Guidelines for Core Population Coverage Indicators for Roll Back Malaria:

To Be Obtained from Household Surveys

June 2006

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TO BE OBTAINED FROM HOUSEHOLD SURVEYS

ROLL BACK MALARIA
MEASURE Evaluation
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ACRONYMS

AED	Academy for Educational Development
DHS	Demographic and Health Surveys
IPT	Intermittent preventive treatment
IRS	Indoor residual house-spraying
ITN	Insecticide-treated nets
M&E	Monitoring and evaluation
MICS	Multiple Indicator Cluster Surveys
MIS	Malaria Indicator Survey
NMCP	National malaria control program
RBM	Roll Back Malaria
SP	Sulphadoxine-pyrimethamine
SSA	Sub-Saharan Africa
UN	United Nations
UNICEF	United Nations Children Fund
USAID	United Stated Agency for International Development
WHO	World Health Organization

1. INTRODUCTION

1.1 BACKGROUND

Malaria poses a tremendous public health problem across the globe with an estimated 40% of the world's population living in areas of malaria risk. An estimated 300–500 million malaria episodes and at least 1 million malaria deaths occur annually. While malaria is endemic within most tropical and subtropical regions of the world, 90% of all malaria deaths currently occur in sub-Saharan Africa (SSA). Young children and pregnant women represent those at greatest risk of malaria-related morbidity and mortality, especially in areas of stable transmission. It has recently been estimated that malaria is responsible for approximately 20% of all deaths among children less than 5 years of age in SSA, accounting for 90% of all malaria-related deaths globally. Malaria also places an enormous toll on the already overburdened health systems across SSA and elsewhere, as it has been estimated that malaria-related illnesses account for approximately 30% of all outpatient clinic visits within malaria-endemic countries of the SSA region [1, 2].

In an effort to combat the growing threat of malaria, the Roll Back Malaria (RBM) partnership was launched in 1998, with the goal of halving the burden of malaria by 2010. Combating malaria has been set as a high priority within the United Nations (UN) Millennium Development Goals.[1] In May 2002, the strategies for protecting children and pregnant women from malaria were also adopted by the UN General Assembly's Special Session on Children (A World Fit For Children). The UN has also declared 2001–2010 the "Decade to Roll Back Malaria" in developing countries, particularly in Africa.[2] Moreover, heads of state from across Africa met in Abuja, Nigeria in 2000 to express their commitment to combating malaria. Specific targets for malaria control strategies were established as a result of the Abuja summit to coincide with specific technical strategies supported by RBM (Table 1).

Table 1: RBM Technical Strategies and Abuja Targets

RBM Technical Strategies	Abuja Target (by 2005)
Vector control via insecticide-treated nets (ITNs)	60% of those at risk for malaria, particularly children under 5 years of age and pregnant women, will benefit from a suitable combination of personal and community protective measures, such as ITNs.
Prompt access to effective treatment	60% of individuals suffering from malaria should have access to and be able to use correct, affordable, and appropriate treatment within 24 hours.
Prevention and control of malaria in pregnant women	60% of pregnant women at risk of malaria will be covered with a suitable combination of personal and community protective measures, such as ITNs. 60% of pregnant women at risk of malaria will have access to intermittent preventive treatment (IPT).

Adapted from the Africa Malaria Report 2003, WHO, 2003.

[1] UN General Assembly, 27th Special Session: Supplement 3, Doc A/S-27/19/Rev.1.
[2] UN General Assembly, Resolution 55/284.

It is recognized that an effective system for monitoring progress and evaluating results will be critical for assessing the success of the RBM technical strategies. Such data will be crucial for identifying areas where modifications in specific technical strategies may be needed, as well as where resources should be focused. To facilitate this process, the RBM partners have established a set of core indicators for population coverage that can be collected through household surveys that permit national-level monitoring of the technical strategies supported by RBM.

1.2 Purpose and Content of Manual

The purpose of this manual is to provide country partners with technical guidance on the detailed specifications of the core indicators for population coverage that can be measured through household surveys, the data required for their construction, as well as issues related to their interpretation. Details of the data collection methods required for estimating these indicators through national-level household surveys are also provided. This manual is intended to maximize internal consistency and comparability of the indicators across countries and over time, and to ensure consistency in the types of data collection methods used.

