

Guyana - Multiple Indicator Cluster Survey 2014

**United Nations Children's Fund, Guyana Bureau of Statistics, Guyana Ministry of
Public Health**

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Sampling

Sampling Procedure

The primary objective of the sample design for the Guyana MICS 2014 was to produce statistically reliable estimates of most indicators, at the national level, for urban and rural areas, and for the two geographic sub-areas defined as interior areas and coastal areas. Urban and rural areas in each of the two domains were defined as the sampling strata.

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

The sample size for the Guyana MICS 5 2014 was established as 6,000 households. For the calculation of the sample size, the key indicator used was the underweight prevalence among children age 0-4 years which produced a sample size of 8,623. But the budget allocated for the survey only allowed for sample 6,000 households.

The number of households selected per cluster for the Guyana MICS 5 2014 was determined as 20 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 300 sample clusters would be needed to be allocated to the two domains across the 10 geographic regions of the country. The allocation was not proportional to the size of the domain. The Interior Domain represents 12.52 percent of the population and if proportional allocation had been used, only 30 clusters would have been allocated to the interior domain instead of the 80. Within each domain the specified number of sample clusters was allocated to the regions approximately in proportion to their size.

The 2012 census frame was used for the selection of clusters. Census enumeration areas (or Enumeration Districts in Guyana) 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 2012 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 two domains, separately for the urban and rural strata.

Even though the sample frame (i.e. the 2012 Population and Housing Census) was relatively up-to-date, the maps and household listings of the selected clusters/EDs were updated prior to selecting the households. A household listing to identify households with children under 5 was done in the field prior to interviewing. This was done to ensure that a certain number of households in the sample would have children and a certain number would not. Therefore, within each PSU the households in the listing were stratified in two groups: (1) households with children under 5 and (2) households without children in that age group.

The mapping and listing exercise was carried out on the coast, from 27th January to 30th March, 2014, prior to the commencement of the field work (prelisted), while this exercise was conducted in the interior areas from 16th April to 6th July 2014 during the actual field work activities. Unlike on the coast where generally the listing was done and the sample was drawn in office, in the case of the interior, the listing was carried out by the data collection teams and the sample households were drawn in the field, prior to conducting interviews.

The listing and mapping exercise utilized 17 teams consisting of two persons in each team: one listed and the other mapped the cluster. All the teams were supervised by checkers. The main responsibilities of the checkers were to identify the boundaries of each of the assigned clusters and verify 10 percent of households in each assigned cluster.

Lists of households for each ED were prepared by the listing teams on the coast and by the data collection teams in the interior areas, identifying the households with and without children under 5 years. The households were then sequentially numbered from 1 to n (the total number of households in the group for each enumeration area), separately for the households with and without children under 5. A total of 20 sample households in each enumeration area allocated to the groups of households with and without children as described below, and within each group the allocated number of households was selected using random systematic selection procedures. Note that selection of the households for the coastal EDs was done in office by the Guyana Bureau of Statistics, while for the interior EDs, this was done in the field by the respective data collection supervisor.

The survey also included a questionnaire for individual men that was to be administered in one-half of the sample of households, with every other household in each sample cluster selected for interviews with all eligible men.

The households listed in each sample cluster were divided into two strata for the second stage selection: Households with children under 5 and households without children under 5. From the household listing sheets 12 households with children under 5 were selected and 8 without children in that age group. If for instance a PSU had only 5 households with children

under 5, these were all selected and the other 15 sample households came from the other stratum (without children under 5). A separate sample of households was selected from each group, using a higher sampling rate for households with children under 5. This sampling strategy increased the number of children under 5 in the sample in order to increase the precision of the indicators based on under-5 children.

The sampling procedures are more fully described in "Multiple Indicator Cluster Survey 2014 - Final Report" pp.339-341.

Response Rate

Of the 5,904 households selected for the sample, 5,526 were found to be occupied. Of these, 5,077 were successfully interviewed for a household response rate of 91.9 percent.

In the interviewed households, 5,809 women (age 15-49 years) were interviewed. Of these, 5,076 were successfully interviewed, yielding a response rate of 87.4 percent within the interviewed households.

The survey also sampled men (age 15-49 years), but required only a subsample. All men (age 15-49 years) were identified in every other household.

Two thousand five hundred and twenty-six (2,526) men (age 15-49 years) were listed in the household questionnaires. Questionnaires were completed for 1,682 eligible men, corresponding to a response rate of 66.6 percent within eligible interviewed households.

