

# Angola - Malaria Indicator Survey 2006-2007

**Consultoria de Servicos e Pesquisas-COSEP, Consultoria, Lda, Consultoria de  
Gestao e Administracao em Saude-Consaude, Lda**

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# Sampling

## Sampling Procedure

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The 2006-07 Angola Malaria Indicator Survey (2006-07 AMIS) is based on a representative probability sample of households. The sample provides information on women of reproductive age (15-49) and children under five, specifically for malaria-related indicators. The survey covered the entire country.

The sample was designed to provide estimates with acceptable levels of precision for key malaria-related indicators and for two sub-populations: pregnant women age 15-49 and children under five. The major sample domains for which these estimates are computed are:

1. Angola at a national level,
2. Total urban areas and total rural areas of Angola, and
3. Major malaria epidemiologic regions, defined as:
  - a) Hyperendemic,
  - b) Mesoendemic Stable,
  - c) Mesoendemic Unstable, and
  - d) Luanda, which was extracted from the Mesoendemic Stable region and represents the capital city.

### SAMPLE FRAME

Angola is divided into 18 provinces, and they can be grouped into eight sub-regions (e.g., North, East, and Center) according to factors that make some provinces homogeneous among themselves. Each province is subdivided into municipalities (161 in total); each municipality is subdivided into communes (635 in total); and each commune is classified as either urban or rural. Each urban commune is subdivided into administrative areas called censal sections (CSs). Each rural commune has a list of villages, with estimated populations in each village. Therefore, the list of CSs in each urban commune and the list of villages in each rural commune constitute the sample frames for the 2006-07 AMIS.

### STRATIFICATION

The communes were grouped by major regions, by rural and urban location, by sub-regions, and by provinces, in order to find homogeneous sampling units. In addition, within each urban commune, several CSs were grouped together to take advantage of the existence of bairros (sub-districts). These groupings were used to stratify the sample.

### SAMPLE SIZE

The sample size for the AMIS was estimated based on the minimum size needed to obtain malaria-related indicators with acceptable levels of precision. The precision levels were calculated for each domain. Since the maximum accepted number of domains for Angola was four (i.e., the three epidemiologic regions plus Luanda), the sample size estimate would have to be multiplied by four.

The key indicator selected for the survey was malaria prevalence. Since little was known about its actual level, an assumption was made about its nationwide level. It was estimated between 25 and 30 percent, and the lower level was selected for increased confidence.

Given an estimated malaria prevalence of 25 percent in each domain, at a relative error level of 15 percent, the sample would require 533 children under age five. This is roughly equivalent to 630 households per domain or about 2,500 households nationwide. However, it was possible that the survey would find other indicators at lower percentage values, e.g., children under five sleeping under a bednet. Also, some indicators would be obtained from a smaller sub-population, such as pregnant women. Therefore, the recommended sample size per domain was 750 households, or 3,000 households nationwide. With a sample of this size, depending on the values found, it was possible that some indicators might not be susceptible to analysis at the domain level, but only at the national and urban-rural levels.

### SAMPLE SELECTION

The 2006-07 AMIS sample was selected using a stratified three-stage cluster design providing 120 clusters, 48 in urban and 72 in rural areas. In each urban or rural area in a given domain, clusters were selected systematically with probability proportional to size. The selection was done using the following formulas at different stages.

In the first sampling stage, communes were stratified by urban-rural area and by province in each major domain. Then communes were selected with probability proportional to their estimated population using the following formula:  $P1i = (30 \times mi) / m_i$

In each selected commune, the second sampling stage selected clusters (censal sections in urban communes and villages in rural communes) with probability proportional to their estimated population size using the following formula:  $P2ji = (ai \times m_{ji}) / j$

mji)

The third stage constituted the final selection of households in a given cluster, using the following formula:  $P_{3ji} = (c/L_{ji})$

The sampling procedures are fully described in Appendix A of "Angola Malaria Indicator Survey 2006-2007 - Final Report" pp.41-45.

## Response Rate

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A total of 2,809 households were selected, of which 2,675 proved to be occupied. The total number of households interviewed was 2,599, yielding a household response rate of 97 percent.

A total of 3,136 eligible women were identified in these households, and interviews were completed for 2,973 women, yielding a response rate of 95 percent. Response rates were slightly higher in rural areas than urban areas.

# Questionnaires

## Overview

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Questionnaires prepared by the Survey and Indicator Guidance Task Force of the Monitoring and Evaluation Reference Group (MERG) for the Roll Back Malaria Partnership were adapted for the 2006-07 AMIS. There were two main questionnaires: a household questionnaire and an individual woman's questionnaire.