This manual begins with a brief discussion on the basic principles of monitoring and evaluation. The core indicators for population coverage that will be used to measure the success of the RBM technical strategies of vector control via insecticide-treated nets (ITNs), prompt access to effective treatment, and prevention and control of malaria in pregnant women are then listed. A brief discussion on the rationale for these RBM technical strategies is also provided. Discussions on measurement tools, methods of measurement, interpretation, and reporting of the indicators are then provided. The manual concludes with detailed guidelines for constructing each indicator.

The guidelines presented in this current manual have changed slightly from those published previously in 2004. Notable changes include:

- The inclusion of Table 3, which provides a summary of primary differences among the respective surveys used for measuring the core indicators.
- ITN indicators (household, children, and pregnant women) have been changed to define an ITN as one that has been treated within the past 12 months or has been permanently treated (Previously defined as treated within and including 12 months).
- The indicator for IPT coverage has been changed to include women at risk for malaria who received two or more doses of a recommended antimalarial drug treatment to prevent malaria during their last pregnancy that led to a live birth within the last 2 years (Previous defined as any antimalarial dose within the last 5 years).
- In addition to Demographic and Health Surveys (DHS) styled questions, questions from the Multiple Indicator Cluster Surveys (MICS) are also included in the appendix for those differing substantially from the DHS surveys.

2. MONITORING AND EVALUATION

Evaluation is the use of social or epidemiological research methods to assess, and ideally improve, the implementation of public health programs. The overall goal of monitoring and evaluation (M&E) is to measure program effectiveness. M&E may be focused on local initiatives as well as measuring program effectiveness at the national and regional levels. Ideally, M&E tools can be used to demonstrate to planners and other decisionmakers that program efforts have had measurable impacts on the outcomes of interest. M&E can also provide insight as to where resources are being used most efficiently versus where new strategies should be considered.

Monitoring is used to verify step-by-step the progress of malaria control programs at various levels to see whether activities have been implemented as planned, ensure accountability, detect problems and constraints related to the intervention activities, and promote evidence-based planning through timely feedback to the relevant authorities. Indicators of inputs, processes, and outputs are typically used for monitoring purposes at the program level. Input indicators are generally used to measure the level of resources available for use by the program or intervention, such as the funding obtained to purchase ITNs. Process indicators are generally used to verify that a program or intervention has been implemented as planned, such as verifying that ITNs have been purchased and are ready for distribution. It is expected that inputs and desired processes will lead to desired changes in output indicators, which are generally used to measure benchmarks of program-level performance, such as the number of ITNs distributed to a particular target population. Figure 1 provides an example schematic of the level and function of indicators typically used for M&E.

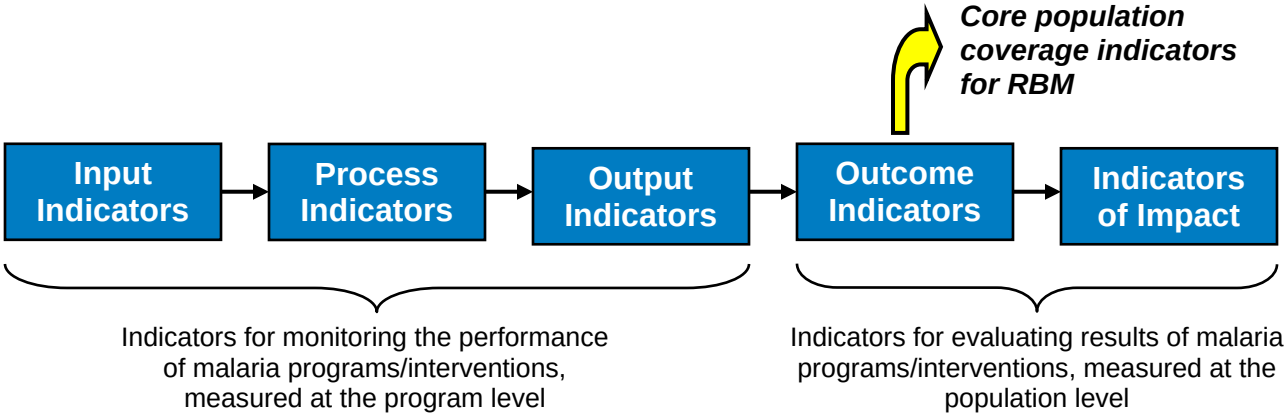
While monitoring is a continuous process, formal evaluation is required to determine and document the extent to which any expectant results are attributable to a particular malaria control program, as measured through outcome and impact indicators. Outcome indicators are generally used to measure medium-term population-level results, such as the level of ITN coverage among a particular target population that can be attributed to an ITN program or intervention. It is expected that desired changes in outcomes will lead to a desired impact, which generally refers to the overall, long-term goals of a program or initiative, such as the RBM goal of halving malaria-related morbidity and mortality by 2010.

