Kingdom of Eswatini - Multiple Indicator Cluster Survey 2014

Central Statistical Office, United Nations Children's Fund

Report generated on: January 25, 2019

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Sampling

Sampling Procedure

Sample design features include target sample size, sample allocation, sampling frame and listing, choice of domains, sampling stages, stratification, and the calculation of sample weights.

A multi-stage, stratified cluster sampling approach was used for the selection of the survey sample.

The sample size required based on the desired level of precision for the Kingdom of Eswatini MICS was calculated as 5,205 households. For calculating this sample size, the key indicator used was the prevalence of pneumonia among children age 0-59 months, estimated to be 0.13 from the 2010 MICS.

The number of households selected per cluster for the 2014 Kingdom of Eswatini MICS5 was determined as 15 households, based on a number of considerations, including the design effect, the budget available, and the time that would be needed per team to complete one cluster. Dividing the total number of households by the number of sample households per cluster, it was calculated that 347 sample clusters would need to be selected nationwide.

SAMPLING FRAME AND SELECTION OF CLUSTERS

The 2007 census frame was used for the selection of clusters. Census enumeration areas were defined as primary sampling units (PSUs), and were selected from each of the sampling strata by using systematic pps (probability proportional to size) sampling procedures, based on the number of households in each enumeration area from the 2007 Population and Housing Census frame. The first stage of sampling was thus completed by selecting the required number of enumeration areas from each of the four regions, separately for the urban and rural strata.

LISTING ACTIVITIES

The sampling frame (the 2007 population census) was not up-to-date, so the more recent listing of households conducted for the ILFS 2013/14 was used for the selection of the 5,211 households from the 347 sample clusters for the MICS in order to reduce the total survey costs, as described above. Therefore, a separate new listing of households was not conducted for the MICS.

SELECTION OF HOUSEHOLDS

The list of households from the ILFS 2013/14 for each of the 347 sample EAs was used for selecting the sample households for MICS. The households were sequentially numbered from 1 to N (the total number of households in each enumeration area) at the Central Statistical Office, where the selection of 15 households in each enumeration area was carried out using random systematic selection procedures. The survey also had a questionnaire for men that was administered in every third household in each sampled cluster for interviews with all eligible men.

Response Rate

Of the 5,205 households selected for the sample, 4,981 were found to be occupied. Of these, 4,865 were successfully interviewed for a household response rate of 98 percent.

In the interviewed households, 5,001 women (age 15-49 years) were identified. Of these, 4,762 were successfully interviewed, yielding a response rate of 95 percent within the interviewed households.

The survey also sampled men (age 15-59 years) but required only a subsample. All men (age 15-59 years) were identified in every third household. A total of 1,629 men (age 15-59 years) were listed in the household questionnaires. Questionnaires were completed for 1,459 eligible men, which corresponds to a response rate of 90 percent within eligible interviewed households.

There were 2,728 children under-five years listed in the household questionnaires. Questionnaires were completed for 2,693 of these children, which corresponds to a response rate of 99 percent within interviewed households.

Weighting

The Kingdom of Eswatini MICS sample is not self-weighting. Essentially, by allocating 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 clusters and households in that particular sampling stratum (h) and PSU (i).

Since the number of households in each enumeration area (PSU) from the 2007 Census frame 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. The numbers of eligible women, men, and under-5 children were obtained from the roster of household members in the Household Questionnaire for households 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 national level. Normalization is achieved by dividing the full sample weights (adjusted for non-response) by the average of these weights across all households at the national level. This is performed by multiplying the sample weights by a constant factor equal to the unweighted number of households at the national level divided by the weighted total number of households (using the full sample weights adjusted for non-response). A similar standardization procedure was followed in obtaining standardized weights for the individual women, men, and under-five questionnaires. The normalized weights varied between 0.103 and 9.218 in the 347 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 every third of the selected households, the sample weight for men includes an additional factor of 3, in addition to the nonresponse adjustment factor.

