Nigeria - Multiple Indicator Cluster Survey 2016-2017

National Bureau of Statistics of Nigeria, United Nations Children's Fund

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Sampling

Sampling Procedure

SAMPLE SIZE AND SAMPLE ALLOCATION

The sample size for the Nigeria MICS5 was calculated as 37,440 households.

The principal domain of reporting to which the sample size n refers in this calculation is the state. For this sample design, determination of the sample size is based on the indicator stunting prevalence in under-5 children as the design variable. The results from the MICS4 of 2011 reported stunting prevalence at 35.8 percent at the national level. This estimate had a relatively high design effect (deff) of 4.85, indicating a large clustering effect for this characteristic. However, with the more efficient sample design for the MICS 2016-17 it was expected that the deff will be lower, so a value of 3.5 was assumed for the deff in calculating the sample size. The value for pb (percentage of children aged 0-4 years in the total population) based on the results of the MICS4 2011 and NDHS 2013 is 17.1; and Average Size (average household size) is 5.0. For state-level results, it is reasonable to use a relative margin of error (RME) of 18%. Based on previous survey results, the household response rate is assumed to be 95%.

For 34 states and the FCT Abuja a sample of 60 EAs was selected per state and 16 households per EA, which gives a sample size of 960 households in each of these states. Six (6) replicates containing ten (10) EAs/clusters each was selected from the NISH2 master sample for each of these states. In the case of Kano and Lagos States, additional results were needed at the level of the three senatorial districts in each state. Therefore, a sample of 40 EAs per senatorial district was selected in these two states from the NISH2 master sample, for a total of 120 sample EAs and 1,920 sample households in each state. The total sample size for Nigeria was 37,440 households. And the selection of 16 households per EA slightly reduces the design effects compared to the MICS 2011, in which 20 households were selected per EA

SAMPLING FRAME AND SELECTION OF CLUSTERS

The MICS sample clusters were selected from the NISH2 master sample, based on the 2006 census frame. For the NISH2 master sample the census enumeration areas were defined as primary sampling units (PSUs), stratified by state. The first stage of sampling for MICS was completed by selecting the required number of enumeration areas from the NISH2 master sample for each of the 36 states of the federation and FCT Abuja which cut across urban and rural areas.

LISTING ACTIVITIES

Since the sampling frame (the 2006 Census) was not up-to-date, a new listing of households was conducted in November 2015 for all the sample enumeration areas prior to the selection of households. For this purpose, listing teams were formed who visited all of the selected enumeration areas and listed all households in each enumeration area. Selected staff of the National Bureau of Statistics (NBS) in all the states carried out the listing exercise. Six (6) teams were constituted that carried out the listing exercise in each state except Lagos and Kano where twelve teams were constituted respectively. Each team comprises of 2 enumerators and one (1) supervisor who supervised two (2) teams. There were three (3) supervisors in each of the 35 states, and six (6) supervisors for Lagos and Kano states respectively. The listing exercise lasted for twelve (12) days. Out of the 2,340 enumeration areas selected for the household listing, one hundred and one (101) of them were not visited because they were inaccessible due to insecurity during the listing exercise.

SELECTION OF HOUSEHOLDS

Lists of households were prepared by the listing teams in the field for each enumeration area. The households were then sequentially numbered from 1 to N (the total number of households in each enumeration area) at the National Bureau of Statistics (Field Services and Methodology Department), where the selection of 16 households in each enumeration area was carried out using random systematic selection procedures.

The survey also included a questionnaire for individual men aged 15 to 49 years. It was administered in eight out of sixteen sampled households. Households with even number in each sample cluster were selected and all eligible men were interviewed.

Within each state, a sub-sample of 30 enumeration areas was systematically selected for the water quality test. In each of these sampled EAs, a systematic sub sample of three households out of sixteen (16) MICS sample households was selected for the water quality tests.

Response Rate

Out of 37,440 households sampled, 35,747 households were visited, 34,289 were found to be occupied and 33,901 were successfully interviewed, representing a household response rate of 98.9 percent.

In the interviewed households, 36,176 women (age 15-49 years) were identified. Of these, 34,376 were successfully interviewed, yielding a response rate of 95.0 percent within the interviewed households.

The survey also sampled men (age 15-49), but required only a subsample. All men (age 15-49) were identified in 17,868 households selected for the men questionnaire; 16,514 men (age 15-49 years) were listed in the household questionnaires. Questionnaires were completed for 15,183 eligible men, which corresponds to a response rate of 91.9 percent within eligible interviewed households.

There were 28,578 children under age five listed in the household questionnaires. Questionnaires were completed for 28,085 of these children, which corresponds to a response rate of 98.3 percent within interviewed households.

Overall response rates of 93.9, 90.9 and 97.2 are calculated for the individual interviews of women, men, and under-5s, respectively.

Weighting

The Nigeria MICS sample is not self-weighting. Essentially, by allocating equal numbers of sample households to each of the states, different sampling fractions were used in each state since the sizes of the states varied. For this reason, sample weights were calculated and these were used in the subsequent analyses of the survey data.

The basic weight for each sample household is equal to the inverse of its probability of selection (calculated by multiplying the probabilities at each sampling stage).

The first component of this probability corresponds to the LGA master sample and the second component corresponds to the NISH2 master sample.

In the case of the states of Kano and Lagos, the NISH2 master sample EAs were stratified by senatorial district and the EAs were selected separately within each senatorial district.

Since the updated number of households in the listing varies by sample enumeration area, individual overall probability of selection for households in each sample enumeration area (cluster) was calculated.

