehensive knowledge is lowest. A

composite indicator on stigma towards people who are HIV positive shows that only 5 percent of women and 15 percent of men age 15-49 expressed accepting attitudes towards persons living with HIV/AIDS.

## FEMALE CIRCUMCISION

The 2008 SLDHS collected data on the practice of female circumcision (or female genital cutting) in Sierra Leone. Awareness of the practice is universally high. Almost all (99 percent) of Sierra Leonean women and 96 percent of men age 15-49 have heard of the practice. The prevalence of female circumcision is high (91 percent). Most women (82 percent) reported that the cutting involves the removal of flesh. The most radical procedure, infibulation-when vagina is sewn closed during the circumcision-is reported by only 3 percent of women. The survey results indicate that almost all of the women were circumcised by traditional practitioners (95 percent); only a small proportion of circumcisions were performed by a trained health professional (0.3 percent).

Among Sierra Leonean adults age 15-49 who have heard of female circumcision, more men than women oppose the practice (41 and 26 percent, respectively), which is similar to patterns in other West African countries.

### KIND OF DATA

Sample survey data

### UNIT OF ANALYSIS

- Household
- Women age 15-49
- Men age 15-59

## Scope

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### NOTES

The Sierra Leone Demographic and Health Survey 2008 covers the following topics:

- Abortion
- Anemia Questions
- Anemia Testing
- Anthropometry
- Birth Registration
- Child Labor
- Female Genital Cutting
- GPS/Georeferenced
- HIV Behavior
- HIV Knowledge
- HIV Testing
- Iodine salt test
- Malaria Module -Includes bednet inventory
- Malaria/Bednet Questions
- Maternal Mortality
- Men's Survey
- Micronutrients
- Reproductive Calendar
- Social Marketing
- TB Questions
- Tobacco Use
- Women's Status

## Coverage

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### GEOGRAPHIC COVERAGE

The survey used a nationally representative sample.

### UNIVERSE

The population covered by the 2008 DHS is defined as the universe of all women age 15-49 who slept in the selected households the night before the survey were eligible to be interviewed; all men age 15-59 who slept in the households

selected for the survey of men were eligible to be interviewed.

## Producers and sponsors

### PRIMARY INVESTIGATORS

Name
Statistics Sierra Leone (SSL)
Ministry of Health and Sanitation (MOHS)

### PRODUCERS

Name	Affiliation	Role
ICF Macro	ICF International Company	Technical assistance

### FUNDING AGENCY/SPONSOR

Name	Abbreviation	Role
Government of Sierra Leone		Funding
United States Agency for International Development	USAID	Funding
United Nations Population Fund	UNFPA	Funding
United Nations Development Programme	UNDP	Funding
United Nations Children's Fund	UNICEF	Funding
Department for International Development	DFID	Funding
World Bank	WB	Funding

### OTHER IDENTIFICATIONS/ACKNOWLEDGMENTS

Name	Role
United Nations High Commission for Refugees (UNHCR)	Logistical support
World Health Organization (WHO)	Logistical support
World Food Programme (WFP)	Logistical support
United Nations Population Fund (UNFPA)	Backstopping support

## Sampling

### SAMPLING PROCEDURE

#### OBJECTIVES OF THE SURVEY

The 2008 Sierra Leone Demographic and Health Survey (SLDHS 2008) is the first DHS survey carried out in the country, although it shares many similarities with previous surveys such as MICS-1 (1995), MICS-2 (2000), and MICS-3 (2005). Based on a nationally representative sample of approximately 8,000 households and 10,000 complete women interviews, the main objectives of the SLDHS 2008 were to provide up-to-date information on fertility and childhood mortality levels; fertility preferences; awareness, approval, and use of family planning methods; maternal and child health; knowledge and attitudes towards HIV/AIDS and other sexually transmitted infections (STI); prevalence level of HIV/AIDS. All women age 15-49 who slept in the selected households the night before the survey were eligible to be interviewed with the Woman's Questionnaire. The survey results are representative for the country as a whole, for urban and rural areas, and for each of the four provinces.

Separate from the main survey of women and children, a survey of men was conducted in one of every two households selected for the main survey. All men age 15-59 who slept in the households selected for the men's survey were interviewed using the Men's Questionnaire. All eligible men age 15-59 and all eligible women age 15-49 in the households selected for

male survey were eligible for HIV testing.