Please note that population-level changes for impact indicators are most often challenging to measure, and are very difficult to attribute to a particular program or intervention without the use of a rigorous experimental design. This is especially true of malaria in areas where the burden of disease is greatest. Current tools for measuring malaria mortality, such as verbal autopsy, are not specific or sensitive for attributing signs and symptoms to malaria. Other factors, such as treatment seeking behavior, and inconsistent and under-reporting of malaria events through national health information systems, may also limit the understanding of the overall impact of increased coverage of malaria interventions.

For these reasons, greater emphasis is needed in measuring changes in population-level coverage of the core RBM indicators at the outcome level. As there is a substantial amount of empirical evidence to support the efficacy of the RBM technical strategies, it is expected that increasing coverage of these key interventions will result in the desired reductions in malaria-related

morbidity and mortality. Therefore, it is crucial that malarious countries implementing these interventions have clear definitions and adequate tools for measuring the pertinent outcome indicators for population-level coverage for the overall success of the RBM initiative to be assessed.

Figure 1: Level and Function of M&E Indicators



3. CORE INDICATORS OF POPULATION COVERAGE FOR EVALUATING PRIMARY RBM TECHNICAL STRATEGIES

There are five core RBM indicators that will be used to measure the proportion of the population that is covered by the interventions outlined by the RBM technical strategies, as outlined in Table 2. It is recognized that these five core indicators may not cover all ongoing malaria control activities, such as indoor residual house-spraying (IRS), which is ongoing within a select number of countries. Thus additional indicators, such as that for IRS, may need to be adopted by certain countries. Additionally, it is recognized that IPT is not an ongoing malaria control strategy outside of the African region, so this indicator may not be pertinent to all RBM partner countries.

Table 2: Indicators of Population Coverage for RBM Technical Strategies

RBM Technical Strategies	Indicator of Population Coverage
Vector control via insecticide-treated nets (ITNs)	1. Proportion of households with at least one ITN.
	2. Proportion of children under 5 years old who slept under an ITN the previous night.
Prompt access to effective treatment	3. Proportion of children under 5 years old with fever in last 2 weeks who received antimalarial treatment according to national policy within 24 hours from onset of fever.
Prevention and control of malaria in pregnant women	4. Proportion of pregnant women who slept under an ITN the previous night.
	5. Proportion of women who received intermittent preventive treatment for malaria during their last pregnancy.

Insecticide-treated Nets

Under trial conditions, ITNs have been shown to reduce malaria transmission by as much as 90% [3], with concomitant reductions in malaria-related morbidity [4, 5]. Community randomized controlled trials have also shown ITNs to be associated with significant reductions in all-cause under 5 child mortality by as much as a third, across a range of malaria transmission settings in SSA [6, 7]. ITNs have also been shown to remain effective under field conditions, as it was shown that social marketing of ITN in Tanzania was associated with a 27% increase in survival, as well as 65% reduction in anemia, among children 1 month to 4 years old [8]. Efforts to scale up coverage of ITNs are underway in most African countries and are greatly assisted by efforts to remove associated taxes and tariffs on imported commodities [1].

Prompt Access to Effective Treatment (among children under 5 years old)

It is widely recognized that access to prompt and effective treatment is a key element in successful malaria control because of the rapid onset of illness and severe health outcomes related to *Plasmodium falciparum* malaria, especially among children and non-immune populations [1, 9]. However, antimalarial drug resistance has become a major challenge in

providing an effective malaria treatment within many regions of the world. Resistance to chloroquine, the cheapest and most widely available antimalarial drug, is now widespread across most of Africa. As a result, most countries in Africa have changed or are in the process of changing national antimalarial treatment policies. Understanding which antimalarial drugs are provided to children for fever and the promptness with which they are received after the onset of symptoms at the community level is an important component for monitoring prompt access to effective treatment.

