

Ethiopia - Demographic and Health Survey 2011

Ministry of Health (MOH), Central Statistical Agency (CSA)

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Sampling

Sampling Procedure

The sample for the 2011 EDHS was designed to provide population and health indicators at the national (urban and rural) and regional levels. The sample design allowed for specific indicators, such as contraceptive use, to be calculated for each of Ethiopia's 11 geographic/administrative regions (the nine regional states and two city administrations). The 2007 Population and Housing Census, conducted by the CSA, provided the sampling frame from which the 2011 EDHS sample was drawn.

Administratively, regions in Ethiopia are divided into zones, and zones, into administrative units called weredas. Each wereda is further subdivided into the lowest administrative unit, called kebele. During the 2007 census each kebele was subdivided into census enumeration areas (EAs), which were convenient for the implementation of the census. The 2011 EDHS sample was selected using a stratified, two-stage cluster design, and EAs were the sampling units for the first stage. The sample included 624 EAs, 187 in urban areas and 437 in rural areas.

Households comprised the second stage of sampling. A complete listing of households was carried out in each of the 624 selected EAs from September 2010 through January 2011. Sketch maps were drawn for each of the clusters, and all conventional households were listed. The listing excluded institutional living arrangements and collective quarters (e.g., army barracks, hospitals, police camps, and boarding schools). A representative sample of 17,817 households was selected for the 2011 EDHS. Because the sample is not self-weighting at the national level, all data in this report are weighted unless otherwise specified.

In the Somali region, in 18 of the 65 selected EAs listed households were not interviewed for various reasons, such as drought and security problems, and 10 of the 65 selected EAs were not listed due to security reasons. Therefore, the data for Somali may not be totally representative of the region as a whole. However, national-level estimates are not affected, as the percentage of the population in the EAs not covered in the Somali region is proportionally very small.

SAMPLING FRAME

The sampling frame used for 2011 EDHS is the Population and Housing Census (PHC) conducted in 2007 provided by the Central Statistical Agency (CSA, 2008). CSA has an electronic file consisting of 81,654 Enumeration Areas (EA) created for the 2007 census in 10 of its 11 geographic regions. An EA is a geographic area consisting of a convenient number of dwelling units which served as counting unit for the census. The frame file contains information about the location, the type of residence, and the number of residential households for each of the 81,654 EAs. Sketch maps are also available for each EA which delimitate the geographic boundaries of the EA. The 2007 PHC conducted in the Somali region used a different methodology due to difficulty of access. Therefore, the sampling frame for the Somali region is in a different file and in different format. Due to security concerns in the Somali region, in the beginning it was decided that 2011 EDHS would be conducted only in three of nine zones in the Somali region: Shinile, Jijiga, and Liben, same as in the 2000 and 2005 EDHS. However, a later decision was made to include three other zones: Afder, Gode and Warder. This was the first time that these three zones were included in a major nationwide survey such as the 2011 EDHS. The sampling frame for the 2011 EDHS consists of a total of 85,057 EAs.

The sampling frame excluded some special EAs with disputed boundaries. These EAs represent only 0.1% of the total population.

Ethiopia is divided into 11 geographical regions. Each region is sub-divided into zones, each zone into Waredas, each Wareda into towns, and each town into Kebeles. Among the 85,057 EAs, 17,548 (21 percent) are in urban areas and 67,509 (79 percent) are in rural areas. The average size of EA in number of households is 169 in an urban EA and 180 in a rural EA, with an overall average of 178 households per EA. Table A.2 shows the distributions of households in the sampling frame, by region and residence. The data show that 81 percent of the Ethiopia's households are concentrated in three regions: Amhara, Oromiya and SNNP, while 4 percent of all households are in the five smallest regions: Afar, Benishangul-Gumuz, Gambela, Harari and Dire Dawa.

Response Rate

A total of 17,817 households were selected for the sample, of which 17,018 were found to be occupied during data collection. Of these, 16,702 were successfully interviewed, yielding a household response rate of 98 percent.

In the interviewed households 17,385 eligible women were identified for individual interview; complete interviews were

conducted for 16,515, yielding a response rate of 95 percent. Similarly, a total of 15,908 eligible men were identified for interview; completed interviews were conducted for 14,110, yielding a response rate of 89 percent. In general, response rates were higher in rural areas than urban areas, for both women and men.