## SAMPLING FRAME

Administratively, Sierra Leone is divided into 4 provinces. Each province is divided into districts, each district is divided into chiefdoms, and each chiefdom is divided into sections. In total, there are 14 districts, 149 chiefdoms, and 1,320 sections. Among the 14 districts, Bo City from Bo district, Bonthe City from Bonthe district, Kenema City from Kenema district, Koidu City from Kono district and Makeni City from Bombali district were separated from the district to form 5 city councils; the rest of the 5 districts form 5 local councils; the other 9 districts each forms a local council. So in total, there are 19 local councils. The five city councils together form a domain of study. For the purpose of the SLDHS, the local councils were adopted as a secondary domain of study. Samples were allocated to each local council and by urban-rural residence within each council.

In addition to these administrative units, during the 2004 Sierra Leone Population and Housing Census (SSL, 2006b), each section was subdivided into convenient area units called Enumeration Areas (EAs), which were compiled electronically into a complete list of all the EAs. The list contains census information on household, population, urban-rural specifications, and administrative matters, etc. for every EA. The census EAs were used as the primary sampling units (PSUs), also called clusters, for the 2008 SLDHS. The sample was selected from the frame of PSUs provided by Statistics Sierra Leone (SSL). The frame excluded the population living in collective housing units, such as hotels, hospitals, work camps, prisons, and the like..

In total, there are 9,671 EAs in Sierra Leone; 2,903 EAs are located in urban areas and 6,768 EAs are located in rural areas. On average, a census EA has 102 households in urban areas and 77 households in rural areas, with an overall average of 85 households per EA. In Sierra Leone, 35.8 percent of the household population lives in urban areas and they occupy 36.3 percent of the households, according to the sampling frame. The statistics from the sampling frame show no differences when compared with the 2004 Population and Housing Census; this indicates that the sampling frame covers the whole country.

## SAMPLE ALLOCATION AND SAMPLE SELECTION

The 2008 SLDHS sample was a stratified sample selected in two stages from the 2004 census frame. Stratification was achieved by separating each local council into urban and rural areas. The West Urban Area and the 5 city councils have only urban areas; in total, 32 sampling strata were constructed. The samples were selected independently in each stratum, using a two-stage selection procedure. By sorting the sampling frame according to administrative order and by using a probability proportional to size selection in the first stage sampling, an implicit stratification and proportion allocation was achieved at each administrative level.

The sample allocation takes into account precision at the domain level. While it would be best to allocate the 10,000 completed women's interviews proportionally to each sampling stratum by stratum size, such a proportional allocation would allocate too small a sample size for the domain Local Councils. DHS surveys in the other countries show that to obtain reasonable precision for most DHS indicators at the domain level, at least 800 completed interviews of women 15-49 are needed for each domain. On the other hand, for survey precision to be comparable across domains, the samples should (as much as possible) be similar in size. This means that the proportional allocation cannot be used. Instead, a power allocation was used-allocation proportional to a power of the stratum size; it is between the proportional allocation and the equal size allocation.

The sample allocation was done in two steps: first, a power allocation was used to allocate the target number of complete women 15-49 to each domain; then the domain sample size was proportionally allocated to each sampling stratum-that is, the urban and rural areas of each local council-within the domain. The sample allocation was then converted to number of households by applying the average number of women 15-49 per household and response rates at household level and the individual level, respectively. The 2004 Population and Housing Census shows that there are 1.53 women age 15-49 per household. By assuming a response rate of 95 percent for both households and women, and a sample take of 22 households per EA, the sample allocation of EAs and households by domain and local council, and by urban-rural specification was carried out (Table 4). In total, 353 EAs were selected with 145 EAs in urban areas and 208 EAs in rural areas; 7,766 households were selected with 3,190 households in urban areas and 4,576 households in rural areas.

The sampling procedure for the men's survey was to interview men age 15-59 in one of every two households selected for the women's survey. The 2004 Population and Housing Census showed an average of 1.5 men age 15-59 per household (SSL, 2006b). By assuming a response rate of 90 percent, the expected number of completed interviews for men age 15-59 was 4,976 (2,042 in urban areas and 2,934 in rural areas). Urban areas were slightly over sampled because of the creation of the five city councils as a domain.

