Nigeria - Malaria Indicator Survey 2015

**National Malaria Elimination Programme (NMEP) - Federal Government of Nigeria,
National Population Commission (NPopC) - Federal Government of Nigeria,
National Bureau of Statistics (NBS) - Feder**

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Sampling

Sampling Procedure

The sample for the 2015 NMIS was designed to provide most of the survey indicators for the country as a whole, for urban and rural areas separately, and for each of the country's six geopolitical zones. Some of these indicators are provided for each of the 36 states and the FCT. Nigeria's geopolitical zones are as follows:
1. North Central: Benue, Kogi, Kwara, Nasarawa, Niger, Plateau, and FCT
2. North East: Adamawa, Bauchi, Borno,1 Gombe, Taraba, and Yobe
3. North West: Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto, and Zamfara
4. South East: Abia, Anambra, Ebonyi, Enugu, and Imo
5. South South: Akwa Ibom, Bayelsa, Cross River, Delta, Edo, and Rivers
6. South West: Ekiti, Lagos, Ogun, Ondo, Osun, and Oyo

The sampling frame for the 2015 NMIS was the 2006 National Population and Housing Census (NPHC) of the Federal Republic of Nigeria, conducted by the National Population Commission. Administratively, Nigeria is divided into states. Each state is subdivided into local government areas (LGAs), and each LGA is divided into localities. In addition to these administrative units, during the 2006 census, each locality was subdivided into convenient areas called census enumeration areas (EAs). The primary sampling unit (PSU), referred to as a cluster for the 2015 NMIS, was defined on the basis of EAs from the 2006 EA census frame.

A two-stage sampling strategy was adopted for the 2015 NMIS. In the first stage, nine clusters (EAs) were selected from each state, including the FCT. The sample selection was done in such a way that it was representative of each state. The result was a total of 333 clusters throughout the country, 138 in urban areas and 195 in rural areas.

A complete listing of households was conducted, and a mapping exercise for each cluster was carried out in June and July 2015, with the resulting lists of households serving as the sampling frame for the selection of households in the second stage. All regular households were listed. The NPopC listing enumerators used global positioning system (GPS) receivers to record the coordinates of the 2015 NMIS sample clusters.

In the second stage of the selection process, 25 households were selected in each cluster by equal probability systematic sampling. All women age 15-49 who were either permanent residents of the households in the 2015 NMIS sample or visitors present in the households on the night before the survey were eligible to be interviewed. In addition, all children age 6-59 months were eligible to be tested for malaria and anaemia. This sample size was selected to guarantee that key survey indicators could be produced for each of the country's six geopolitical zones, with approximately 1,338 women in each zone expected to complete interviews. In order to produce some of the survey indicators at the state level for each of the 36 states and the FCT, interviews were expected to be completed with approximately 217 women per state.

For further details of the sample design, see Appendix A of the final report.

Response Rate

A total of 8,148 households were selected for the sample. This does not include six rural clusters in Borno State and one cluster in Plateau State that were dropped from the sample due to security concerns. Of the households selected, 7,841 were occupied. Of the occupied households, 7,745 were successfully interviewed, yielding a response rate of 99 percent. The response rate among households in rural areas was slightly higher (99 percent) than that among households in urban areas (98 percent). No clusters in rural areas of Borno State were visited; thus, estimates for national indicators and indicators in the North East Zone do not include rural Borno State.

In the interviewed households, 8,106 women were identified as eligible for individual interviews. Interviews were completed with 8,034 women, yielding a response rate of 99 percent. The response rate among eligible women did not differ by residence (urban or rural).

Weighting

Due to the non-proportional allocation of the sample to the different states and the possible differences in response rates, sampling weights are required for any analysis using the 2015 NMIS data to ensure the actual representativeness of the survey results at national, zonal, and state levels. Because the 2015 NMIS sample is a two-stage stratified cluster sample

selected from the sampling frame, sampling weights were calculated based on sampling probabilities separately for each sampling stage, and for each cluster.

For further details of sample weights, see Appendix A.4 of the final report.