There were 3,482 children under age five listed in the household questionnaires. Questionnaires were completed for 3,358 of these children, which corresponds to a response rate of 96.4 percent within the households that were interviewed.

Overall response rates of 80.3 percent, 61.2 percent, and 88.6 percent are calculated for the individual interviews of women, men, and under-five's, respectively.

Weighting

The Guyana MICS 5 2014 sample is not self-weighting. Essentially, by allocating a disproportionate number of households to each of the domains, different sampling fractions were used in each domain since the sizes of the regions varied. At the second stage different sampling rates were also used for the households with and without children under 5. For these reasons, 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 and PSU.

A final component in the calculation of sample weights takes into account the level of non-response for the households and individual interviews. The adjustment for household non-response in each stratum is equal to: $1/RR_h$

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 design weights for the households were calculated by multiplying the inverse of the probabilities of selection by the non-response adjustment factor for each stratum. These weights were then standardized (or normalized) in order 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 nonresponse) 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 nonresponse). A similar standardization procedure was followed in obtaining standardized weights for the individual women, men, and under-5 questionnaires. Adjusted (normalized) weights varied between 0.039742092 and 4.89493688 in the 296 sample enumeration areas (clusters). Four PSUs in the Interior domain could not be visited because they were inaccessible during the interview period.

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 raw sample weight for men includes a factor of 2, in addition to the nonresponse adjustment factor.

The last stage probability of selection in each sample EA is different for households with and without children under 5. For this reason separate weights were calculated for each group of households in the sample EA.

Questionnaires

Overview

The questionnaires for the Generic MICS were structured questionnaires based on the MICS5 model questionnaire with some modifications and additions. Household questionnaires were administered in each household, which collected various information on household members including sex, age and relationship. The household questionnaire includes List of Household Members, Education, Child Labour, Child Discipline, Household Characteristics, Insecticide Treated Nets, Water and Sanitation, Handwashing, and Salt Iodization.

In addition to a household questionnaire, questionnaires were administered in each household for women age 15-49, men age 15-49 and children under age five. The questionnaire was administered to the mother or primary caretaker of the child.

The women's questionnaire includes Woman's Background, Access to Mass Media and Use of Information, Communication Technology, Fertility/Birth History, Desire for Last Birth, Maternal and Newborn Health, Post-natal Health Checks, Illness Symptoms, Contraception, Unmet Need, Attitudes Toward Domestic Violence, Marriage/Union, Sexual Behaviour, Prevention, HIV/AIDS, Tobacco and Alcohol Use, Chronic Illness Control, and Life Satisfaction.

The men's questionnaire includes Man's Background, Access to Mass Media and Use of Information, Communication Technology, Fertility, Attitudes Toward Domestic Violence, Marriage/Union, Sexual Behaviour, HIV/AIDS, Tobacco and Alcohol Use, Chronic Illness Control, and Life Satisfaction.

The children's questionnaire includes Child's age, Birth Registration, Early Childhood Development, Breastfeeding and Dietary Intake, Immunization, Care of Illness, and Anthropometry.

The questionnaires are based on the MICS5 model questionnaire. From the MICS5 model English version, the questionnaires were customised and were pre-tested in three (3) locations in both urban and rural areas including a community in the interior areas during February 2014. Based on the results of the pre-test, modifications were made to the wording of the questionnaires.

Data Collection

Data Collection Dates

Start	End	Cycle
2014-04	2014-07	N/A

Data Collection Mode

Face-to-face [f2f]

DATA COLLECTION NOTES

Training for the fieldwork was conducted for 15 days (three work-weeks) between the 25th of February and 18th of March 2014. The training methodologies included lectures on interviewing techniques utilising each of the questionnaires and role-play modelling the various functions interchangeably.

As part of the selection process, participants were observed during the role-plays and scored. Quizzes were also administered to participants. Once the questionnaires were finalised and the teams were selected, the survey implementation was piloted. During this process, trainees spent a day in the field in six (6) locations in both urban and rural areas, to ensure that the processes of the fieldwork would work as close as possible to how it was envisioned during the training. Both the pilot and training were conducted in the coastal regions and therefore the interior areas were visited at the time of the listing and enumeration.

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.

