

**MALARIA INDICATOR SURVEY:  
BASIC DOCUMENTATION FOR SURVEY DESIGN AND IMPLEMENTATION**

**ROLL BACK MALARIA  
MONITORING AND EVALUATION REFERENCE GROUP**

World Health Organization  
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MEASURE DHS  
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Please visit: <http://www.rbm.who.int/merg> for the most recent updates and information on the Malaria Indicator Survey.

# **Malaria Indicator Survey**

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## **Overview**

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**ORC Macro  
Calverton, Maryland**

**April 2005**

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## ABBREVIATIONS

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|        |  |
|--------|--|
| ACT    | Artemisinin-based combination therapy              |
| ANC    | Antenatal care                                     |
| CDC    | U.S. Centers for Disease Control and Prevention    |
| CL     | Confidence limits                                  |
| CSPRO  | Census and Survey Processing System                |
| Deft   | Design effect                                      |
| DHS    | Demographic and Health Surveys                     |
| EA     | Enumeration area                                   |
| FDA    | U.S. Food and Drug Administration                  |
| GHPC   | General Household and Population Census            |
| GIS    | Geographic information system                      |
| GPS    | Global Positioning System                          |
| HBV    | Hepatitis B virus                                  |
| HH     | Household  |
| HIV    | Human immunodeficiency virus                       |
| HQ     | Household Questionnaire                            |
| IPT    | Intermittent preventive treatment                  |
| IRS    | Indoor residual spraying                           |
| ITN    | Insecticide-treated net                            |
| LLIN   | Long-lasting insecticidal net                      |
| M&E    | Monitoring and evaluation                          |
| MARA   | Mapping Malaria Risk in Africa                     |
| MERG   | Monitoring and Evaluation Reference Group          |
| MICS   | Multiple Indicator Cluster Survey                  |
| MIS    | Malaria Indicator Survey                           |
| NMCP   | National malaria control program                   |
| OSHA   | U.S. Occupational Safety and Health Administration |
| PDA    | Personal digital assistant                         |
| PET    | Prompt, effective treatment                        |
| RBM    | Roll Back Malaria                                  |
| RSE    | Relative standard error                            |
| SP     | Sulfadoxine-pyrimethamine                          |
| UN     | United Nations                                     |
| UNICEF | United Nations Children's Fund                     |
| USAID  | U.S. Agency for International Development          |
| VIP    | Ventilated improved pit                            |

## INTRODUCTION

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To provide a coordinated global approach to fighting malaria, the Roll Back Malaria (RBM) Partnership was launched in 1998 by numerous global partners. Controlling malaria will contribute significantly to the United Nations (UN) Millennium Development Goals, which all 191 UN Member States have pledged to achieve by 2015. Beyond reducing disease burden, a successful fight against malaria will have a far-reaching positive effect on child mortality, maternal health, and poverty, which in turn may increase global stability. Regarding the overall burden of malaria and coverage of RBM's key interventions, RBM partners are committed to sound, evidence-based approaches in documenting progress towards key targets and indicators.

In 2002, the RBM Monitoring and Evaluation Reference Group (MERG) was established to act as an advisory body for the RBM Partnership Board on all matters pertaining to monitoring and evaluation of RBM initiatives at the international, regional, and national levels. The MERG provides technical advice on state-of-the-art approaches for the monitoring and evaluation of malaria programs. Relative to measurement of key targets and indicators, the technical focus of the MERG has been on assessing core indicators to ensure consistency and accuracy in national and regional reporting. Further, the MERG is guided by the overall commitment of the RBM partners to i) partnership and capacity building; ii) harmonization, accountability, and transparency in scaling-up actions; and iii) bridging the gaps between technical and programmatic support needs at the country level.

Following these principles, the RBM MERG Household Survey Task Force arranged for the development of *Malaria Indicator Survey (MIS) Basic Documentation for Survey Design and Implementation*—a comprehensive package of tools for providing guidance in carrying out household-level surveys relevant for assessing core malaria indicators. Specifically, the questionnaires were designed to assess the core household indicators outlined in RBM's *Guidelines for Core Population Coverage Indicators for Roll Back Malaria: To Be Obtained from Household Surveys*.<sup>1</sup> Household surveys are especially relevant in many malaria endemic settings for measuring coverage of interventions that primarily target the household level, such as insecticide-treated nets (ITNs), and for understanding patterns of antimalarial use among target populations, especially in areas where antimalarial treatment and prevention may occur outside the formal health sector.

The MIS package contains a series of guidelines, questionnaires, recommended tabulations, and relevant manuals to assist those conducting household-level malaria surveys. These recommendations are based on field-tested questions and methods and represent the combined experience of RBM MERG Household Survey Task Force agencies. The MIS package contains additional recommendations for issues, such as measuring coverage of indoor residual spraying (IRS), anaemia and malaria parasitaemia testing (to be developed) in survey field conditions, as well as guidance on integrating geocoding and personal digital assistants into survey sampling and data collection.