Questionnaires

Overview

Four 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 three households to all men age 15-59 years; and 4) an under-five questionnaire, administered to mothers (or caretakers) of all children under-five years of age living in the household.

The questionnaires are based on the MICS5 model questionnaires. From the MICS5 model English, version, the questionnaires were customised and translated into siSwati and were pre-tested in Moti, Sphocosini and the Police College in July 2014. Based on the results of the pre-test, modifications were made to the wording and translation of the questionnaires. A copy of the Kingdom of Eswatini MICS5 questionnaires is provided as a Related Material.

In addition to the administration of questionnaires, fieldwork teams tested the salt used for cooking in the households for iodine content, observed the place for handwashing, and measured the weights and heights of children age under-five years. Details and findings of these observations and measurements are provided in the respective sections of the report

A number of country specific modifications were also made to better serve the data needs of the country. The modifications include the following:

Modules that are not part of the generic MICS5 that have been included in the Kingdom of Eswatini 2014 MICS5:

Household Questionnaire

- Children Orphaned or made Vulnerable (children 0-17 years)

- Basic Needs (children age 5-17 years)

Questionnaire for Individual Women

- Non Communicable Diseases

- Social Participation

Questionnaire for Individual Men

- Non Communicable Diseases

- Social Participation

Modules that are part of the generic MICS5 that have been omitted:

Household Questionnaire

- Child Labour

- Insecticide Treated Nets

- Indoor Residual Spraying

Women Questionnaire

- Female Genital Cutting Under-Five Questionnaire

- Malaria

Data Collection

Data Collection Dates

Start	End	Cycle
2014-07	2014-10	N/A

Data Collection Mode

Face-to-face [f2f]

DATA COLLECTION NOTES

Training for the fieldwork was conducted for 19 days in July 2014. Training included lectures on interviewing techniques and the contents of the questionnaires, and mock interviews between trainees to gain practice in asking questions. Towards the end of the training period, trainees spent five days in practice interviewing in Khoza, Ludzeludze and Maliyaduma.

The data was collected by eight teams; each comprised five interviewers, one driver, one editor, one measurer and a supervisor. Fieldwork began in July 2014 and concluded in October 2014.

Data Processing

Data Editing

Data was entered using the CSPro software, Version 5.0. The data was entered on seven desktop computers and carried out by seven data entry operators and one data entry supervisor. For quality assurance purposes, all questionnaires were double-entered and internal consistency checks were performed. Procedures and standard programs developed under the global MICS programme and adapted to the Kingdom of Eswatini MICS5 questionnaire were used throughout. Data processing began simultaneously with data collection in August 2014 and was completed in November 2014. Data were analysed using the Statistical Package for Social Sciences (SPSS) software, Version 21. Model syntax and tabulation plans developed by UNICEF were customized and used for this purpose.

Data Appraisal

Estimates of Sampling Error

The sample of respondents selected for the Kingdom of EswatiniMultiple Indicator Cluster Survey 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 within which the true value for the population can be reasonably assumed to fall, with a specified level of confidence. For any given statistic calculated from the survey, the value of that statistic will fall within a range of plus or minus two times the standard error (r + 2.se or r - 2.se) of the statistic in 95 percent of all possible samples of identical size and design.

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Related Materials

Questionnaires

Kingdom of Eswatini- Multiple Indicator Cluster Survey 2014: Questionnaire

Title   Kingdom of Eswatini- Multiple Indicator Cluster Survey 2014: Questionnaire
Language English
Filename Questionnaires.pdf

Reports

Kingdom of Eswatini- Multiple Indicator Cluster Survey 2014: Key Findings

Title   Kingdom of Eswatini- Multiple Indicator Cluster Survey 2014: Key Findings
Language English
Filename Swaziland 2014 MICS KFR_English.pdf

Kingdom of Eswatini- Multiple Indicator Cluster Survey 2014: Final Report

Title   Kingdom of Eswatini- Multiple Indicator Cluster Survey 2014: Final Report
Language English
Filename Swaziland 2014 MICS Final Report_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