Liberia - Demographic and Health Survey 2007

Liberia Institute for Statistics and Geo-Information Services (LISGIS)

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Sampling

Sampling Procedure

The LDHS sample was designed to produce most of the key indicators for the country as a whole, for urban and rural areas separately, and for Monrovia and each of five regions that were formed by grouping the 15 counties. The regional groups are as follows:
1 Greater Monrovia
2 North Western: Bomi, Grand Cape Mount, Gbarpolu
3 South Central: Montserrado (outside Monrovia), Margibi, Grand Bassa
4 Southeastern A: River Cess, Sinoe, Grand Gedeh
5 Southeastern B: Rivergee, Grand Kru, Maryland
6 North Central: Bong, Nimba, Lofa

Thus the sample was not spread geographically in proportion to the population, but rather more or less equally across the regions. As a result, the LDHS sample is not self-weighting at the national level and sample weighting factors have been applied to the survey records in order to bring them into proportion.

The survey utilised a two-stage sample design. The first stage involved selecting 300 sample points or clusters from the list of 4,602 enumeration areas (EAs) covered in the 1984 Population Census. This sampling 'frame' is more than 20 years old and in the intervening years Liberia has experienced a civil war and considerable population change. Many people left the country altogether, others lost their lives, while others moved within the country. For example, some households in rural areas relocated into larger villages in order to be better protected. New communities were established, while existing ones had expanded or contracted or even disappeared. Furthermore, as urban areas-especially Monrovia-expanded, some EAs that were previously considered rural may have become urban, but this will not be reflected in the sample frame. Taking all these factors into account, it is obvious that the 1984 census frame is not ideal to be used as sampling frame; however, it is still the only national frame which covers the whole country.

LISGIS conducted a fresh listing of the households residing in the selected sample points, along with identifying the geographic coordinates (latitude and longitude) of the center of each cluster (GPS coding). The listing was conducted from March to May 2006. The second stage of selection involved the systematic sampling of 25 of the households listed in each cluster. It later turned out that there was a problem with the sample frame for Monrovia that resulted in two areas being erroneously oversampled. To correct this error, two clusters were dropped altogether, while five others were replaced in order to provide more balance in the selection. Thus the survey covered a total of 298 clusters-114 urban and 184 rural.

All women and men aged 15-49 years who were either permanent residents of the households in the sample or visitors present in the household on the night before the survey were eligible to be interviewed in the survey and to give a few drops of blood for HIV testing.

Note: See detailed description of the sample design in Appendix A of the survey final report.

Response Rate

A total of 7,471 households were selected in the sample, of which 7,021 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, 6,824 were successfully interviewed, yielding a household response rate of 97 percent.

In the households interviewed in the survey, a total of 7,448 eligible women were identified, of whom 7,092 were successfully interviewed yielding a response rate of 95 percent. With regard to the male survey results, 6,476 eligible men were identified, of whom 6,009 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.

Note: See summarized response rates in Table 1.1 of the survey final report.

Questionnaires

Overview

Three questionnaires—a Household Questionnaire, a Women's Questionnaire, and a Men's Questionnaire—were used in the survey. The contents of these questionnaires were based on model questionnaires developed by the MEASURE DHS program.

In consultation with a group of stakeholders, LISGIS and Macro staff modified the DHS model questionnaires to reflect relevant issues in population, family planning, HIV/AIDS, and other health issues in Liberia. Given that there are dozens of local languages in Liberia, most of which have no accepted written script and are not taught in the schools, and given that English is widely spoken, it was decided not to attempt to translate the questionnaires into vernaculars. However, many of the questions were broken down into a simpler form of Liberian English that interviewers could use with respondents.

The Household Questionnaire was used to list all the usual members and visitors 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 the 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 of the house, 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 years and of children under the age of 5 years and women's and men's consent to volunteer to give blood samples. The HIV 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
- Prenatal 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 behavior about HIV/AIDS and other STIs
- Adult mortality including maternal mortality.

The Women's Questionnaire also included a series of questions to obtain information on women's experience of domestic violence. These questions were administered to one woman per household. In households with two or more eligible women, special procedures were followed in order to ensure that there was random selection of the woman to be interviewed and that these questions were administered in privacy.

