Mongolia - Multiple Indicator Cluster Survey 2016, Nalaikh district

National Statistics Office of Mongolia, United Nations Children's Fund

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Sampling

Sampling Procedure

The sample for the CDS was designed to provide estimates for a large number of indicators on the situation of children, women and men in Nalaikh district, and its seven khoroos (first to seven khoroos).

A total of 1000 households were selected and selection probabilities and corresponding weights vary by khoroos. The two-stage sampling method was used for household selection. At the first stage of sampling, the primary sampling units (PSUs-khesegs) were selected systematically with probability proportional to size (PPS). In the second stage, a systematic sample of 25 households were drawn from each sample kheseg's household listing.

The official statistics report of the population and household registration as of end of 2015 was used as a sampling frame. Kheseg is the lowest administrative unit and is defined as primary sampling units (PSUs). 52 khesegs of 7 khoroos were covered and the household listing was updated in September and October of 2016.

The survey data collection was carried out during November and December of 2016 when the internal migration of households was stable. Thus, all 52 selected sampling units were entirely covered in the survey. A more detailed description of the ample design can be found in the Final Report (Appendix A) attached as a Related Material.

Response Rate

Of the 1000 households selected for the sample 995 households were found to be occupied. Of these 975 households were successfully interviewed yielding a response rate of 98.0 percent . The total 831 women age 15-49 years were listed within the interviewed households, of which 758 were successfully interviewed indicating a response rate of 91.2 percent.

The survey also sampled men age 15-49, but required only a subsample of all men in every second household. In total 343 men, aged between 15-49 years were listed in the household questionnaires. Questionnaires were completed for 296 eligible men, which corresponds to a response rate of 86.3 percent within eligible interviewed households. In addition, 379 children under 5 listed in the household questionnaires. Questionnaires were completed for 374 of these children, which corresponds to a response rate of 98.7 percent within interviewed households.

Overall response rates in Nalaikh district stands at 84.6 percent of men age 15-49 years, 89.4 percent of women and 96.7 percent calculated for mothers/ caretakers of children under 5.

Weighting

Essentially, by allocating not equal numbers of households to each of the regions, different sampling fractions were used in each region since the sizes of the regions varied. For this reason, sample weights were calculated and these were used in the subsequent analyses of the survey data.

The major component of the weight is the reciprocal of the sampling fraction employed in selecting the number of sample households in that particular sampling stratum (h) and PSU (i).

Since the number of households in each enumeration area (PSU) from the 2015 population and household register used for the first stage selection and the updated number of households in the enumeration area from the listing are generally different, individual overall probabilities of selection for households in each sample enumeration area (cluster) were calculated.

A final component in the calculation of sample weights takes into account the level of non-response for the household and individual interviews.

After the completion of fieldwork, response rates were calculated for each sampling stratum. These were used to adjust the sample weights calculated for each cluster.

The non-response adjustment factors for the individual women, men, and under-5 questionnaires were applied to the adjusted household weights. Numbers of eligible women, men, and under-5 children were obtained from the roster of household members in the Household Questionnaire forhouseholds where interviews were completed.

The design weights for the households were calculated by multiplying the inverse of the probabilities of selection by the non-response adjustment factor for each enumeration area. These weights were then standardized (or normalized), one purpose of which is to make the weighted sum of the interviewed sample units equal to the total sample size at the province level. Normalization is achieved by dividing the full sample weights (adjusted for nonresponse) by the average of these weights across all households at the province level. This is performed by multiplying the sample weights by a constant factor equal to the unweighted number of households at the province level divided by the weighted total number of households (using the full sample weights adjusted for nonresponse). A similar standardization procedure was followed in obtaining standardized weights for the individual women, men, under-5 and water quality test questionnaires. Adjusted (normalized) weights varied between 0.3944 weight and 1.5062 in the 40 sample enumeration areas (clusters).

Sample weights were appended to all data sets and analyses were performed by weighting households, women, men, or under-5s with these sample weights.

Since interviews with eligible men were conducted in one-half of the selected households, the sample weight for men includes an additional factor of 2, in addition to the nonresponse adjustment factor.

Questionnaires

Overview

Questions and indicators for the survey were identified based on the survey objectives and covering the main indicators of the 5th round of the MICS1 model questionnaire recommended by UNICEF. Moreover, the principle of comparability internationally and with previous surveys was considered.

Five sets of questionnaires were used in the survey:

1. A household questionnaire which was used to collect basic demographic information on all de jure household members (usual residents), the household, and the dwelling;

2. A questionnaire for individual women administered in each household to all women age 15-49 years;

3. A questionnaire for individual men administered in every second household to all men age 15-49 years;

4. An under-5 questionnaire, administered to mothers (or caretakers) for all children under

5 living in the household;

5. A questionnaire for evaluating water quality2 administered in every third household.

In addition to the administration of the questionnaires, fieldwork teams tested the salt used for cooking in the households for iodine content, observed the place for hand washing and measured the weights and heights of children age under 5 years. Data from these measurements and observations are recorded in the respective place in the questionnaires.

The Questionnaire for Child under 55 was administered to mothers or caretakers of all children under 5 years of age living in the households. Normally, the questionnaire was administered to mothers of under-5 children; in cases when the mother was not listed in the household roster, a primary caretaker for the child was identified and interviewed.

Water Quality questionnaire was administered in every third household which included question on drinking-water quality, questioning water source of the household and testing residential water quality.

The questionnaires were pre-tested in July 2016 in 3 baghs of Kherlen and Tsenkhermandal soums of Khentii aimag and in 2 khesegs of 8th khoroo of Bayanzurkh district, Ulaanbaatar, in total 5 PSUs.

