

Guyana - Demographic and Health Survey 2009

Bureau of Statistics (BOS), Ministry of Health (MOH)

Report generated on: June 16, 2017

Visit our data catalog at: <http://microdata.worldbank.org>

Sampling

Sampling Procedure

SAMPLE FRAME

Administratively, Guyana is divided into 10 regions. For census purposes, each region is divided into enumeration areas (EAs), either urban or rural. The available list of EAs has information on the population size and number of households for each EA. This information and the available demarcated cartographic material from the last census for each EA constitute an adequate sample frame for the selection of EA as the primary sampling units for the 2009 GDHS.

SAMPLE SELECTION

The 2002 Population and Housing Census constituted the frame for the 2009 GDHS sample design. The 2009 GDHS sample of households was selected using a stratified, two-stage cluster design consisting of 330 clusters, which are required for a sample of about 6,590 households. The first-stage units (primary sampling units or PSUs) are the enumeration areas (EAs) used for the 2002 Population and Housing Census. After allocating the total sample among the major regions in the most optimal way possible, the number of EAs (clusters) in each domain region was calculated by dividing its total allocated number of households by the sample take (25 households for selection per EA).

For the first stage, in each major domain, clusters are selected systematically, with probability proportional to size. The selection is done using the following formula:

$$P1i = (b \text{ mi} / S \text{ mi})$$

where

- b : number of EAs in the 2009 GDHS assigned to a given domain region mi: measure of size (number of households) of the ith EA S

- mi : total measure of size (total number of households) for the corresponding domain region

In each selected EA, a household listing operation was carried out prior to fieldwork, and households were selected to achieve a fixed sample take per cluster.

For the second stage, in the ith cluster in a given area combination (location by residence), a fixed number of households (c) were selected out of the total households (Li) found in the 2009 GDHS listing process.

Then the household probability in the selected ith cluster can be expressed as $P2i = (c / Li)$

The overall probability of the households in the ith cluster could be calculated as $fi = P1i * P2i$

The sampling design weight for the ith cluster is given as $1/fi = 1/(P1i * P2i)$

SAMPLE ALLOCATION

Result shows the percent distribution of the population of Guyana by urban-rural residence for each of the 10 regions and the sample allocation for the 2009 GDHS: the number of households and the resulting number of primary sampling units.

Seventy-one percent of the population in Guyana resides in Rural areas. The Rural areas of Regions 3, 4, and 6 are the most densely populated. Regions 1, 7, 8, 9, and 10 each account for less than 4 percent of the rural population, and Region 5 accounts for 10 percent. On the other hand, Region 4 includes almost two-thirds (64 percent) of the urban population. Because of these differences, the sample was not allocated by region according to the actual distribution of the population. A minimum of 400 households were allocated to each region. The largest number of households was allocated to Region 4 (1,600) and Region 6 (1,000). Around 600-650 households were allocated to each of Regions 2, 3, and 10 for a total of 6,590 households. Out of this total, around 3,000 households were allocated to the Coastal (rural) domain.

The allocated number of clusters per domain is calculated in Table A.1 by dividing by 25 the number of households allocated for each domain, given that the sample design calls for the selection of 25 households per cluster in the second stage.

As a result of the non-proportional allocation of the number of EDs for the urban-rural domains, the household sample for the 2009 GDHS is not a self-weighted sample. Weights were calculated to ensure that the distribution of respondents (weighted percent and weighted number) reflects the actual representation at the national level.

In the second stage, 25 households were selected by systematic random sampling from the full updated list of households for each of the selected EDs for a total of 6,590 households. All women and men age 15-49 who were either permanent residents of the households in the 2009 GDHS sample or visitors who were present in the household on the night before the survey were eligible to be interviewed in the survey.

Response Rate

Of the 6,376 selected households, 6,042 households were occupied, and a total of 5,632 households were interviewed, yielding a household response rate of 93 percent. By residence, the household response rate is lowest in urban areas (91 percent), especially in Georgetown (86 percent), and highest in Interior areas of the country (96 percent). By region, the household response rate ranges from 89 percent in Region 4 to 99 percent in Region 8.

In the households interviewed, a total of 5,547 eligible women were identified. Interviews were completed with 4,996 of these women, yielding a response rate for women of 90 percent. The women's response rates were lowest in the Interior areas (86 percent) and in Region 1 (83 percent) and highest in the Coastal areas (92 percent) and Region 2 (95 percent).