The Men's Questionnaire collected similar information contained in the Woman's Questionnaire, but was shorter because it did not contain questions on reproductive history, maternal and child health, nutrition, maternal mortality, or domestic violence.

All aspects of the LDHS data collection were pretested in July 2006. For the pretest, LISGIS recruited 19 people to attend the training, most of whom were LISGIS staff with a few from other organizations involved in the survey, e.g., the NACP. Training was held at the Liberia Bible Society for 11 days from June 20 through July 1. Twelve of the 19 participants were selected to implement the pretest interviewing. Two teams were formed for the pretest, each with one supervisor, three female interviewers. and two male interviewers. Each team covered one rural and one urban EA. Because the work was being done during the period of heavy rainfall, the rural areas selected were off a main paved road, about 1-2 hours' drive from Monrovia, and the urban areas were both in Monrovia itself. Pretest interviewing took six days, from July 4 through July 9. In total, the teams completed interviews with 95 households, 82 women and 60 men, and collected 118 blood samples. The pretest resulted in deleting some questions and making modifications in others.

Data Collection

Data Collection Dates

Start	End	Cycle
2006-12-15	2007-04-01	N/A

Data Collection Mode

Face-to-face

DATA COLLECTION NOTES

TRAINING

LISGIS recruited 122 field staff candidates from Monrovia, mostly by word of mouth. Many of the candidates had participated in either the LDHS pretest or a prior survey. LISGIS then organized a four-week training course from November 14 through December 9 at the LISGIS Headquarters in Monrovia. Trainers included four staff who participated in the LDHS pretest and two Macro staff. Training consisted mainly of lectures followed by mock interviews between trainees. Three quizzes were administered, graded, and reviewed.

The third week of training consisted largely of instructions on how to take anthropometric measurements and procedures for HIV testing (how to administer informed consent, how to take blood spot samples, how to dry the filter papers, and how to pack them the next morning). During the final week of training, participants had two field practice sessions in which they were divided into teams and conducted interviews with households located in Monrovia.

After several meetings, senior LDHS staff and the trainers decided on the final assignment of participants to teams. Unfortunately, the pool of candidates did not include a sufficient number of speakers of all the local dialects spoken in the sampled areas. Although English is widely spoken, it is preferable to be able to conduct the interviews in respondents' dialects, given the sensitivity and complexity of some of the questions. Also, because the vehicles could only hold six people, it was decided not to have a field editor on each team and instead ask one of the interviewers to help the supervisor in checking questionnaires when the workload was heavy. The final day of training consisted of a session with the team supervisors to train them on how to supervise fieldwork and edit completed questionnaires.

FIELDWORK

A total of 19 teams—each comprising one supervisor, two female interviewers, two male interviewers, and one driver—were organized for the data collection. Two senior staff from LISGIS and one from the NACP were designated as field coordinators and were each assigned a number of teams to monitor. Data collection started on December 25, 2006. Several weeks later, a review of completed questionnaires showed considerable errors, low response rates, and lack of attention to details. Consequently, all teams were recalled to Monrovia for two days of additional training and three teams were relieved of their duties altogether. The remaining 16 teams continued with data collection until April 2007.

A number of challenges were faced by the field teams. There were several road accidents, including one in which the vehicle turned over on Christmas Eve, thankfully causing no serious injuries. In several clusters, many selected households had moved or could not be found.

Data Processing

Other Processing

The processing of the LDHS data began a few weeks after the fieldwork commenced. Completed questionnaires were returned periodically from the field to the LISGIS office in Monrovia, where they were coded by data processing personnel recruited and trained for this task. The data processing staff consisted of two supervisors from LISGIS, four questionnaire administrators/coding clerks, and 14 data entry operators, all of whom were trained by Macro staff. Data were entered using the CSPro computer package. All data were entered twice (100 percent verification). The concurrent processing of the data was a distinct advantage for data quality, because LISGIS was able to advise field teams of errors detected during data entry. The data entry and editing phase of the survey was completed in early July 2007.