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<sup>1</sup> Roll Back Malaria, MEASURE Evaluation, World Health Organization, and United Nations Children's Fund. 2004. *Guidelines for core population coverage indicators for Roll Back Malaria: To be obtained from household surveys*. Calverton, Maryland: MEASURE Evaluation.

This package of tools is relevant for RBM partners and stakeholders engaged in monitoring and evaluation of malaria programs, particularly those conducting or with an interest in conducting household surveys. At the country level, national malaria control program (NMCP) authorities are the primary stakeholder in malaria monitoring and evaluation activities, and close collaboration with NMCP authorities is crucial for successful implementation of the MIS package of tools. In particular, NMCP input is needed in the refinement of questionnaires related to net branding and national antimalarial treatment policy. Results from coverage assessments are important for evaluating overall malaria control efforts and for understanding where further targeting of interventions is appropriate. Dissemination of results among stakeholders is also important for advocacy and further resource mobilization.

Essential to any successful, large-scale survey is the involvement of experienced survey practitioners and survey statisticians. Adequate skills in survey design and conduct are often found within countries in central bureaus of statistics, in universities, or in other agencies experienced in survey work. The MIS package is designed to assist those with existing experience in designing and conducting household surveys to assess and present malaria-relevant indicators in a standardized manner. Further, the questionnaires and tabulation plans developed for the MIS contain the minimum recommended methods and wording for understanding the core indicators that are relevant for RBM. It is expected that agencies conducting the MIS will consider including additional questions and tabulations as necessary for measuring additional national or local targets.

Effective survey data management is important to ensure quality and timely results. Data management incorporates skilled data managers with robust software packages for entering, cleaning, and tabulating survey results. Within countries, skills for survey data processing and management may be available within central bureaus of statistics, universities, or private agencies. Many public domain software packages are available for use and integration with the MIS survey, making effective data management for the MIS survey more affordable. These software packages include Epi Info<sup>2</sup> and the Census and Survey Processing System (CSPro).<sup>3</sup>

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<sup>2</sup> Centers for Disease Control and Prevention. 2005. Epi Info (Version 3.3.2). Available at <http://www.cdc.gov/epiinfo/index.htm>.

<sup>3</sup> U.S. Census Bureau, ORC Macro, and Serpro. 2005. Census and Survey Processing System (CSPro) (Version 2.5.007). Available at <http://www.cspro.org/>.



## OVERVIEW OF THE MIS PACKAGE

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The MIS package contains several components that are relevant for designing and conducting surveys, as well as recommendations for presentation of survey results. These include detailed questionnaires for assessing the core malaria indicators, a rationale for questions, and select data tabulation recommendations. The MIS package also contains many procedural manuals for survey design and sampling, interviewer techniques and training, and overall survey supervision. This section provides a brief overview of the each component.

### *Core Components*

Consistency in the methods, wording of questions, and presentation of results is *essential* for national, regional, and global comparisons of results and determination of progress. Additional questions may be added as needed by local program efforts, but it is imperative that the recommended questions and data tabulations for the core indicators remain unchanged for all planned MIS surveys.

### HOUSEHOLD AND WOMEN'S QUESTIONNAIRES

The Household and Women's Questionnaires contain the recommended wording, skip patterns, interviewer instructions, and respondent details necessary for conducting household interviews. The Household Questionnaire contains basic demographic information, a complete household listing, a record of selected household assets, suggested questions for measuring IRS coverage, and the recommended net roster for recording ITN possession and use. Haemoglobin measurements for assessing anaemia status are also recorded in the household module.

The Women's Questionnaire includes information on women's characteristics and questions for recording a recent birth history, pregnancy status, use of intermittent preventive treatment with sulfadoxine-pyrimethamine during pregnancy, and access to prompt treatment with antimalarials for children with reported fever. Patterns of health-care-seeking behaviour for febrile children is also included.

### RATIONALE

The rationale explains in broad terms the various sections of the Household and Women's Questionnaires and the reasons for including each section. For example, questions about basic household assets are useful for calculating an asset-based wealth index, which can be divided into wealth quintiles to analyse malaria-related inequities. Possession and use of ITNs are most efficiently and reliably assessed through a mosquito net roster linked to the household listing.

### INTERVIEWER'S MANUAL

This manual explains to interviewers how to do their job. The manual includes information about implementation of the survey, training activities, and fieldwork procedures. It details interview techniques and procedures for completing the questionnaires.

## SUPERVISOR'S MANUAL

This manual explains to field supervisors how to do their jobs. This is a “model” manual that reflects the standard MIS protocol for how to organize and implement the survey. Responsibilities of field supervisors, ensuring the availability of necessary training and fieldwork materials, organizing and overseeing interviewers and interviewer fieldwork, and monitoring interviewer performance are discussed in detail.

## HOUSEHOLD LISTING MANUAL

Prior to interviewing, it is necessary to list all households in the clusters selected from the sampling frame. This manual discusses the responsibilities of the listing staff, definition of terms, materials needed, the locating of the clusters, drawing sketch maps of the clusters, listing the households, segmentation of large clusters, and quality control issues of listing procedures.