Prior to the main survey, a household listing operation was carried out in all of the selected EAs, and the resulting lists of households served as the sampling frame for the selection of households in the second stage. Some of the selected EAs

were large in size; to minimize the task of household listing, selected EAs that had more than 200 households were segmented. Only one segment was selected for the survey with probability proportional to the segment size. The household listing was conducted only in the selected segment; therefore, a SLDHS 2008 cluster is either an EA or a segment of an EA. Household selection in the second stage was an equal probability systematic selection of fixed size: 22 households per cluster. The fixed second stage sample size facilitates allocation of workloads to different interviewers and as well as quality control during fieldwork.

In the central office, a spreadsheet with the selected household numbers for each cluster was prepared for the household selection. Survey interviewers were asked to interview only the preselected households. To prevent bias, no replacements and no changes in the pre-selected households were allowed in the implementing stages. All women age 15-49 who slept in the selected households the night before the survey were eligible to be interviewed; all men age 15-59 who slept in the households selected for the survey of men were eligible to be interviewed.

The survey yielded a smaller number of completed interviews for both women and men because there were fewer eligible women and men per household, compared with the census numbers.

#### RESPONSE RATE

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 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 slightly lower response rate for men reflects the more frequent and longer absences of men from the households.

## Data collection

#### DATES OF DATA COLLECTION

Start	End
2008-04	2008-06

#### DATA COLLECTION MODE

Face-to-face

#### SUPERVISION

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, ICF Macro staff, and the DHS resident consultant monitored fieldwork in addition to SSL top management and the UN interagency team.

#### DATA COLLECTION NOTES

##### 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 Statistics Sierra Leone during a four-week period from 17 March to 15 April, 2008. The training was conducted by senior staff from Statistics Sierra Leone, who participated in the pretest, with support from UNFPA, UNICEF, the Ministry of Health and Sanitation, and ICF Macro. Training consisted of lectures, demonstrations, practice interviews in small groups, and examinations. The last week of training provided instruction on how to take anthropometric measurements and the 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 the fieldwork and how to edit completed questionnaires.

## 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.

### HAEMOGLOBIN TESTING

Haemoglobin testing is the primary method of anaemia diagnosis. Reliable measures are obtained using the HemoCue system (Hb 201+). In half of the households selected for the 2008 SLDHS, men age 15-59, women age 15-49, and children age 6-59 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, single-use, self-retracting lancet. A drop 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.

### 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 the DHS programme and approved by ICF Macro'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 information which 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, which 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, to obtain informed consent for collecting blood 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 HIV status through voluntary counselling and testing (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 to track the blood sample from the field to the laboratory. The 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, then 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 to be logged in. After this, 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 programme specially developed by ICF 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-i.e., a completely filled and well-saturated spot without blood clot-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 7.37.4) 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.

Prior to the survey, the National Reference Laboratory (NRL) had experience using its ELISA machine for testing for HIV. ICF Macro supplied the NRL staff with the necessary equipment and reagents. ICF Macro consultants visited and worked with the NRL staff and trained seven laboratory technicians in how to run the various tests and use the software. The HIV test results were merged with the individual questionnaire records after the questionnaires were destroyed and the cluster numbers scrambled.



## DATA COLLECTORS

Name	Abbreviation
Statistics Sierra Leone	SSL

## Questionnaires

## QUESTIONNAIRES

Three types of questionnaires were administered for the 2008 SLDHS: a) the Household Questionnaire, b) the Women's Questionnaire, and c) the 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. The SSL, in collaboration with other stakeholders and ICF Macro staff, held a series of meetings to adapt the model questionnaires to the situation in Sierra Leone regarding relevant issues in population, family planning, HIV/AIDS, and other health issues in Sierra Leone. Given that there are many 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.

a) 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 the characteristics of the household 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. The Household 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 voluntary consent to give blood samples for testing. The HIV and anaemia testing procedures are described in detail in the next section.

b) 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

c) 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 and nutrition.