Based on the results of the pre-test, modifications were made to the wording of the questionnaires. A copy of the questionnaires is provided as Related Materials.

Data Collection

Data Collection Dates

Start	End	Cycle
2016-11-13	2016-12-06	N/A

Data Collection Mode

Face-to-face [f2f]

DATA COLLECTION NOTES

The NSO has conducted training for 25 fieldwork staff for 15 days during October 26 to November 11, 2016 by combined forms of lectures and practical sessions. The training included lectures on interviewing techniques and the questionnaires contents using tablets.

The paper questionnaire testing along with practice interviews towards the end were carried out in 7th khoroo of Nalaikh district for two days and the practice interview with tablets in 6th khoroo for another two days. As the module on water quality was included in the CDS for the first time, a consultant from the Public Health Institute of Mongolia has been invited to give lectures on the water quality testing. Finally, all 25 participants were examined, on a basis of which we have selected the interviewers and supervisors.

The data was collected by three teams; each team was comprised of a supervisor, 5 interviewers (2 men assigned as main measurers) and 2 drivers.

The data collection was carried out during November 13 to December 6, 2016. Monitoring, assessment and timely clarification of the data entered on the central network during the data collection helped to improve the quality of data. In addition, field monitoring visits were done during data collection by NSO and UNICEF staff, who held discussions with the teams to address the issues and inaccuracies and ways for improvement. These contributed to overall quality of the data.

Data Processing

Data Editing

The CDS utilized tablet PCs for data collection. This environmental friendly solution offered many advantages including, sending the data collected from the field immediately to the central office, ensuring data quality and safety and saving time, manpower and cost.

The data collected by the interviewers was aggregated at the team supervisors level and after required clarification and editing, it was sent to the central network of the NSO. The data received at the central office were monitored and checked. Where additional clarifications were needed on a particular data, the team supervisors were made to contact the particular household.

The data collected from the selected households were entered on computers using the CSPro 5.03 software program. Procedures and standard programs developed under the global MICS4 programme and adapted to the CDS questionnaires with additional module and questions were used throughout. The data were analyzed using the standard SPSS 21.0 (Statistical Package for Social Sciences) software program and the model syntax and tabulation plans developed by UNICEF were customized for this purpose.

Data Appraisal

Estimates of Sampling Error

The sample of respondents selected in the Nalaikh district's CDS-2016 is only one of the samples that could have been selected from the same population, using the same design and 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 the estimates from all possible samples. The extent of variability is not known exactly, but can be estimated statistically from the survey data.

The following sampling error measures are presented in this appendix for each of the selected indicators:

- Standard error (se): Standard error is the square root of the variance of the estimate. For survey indicators that are means, proportions or ratios, the Taylor series linearization method is used for the estimation of standard errors. For more complex statistics, such as fertility and mortality rates, the Jackknife repeated replication method is used for standard error estimation.

- Coefficient of variation (se/r) is the ratio of the standard error to the value (r) of the indicator, and is a measure of the relative sampling error.

- Design effect (deff) is the ratio of the actual variance of an indicator, under the sampling method used in the survey, to the variance calculated under the assumption of simple random sampling based on the same sample size. The square root of the design effect (deft) is used to show the efficiency of the sample design in relation to the precision. A deft value of 1.0 indicates that the sample design of the survey is as efficient as a simple random sample for a particular indicator, while a deft value above 1.0 indicates an increase in the standard error due to the use of a more complex sample design.

- Confidence limits are calculated to show the interval which contains the true value of the indicator for the population, with a specified level of confidence. For CDS results 95% confidence intervals are used, which is the standard for this type of survey. The concept of the 95% confidence interval can be understood in this way: if many repeated samples of identical size and design were taken and the confidence interval computed for each sample, then 95% of these intervals would contain the true value of the indicator.

For the calculation of sampling errors from CDS data, programs developed in CSPro Version 5.0, SPSS Version 21 Complex Samples module and CMRJack1 have been used.

Given the use of normalized weights, by comparing the weighted and unweighted counts it is possible to determine whether a particular domain has been undersampled or over-sampled compared to the average sampling rate. If the weighted count is smaller than the unweighted count, this means that the particular domain had been oversampled.

Sampling errors are calculated for indicators of primary interest, for the province level, for urban and rural areas, and for all regions. Three of the selected indicators are based on households, 8 are households members, 39 are based on women, 24 are based on men, and 39 are based on children under 5.

Related Materials

Questionnaires

Mongolia, Nalaikh district - Multiple Indicator Cluster Survey 2016: Questionnaire

Title	Mongolia, Nalaikh district - Multiple Indicator Cluster Survey 2016: Questionnaire
Country	Mongolia
Language	English
Filename	Mongolia_Questionnaire.pdf

Reports

Mongolia, Nalaikh district - Multiple Indicator Cluster Survey 2016: Report (English)

Title	Mongolia, Nalaikh district - Multiple Indicator Cluster Survey 2016: Report (English)
Country	Mongolia
Language	English
Filename	Mongolia 2016 MICS-CDS (Nalaikh District)_English.pdf

Technical documents

MICS5 Survey Planning Tools

Title	MICS5 Survey Planning Tools
Filename	http://mics.unicef.org/tools?round=mics5

MICS5 Indicator List

Title	MICS5 Indicator List
Filename	http://mics.unicef.org/tools?round=mics5

MICS5 Sampling Tools

Title	MICS5 Sampling Tools
Filename	http://mics.unicef.org/tools?round=mics5