

# Qatar - Multiple Indicator Cluster Survey 2012

**Ministry of Development Planning and Statistics, Supreme Council for Health and  
Qatar Foundation for Education, United Nations Children's Fund**

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# Sampling

## Sampling Procedure

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The major features of the sample design are described in this appendix. 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. The primary objective of the sample design for the Qatar Multiple Indicator Cluster Survey was to produce statistically reliable estimates of most indicators, at the national level. A multi-stage, stratified cluster sampling approach was used for the selection of the survey sample.

The target sample size for the Qatar MICS was calculated as 4576 households. For the calculation of the sample size, the key indicator used was the ["gross enrolment ratio in preprimary level"].

Originally 100 sample Qatari enumeration areas (EAs) and 100 sample non-Qatari EAs were selected at the first sampling stage covering all municipalities, and it was planned to select 23 households in each sample EA at the second stage. However, three Qatari sample EAs were not visited for cultural reasons. These EAs had previously been selected for more than one recent survey, and would thus place a heavy burden on these households. In addition, two non-Qatari EAs were not visited, as these had since been demolished. Therefore the final sample included 97 clusters for Qatari households and 98 clusters for non-Qatari households, for a total of 195 sample clusters. Given that three Qatari sample clusters and two non-Qatari sample clusters could not be enumerated, the second stage sampling procedures were adjusted to select 25 households in the Qatari sample EAs and 24 households in the non-Qatari sample EAs. The number of households selected per sample EA takes into account several considerations, including the design effect, available budget, and the need to complete the work of each cluster.

### SAMPLING FRAME AND SELECTION OF CLUSTERS

The 2010 Qatar 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 frame was stratified by nationality (Qatari and Non-Qatari) by using systematic pps (probability proportional to size) sampling procedures. The first stage of sampling was thus completed by selecting the required number of enumeration areas in each stratum.

Two separate area frames were constructed; 1) Qatari Households and 2) Non-Qatari Households. The Qatari frame consists of PSUs that will have only Qatari households and the same is true for the non-Qatari frame. This implies that in Qatari PSU, there is no chance of selection of a non-Qatari household and vice versa but all the households will have a chance of being selected in the sample in their respective PSUs.

### LISTING ACTIVITIES

Since the sampling frame (the 2010 Population Census) was not up-to-date, a new listing of households was conducted in all the sample enumeration areas prior to the selection of households. For this purpose, listing teams were formed, who visited each enumeration area, and listed the occupied households.

### 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 MDP&S, where the selection of 25 households in each enumeration area for the Qatari stratum and 24 households for the non-Qatari stratum was carried out using random systematic selection procedures.

## Response Rate

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Of the 4,580 households selected for the sample, 4541 were found to be occupied. Of these, 4501 were successfully interviewed for a household response rate of 99 percent. In the interviewed households, 5,809 women (age 15-49 years) were identified. Of these, 5699 were successfully interviewed, yielding a response rate of 98 percent. Similarly, the interviewed households, 5,705 men (age 15-49 years) were identified. Of these, 5,630 were successfully interviewed, yielding a response rate of 99 percent. In addition, 2,121 children under age five were listed in the household questionnaire. Questionnaires were completed for 2,082 of these children, which corresponds to a response rate of 98 percent within interviewed households. Overall response rates for all interviews with adult women 97percent, adult men 98 percent, and for children below the age of five 97 percent.

## Weighting

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The Qatar MICS4 sample is not a self-weighted sample, and therefore it was necessary to calculate sample weights, which were used in the analysis of survey results.

The design weight associated with any sampling unit was calculated as the inverse of the probability of selecting that unit in the sample. For example, the probability of selecting a Qatari household is the outcome of multiplying two probabilities: the probability of selecting the cluster where the household is living, and the probability of selecting the household within the cluster.

Since the estimated number of households in each enumeration area (PSU) in the sampling frame used for the first stage selection and the updated number of households in the enumeration area from the listing were different, individual sampling fractions for households in each sample enumeration area (cluster) were calculated. The sampling fractions for households in each enumeration area (cluster) included the first stage probability of selection of the enumeration area in that particular sampling stratum and the second stage probability of selection of a household within the sample enumeration area (cluster).

The next component of calculating the sample weights adjusts the weights for non-response, both for households and individuals. In the case of the household weight, the non-response adjustment factor for Qatari households would be equal to the inverse value of the household response rate  $\alpha_i$ , defined as follows:

$\alpha_i$  = number of households with completed interviews within the sample level (i) / number of populated households listed in level list (i)

In the case of the women and child (under-5's) weights, another adjustment factor takes into account the level of non-response for the individual interviews. This non-response adjustment factor is equal to the inverse value of:

$RR_h$  = Completed women's (or under-5's) questionnaires in stratum h / Eligible women (or under-5s) in stratum h

The non-response adjustment factors for women's and under-5's questionnaires are applied to the adjusted household weights. Numbers of eligible women and under-5 children were obtained from the roster of household members in the Household Questionnaire for households where interviews were completed.