Data Appraisal

Estimates of Sampling Error

The estimates from a sample survey are affected by two types of errors: nonsampling errors and sampling errors. Nonsampling errors are the results of mistakes made in implementing data collection and data processing, such as failure to locate and interview the correct household, misunderstanding of the questions on the part of either the interviewer or the respondent, and data entry errors. Although numerous efforts were made during the implementation of the 2007 Liberia Demographic and Health Survey (2007 LDHS) to minimize this type of error, nonsampling errors are impossible to avoid and difficult to evaluate statistically.

Sampling errors, on the other hand, can be evaluated statistically. The sample of respondents selected in the 2007 LDHS 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 2007 LDHS 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 LDHS 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.

Note: See detailed estimate of sampling error calculation in APPENDIX B of the survey final report.

Other forms of Data Appraisal

Data Quality Tables

- Household age distribution
- Age distribution of eligible and interviewed women
- Age distribution of eligible and interviewed men
- Completeness of reporting
- Births by calendar years
- Reporting of age at death in days
- Reporting of age at death in months
- Nutritional status of children
- Coverage of HIV testing among interviewed women by social and demographic characteristics
- Coverage of HIV testing among interviewed men by social and demographic characteristics
- Coverage of HIV testing among interviewed women by sexual behavior characteristics
- Coverage of HIV testing among interviewed men by sexual behaviorcharacteristics

Note: See these tables in APPENDIX C of the survey final report.

Related Materials

Questionnaires

Demographic and Health Survey 2006-2007: Household Questionnaire

Title	Demographic and Health Survey 2006-2007: Household Questionnaire
Author(s)	Liberia Institute for Statistics and Geo-information Services (LISGIS) Macro International Inc.
Date	2006-08-31
Country	Liberia
Language	English
Filename	Household Questionnaire.pdf

Demographic and Health Survey 2006-2007: Questionnaire for Women 15-49

Title	Demographic and Health Survey 2006-2007: Questionnaire for Women 15-49
Author(s)	Liberia Institute for Statistics and Geo-information Services (LISGIS) Macro International Inc.
Date	2006-08-31
Country	Liberia
Language	English
Filename	Women Questionnaire.pdf

Demographic and Health Survey 2006-2007: Questionnaire for Men Aged 15-49

Title	Demographic and Health Survey 2006-2007: Questionnaire for Men Aged 15-49
Author(s)	Liberia Institute for Statistics and Geo-information Services (LISGIS) Macro International Inc.
Date	2006-08-31
Country	Liberia
Language	English
Filename	Men Questionnaire.pdf

Reports

Demographic and Health Survey 2007 - Final Report

Title	Demographic and Health Survey 2007 - Final Report
Author(s)	Liberia Institute of Statistics and Geo-Information Services (LISGIS) Ministry of Health and Social Welfare National AIDS Control Program Macro International Inc.
Date	2008-07-01
Country	Liberia
Language	English
Contributor(s)	Macro International LISGIS
Publisher(s)	LISGIS
Filename	http://www.dhsprogram.com/pubs/pdf/FR201/FR201.pdf

Demographic and Health Survey 2007 - HIV Fact Sheet

Title	Demographic and Health Survey 2007 - HIV Fact Sheet
Author(s)	MEASURE DHS
Country	Liberia
Language	English
Filename	http://www.dhsprogram.com/pubs/pdf/HF24/HF24.pdf

Demographic and Health Survey 2007 - Key Findings

Title	Demographic and Health Survey 2007 - Key Findings
Author(s)	Macro Internatinal Inc.
Date	2008-01-01
Country	Liberia
Language	English
Filename	http://www.dhsprogram.com/pubs/pdf/SR140/SR140.pdf

Technical documents

Press Release: New National Survey Finds 2 Percent of Liberian Adults Have HIV

Title	Press Release: New National Survey Finds 2 Percent of Liberian Adults Have HIV
Date	2007-07-13
Country	Liberia
Language	English
Filename	Press release.pdf

DDI Data Dictionary

Title	DDI Data Dictionary
Date	2008-03-01
Country	Liberia
Language	English
Filename	DDI Data Dictionary.pdf