Of the 4,553 eligible men identified in the same interviewed households, a total of 4,553 men were identified. Interviews were conducted with only 3,522 men, yielding a response rate for men of 77 percent. Men from the Interior area (70 percent) and from Region 1 (62 percent) have the lowest response rates, while men in Urban and Coastal (urban) areas (82 percent, each) have the highest response rates.

The primary reason for non-response among eligible women and men was the failure to find individuals at home despite repeated visits to the household. The substantially lower response rate for men reflects the more frequent and longer absences of men from the household, principally related to employment and lifestyle activities (data not shown).

Weighting

The weighted numbers are shown because weighting is necessary for the calculation of most indicators-percent distributions, percentages, and rates. This is because the sample was not allocated by region according to the actual distribution of the population. Instead, the sample was allocated to provide a sufficient number of respondents for each region to allow calculation of most survey variables at the regional level. The unweighted numbers are the actual numbers of interviews. Some subgroups shown may include comparatively small numbers of respondents (e.g., respondents with no education and those in some religious and ethnic groups). In some tables in this report, estimates for these subgroups are not shown if the unweighted number of cases is fewer than 25. Also, estimates based on 25 to 49 unweighted cases are shown enclosed in parentheses.

Although only 1,179 women were interviewed in Region 4 (24 percent of the total unweighted number of all women), the weighted number is 2,168 women (43 percent of the total weighted number of women). On the other hand, 280 women were interviewed in Region 9 (6 percent of the total unweighted number of all women), and the weighted number is 78 women (2 percent of the total weighted number of women).

The regional distribution of the population shows no marked differences by sex, with around three in ten women (30 percent) and men (27 percent) living in Urban areas, with two-thirds of these living in Georgetown. Approximately nine in ten respondents of both sexes (90 percent of women and 89 percent of men) live in the Coastal areas, with the majority (60 percent of women and 62 percent of men) living in the Coastal (rural) areas. Only one-tenth of the respondents (10 percent of women and 11 percent of men) live in the Interior areas of the country.

Questionnaires

Overview

Three questionnaires were used for the 2009 GDHS: the Household Questionnaire, the Women's Questionnaire, and the Men's Questionnaire. The contents of these questionnaires were based on the model questionnaires developed by the MEASURE DHS program. In consultation with USAID/Guyana, technical institutions, and local and international organizations, the contents of the model questionnaires were modified to reflect relevant issues in population, family planning, and other health issues in Guyana.

a) The Household Questionnaire was used to list all the usual members and visitors in the selected households. The following basic information was collected:

- Characteristics of each person listed, including age, sex, education, and relationship to the head of the household. As a result, women and men who would be eligible for a subsequent individual interview could be identified.
- 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.
- Height and weight measurements of women age 15-49 and children under age 6, as well as the results of anemia testing.

b) The Women's Questionnaire was used to collect information from all women age 15-49. Eligible women were asked questions on the following topics:

- Background characteristics (e.g., education, residential history, media exposure)
- Birth history and childhood mortality
- Knowledge and use of family planning methods
- Fertility preferences
- Antenatal and delivery care for children born after January 2004
- Breastfeeding and infant feeding practices
- Vaccinations and illnesses for children born after January 2004
- Marriage and sexual activity
- Woman's work and husband's background characteristics
- Awareness and behavior regarding AIDS and other STIs

c) The Men's Questionnaire was administered to all men age 15-49 living in households included in the 2009 GDHS sample. The Men's Questionnaire collected information similar to that of the Women's Questionnaire but was shorter because it did not include a reproductive history or questions on maternal and child health and nutrition. The following topics were addressed:

- Background characteristics (e.g., education, residential history, media exposure)
- Reproductive history and basic health questions about last birth
- Knowledge and use of family planning methods
- Fertility preferences
- Marriage and sexual activity
- Employment and gender roles
- Awareness and behavior regarding AIDS and other sexually transmitted infections (STIs)

Data Collection

Data Collection Dates

Start	End	Cycle
2009-03	2009-07	N/A

Data Collection Mode

Face-to-face

DATA COLLECTION NOTES

A training of trainers took place in early December 2008. One hundred and twelve candidates (50 men and 62 women) participated in the main survey training of interviewers, supervisors, and field editors, which took place on December 9-19, 2008, and January 12-22, 2009. Special parallel training sessions for supervisors and editors were conducted on January 19-21. All participants received training in interviewing techniques and became acquainted with the contents of the survey questionnaires. The training was conducted following standard DHS procedures and included class presentations, mock interviews, and tests in which the actual 2009 GDHS questionnaires were used. During the last week of January 2009, the editors of each team received training and instruction on how to use measuring boards and scales to conduct anthropometric measurements (height and weight) of women and young children and on how to conduct anemia testing. Because the beginning of fieldwork was delayed, a refresher training course was conducted on February 24-26, 2009.