The Household Questionnaire was used to list all the usual members and visitors in 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. The main purpose of the Household Questionnaire was to identify women who were eligible for individual interviews. The Household Questionnaire also collected information on characteristics of a household's dwelling, including the water source, toilet facilities, and flooring materials; the household's ownership of durable goods and mosquito nets; and the use of mosquito nets and indoor residual spraying.

In addition, the Household Questionnaire provided for the collection of blood samples for two biomarkers: hemoglobin and the presence of malaria parasites. Hemoglobin tests were performed on all children under age five and women age 15-49, while malaria tests were performed on children under age five and pregnant women.

The Women's Questionnaire was used to interview all women age 15-49. It covered the following topics: background characteristics, education, reproduction, pregnancy and intermittent preventive treatment (IPT) of malaria, and treatment of fever in children.

The questionnaires were translated into Portuguese and six national languages: Kikongo, Kimbunda, Umbundu, Kiokw, Nganguela, and Kuanhama.

The survey protocol was submitted to and approved by the Ethical Review Committee at the National Malaria Control Program and the Institutional Review Board (IRB) of Macro International.

# Data Collection

## Data Collection Dates

Start	End	Cycle
2006-11	2007-04	N/A

## Data Collection Mode

Face-to-face [f2f]

### DATA COLLECTION NOTES

#### Recruitment and Training of Personnel

Every aspect of the 2006-07 AMIS was conducted to ensure the highest quality of data collection, entry, and analysis. After the questionnaires were adapted to meet the country's needs, interviewers and health technicians were hired for the pretest and training on the administration of the questionnaires and fieldwork procedures. The pretest took place between September and October 2006, and the main training began in November 2006.

#### Fieldwork

Field work began in November 2006 following the training. Four teams—each consisting of four interviewers, one supervisor, and one editor—conducted the fieldwork, which began in Luanda and then expanded to the remainder of the country. Although fieldwork was originally scheduled to last two months, logistical difficulties, such as the lack of roads, and torrential rains during late 2006 and early 2007 created delays. Fieldwork was completed in April 2007.

## Data Collectors

Name	Abbreviation	Affiliation
Consultoria de Servicos e Pesquisas-COSEP, Consultoria, Lda		
Consultoria de Gestao e Administracao em Sade-Consade, Lda		

### SUPERVISION

There is one supervisor for each of the 4 data collection teams in the field.

# Data Processing

## Data Editing

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Data entry began two weeks after the start of data collection. Four data entry operators entered data under the supervision of a data processing manager, a questionnaire organizer, and a questionnaire editor. Check tables on the performance of individual interviewers and teams were assessed periodically, especially during the early weeks of fieldwork. Such checks showed initial weaknesses in certain teams, which required extra supervisory field trips. Once all data were entered, a consultant verified completeness of the forms and internal consistency between data entry and initial results.

# Data Appraisal

## Estimates of Sampling Error

The sample of respondents selected in the 2006-07 AMIS 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 (such as a mean or percentage), 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 2006-07 AMIS sample is the result of a multi-stage stratified design, and, consequently, it is necessary to use more complex formulae. The computer software used to calculate sampling errors for the 2006-07 AMIS 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.

Sampling errors for the 2006-07 AMIS are calculated for selected variables considered to be of primary interest for the survey. The results are presented for the country as a whole, for urban and rural areas, and for each of the three malaria epidemiologic regions plus Luanda, the capital city. Table B.1 gives the type of statistic (mean or proportion) and the base population for each selected variable. Tables B.2 through B.8 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 (R<sub>2</sub>SE) for each variable. The DEFT is considered undefined when the standard error considering simple random sample 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.

Sampling errors are analyzed for the national sample and for six separate groups (the two residence areas and the four malaria regions) for estimates of means and proportions. The relative standard errors (SE/R) for the means and proportions in the national sample range between 4.2 percent and 23 percent, with an average of 16.6 percent; the highest relative standard errors are for estimates of very low values (such as "pregnant women who took any SP/Fansidar," with a 23 percent relative error) or small sample sizes (such as "pregnant women who slept under any net last night," with a 16 percent relative error). All but four indicators have relative errors of 10 percent or less for the national sample. When these four indicators are excluded, the average relative error drops to 7.65 percent. Thus, the relative standard errors for most estimates for the country as a whole are small.

The sampling errors are fully described in Appendix B of "Angola Malaria Indicator Survey 2006-2007 - Final Report" pp.47-52.