It is also important to adjust the basic weights for the households to take into account the non-response at the stratum level.

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.

Following the adjustment of the raw household weights for non-response, these weights are generally normalized (standardized) so that relative weights are used for the analysis of the survey data. In this way the sum of the relative weights is equal to the number of sample households at the national level. The household weights were normalized by dividing each weight by the average weight at the national level (that is, the sum of the weights for all sample households divided by the number of sample households).

Given that sometimes it is not possible to complete a woman questionnaire for each eligible woman identified in a sample household, it is also necessary to have a separate woman weight with an additional nonresponse adjustment factor applied to the household weight at the stratum level.

There were cases where a child questionnaire was not completed for all the children under 5 years in some sample households. Therefore, a separate child weight with an additional non-response adjustment factor applied to the adjusted household weight was used.

The weights for the men questionnaires were calculated in the same way as the women weights, except that the raw household weight was multiplied by 2, since half of the sample households were selected for the men's questionnaires. In this case the number of sample men in the numerator and denominator of the non-response adjustment factor was based only on the sample households selected for the men's questionnaires.

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 for households where interviews were completed.

The women, men and child weights are normalized in the same way as the household weights. In this case the full (raw) weights were divided by the average women, men or child weight, respectively.

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

Questionnaires

Overview

The questionnaires are based on the MICS5 questionnaire3 model (English version), customized and pre-tested in Cross River, Enugu, Gombe, Lagos, Kaduna, Kano, Nasarawa and Oyo states in April 2016. Based on the results of the pre-test, modifications were made to the wording of the questionnaires. A copy of the Nigeria MICS questionnaires is provided as Related Material.

In addition to the administration of questionnaires, salt iodization and water quality tests were conducted. Weight and height of children age under 5 years were also measured.

Data Collection

Data Collection Dates

Start	End	Cycle
2016-09	2017-01	N/A

Data Collection Mode

Face-to-face [f2f]

DATA COLLECTION NOTES

Training for the fieldwork was conducted for thirty-one (31) days in August 2016. Training included lectures on interviewing techniques and contents of the questionnaires. Mock interviews among trainees were also conducted to gain practice in asking questions. Towards the end of the training period, trainees spent 2 days in field practice in purposively selected residential areas in 2 communities in each of the 6 training locations in Keffi (Nasarawa state), Gombe (Gombe state), Kano (Kano state), Enugu (Enugu state), Ikeja (Lagos state) and Calabar (Cross River state).

The data were collected by 78 teams; each team comprised four interviewers, one driver, one measurer and a supervisor. Fieldwork began in September 2016 and concluded in January 2017.

Using Computer Assisted Personal Interviewing (CAPI), the data were electronically captured from the field and transmitted to a central server, using CSPro CAPI application, Version 5.0. Being the first time of using CAPI, the programme was pretested to know the effectiveness and efficiency of the device. Using CAPI to captured data helps in reducing error associated with paper questionnaire such as omission and skipping errors.

Data Processing

Data Editing

Data were analyzed using the Statistical Package for Social Scientists (SPSS) software, Version 21. Model syntax and tabulation plans developed by UNICEF MICS team were customized and used for this purpose.

Data Appraisal

Estimates of Sampling Error

The sample of respondents selected in the Multiple Indicator Cluster Survey (MICS) 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 MICS 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 MICS data, programs developed in CSPro Version 5.0, SPSS Version 21 Complex Samples module and CMRJack have been used.

Related Materials

Questionnaires

Nigeria - Multiple Indicator Cluster Survey 2016-2017: Questionnaire

Title	Nigeria - Multiple Indicator Cluster Survey 2016-2017: Questionnaire
Filename	Questionnaire.pdf

Reports

Nigeria - Multiple Indicator Cluster Survey 2016-2017: Survey Finding Report

Title	Nigeria - Multiple Indicator Cluster Survey 2016-2017: Survey Finding Report
Country	Nigeria
Language	English
Description	This report is based on the Multiple Indicator Cluster Survey (MICS), conducted between September 2016 and January 2017 by National Bureau of Statistics (NBS), with technical and financial support from UNICEF, WHO, UNFPA, Bill and Melinda Gates Foundation, Save One Million Lives and NACA. The survey provides statistically sound and internationally comparable data essential for developing evidence-based policies and programmes, and for monitoring progress toward national goals and global commitments. Among these global commitments are those emanating from the World Fit for Children Declaration and Plan of Action, the goals of the United Nations General Assembly Special Session on HIV/AIDS, the Education for All Declaration and the Millennium/Sustainable Development Goals (MDGs/SDGs).
Filename	Nigeria 2016-17 MICS_English.pdf

Nigeria - Multiple Indicator Cluster Survey 2016-2017: Survey Finding Report Kano State

Title	Nigeria - Multiple Indicator Cluster Survey 2016-2017: Survey Finding Report Kano State
Date	2017-10-01
Country	Nigeria
Language	English
Filename	Nigeria Kano State 2016-17 MICS_English.pdf

Nigeria - Multiple Indicator Cluster Survey 2016-2017: Survey Finding Report Lagos-State

Title	Nigeria - Multiple Indicator Cluster Survey 2016-2017: Survey Finding Report Lagos-State
Date	2017-10-01
Country	Niger
Language	English
Filename	Nigeria Lagos State 2016-17 MICS_English.pdf

Technical documents

MICS5 Survey Planning Tools

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

MICS5 Sampling Tools

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

MICS5 Indicator List

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