Due to the non-proportional allocation of the sample to the different regions and to their urban and rural areas, sampling weights are used for analyzing the 2011 EDHS data to ensure the actual representativeness of the survey results at the national and regional level. Whenever applicable, both weighted and unweighted numbers are used in the tables of this report.

Weighting

The sampling weight for each household is the inverse of its overall selection probability.

Design weights were adjusted for household non-response and as well as for individual (women and men) non-response to get the sampling weights. The differences of the household sampling weights and the individual sampling weights are introduced by individual non-response. The final sampling weights (both household and individual weights) were normalized in order to give the total number of unweighted cases equal to the total number of weighted cases at the national level. The normalized weights are relative weights which are valid for estimating means, proportions and ratios, but not valid for estimating population totals and for pooled data. The sampling weights for HIV testing were calculated in a similar way, but the normalization of the individual sampling weights was different compared to the individual survey weights. The HIV testing weights were normalized for women and men together at the national level, so that the HIV prevalence calculated for all adults (women and men) are valid.

Questionnaires

Overview

The 2011 EDHS used three questionnaires: the Household Questionnaire, the Woman's Questionnaire, and the Man's Questionnaire. These questionnaires were adapted from model survey instruments developed for the MEASURE DHS project to reflect the population and health issues relevant to Ethiopia. Issues were identified at a series of meetings with the various stakeholders. In addition to English, the questionnaires were translated into three major languages—Amharigna, Oromiffa, and Tigrigna.

The Household Questionnaire was used to list all the usual members and visitors of selected households. Basic information was collected on the characteristics of each person listed, including age, sex, education, and relationship to the head of the household. For children under age 18, survival status of the parents was determined. The data on the age and sex of household members obtained in the Household Questionnaire were used 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 of the house, and ownership of various consumer durable goods. In addition, this questionnaire was used to record height and weight measurements of eligible women and men and children under age 5, as well as male and female respondents' voluntary consent to give blood samples.

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

- Background characteristics such as age, education and media exposure
- Birth history and childhood mortality
- Knowledge and use of family planning methods
- Fertility preferences
- Antenatal, delivery and postnatal care
- Breastfeeding and infant feeding practices
- Vaccinations and childhood illnesses
- Marriage and sexual activity
- Women's work
- Husband's background characteristics
- Awareness and behaviour regarding AIDS and other sexually transmitted infections (STIs)
- Adult mortality, including maternal mortality

The Man's Questionnaire was administered to all men age 15-59 in each household in the 2011 EDHS sample. The Man's Questionnaire collected much of the same information as the Woman's Questionnaire but was shorter because it did not contain a detailed reproductive history or questions on maternal and child health.

Data Collection

Data Collection Dates

Start	End	Cycle
2010-12-27	2011-06-03	N/A

Data Collection Mode

Face-to-face [f2f]

DATA COLLECTION NOTES

LISTING, PRETEST, MAIN TRAINING, FIELDWORK, AND DATA PROCESSING

Listing

After the selection of the 624 clusters throughout the 11 regions and administrative areas, a listing operation was conducted in the selected clusters for about four months, starting in September 2010. For this purpose, training was conducted for 44 listing staff and 11 supervisors who had been recruited from all the regions and from the CSA head office to carry out the listing of households and preparation of the sketch map for each selected EA. A manual that described the listing and mapping procedures was prepared as a guideline, and the training involved both classroom demonstrations and field practice. The listing was performed by organizing the listing staff into teams, with two listers per team. Eleven supervisors were also assigned from the CSA branch offices to perform quality checks and handle all the administrative and financial aspects of the listing operation. Rounds of supervision were carried out by CSA central office staff to assess the quality of the field operation and to ensure proper listing.

Pretest

Before the start of fieldwork, the questionnaires were pretested in all three local languages to make sure that the questions were clear and could be understood by the respondents. Testing of blood sample collection was also conducted during the pretest. CSA staff and various experts from government ministries and donor organizations participated in a three-week pretest training and fieldwork conducted by staff from ICF International, from 20 September to 8 October 2010. Fifty-five participants were trained to administer paper questionnaires, take anthropometric measurements, and collect blood samples for anaemia and HIV testing. Representatives from EHNRI assisted in training participants on the finger prick for blood collection and proper handling and storage of the dried blood spots (DBS) for HIV testing. The pretest fieldwork was conducted over five days in the selected urban kebeles of Addis Ababa; and in both urban and rural kebeles in the surrounding towns of Ambo, Debre Birhan, Hawassa, and Mekele, covering 191 households. Debriefing sessions were held with the pretest field staff, and the questionnaires were modified based on lessons drawn from the pretest exercise.