## GUIDELINES FOR SAMPLING FOR THE MALARIA INDICATOR SURVEY

This manual presents the general policy on sampling for the MIS survey. Probability sampling using a preexisting sampling frame, with a two-stage cluster sample selection, is recommended. Issues to consider in understanding the sampling frame, details of sample design, and sample size determinations are provided with dynamic worksheets to assist with calculations. Procedures for selecting households from clusters (enumeration areas) are also explained.

## TABULATIONS FOR KEY MALARIA INDICATORS

This plan provides the recommended tables for presenting results obtained from the MIS Household and Women's Questionnaires for the key RBM coverage indicators. Details are provided for inclusion of appropriate questionnaire numbers for calculation of numerators and denominators in recommended indicators. For a full report on the results of the MIS survey, additional tables may be needed on such topics as household characteristics, women's characteristics, and IRS for mosquitoes.

### ***Biologic Components***

#### ANAEMIA TESTING MANUAL (PRELIMINARY DRAFT)

This manual provides an overview of procedures for conducting anaemia testing in the field during household surveys. The manual lays out a standard approach for haemoglobin testing using the HemoCue system and includes protocols for biohazard waste disposal and safety precautions when taking blood samples.

#### PARASITAEMIA TESTING MANUAL (TO BE DEVELOPED)

This manual is being developed.

## ***Complementary Documents***

### **INCORPORATING GEOGRAPHIC INFORMATION INTO MEASURE SURVEYS: A FIELD GUIDE TO GPS DATA COLLECTION AND DEMOGRAPHIC AND HEALTH SURVEY GPS CLUSTER POSITION FORM**

This manual addresses the geocoding of household- or cluster-level survey measurements, which adds a geographical dimension to survey information. Understanding the spatial representation of malaria survey data is important because of the variation of malaria transmission by factors such as altitude or proximity to breeding sites. With geographic locations, it is possible, for example, to link the MIS data with other geocoded data sets, such as health care facilities, or to aggregate information by new units of analysis. Accounting for spatial patterns of disease or coverage of interventions can further inform intervention-targeting efforts. Geocoding survey information can be a cost-effective way to increase the analytic potential of survey results. However, ethical issues of confidentiality of the data collected and the protection of human subjects need to be fully considered when geocoding MIS clusters and making the data available with longitude and latitude coordinates.

Two previously published manuals outline procedures for geocoding household survey information.<sup>4,5</sup> The choice of procedures and training required depends on the Global Positioning System (GPS) receivers used.

### **PDA MANUAL FOR FIELD DATA COLLECTION AND SAMPLING**

This manual explains survey data collection, questionnaire administration, and data processing, which can be greatly enhanced with the use of personal digital assistants (PDAs). PDAs are hand-held mini-computers that, when used in the field by interviewers, can store and present information collected from survey questionnaires. PDAs are advantageous because they can be preprogrammed to navigate through questionnaire skip patterns and adjust question wording for specific situations; with PDAs, survey results can be cleaned and downloaded quickly after fieldwork. Many PDAs also now come with GPS receivers included or as add-on devices for integrating geocodes with survey data automatically. Further, PDAs with embedded GPS receivers can be useful for fully automating the process of survey sample design and mapping households for the household listing.

### **CALCULATING THE COST OF THE MALARIA INDICATOR SURVEY**

This guide addresses how to develop an appropriate budget for the MIS survey. Issues to consider in calculating cost include materials and training, adequate sample size, personnel and fieldwork, and publication and dissemination of results.

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<sup>4</sup> Montana, L., and J. Spencer. 2004. *Incorporating geographic information into MEASURE surveys: A field guide to GPS data collection*. Calverton, Maryland: ORC Macro. Available at [http://www.measuredhs.com/basicdoc/gps/DHS\\_GPS\\_Manual.pdf](http://www.measuredhs.com/basicdoc/gps/DHS_GPS_Manual.pdf).

<sup>5</sup> World Health Organization (WHO). 2002. *GPS field guide*. Geneva: WHO. Available at [http://www3.who.int/whs/P/gps/GPS\\_field\\_guide.pdf](http://www3.who.int/whs/P/gps/GPS_field_guide.pdf).

The value of showing progress in coverage of the key RBM interventions, as well as other national targets and indicators, is of interest to all RBM partners and malaria monitoring and evaluation stakeholders. Often, to generate support and financing for efforts, advocacy among relevant stakeholders is needed to present a unified approach for attaining measurable results. Most importantly, financing the MIS survey requires careful planning and leveraging of funds from appropriate agencies, both national and external. For example, almost all malaria endemic countries have successful proposals and will receive funding from the Global Fund to Fight AIDS, Tuberculosis and Malaria. Incorporating assessments of coverage into existing and future proposals is important for evaluating progress and should be explored. Opportunities for adding MIS-recommended questions into ongoing surveys may also reduce costs and provide valuable results.