Data collection for the 2009 GDHS took place over a five-month period from March 1 through late July 2009 and was carried out by 16 interviewing teams. Each team consisted of one team supervisor, one field editor, two female and two male interviewers, and one driver. In total, 96 fieldworkers completed work first in the Coastal enumeration districts (Regions 2, 3, 4, 5, and 10). At a later stage, 60 fieldworkers were selected to work in the Interior districts (Regions 1, 7, 8, 9, and 10).

SUPERVISION

Staff from the Bureau of Statistics was responsible for coordinating and supervising fieldwork activities. Two nurses supervised the anthropometry and anemia testing. ICF Macro staff participated in the survey, assisting with questionnaire design, training for data collection, data processing and tabulation, field supervision of interviews, and training in anthropometry and anemia testing.

Data Processing

Data Editing

The processing of the 2009 GDHS questionnaires began on March 16, 2009, shortly after fieldwork commenced. Completed questionnaires were submitted periodically to BOS offices in Georgetown, where they were edited by data processing personnel who had been trained specifically for this task by ICF Macro staff. Data processing was done concurrently with fieldwork using CPro, a program specially developed for use in complex surveys. The concurrent processing of the data was an advantage because field check tables were produced periodically to advise field teams of any problems that were detected during data processing. Data processing was completed in late August 2009.

Data Appraisal

Estimates of Sampling Error

The estimates from a sample survey are affected by two types of errors: (1) non-sampling errors, and (2) sampling errors. Non-sampling 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 2009 Guyana Demographic and Health Survey (GDHS) to minimize this type of error, non-sampling 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 2009 GDHS 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 between all possible samples. Although the degree of variability is not known exactly, it can be estimated from the survey results.

A 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 2009 GDHS sample is the result of a multi-stage stratified design, and, consequently, it was necessary to use more complex formulas. The computer software used to calculate sampling errors for the 2009 GDHS is the ISSA Sampling Error Module. This module uses the Taylor linearization method of variance estimation for survey estimates that are means or proportions. The Jackknife repeated replication method is used for variance estimation of more complex statistics such as fertility and mortality rates.

The Jackknife repeated replication method derives estimates of complex rates from each of several replications of the parent sample, and calculates standard errors for these estimates using simple formulas. Each replication considers all but one cluster in the calculation of the estimates. Pseudo-independent replications are thus created. In the 2009 GDHS, there were 325 non-empty clusters. Hence, 325 replications were created.

In addition to the standard error, the design effect (DEFT) for each estimate is also calculated. The design effect is defined as the ratio between the standard error using the given sample design and the standard error that would result if a simple random sample had been used. A DEFT value of 1.0 indicates that the sample design is as efficient as a simple random sample, while a value greater than 1.0 indicates the increase in the sampling error due to the use of a more complex and less statistically efficient design. Relative errors and confidence limits for the estimates are also computed.

Sampling errors for the 2009 GDHS are calculated for selected variables considered to be of primary interest for the women's and men's samples. The results are presented in an Appendix to the Survey Final Report for the country as a whole, for urban and rural areas, and for each of the 10 regions. For each variable, the type of statistic (mean, proportion, or rate) and the base population are given in Table B.1. Tables B.2.1 to B.2.14 present the value of the statistic (R), its standard error (SE), the number of unweighted (N) and weighted (WN) cases, the design effect (DEFT), the relative standard error (SE/R), and the 95 percent confidence limits (R2SE), for all the selected variables, except for fertility and mortality rates. The sampling errors for fertility rates for the three-year period preceding the survey are included in Table B.3. The sampling errors for mortality rates for the five-year period preceding the survey are presented in Table B.4.1 for the total population. Table B.4.1 also includes the sampling errors for the infant mortality rate for several five-year periods preceding the survey. The sampling errors for mortality rates are presented in Table B.4.2 by residence for the ten-year period preceding the survey. The DEFT is considered undefined when the standard error is zero (when the estimate is close to 0 or 1). In the case of the total fertility rate, the number of unweighted cases is not relevant, as there is no known unweighted value for woman-years of exposure to childbearing.

