

Nepal - Demographic and Health Survey 2011

Population Division - Ministry of Health and Population (MOHP), New ERA

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Sampling

Sampling Procedure

The primary focus of the 2011 NDHS was to provide estimates of key population and health indicators, including fertility and mortality rates, for the country as a whole and for urban and rural areas separately. In addition, the sample was designed to provide estimates of most key variables for the 13 eco-development regions.

Sampling Frame

Nepal is divided into 75 districts, which are further divided into smaller VDCs and municipalities. The VDCs and municipalities, in turn, are further divided into wards. The larger wards in the urban areas are divided into subwards. An enumeration area (EA) is defined as a ward in rural areas and a subward in urban areas. Each EA is classified as urban or rural. As the upcoming population census was scheduled for June 2011, the 2011 NDHS used the list of EAs with population and household information developed by the Central Bureau of Statistics for the 2001 Population Census. The long gap between the 2001 census and the fielding of the 2011 NDHS necessitated an updating of the 2001 sampling frame to take into account not only population growth but also mass internal and external migration due to the 10-year political conflict in the country. To obtain an updated list, a partial updating of the 2001 census frame was carried out by conducting a quick count of dwelling units in EAs five times more than the sample required for each of the 13 domains. The results of the quick count survey served as the actual frame for the 2011 NDHS sample design.

Domains

The country is broadly divided into three horizontal ecological zones, namely mountain, hill, and terai. Vertically, the country is divided into five development regions. The cross section of these zones and regions results in 15 eco-development regions, which are referred to in the 2011 NDHS as subregions or domains. Due to the small population size in the mountain regions, the Western, Mid-western, and Far-western mountain regions are combined into one domain, yielding a total of 13 domains. In order to provide an adequate sample to calculate most of the key indicators at an acceptable level of precision, each domain had a minimum of about 600 households.

Stratification was achieved by separating each of the 13 domains into urban and rural areas. The 2011 NDHS used the same urban-rural stratification as in the 2001 census frame. In total, 25 sampling strata were created. There are no urban areas in the Western, Mid-western, and Far-western mountain regions. The numbers of wards and subwards in each of the 13 domains are not allocated proportional to their population due to the need to provide estimates with acceptable levels of statistical precision for each domain and for urban and rural domains of the country as a whole. The vast majority of the population in Nepal resides in the rural areas. In order to provide national urban estimates, urban areas of the country were oversampled.

Sample Selection

Samples were selected independently in each stratum through a two-stage selection process. In the first stage, EAs were selected using a probability-proportional-to-size strategy. In order to achieve the target sample size in each domain, the ratio of urban EAs to rural EAs in each domain was roughly 1 to 2, resulting in 95 urban and 194 rural EAs (a total of 289 EAs).

Complete household listing and mapping was carried out in all selected EAs (clusters). In the second stage, 35 households in each urban EA and 40 households in each rural EA were randomly selected. Due to the nonproportional allocation of the sample to the different domains and to oversampling of urban areas in each domain, sampling weights are required for any analysis using the 2011 NDHS data to ensure the actual representativeness of the sample at the national level as well as at the domain levels. Since the 2011 NDHS sample is a two-stage stratified cluster sample, sampling weights were calculated based on sampling probabilities separately for each sampling stage, taking into account nonproportionality in the allocation process for domains and urban-rural strata.

Response Rate

A total of 11,353 households were selected, out of which 10,888 were found to be occupied during data collection. Interviews were completed for 10,826 of these existing households, yielding a response rate of 99 percent. In the selected households, 12,918 women were identified as eligible for the individual interview.

Interviews were completed for 12,674 women, resulting in a response rate of 98 percent. Of the 4,323 eligible men identified in the selected subsample of households, 4,121 were successfully interviewed, yielding a 95 percent response rate. Response rates were higher in rural than urban areas, especially for eligible men.