## Data Processing

## DATA EDITING

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, 15 data entry editors, 23 data entry operators, and four secondary editors. Data were entered using the CSPro computer package. All data were entered twice for 100 percent verification. The concurrent processing of data was a distinct advantage for assessing data quality because 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.

## Data Appraisal

### ESTIMATES OF SAMPLING ERROR

Sampling errors, on the other hand, can be evaluated statistically. The sample of respondents selected in the SLDHS 2008 is only one of many samples that could have been selected from the same population, using the same design and expected size. Each of these samples would yield results that differ somewhat from the results of the actual sample selected. Sampling errors are a measure of the variability between all possible samples. Although the degree of variability is not known exactly, it can be estimated from the survey results.

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

If the sample of respondents had been selected as a simple random sample, it would have been possible to use straightforward formulas for calculating sampling errors. However, the SLDHS 2008 sample is the result of a multi-stage stratified design, and, consequently, it was necessary to use more complex formulae. The computer software used to calculate sampling errors for the SLDHS 2008 is a Macro SAS procedure. This procedure used the Taylor linearization method of variance estimation for survey estimates that are means or proportions. The Jackknife repeated replication method is used for variance estimation of more complex statistics such as fertility and mortality rates.

The Jackknife repeated replication method derives estimates of complex rates from each of several replications of the parent sample, and calculates standard errors for these estimates using simple formulae. Each replication considers all but one cluster in the calculation of the estimates. Pseudo-independent replications are thus created. In the SLDHS 2008, there were 353 non-empty clusters. Hence, 353 replications were created.

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

Sampling errors for the SLDHS 2008 are calculated for selected variables considered to be of primary interest for the women's survey and for the men's surveys, respectively. The results are presented in this appendix for the country as a whole, for urban and rural areas, for each of the four geographical regions. For each variable, the type of statistic (mean, proportion, or rate) and the base population are given in Table B.1. Tables B.2 to B.8 present the value of the statistic (R), its standard error (SE), the number of unweighted (N-UNWE) and weighted (N-WEIG) cases, the design effect (DEFT), the relative standard error (SE/R), and the 95 percent confidence limits ( $R \pm 2SE$ ), for each variable. The DEFT is considered undefined when the standard error considering simple random sample is zero (when the estimate is close to 0 or 1). In the case of the total fertility rate and total abortion rate, the number of unweighted cases is not relevant, as there is no known unweighted value for woman-years of exposure to child-bearing.

The confidence interval (e.g., as calculated for children ever born to women aged 40-49) can be interpreted as follows: the overall average from the national sample is 5.538 and its standard error is 0.114. Therefore, to obtain the 95 percent confidence limits, one adds and subtracts twice the standard error to the sample estimate, i.e.,  $5.538 \pm 2 \times 0.114$ . There is a high probability (95 percent) that the true average number of children ever born to all women aged 40 to 49 is between 5.310 and 5.766.

For the total sample, the value of the DEFT, averaged over all variables, is 1.5. This means that, due to multi-stage clustering of the sample, the average standard error is increased by a factor of 1.5 over that in an equivalent simple random sample.

### DATA APPRAISAL

Nonsampling errors are the results of mistakes made in implementing data collection and data processing, such as failure to locate and interview the correct household, misunderstanding of the questions on the part of either the interviewer or the respondent, and data entry errors. Although numerous efforts were made during the implementation of the 2008 Sierra Leone Demographic and Health Survey (SLDHS 2008) to minimize this type of error, nonsampling errors are impossible to avoid and difficult to evaluate statistically.

## Access policy

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### CITATION REQUIREMENTS

Use of the dataset must be acknowledged using a citation which would include:

- the Identification of the Primary Investigator
- the title of the survey (including country, acronym and year of implementation)
- the survey reference number
- the source and date of download

### ACCESS AUTHORITY

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## Disclaimer and copyrights

### DISCLAIMER

The user of the data acknowledges that the original collector of the data, the authorized distributor of the data, and the relevant funding agency bear no responsibility for use of the data or for interpretations or inferences based upon such uses.

## Metadata production

### DDI DOCUMENT ID

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### PRODUCERS

Name	Abbreviation	Role
World Bank, Development Economics Data Group	DECDG	Generation of DDI documentation

**Data Dictionary**

Data file	Cases	Variables
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