Questionnaires

Overview

Three questionnaires were used in the survey: the Household Questionnaire; the Woman's Questionnaire, which was administered to all women age 15-49 in the selected households; and the Biomarker Questionnaire.

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. Data on age and sex were used to identify women 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, ownership of various durable goods, and ownership and use of mosquito nets.

The Woman's Questionnaire was used to collect information from all women age 15-49. These women were asked questions on the following main topics:
• Background characteristics (e.g., education, media exposure)
• Birth history and childhood mortality
• Antenatal care and malaria prevention for most recent birth and pregnancy
• Malaria prevention and treatment
• Knowledge about malaria (symptoms, causes, prevention, drugs used in treatment)

The Biomarker Questionnaire was used to record the results of the anaemia and malaria testing as well as the signatures of the fieldworker and the respondent who gave consent.

Data Collection

Data Collection Dates

Start	End	Cycle
2015-10	2015-11	N/A

Data Collection Mode

Face-to-face [f2f]

DATA COLLECTION NOTES

Thirty-seven interviewing teams carried out data collection for the 2015 NMIS. Each team consisted of one supervisor, two interviewers (one of whom was a nurse), a laboratory scientist, and one driver. Nineteen field coordinators from NMEP, NPopC, NMEP, and some of the Roll Back Malaria (RBM) partners coordinated and supervised fieldwork activities, supported by two central coordinators. Three ICF International staff (the survey manager, the data processing specialist, and the biomarker specialist) also monitored fieldwork. Data collection took place during October and November 2015.

Data Processing

Data Editing

Data for the 2015 NMIS were collected through questionnaires programmed onto tablet computers. The computers were programmed by an ICF data processing specialist and loaded with the Household, and Woman's Questionnaires in English and the three major local languages. The tablets were Bluetooth-enabled to facilitate electronic transfer of files, for example, transfer of data from the Household Questionnaires among survey team members and transfer of completed questionnaires to the team supervisor's tablets. The field supervisors transferred data on a daily basis to the central data processing office using the Internet. To facilitate communication and monitoring, each field worker was assigned a unique identification number.

Two data management officers were positioned at the central data office to monitor and supervise daily submission of completed interview data from teams. They also provided technical assistance on the functioning of the tablets and constantly liaised with the central coordination and ICF teams to manage data transfers from the field teams to the central office. They made intermittent visits to assist field teams with serious situations that could not be resolved at the central office, either to replace or fix the tablets.

The Census Survey Processing (CSPro) software program was used for data editing, weighting, cleaning, and tabulation. In the NPopC central office, data received from the supervisors' tablets were registered and checked for any inconsistencies and outliers. Data editing and cleaning included structure and internal consistency checks to ensure completeness of work in the field. Any anomalies were communicated to the respective team through field coordinators and the team supervisor. Corrected results were re-sent to the central processing unit. Data processing was completed during the first week of December 2015.

Data Appraisal

Estimates of Sampling Error

The estimates from a sample survey are affected by two types of errors: nonsampling errors and sampling errors. Nonsampling errors are the results of mistakes made in implementing data collection and data processing, such as failure to locate and interview the correct household, misunderstanding of the questions on the part of either the interviewer or the respondent, and data entry errors. Although numerous efforts were made during the implementation of the 2015 Nigeria Malaria Indicator Survey (NMIS) to minimize this type of error, nonsampling errors are impossible to avoid and difficult to evaluate statistically.

Sampling errors, on the other hand, can be evaluated statistically. The sample of respondents selected in the 2015 NMIS is only one of many samples that could have been selected from the same population, using the same design and expected 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 among all possible samples.

Although the degree of variability is not known exactly, it can be estimated from the survey results. Sampling error is usually measured in terms of the standard error for a particular statistic (mean, percentage, etc.), which is the square root of the variance. The standard error can be used to calculate confidence intervals within which the true value for the population can reasonably be assumed to fall. For example, for any given statistic calculated from a sample survey, the value of that statistic will fall within a range of plus or minus two times the standard error of that statistic in 95 percent of all possible samples of identical size and design.