Prevention and Control of Malaria in Pregnant Women

Malaria infection during pregnancy is a major public health concern among adult populations across malaria endemic areas with stable transmission, such as tropical Africa. Malaria during pregnancy can result in poor outcomes for the woman and her newborn, such as maternal anemia, low birth weight, and premature delivery [10]. Low birth weigh is the single greatest risk factor for neonatal and a major contributor to infant mortality [11, 12]. This increased risk of adverse outcomes for mothers and their newborns is typically greatest for the mother's first two pregnancies. However, in the presence of HIV infection, the risk associated with placental malaria appears to be independent of the number of pregnancies [13]. Effective strategies for preventing and controlling malaria during pregnancy, such as the use of ITNs and IPT, have been shown to have a dramatic impact on the health of mothers and their newborns within areas of stable malaria transmission. ITN use has been shown to significantly reduce the prevalence of low birth weight deliveries, as well as malaria-related morbidity among pregnant women [1, 14]. At present, the standard IPT regimen is a therapeutic dose of sulphadoxine-pyrimethamine (SP) given at least twice after quickening to all pregnant women during routine antenatal care. IPT in two doses of SP during pregnancy has been shown to significantly reduce the prevalence of anemia and placental malaria infections at the time of delivery [15-17]. However, to achieve optimal benefit in settings with HIV prevalence in pregnant women of greater than 10%, it may likely be more cost effective to treat all women with a 3-dose regimen than to screen for HIV and provide this regimen only to HIV+ women [18].

3.1 MEASUREMENT TOOLS

Nationally representative, population-based sample surveys are the principal measurement tools required to collect the necessary data for constructing all five core RBM indicators for population coverage. Many different forms of these surveys are currently being routinely implemented across much of SSA. However, few of these surveys collect data on malaria-specific issues. Two large survey efforts that currently do collect data on malaria are the DHS and the MICS surveys.

Demographic and Health Surveys: The DHS surveys are nationally representative, population-based sample surveys that are routinely undertaken in many countries of SSA every 4-5 years to collect data on a wide variety of demographic and health indicators. Importantly, the DHS surveys are designed to produce data that are comparable over time and among countries. The DHS survey includes a household register for the ascertainment of the age, sex, and relationship to the head of household for all individuals within selected households. The DHS surveys are typically designed to provide relatively precise population-level estimates by age groups, sex, urban/rural residence, and regions. The DHS survey package includes an

optional module for malaria that allows the collection of all necessary data for the construction of these five core RBM indicators for population coverage. Published reports, questionnaires, and materials related to the DHS surveys can be found online at http://www.measuredhs.com.

Multiple Indicator Cluster Surveys: The MICS surveys are nationally representative, population-based sample surveys developed by the United Nations Children Fund (UNICEF) and its partners. Initially designed to collect indicators marking progress toward the World Summit for Children goals, the MICS surveys have continued to be an important component of national data collection in many countries. The MICS surveys are conducted in rounds approximately every 5 years in some 70 countries. Importantly, the MICS surveys are designed to produce data that are comparable over time and among countries. The MICS surveys include a household register for the ascertainment of the age, sex, and the relationship to the head of household for all individuals within selected households. The MICS surveys include a specific questionnaire module for assessing coverage of antimalarial treatment among febrile children and ITN use among all children. A separate section also collects information on antimalarial use in pregnancy. However, the MICS surveys do not typically obtain current pregnancy status, so the indicator on bednet use during pregnancy cannot be calculated. Published reports, questionnaires, and materials related to the MICS surveys can be found online at http://www.childinfo.org.

Malaria Indicator Survey (MIS): In addition to these ongoing survey efforts, the RBM partners have developed standard MIS survey package for assessing the key household coverage indicators. This includes a core questionnaire and data tabulation plan, as well as related materials for organizing and conducting fieldwork. This stand-alone survey is designed to be implemented in a similar manner to the DHS surveys, producing nationally representative, population-based data from which all five core RBM outcome indicators of population coverage can be constructed. The MIS survey will also produce a wide range of data for in-depth assessment of the malaria situation within countries. It is designed to be shorter, less expensive, and quicker to implement than many of the more comprehensive national survey efforts. The MIS survey questionnaire and related materials can be found online at http://www.rbm.who.int/merg.