Questionnaires

Overview

Three questionnaires were administered in the 2011 NDHS: the Household Questionnaire, the Woman's Questionnaire, and the Man's Questionnaire. These questionnaires were adapted from the standard DHS6 core questionnaires to reflect the population and health issues relevant to Nepal at a series of meetings with various stakeholders from government ministries and agencies, nongovernmental organizations, EDPs, and international donors. The final draft of each questionnaire was discussed at a questionnaire design workshop organized by the MOHP, Population Division on 22 April 2010 in Kathmandu. These questionnaires were then translated from English into the three main local languages—Nepali, Maithali, and Bhojpuri—and back translated into English. Questionnaires were finalized after the pretest, which was held from 30 September to 4 November 2010, with a one-week break in October for the Dasain holiday.

The Household Questionnaire was used to list all of 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. For children under age 18, the survival status of the parents was determined. The Household Questionnaire was used to identify women and men who were eligible for the individual interview and women who were eligible for the interview focusing on domestic violence. The Household Questionnaire also collected information on characteristics of the household's dwelling unit, such as source of water, type of toilet facilities, materials used for the floor of the house, ownership of various durable goods, ownership of mosquito nets, and household food security. The results of salt testing for iodine content, height and weight measurements, and anemia testing were also recorded in the Household Questionnaire.

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

- background characteristics (education, residential history, media exposure, etc.)
- pregnancy 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
- work characteristics and husband's background characteristics
- awareness and behavior regarding AIDS and other sexually transmitted infections
- domestic violence

The Man's Questionnaire was administered to all men age 15-49 living in every second household in the 2011 NDHS. 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, nutrition, or domestic violence.

HEMOGLOBIN TESTING

In the 2011 NDHS, anemia testing was conducted in every second household (i.e., in households where male interviews were conducted). In such households, all women age 15-49 and children age 6-59 months were tested for anemia. The protocol for hemoglobin testing was approved by the Nepal Health Research Council and the ICF Macro Institutional Review Board in Calverton, Maryland, USA.

Selected interviewers were trained to conduct this procedure. Respondents (and their parent or guardian in the case of unmarried minors) were asked for their consent to participate in the anemia testing. The interviewers explained the purpose of the test, informed prospective subjects and/or their caretakers that the results would be made available as soon as the test was completed, and requested permission for the test to be carried out. Levels of anemia were classified as severe, moderate, or mild according to criteria developed by the World Health Organization (DeMaeyer et al., 1989).

To measure the level of hemoglobin, capillary blood was taken in the field from a finger using sterile, one-time-use lancets that allowed for a relatively painless puncture. The concentration of hemoglobin in the blood was measured using the HemoCue system. Before the blood was taken, the finger was wiped with an alcohol prep swab and allowed to air-dry. Then the palm side of the end of the finger was punctured with a sterile, non-reusable, self-retractable lancet. A drop of blood was collected with a HemoCue microcuvette and placed in a HemoCue photometer, where the results were displayed. For children age 6 to 11 months who were particularly undernourished and bony, a heel puncture was made to draw a drop of blood. The results were recorded in the Household Questionnaire, as well as on a brochure given to each woman, parent, or

responsible adult explaining what the results meant. Women or children whose results indicated severe anemia were provided with a card referring them to the nearest health facility.

Data Collection

Data Collection Dates

Start	End	Cycle
2011-02-02	2011-06-14	N/A

Data Collection Mode

Face-to-face

DATA COLLECTION NOTES

Listing

From the sampling frame, a total of 289 clusters were selected throughout the 13 subregions. A listing operation was conducted from 27 September to 14 December 2010 by 26 teams of two members each, with one member working as a lister and the other as a mapper. Altogether, 52 listers and mappers were recruited from all regions to do the listing of the households. Training was provided using standard DHS manuals and guidelines modified for Nepal that described the listing procedures in detail. Training included classroom demonstrations and field practice, and instructions were given on the use of Global Positioning System (GPS) units to obtain location coordinates for selected clusters.