Main Training

Recruitment of interviewers, editors, and supervisors for the main fieldwork was conducted in the nine regions and two city administrations, taking into account the languages of the specific areas. Accommodation was arranged for the trainees and trainers at a training site, Ethiopian Civil Service College in Addis Ababa. CSA recruited and trained 307 people for the main fieldwork to serve as supervisors, editors, male and female interviewers, and reserve interviewers. Also trained were field quality control staff, office editors, and office supervisors. The training of interviewers, editors and supervisors was conducted from 24 November to 23 December 2010. The training consisted of instruction on interviewing techniques and field procedures, a detailed review of the questionnaire content, instruction and practice in weighing and measuring children, mock interviews between participants in the classroom, and practice interviews with real respondents in areas outside the 2011 EDHS sample points. Field practice in anthropometry, anaemia testing, and blood sample collection was also carried out for interviewers who were assigned as team biomarker technicians. Team supervisors and editors were trained in data quality control procedures and fieldwork coordination.

The Amharic questionnaires were mainly used during the training, while the Tigrigna and Oromiffa versions were simultaneously checked against the Amharic questionnaires to ensure accurate translation.

Fieldwork

Thirty-five interviewing teams carried out data collection for the 2011 EDHS. Each team consisted of one team supervisor, one field editor, four female interviewers, two male interviewers, one cook, and one driver. Ten staff members from CSA coordinated and supervised fieldwork activities. An ICF International staff and representatives from other organisations supporting the survey, including EHNRI, CDC, and USAID, participated in fieldwork monitoring. In addition to the field teams,

a quality control team was present in each of the 11 regions. Each quality control team included a field coordinator, one female and one male staff member to monitor the quality of the interviews, and one biomarker quality control staff member. The quality control teams regularly visited and often stayed with the EDHS teams throughout the fieldwork period to closely supervise and monitor them. Data collection took place over a five-month period from 27 December 2010 to 3 June 2011.

ANTHROPOMETRY, ANAEMIA, AND HIV TESTING

The 2011 EDHS included height and weight measurement, anaemia testing, and blood sample collection for HIV testing in the laboratory.

Height and Weight Measurement

Height and weight measurements were carried out on women age 15-49, men age 15-59, and children under age 5 in all selected households. Weight measurements were obtained using lightweight, SECA mother-infant scales with a digital screen, designed and manufactured under the guidance of UNICEF. Height measurements were carried out using a measuring board. Children younger than 24 months were measured for height while lying down, and older children, while standing.

Anaemia Testing

Blood specimens were collected for anaemia testing from all children age 6-59 months, women age 15-49, and men age 15-59 who voluntarily consented to the testing. Blood samples were drawn from a drop of blood taken from a finger prick (or a heel prick in the case of young children with small fingers) and collected in a microcuvette.

Haemoglobin analysis was carried out onsite using a battery-operated portable HemoCue analyser. Results were given verbally and in writing. Parents of children with a haemoglobin level under 7 g/dl were instructed to take the child to a health facility for follow-up care. Likewise, nonpregnant women were referred for follow-up care if their haemoglobin level was below 7 g/dl, and pregnant women and men were referred if their haemoglobin level was below 9 g/dl. All households in which anaemia testing was conducted received a brochure explaining the causes and prevention of anaemia.

HIV Testing

Blood specimens for laboratory testing of HIV were collected by the EDHS biomarker technicians from all women age 15-49 and men age 15-59 who consented to the test. The protocol for the blood specimen collection and analysis was based on the anonymous linked protocol developed for MEASURE DHS. This protocol allows for the merging of the HIV test results with the sociodemographic data collected in the individual questionnaires after all information that could potentially identify an individual respondent has been destroyed.

Interviewers explained the procedure, the confidentiality of the data, and the fact that the test results would not be made available to the respondent. If a respondent consented to the HIV testing, five blood spots from the finger prick were collected on a filter paper card labelled with a barcode unique to the respondent. Respondents were asked whether they consented to having the laboratory store their blood sample for future unspecified testing. If the respondent did not consent to additional testing using their sample, the words "no additional testing" were written on the filter paper card.