Rider Questions on Other Surveys: If a country cannot obtain data on the core indicators of population coverage through one of the methods discussed above, it may be possible to collect the required data through rider questions, which are added on to other national-level survey efforts. The caveat in this situation is that every effort must be made to ensure that the data collection methods meet the requirements for a nationally representative household survey. If data are collected using alternate or sub-national sampling procedures, the indicators calculated will not be compatible with those from national surveys. In addition to DHS and MICS surveys, other surveys with potential for collecting malaria data at the national level include the World Bank's Living Standards Measurement Surveys, the DHS AIDS Indicator Surveys, the World Health Organization's (WHO's) World Health Survey, the World Bank's Core Welfare Indicators Surveys, national anemia surveys (usually conducted by Ministries of Health), NETMARK baseline surveys (USAID/Academy for Educational Development), RBM Baseline Surveys (WHO Afro), and commercial Omnibus Surveys. Some other possibilities are health examination surveys, income and expenditure surveys, and labor force surveys. A complete discussion of rider questions, including sample questions, is included in the appendix. These

questions may be added as is, or with slight modifications, onto to any household sample surveys that are nationally representative.

It is recommended that the five core RBM indicators for population coverage be measured using either the DHS or MICS surveys because of their sampling design rigor and reliability over time and across countries. However, these surveys are only implemented every 5 years. If immediate data collection is required that does not fit within the implementation schedule of either the DHS or MICS surveys within a particular country, it is recommended that the MIS survey be used to obtain the necessary data for measuring the core RBM coverage indicators. This will ensure their comparability with the DHS and MICS surveys over time and across countries. However, the implementation of the MIS survey can be quite resource intensive. If funding is not available to implement an MIS survey and the DHS and MICS surveys are not available, it is recommended that a set of questions be added as a rider to other types of surveys described above. Table 3 provides a summary of the primary issues that need to be considered when measuring each core indicator with the three main types of surveys available. The appendix provides further details of the relevant issues for adding questions as a rider to other types of surveys.

Table 3: Summary of Primary Differences among the Respective Surveys Used for Measuring the Core Indicators

	Indicators of Population Coverage				
Surveys	*Proportion households with at least 1 ITN*	*Proportion children <5 who slept under ITN previous night*	*Proportion children <5 with fever who received prompt/ effective treatment*	*Proportion pregnant women who slept under ITN previous night*	*Proportion women who received 2 or more doses of IPT during last pregnancy*
Demographic and Health Survey (DHS)	Net registry used to assess each net in household for brand and retreatment status	Only captures children <5 with a mother of reproductive age that slept in house the previous night	Only captures children <5 with a mother of reproductive age that slept in house the previous night	Needs sufficient sample size to estimate this indicator	Captures 2 doses of IPT during pregnancy that resulted in live birth within the past 2 years
Multiple Indicator Cluster Survey (MICS)	Typically assess one net in each household for brand and retreatment status (Version 2005 onward)	Captures all children <5 within household (obtains information from primary care giver)	Captures all children <5 within household (obtains information from primary care giver)	Data for this indicator is not collected because current pregnancy status is not collected	Captures 2 doses of IPT during pregnancy that resulted in live birth within the past 2 years
Malaria Indicator Survey (MIS)	Net registry used to assess each net in household for brand and retreatment status	Only captures children <5 with a mother of reproductive age that slept in house the previous night	Only captures children <5 with a mother of reproductive age that slept in house the previous night	Needs sufficient sample size to estimate this indicator	Captures 2 doses of IPT during pregnancy that resulted in live birth within the past 2 years

ITN = Insecticide–Treated Net
IPT = Intermittent Preventive Treatment

3.2 METHOD OF MEASUREMENT AND DATA COLLECTION

There are several general issues pertaining to method of measurement and data collection that are relevant to all five core indicators for population coverage. As stated, it is recommended that the data used for constructing the core indicators for population coverage be measured through nationally representative household sample surveys, such as the DHS, MICS, or MIS surveys. However, to remain consistent with the Abuja targets, the coverage indicators are intended to be measured among the population "at risk for malaria," which in some instances may create implications for survey design.