After the completion of fieldwork, the response rates for households, women and under-5's were calculated for each sampling stratum. These were used to adjust the sample weights calculated for each cluster.

The design weights for the households were calculated by multiplying the above factors 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 the total sample size at the national level. Normalization is performed by dividing the aforementioned design weights by the average design weight at the national level. The average design weight is calculated as the sum of the design weights divided by the unweighted total. A similar standardization procedure was followed in obtaining standardized weights for the women's and under-5's questionnaires. Adjusted (normalized) weights varied between [0.20] and [8.64] in the 195 sample enumeration areas (clusters).

Sample weights were appended to all data sets and analyses were performed by weighting each household, woman or under-5 with these sample weights.

# Questionnaires

## Overview

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Four sets of questionnaires were used in the survey: 1) a household questionnaire which was used to collect information on all de jure household members (usual residents), and the dwelling; 2) the Questionnaire for Individual Women was administered to all women aged 15-49 years living in the households (excluding domestic help); 3) the questionnaire for individual men was administered to all for men aged 15-49 years, living in the household (excluding domestic help); 4) the Questionnaire for Children under Five was administered to mothers or caretakers of children under 5 years of age<sup>2</sup> living in the households. Normally, the questionnaire was administered to mothers of under-5 children; in cases when the mother was not listed in the household roster, a primary caretaker for the child was identified and interviewed.

The questionnaires are based on the MICS4 model questionnaire. From the MICS4 standard questionnaire version in Arabic, the questionnaires were customized to the local context and were pre-tested during April 2012. Based on the results of the pre-test, modifications were made to the wording and translation of the questionnaires and the standard data entry application. A copy of the State of Qatar MICS questionnaires is provided in the Related Materials.

# Data Collection

## Data Collection Dates

Start	End	Cycle
2012-05	2012-06	N/A

## Data Collection Mode

Face-to-face [f2f]

### DATA COLLECTION NOTES

Training for the fieldwork was conducted for two weeks, starting on 18 April 2012, and continued until the beginning of May. Training included lectures on interviewing techniques and the contents of the questionnaires, and mock interviews between trainees to gain practice in asking questions. The last few days of the training were devoted to familiarizing the enumerators with the data processing work processes and use of the Personal Digital Assistant (PDA) application.

The data were collected by 27 field teams; each comprising three interviewers, one driver, and a supervisor. Fieldwork began in May 2012 and concluded in June 2012. Field work monitoring was conducted by one general supervisor and seven inspectors.

# Data Processing

## Data Editing

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Data were entered using the CSPro software. The data was collected using a PDA device. Procedures and standard MICS data processing and analysis application for Computer Aided Personal Interviewing (CAPI) developed under the global MICS4 programme were adapted to the State of Qatar questionnaire and were used throughout data collection and analysis. Data were shared with the central office and field work was monitored on a daily basis. Data were analysed using the Statistical Package for Social Sciences (SPSS) software program, Version 19, and the model syntax and tabulation plans developed by UNICEF were used for this purpose. Data processing support was provided for the entire period of field work through the UNICEF Regional Office data processing consultants and through regular interaction with the data processing team at UNICEF HQs.

# Data Appraisal

## Estimates of Sampling Error

The sample of respondents selected in the Qatar Multiple 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): Sampling errors are usually measured in terms of standard errors for particular indicators (means, proportions etc). Standard error is the square root of the variance of the estimate. The Taylor linearization method is used for the estimation of standard errors.
- Coefficient of variation (se/r) is the ratio of the standard error to the value 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. 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 is as efficient as a simple random sample, while a deft value above 1.0 indicates the 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, SPSS Version 18 Complex Samples module has 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.

Sampling errors are calculated for indicators of primary interest for the national level. Two of the selected indicators are based on household members, 13 are based on women, 6 are based on children under 5, and 6 are based on men.



## Related Materials

### Questionnaires

#### Qatar- Multiple Indicator Cluster Survey 2012: Questionnaire

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Title Qatar- Multiple Indicator Cluster Survey 2012: Questionnaire  
 Filename Questionnaire.pdf

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### Reports

#### Qatar- Multiple Indicator Cluster Survey 2012: Survey Findings Report

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Title Qatar- Multiple Indicator Cluster Survey 2012: Survey Findings Report  
 Country Qatar  
 Language English  
 Filename Qatar 2012 MICS\_English.pdf

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### Technical documents

#### MICS4 Survey Planning Tools

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Title MICS4 Survey Planning Tools  
 Filename <http://mics.unicef.org/tools?round=mics4>

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#### MICS4 Indicator List

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Title MICS4 Indicator List  
 Filename <http://mics.unicef.org/tools?round=mics4>

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#### MICS4 Sampling Tools

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