The data were collected by 14 teams; each was comprised of four (4) interviewers, one (1) editor, one (1) measurer, one (1) supervisor and one (1) driver. Fieldwork began in April 2014 and concluded in July 2014.

SUPERVISION

There is one supervisor for each of the 14 data collection teams in the field.

Data Processing

Data Editing

The data were entered using the CPro software, Version 5.0. The data were entered on nine (9) desktop computers and carried out by nine (9) data entry operators and one (1) data entry supervisor. For quality assurance purposes, all questionnaires were double-entered and internal consistency checks were conducted. The procedures and standard programs developed by the global MICS programme, informed the adaption of Guyana MICS5 2014 questionnaires, and guided the process throughout. Data processing began just after the second week of data collection in April 2014 and was completed in mid-December 2014. Data were analysed using the Statistical Package for Social Sciences (SPSS) software, Version 21. The model syntax and tabulation plans developed by UNICEF were customised and used for this purpose.

Data Appraisal

Estimates of Sampling Error

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 (deff) is used to show the efficiency of the sample design in relation to the precision. A deff 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 deff 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.

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.

The results are shown in the tables that follow. In addition to the sampling error measures described above, the tables also include weighted and unweighted counts of denominators for each indicator. Given the use of normalized weights, by comparing the weighted and unweighted counts it is possible to determine whether a particular domain has been under-sampled or oversampled 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 national level, for urban and rural areas, for the geographic sub-areas defined as interior and coastal areas, as well as urban coastal and rural coastal areas, and for all regions. Three of the selected indicators are based on household members, 12 are based on women, 3 are based on men, and 4 are based on children under 5.

Other forms of Data Appraisal

A series of data quality tables are available to review the quality of the data and include the following:

- Age distribution of household population
- Age distribution of eligible and interviewed women
- Age distribution of eligible and interviewed men
- Age distribution of children in household and under-5 questionnaires
- Birth date reporting: Household population
- Birth date and age reporting: Women
- Birth date and age reporting: Men
- Birth date and age reporting: Under-5s
- Birth date reporting: Children, adolescents and young people
- Birth date reporting: First and last births
- Completeness of reporting
- Completeness of information for anthropometric indicators: Underweight
- Completeness of information for anthropometric indicators: Stunting
- Completeness of information for anthropometric indicators: Wasting
- Heaping in anthropometric measurements
- Observation of birth certificates
- Observation of vaccination cards
- Observation of women's health cards
- Observation of bednets and places for handwashing
- Presence of mother in the household and the person interviewed for the under-5 questionnaire
- Selection of children age 1-17 years for the child labour and child discipline modules
- School attendance by single age
- Sex ratio at birth among children ever born and living
- Births by periods preceding the survey
- Reporting of age at death in days
- Reporting of age at death in months

The results of each of these data quality tables are shown in appendix E in document "Multiple Indicator Cluster Survey 2014 - Final Report" pp.363-382.

Related Materials

Questionnaires

Guyana Multiple Indicator Cluster Survey 2014 - Questionnaire

Title	Guyana Multiple Indicator Cluster Survey 2014 - Questionnaire
Date	2014-12-01
Country	Guyana
Language	English
Table of contents	Household questionnaire modules
	Household member questionnaire modules
	Women questionnaire modules
	Children questionnaire modules
	Vaccination records at health facility questionnaire modules
Filename	Guyana 2014 MICS_English_Questionnaire.pdf

Reports

Guyana Multiple Indicator Cluster Survey 2014 - Report

Title	Guyana Multiple Indicator Cluster Survey 2014 - Report
Author(s)	Guyana Bureau of Statistics United Nations Children's Fund (UNICEF)
Date	2014-12-01
Country	Guyana
Language	English
Filename	https://mics-surveys-prod.s3.amazonaws.com/MICS5/Latin%20America%20and%20Caribbean/Guyana/2014/Final/Guyana%202014%20MICS_English.pdf

Guyana Multiple Indicator Cluster Survey 2014 - Key Findings

Title	Guyana Multiple Indicator Cluster Survey 2014 - Key Findings
Author(s)	Guyana Bureau of Statistics United Nations Children's Fund (UNICEF)
Date	2014-07-01
Country	Guyana
Language	English
Filename	https://mics-surveys-prod.s3.amazonaws.com/MICS5/Latin%20America%20and%20Caribbean/Guyana/2014/Key%20findings/Guyana%202014%20MICS%20KFR_English.pdf