To ensure that standard statistical methods can be used to estimate the five coverage indicators and accompanying standard errors, it is recommended that scientific sampling procedures follow similar methods to those used by the DHS, MICS, or MIS surveys. Such procedures typically entail a two-stage cluster sampling design with primary sampling units selected with probability proportional to size. Additionally, these samples are typically stratified by region, and by urban/rural residence, as stipulated by survey objectives. For further details of this general type of sampling method, please refer to the sampling guidelines for the DHS, MICS, or MIS surveys, which can be found online.

Both the DHS and MICS surveys typically include all primary sampling units for an entire country in their sampling frames to ensure nationally representative estimates. In countries with endemic or epidemic-prone malaria throughout, it is appropriate to include all primary sampling units within the country in the sampling frame, given that pre-stratification by urban and rural residence is also undertaken, as is the case with the DHS and MICS surveys. If a DHS or MICS survey is to be used for obtaining the coverage indicators within countries with defined areas without endemic or epidemic-prone malaria, such as those with mountainous areas or deserts, it should be noted that national estimates will include populations not at risk for malaria. For countries without endemic or epidemic-prone malaria throughout and where the MIS or another survey other than the DHS or MICS survey is to be used, it may be possible to limit the sampling frame only to districts, or other aggregated primary sampling units, that are deemed malarious. Please refer to the MIS Sampling Guidelines for a more detailed description of how best to construct a sampling frame for countries with widely varying levels of malaria endemicity.

Sample surveys used to collect the data for all five indicators should be conducted with sufficient design and sample size to allow at a minimum, the comparisons among regions and urban/rural strata at the individual and household level within malaria-endemic areas. Because of the small number of currently pregnant women at any given time, a survey designed to collect these data should normally have an overall sample of at least 5,000 women (to be comparable with the DHS, MICS, and MIS surveys). If the household survey used for collecting data for these indicators does not specifically use a survey population defined as those at risk for malaria, care must be taken to ensure a sufficient sample size is obtained within malaria endemic areas of the country so that desired levels of precision are obtained. It may also be necessary to oversample within certain districts with known levels of malaria transmission for comparison purposes and to aid with interpretation.

Specific notes on methodological issues are provided separately in Section 4 and again in the appendix for each indicator.

3.3 INTERPRETATION

There are two particular issues that will likely affect the interpretation of all five core indicators for population coverage.

The first issue of interpretation that applies to all five indicators is the recall bias of household respondents. Recall bias is the decrease in accuracy of reported data resulting from time lapse since occurrence. This may affect recall of mosquito net retreatment, the details of IPT during the last pregnancy, including the type of antimalarial given, and the treatment of a child with a fever within 2 weeks. In the last case, recall would be an issue for the reporting of fever within the last 2 weeks for children within the household, whether an antimalarial was given, how long after the onset of fever the treatment was given, as well as the type of antimalarial given. While recall bias creates difficulty for the overall interpretability of the actual point estimates of these indicators, this type of bias would likely not affect relative comparisons for evaluative purposes, as this type of bias may be nondifferential between different countries and across time.

The second issue that may affect the interpretation of the core indicators involves the definition of the target population. As stated previously, the Abuja targets stipulate that the coverage indicators are intended to be measured among the target population defined as those at risk for malaria. For countries where malaria is endemic or epidemic-prone throughout, this issue should not be of particular concern given that stratification by urban and rural residency is undertaken, as is typically the case with the DHS and MICS surveys. However, within countries that contain large segments of the populations within areas absent of malaria, such as those with mountainous areas or deserts, national-level estimates, such as those obtained from the DHS and MICS surveys, may likely result in an underestimate of coverage for those at risk for malaria. In such a situation, it may be advisable during data analysis to limit the analysis to survey domains, such as regions, that are deemed to be malarious. If this is not possible, data should be interpreted accordingly.

At a minimum, the following basic demographic variables will need to be collected to assist with interpretation of the five core indicators for population coverage:

- Mother's level of education
- Age and sex of children under 5 years of age
- Region of residence
- Urban or rural residence
- Quality of housing (e.g., electricity, piped water, flush toilet, type of floor).

Notes on significant assumptions and potential bias are provided separately in Section 4 under the description of each indicator.