Pretest

Prior to the start of the fieldwork, the questionnaires were pretested in Nepali, Bhojpuri, and Maithali to make sure that the questions were clear and could be understood by the respondents. One of the important components of the pretest was to test the entry program on tablet personal computers (PCs), as 2011 marked the first time the NDHS used tablet PCs to collect data from the field. The data file transfer process using the Internet File Streaming System (IFSS), through which data from the field could be transferred to the main office via the Internet, was also tested.

In order to conduct the pretest, 12 interviewers were recruited to interview in the three local languages.

Training for the pretest was held at the New ERA office. The pilot survey was conducted (as mentioned) from 30 September to 4 November 2010 in three selected sites. The areas selected for the pretest were Kathmandu (for the Nepali language), the Parsa district (for the Bhojpuri language), and the Dhanusha district (for the Maithili language). Both rural and urban households were selected for the pretest in all three districts. Based on the findings of the pretest, the Household Questionnaire, Woman's Questionnaire, and Man's Questionnaire were further refined in all three languages. Similarly, necessary revisions in the computer program files were made based on the suggestions and feedback obtained in the pretest.

Training of Field Staff

A stringent recruitment process was carried out in which candidates had to complete a written examination, a computer aptitude test, and an oral interview to qualify for training. A total of 96 persons were trained to serve as fieldwork supervisors, interviewers, quality control staff, and reserves. The main training took place in Kathmandu from 15 December 2010 to 16 January 2011.

Training consisted of two components: training on paper questionnaires and training on the use of tablet PCs. The New ERA research team led the three-week training on paper-based questionnaires and biomarkers, while MEASURE DHS staff led the two-week training on tablet PC use.

The training included theoretical and practical sessions and presentations, practical demonstrations, practice interviewing in small groups, and several days of field practice. The participants were also trained in measuring women and children's height and weight and in conducting anemia testing. Special classes on several topics were organized during the training sessions, including Nepal's health delivery system, family planning, maternal health, abortion, child health, nutrition, women's empowerment, and domestic violence. These classes were led by experts from the different divisions of the Ministry of Health and Population. During the training sessions, several rounds of mock interviews were also conducted so that the interviewers had ample opportunities to understand the questionnaire and become accustomed with the new technology of conducting interviews with tablet PCs before they started the real fieldwork.

Fieldwork

Data collection was carried out by 16 field teams, each consisting of three female interviewers, one male interviewer, and a

male supervisor. Teams were initially deployed around Kathmandu on 23 January 2011 to enable intense supervision and technical backstopping. Each team completed one cluster and electronically sent the data to the central office via the Internet. A review session was organized to share the experiences of the teams. The core team provided necessary feedback to the field teams.

Field teams traveled to their respective designated clusters on 2 February 2011, and the fieldwork was completed on 14 June 2011. Fieldwork supervision was done by six quality control teams, each consisting of one male and one female member. Additionally, two field coordinators monitored overall data quality. Close contact between the New ERA central office and the teams was maintained through field visits by New ERA senior staff, members of the technical advisory and working committees, staff of the Ministry of Health and Population, and staff of USAID/Nepal. Regular communication was maintained through cell phones. Two review sessions were held to share field issues and refill supplies. The first was held after one month of fieldwork, on 3-5 March 2011, and the second was held on 21 April 2011. These sessions were helpful in updating progress, providing feedback to the teams based on field check tables and field observations, and discussing data inconsistencies and problems faced by the teams.

Data Processing

Data Editing

The 2011 NDHS used ASUS Eee T101MT tablet PCs with data entry programs developed in CSPro. Code division multiple access (CDMA) wireless technology via Internet File Streaming System (IFSS) was used to transfer data from the field to the central office in Kathmandu. The IFSS package was developed by MEASURE DHS and tested for the first time in Nepal.

The data were sent to the central office at New ERA by the teams once they had checked and closed each EA file. This was mostly done before the team left the EA. In the central office, the data were edited by a senior data supervisor who had been specially trained for this task. The concurrent processing of the data was an advantage because field check tables to monitor various data quality parameters could be generated almost instantly and sent to the teams through the field coordinators, the quality control teams, and the core study team members. This allowed the field teams to receive immediate feedback and improve their performance. The data entry and editing phase of the survey was complete by the end of June 2011.