If the sample of respondents had been selected as a simple random sample, it would have been possible to use straightforward formulas for calculating sampling errors. However, the 2015 NMIS sample is the result of a multi-stage stratified design, and, consequently, it was necessary to use more complex formulas. Sampling errors are computed in either ISSA or SAS, using programs developed by ICF Macro. These programs use the Taylor linearization method of variance estimation for survey estimates that are means, proportions, or ratios.

The Taylor linearization method treats any percentage or average as a ratio estimate, r = y/x, where y represents the total sample value for variable y, and x represents the total number of cases in the group or subgroup under consideration.

Note: A more detailed description of estimate of sampling error is presented in Appendix B of the survey report.

Other forms of Data Appraisal

Data Quality Tables
- Household age distribution
- Age distribution of eligible and interviewed women
- Completeness of reporting
- Births by calendar years

Note: See detailed data quality tables in Appendix C of the report.

Related Materials

Questionnaires

Nigeria Malaria Indicator Survey 2015, Household Questionnaire

Title	Nigeria Malaria Indicator Survey 2015, Household Questionnaire
Author(s)	National Malaria Elimination Programme (NMEP) National Population Commission (NPopC) National Bureau of Statistics (NBS)
Date	2015-08-21
Country	Nigeria
Language	English
Filename	Nigeria_2015_MIS_hh_questionnaire.pdf

Nigeria Malaria Indicator Survey 2015, Woman's Questionnaire

Title	Nigeria Malaria Indicator Survey 2015, Woman's Questionnaire
Author(s)	National Malaria Elimination Programme (NMEP) National Population Commission (NPopC) National Bureau of Statistics (NBS)
Date	2015-08-21
Country	Nigeria
Language	English
Filename	Nigeria_2015_MIS_woman_questionnaire.pdf

Nigeria Malaria Indicator Survey 2015, Biomarker Questionnaire

Title	Nigeria Malaria Indicator Survey 2015, Biomarker Questionnaire
Author(s)	National Malaria Elimination Programme (NMEP) National Population Commission (NPopC) National Bureau of Statistics (NBS)
Date	2015-08-21
Country	Nigeria
Language	English
Filename	Nigeria_2015_MIS_biomarker_questionnaire.pdf

Reports

Nigeria Malaria Indicator Survey 2015, Report

Title	Nigeria Malaria Indicator Survey 2015, Report
Author(s)	National Malaria Elimination Programme, Federal Ministry of Health, Federal Republic of Nigeria Abuja, Nigeria National Population Commission, Federal Republic of Nigeria, Abuja, Nigeria National Bureau of Statistics, Federal Republic of Nigeria, Abuja,
Date	2016-08-01
Country	Nigeria
Language	English

Table of contents

Filename	http://dhsprogram.com/pubs/pdf/MIS20/MIS20.pdf

2015 Nigeria Malaria Indicator Survey (NMIS), Atlas of Key Indicators

Title	2015 Nigeria Malaria Indicator Survey (NMIS), Atlas of Key Indicators
Author(s)	The DHS Program
Date	2016-08-01
Country	Nigeria
Language	English
Filename	http://dhsprogram.com/pubs/pdf/ATR17/ATR17.pdf

Fast Facts from The 2015 Nigeria Malaria Indicator Survey

Title	Fast Facts from The 2015 Nigeria Malaria Indicator Survey
Author(s)	The DHS Program
Date	2016-08-01
Country	Nigeria
Language	English
Filename	http://dhsprogram.com/pubs/pdf/DM90/DM90.pdf

2015 Malaria Indicator Survey Fact Sheet

Title	2015 Malaria Indicator Survey Fact Sheet
Author(s)	The DHS Program
Date	2016-08-01
Country	Nigeria
Language	English
Filename	http://dhsprogram.com/pubs/pdf/MF17/MF17.pdf

Other materials

Reading and Understanding Tables from the 2015 Nigeria Malaria Indicator Survey (NMIS)

Title	Reading and Understanding Tables from the 2015 Nigeria Malaria Indicator Survey (NMIS)
Author(s)	The DHS Program
Date	2016-08-01
Country	Nigeria
Language	English
Filename	http://dhsprogram.com/pubs/pdf/DM93/DM93.pdf