The confidence interval (e.g., as calculated for children ever born to women age 40-49) can be interpreted as follows: the overall average from the national sample is 3.440, and its standard error is 0.091. Therefore, to obtain the 95 percent confidence limits, one adds and subtracts twice the standard error to the sample estimate, i.e., 3.440 \pm 2(0.091). There is a high probability (95 percent) that the true average number of children ever born to all women age 40 to 49 is between 3.257 and 3.633.

Related Materials

Questionnaires

Guyana Demographic and Health Survey 2009 - Household Questionnaire

Title	Guyana Demographic and Health Survey 2009 - Household Questionnaire
Author(s)	Ministry of Health (MOH) and Bureau of Statistics (BOS)
Date	2009-03-01
Country	Guyana
Language	English
Contributor(s)	ICF Macro
Description	<p>The Household Questionnaire was used to list all the usual members and visitors in the selected households. The following basic information was collected:</p> <ul style="list-style-type: none"> - Characteristics of each person listed, including age, sex, education, and relationship to the head of the household. As a result, women and men who would be eligible for a subsequent individual interview could be identified. - 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. - Height and weight measurements of women age 15-49 and children under age 6, as well as the results of anemia testing.
Filename	GUY_DHS_2009_Questionnaire_Household_En.pdf

Guyana Demographic and Health Survey 2009 - Woman's Questionnaire

Title	Guyana Demographic and Health Survey 2009 - Woman's Questionnaire
Author(s)	Ministry of Health (MOH) and Bureau of Statistics (BOS)
Date	2009-03-01
Country	Guyana
Language	English
Contributor(s)	ICF Macro
Description	<p>The Women's Questionnaire was used to collect information from all women age 15-49. Eligible women were asked questions on the following topics:</p> <ul style="list-style-type: none"> - Background characteristics (e.g., education, residential history, media exposure) - Birth history and childhood mortality - Knowledge and use of family planning methods - Fertility preferences - Antenatal and delivery care for children born after January 2004 - Breastfeeding and infant feeding practices - Vaccinations and illnesses for children born after January 2004 - Marriage and sexual activity - Woman's work and husband's background characteristics - Awareness and behavior regarding AIDS and other STIs
Filename	GUY_DHS_2009_Questionnaire_Woman_En.pdf

Guyana Demographic and Health Survey 2009 - Man's Questionnaire

Title	Guyana Demographic and Health Survey 2009 - Man's Questionnaire
Author(s)	Ministry of Health (MOH) and Bureau of Statistics (BOS)
Date	2009-03-01
Country	Guyana
Language	English

Contributor(s) ICF Macro

The Men's Questionnaire was administered to all men age 15-49 living in households included in the 2009 GDHS sample. The Men's Questionnaire collected information similar to that of the Women's Questionnaire but was shorter because it did not include a reproductive history or questions on maternal and child health and nutrition. The following topics were addressed:

- Background characteristics (e.g., education, residential history, media exposure)
- Reproductive history and basic health questions about last birth
- Knowledge and use of family planning methods
- Fertility preferences
- Marriage and sexual activity
- Employment and gender roles
- Awareness and behavior regarding AIDS and other sexually transmitted infections (STIs)

Filename GUY_DHS_2009_Questionnaire_Man_En.pdf

Guyana Demographic and Health Survey 2009 - Final report

Title Guyana Demographic and Health Survey 2009 - Final report

Author(s) Ministry of Health (MOH) and Bureau of Statistics (BOS)

Date 2010-10-01

Country Guyana

Language English

Contributor(s) ICF Macro

This report summarizes the results of the 2009 Guyana Demographic and Health Survey (2009 GDHS), implemented by the Ministry of Health (MOH) and the Bureau of Statistics (BOS), with technical assistance from ICF Macro. Funds for the survey were provided in their entirety by the local mission of the United States Agency for International Development (USAID/Guyana) under the MEASURE DHS program. The 2009 GDHS is part of the worldwide MEASURE DHS program, which is designed to assist developing countries to collect, analyze, and disseminate data on fertility, family planning, and maternal and child health.

Filename <http://www.dhsprogram.com/pubs/pdf/FR232/FR232.pdf>