Data Appraisal

Estimates of Sampling Error

Sampling errors for the 2011 NDHS were calculated for selected variables considered to be of primary interest. The results are presented in an appendix to the Final report for the country as a whole, for urban and rural areas, three ecological zones, and for five development regions. For each variable, the type of statistic (mean, proportion, or rate) and the base population are given in Table B.1 of the Final Report. Tables B.2 through B.12 present the value of the statistic (R), its standard error (SE), the number of un-weighted (N) and weighted (WN) cases, the design effect (DEFT), the relative standard error (SE/R), and the 95 percent confidence limits (R2SE), for each variable. The sampling errors for mortality rates are presented for the five year period preceding the survey for the whole country and for the ten year period preceding the survey by residence, ecological zones, and development regions. The DEFT is considered undefined when the standard error considering a simple random sample is zero (when the estimate is close to 0 or 1). In the case of the total fertility rate, the number of unweighted cases is not relevant, as there is no known unweighted value for woman-years of exposure to childbearing.

The confidence interval (e.g., as calculated for children ever born to women age 40-49) can be interpreted as follows: the estimated proportion from the national sample is 4.250 and its standard error is 0.083. Therefore, to obtain the 95 percent confidence limits, one adds and subtracts twice the standard error to the sample estimate, i.e., 4.250±0.166. 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 4.084 and 4.416.

In general, the relative standard error for most estimates for the country as a whole is small, except for estimates of very small proportions values. The relative error for the total fertility rate is 3.8 percent. However for the mortality rates, the average relative standard error for the five-year period mortality rates is much higher, about 10 percent.

There are differentials in the relative standard error for estimates of sub-populations of women, for example for the variable children ever born to women 40-49, the relative standard error as percent of the estimated value for the whole country, for the urban area, and for the rural area are 2 percent, 2.8 percent, and 2.2 percent, respectively.

Related Materials

Questionnaires

Nepal 2011 Demographic and Health Survey - Questionnaires

Title Nepal 2011 Demographic and Health Survey - Questionnaires
 Date 2010-11-04
 Country Nepal
 Language English
 Description Household, women, and men questionnaires
 Filename NPL_2011_DHS_questionnaire.pdf

Reports

Nepal 2011 Demographic and Health Survey - Final Report

Title Nepal 2011 Demographic and Health Survey - Final Report
 Author(s) Population Division, Ministry of Health and Population, Government of Nepal New ERA, Kathmandu, Nepal ICF International, Calverton, Maryland, U.S.A.
 Date 2012-03-01
 Country Nepal
 Language English
 Description Household, women, and men questionnaires
 Filename [http://www.dhsprogram.com/pubs/pdf/FR257/FR257\[13April2012\].pdf](http://www.dhsprogram.com/pubs/pdf/FR257/FR257[13April2012].pdf)

Nepal 2011 Demographic and Health Survey - Fact Sheet

Title Nepal 2011 Demographic and Health Survey - Fact Sheet
 Author(s) MEASURE DHS
 Date 2012-03-01
 Country Nepal
 Language English
 Description Household, women, and men questionnaires
 Filename <http://www.dhsprogram.com/pubs/pdf/GF25/GF25.pdf>

Nepal 2011 Demographic and Health Survey -Key Findings

Title Nepal 2011 Demographic and Health Survey -Key Findings
 Author(s) MEASURE DHS
 Date 2012-03-01
 Country Nepal
 Language English
 Description Household, women, and men questionnaires
 Filename <http://www.dhsprogram.com/pubs/pdf/SR189/SR189.pdf>

Nepal 2011 Demographic and Health Survey -Key Findings

Title Nepal 2011 Demographic and Health Survey -Key Findings
Author(s) MEASURE DHS
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Country Nepal
Language English
Description Household, women, and men questionnaires
Filename <http://www.dhsprogram.com/pubs/pdf/PPT17/PPT17.zip>