## Other forms of Data Appraisal

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

- Household age distribution
- Age distribution of eligible and interviewed women
- Births by calendar years
- 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 C of "Angola Malaria Indicator Survey 2006-2007 - Final Report" pp.53-56.



# Related Materials

## Questionnaires

### Angola 2006-07 MIS questionnaire (English)

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Title Angola 2006-07 MIS questionnaire (English)  
 Country Angola  
 Language English  
 Filename AGO\_2006\_MIS\_Questionnaire\_EN.pdf

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### Angola 2006-07 MIS questionnaire (Portuguese)

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Title Angola 2006-07 MIS questionnaire (Portuguese)  
 Country Angola  
 Language Portuguese  
 Filename AGO\_2006\_MIS\_Questionnaire\_PT.pdf

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## Reports

### Angola 2006-07 MIS Final Report (English)

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Title Angola 2006-07 MIS Final Report (English)  
 Author(s) Consultoria de Servicos, Estudos e Pesquisas - COSEP, Consultoria, Lda. Consultoria de Gestao e Administracao em Saude - Consaude, Lda. Macro International Inc.  
 Date 2007-11-01  
 Country Angola  
 Language English  
 Filename <http://www.dhsprogram.com/pubs/pdf/MIS2/MIS2.pdf>

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### Angola 2006-07 MIS Final Report Error Correction (English)

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Title Angola 2006-07 MIS Final Report Error Correction (English)  
 Author(s) Consultoria de Servicos, Estudos e Pesquisas - COSEP, Consultoria, Lda. Consultoria de Gestao e Administracao em Saude - Consaude, Lda. Macro International Inc.  
 Date 2013-10-24  
 Country Angola  
 Language English  
 Filename [http://www.dhsprogram.com/pubs/pdf/MIS2/errata\\_Angola\\_2006-07\\_MIS\\_English\\_24Oct2013.pdf](http://www.dhsprogram.com/pubs/pdf/MIS2/errata_Angola_2006-07_MIS_English_24Oct2013.pdf)

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### Angola 2006-07 MIS Final Report (Portuguese)

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Title Angola 2006-07 MIS Final Report (Portuguese)  
 Author(s) Consultoria de Servicos, Estudos e Pesquisas - COSEP, Consultoria, Lda. Consultoria de Gestao e Administracao em Saude - Consaude, Lda. Macro International Inc.  
 Country Angola  
 Language Portuguese  
 Filename <http://www.dhsprogram.com/pubs/pdf/MIS3/MIS3.pdf>

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## Angola 2006-07 MIS Final Report Error Correction (Portuguese)

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Title Angola 2006-07 MIS Final Report Error Correction (Portuguese)  
 Author(s) Consultoria de Servicos, Estudos e Pesquisas - COSEP, Consultoria, Lda. Consultoria de Gestao e Administracao em Saude - Consaude, Lda. Macro International Inc.  
 Country Angola  
 Language Portuguese  
 Filename [http://www.dhsprogram.com/pubs/pdf/MIS3/errata\\_Angola\\_2006-07\\_MIS\\_Portuguese\\_24Oct2013\\_A4.pdf](http://www.dhsprogram.com/pubs/pdf/MIS3/errata_Angola_2006-07_MIS_Portuguese_24Oct2013_A4.pdf)

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## Angola 2006-07 MIS Fact Sheet (English)

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Title Angola 2006-07 MIS Fact Sheet (English)  
 Country Angola  
 Language English  
 Filename <http://www.dhsprogram.com/pubs/pdf/MF1/GF9.pdf>

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## Angola 2006-07 MIS Fact Sheet (Portuguese)

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Title Angola 2006-07 MIS Fact Sheet (Portuguese)  
 Country Angola  
 Language Portuguese  
 Filename <http://www.dhsprogram.com/pubs/pdf/MF1/GF9.1.pdf>

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## Technical documents

### DHS-V Recode Manual

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Title DHS-V Recode Manual  
 Author(s) MEASURE DHS  
 Language English  
 The Recode Manual provides the information necessary to understand these datasets. It describes each data file and contains its associated dictionary and documentation. Each data file and its associated dictionary and Description documentation are distributed in archived ZIP files, for all available formats (hierarchical and flat). ASCII data and System data files are available for CSPro, SAS, SPSS, and STATA. Users are strongly encouraged to download the DHS recode manual for use with all recode files.  
 Filename Recode5DHS.pdf

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### Angola 2006-07 MIS (DHS V) Individual Recode Documentation

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Title Angola 2006-07 MIS (DHS V) Individual Recode Documentation  
 Language English  
 Filename AOIR51FL.pdf

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