Each household, whether individuals consented to HIV testing or not, received an informational brochure on HIV/AIDS and a list of fixed sites providing voluntary counselling and testing (VCT) services within the surrounding 10 km radius from the cluster for each region. For households farther than 10 km from a fixed VCT site, mobile VCT units were set up in or near survey areas following data collection. The USAID and CDC partners provided the logistical services for the provisions of mobile VCT services.

For each barcoded blood sample, a duplicate label was attached to the Biomarker Data Collection Form. A third copy of the same barcode was affixed to the Blood Sample Transmittal Form to track the blood samples from the field to the laboratory. Blood samples were dried overnight and packaged for storage the following morning. Samples were periodically collected in the field, along with the completed questionnaires, and transported to CSA in Addis Ababa to be logged in and checked; blood samples were then transported and submitted for testing to EHNRI in Addis Ababa.

Upon arrival at EHNRI, each blood sample was logged into the CSPro HIV Test Tracking System (CHTTS) database, given a laboratory number, and stored at -20C until tested. The HIV testing protocol stipulates that testing of blood can be conducted only after the questionnaire data entry is completed, verified, and cleaned, and all unique identifiers except the anonymous barcode number are removed from the questionnaire file. The testing algorithm calls for testing all samples on the first ELISA assay test, the Vironostika HIV Uni-Form II Plus O (Biomerieux). All positives were subjected to a second ELISA, the Murex HIV Ag/Ab Combination. If the first and second tests were discordant, a third confirmatory test, the HIV 2.2

western blot (DiaSorin), was conducted to resolve the discordance. The final result was rendered positive if the western blot confirmed the result to be positive and was rendered negative if the western blot confirmed it to be negative. When the western blot results were indeterminate, the sample result was recorded indeterminate.

Following HIV testing, the HIV test results for the 2011 EDHS were entered into the CHITS database with a barcode as the unique identifier to the result. The barcodes identifying the HIV test results were linked with the data from the individual interviews to enable analysis and publication of HIV data linked with other EDHS data.

Data Processing

Data Editing

All questionnaires for the 2011 EDHS were returned to the CSA headquarters in Addis Ababa for data processing, which consisted of office editing, coding of open-ended questions, data entry, and editing computer-identified errors. The data were processed by a team of 32 data entry operators, 6 office editors, and 4 data entry supervisors. Data entry and editing were accomplished using the CPro software. The processing of data was initiated in January 2011 and completed in June 2011.

Data Appraisal

Estimates of Sampling Error

Sampling errors were calculated for selected indicators for the national sample, for the urban and rural areas separately, and for each of the eleven regions. They are calculated for variables considered to be of primary interest for woman's survey and for man's surveys, respectively.

Related Materials

Questionnaires

Demographic and Health Survey 2011 - Questionnaires

Title Demographic and Health Survey 2011 - Questionnaires
 Date 2010-09-01
 Country Ethiopia
 Language English
 Filename ETH_2011_DHS_Questionnaire.pdf

Reports

Ethiopia: DHS, 2011 - Final Report

Title Ethiopia: DHS, 2011 - Final Report
 Author(s) Central Statistical Agency, Addis Ababa, Ethiopia and ICF International, Calverton, Maryland, USA
 Date 2012-03-01
 Country Ethiopia
 Language English
 Filename <http://www.dhsprogram.com/pubs/pdf/FR255/FR255.pdf>

Ethiopia DHS 2011 Fact Sheet

Title Ethiopia DHS 2011 Fact Sheet
 Author(s) MEASURE DHS
 Date 2012-03-01
 Country Ethiopia
 Language English
 Filename <http://www.dhsprogram.com/pubs/pdf/GF26/GF26.pdf>

Ethiopia: DHS, 2011 - Key Findings

Title Ethiopia: DHS, 2011 - Key Findings
 Author(s) MEASURE DHS
 Date 2012-03-01
 Country Ethiopia
 Language English
 Filename <http://www.dhsprogram.com/pubs/pdf/SR191/SR191.pdf>

Ethiopia: DHS, 2011 - Survey Presentations

Title Ethiopia: DHS, 2011 - Survey Presentations
 Author(s) MEASURE DHS
 Date 2012-03-01
 Country Ethiopia

Language English

Filename <http://www.dhsprogram.com/pubs/pdf/PPT5/PPT5.zip>