4. GUIDELINES FOR CONSTRUCTING EACH CORE RBM OUTCOME INDICATOR FOR POPULATION COVERAGE

The final section of this manual provides a detailed description of how to construct each of the five core RBM outcome indicators used for measuring population coverage. They are organized according to the three primary RBM technical strategies previously outlined: ITNs, prompt access to effective treatment, and prevention and control of malaria in pregnant women. A detailed description is given for each indicator, including the details of the numerator and denominator, purpose, method of measurement, suggested questions, and specific issues of interpretation. Ideally, countries with an active malaria control program should report on all five of these core indicators on a regular basis. At a minimum, it is recommended that these indicators be measured every 2 to 3 years.

4.1 CORE POPULATION COVERAGE INDICATORS FOR MEASURING THE RBM TECHNICAL STRATEGY OF VECTOR CONTROL VIA ITNS

1. Proportion of Households with at least One ITN

- **Numerator:** Number of households surveyed within malaria endemic areas with at least one mosquito net, which has been treated within 12 months or has been permanently treated.
- **Denominator:** Total number of households surveyed within malaria endemic areas.

Purpose

This indicator will be used to measure household ITN possession among the population at risk for malaria at the national level.

Method of Measurement

This indicator requires data collected at the household level from nationally representative sample surveys. Areas of the country without endemic malaria must be identified so that they may be excluded from this indicator. It is important that these data be collected on a household questionnaire, rather than on an individual questionnaire, as the individuals interviewed may not be representative of household possession. It is also important that surveys be conducted with sufficient design and sample size to allow comparisons among regions and urban/rural strata at the household level.

The numerator for this indicator is obtained from asking household respondent if there is any mosquito net in the house that can be used to avoid being bitten while sleeping, and from determining whether it has been treated within 12 months or has been permanently treated. The denominator is simply measured by the total number of surveyed households.

Interpretation

This indicator provides a proxy measure for household ITN use at the national level among those at risk for malaria.

Strengths	➢ The limited number of questions required to ascertain data for this indicator can be easily added to any nationally representative sample survey of households. ➢ Presence of a net is typically verified at time of interview. ➢ Comparable across countries given that appropriate and consistent sampling procedures are followed and confounding factors are accounted for.
Limitations	➢ Because of issues of date recall of last impregnation, this indicator may not provide reliable estimates of net retreatment status. ➢ May be difficult to interpret at the national level unless stratified by urban and rural strata as malaria transmission is most often localized. ➢ Typically, no information is collected on whether the insecticide used to treat the net is an "approved" insecticide. ➢ No information is collected on whether the net was washed after treatment, which can reduce its effectiveness.

2. Proportion of Children Under 5 Years Old Who Slept Under an ITN the Previous Night

- **Numerator:** Number of children under 5 years old at risk from malaria who slept under a mosquito net the previous night, which has been treated within the past 12 months or has been permanently treated.
- **Denominator:** Total number of children under 5 years old at risk for malaria who slept in surveyed households the previous night.

Purpose

This indicator will be used to measure the level of ITN coverage of children under 5 years old who are at risk for malaria at the national level.

Method of Measurement

This indicator requires data collected from nationally representative household sample surveys. Areas of the country without endemic malaria must be identified so that they may be excluded from this indicator. It is important that the survey contain a household listing that captures all children under 5 years old within each surveyed household. Such surveys should be conducted with sufficient design and sample size to allow comparisons among regions and urban/rural strata.

The data for the denominator are obtained from the household questionnaire that lists every child under 5 who slept in the house the previous night. The data for the numerator are then obtained from a listing of the same children in the house who slept under a mosquito net the previous night, in combination with information on whether the net had been treated with insecticide within 12 months or had been permanently treated.

Interpretation

This indicator provides a direct measure of ITN use by children under 5 years of age at risk for malaria at the national level.

Strengths	➢ The limited number of questions required to ascertain data for this indicator can be easily added to any nationally representative sample survey of households. ➢ Presence of a net is typically verified at time of interview. ➢ Comparable across countries given that appropriate and consistent sampling procedures are followed and confounding factors are accounted for.
Limitations	➢ Because of issues of date recall of last impregnation, this indicator may not provide reliable estimates of net retreatment status. ➢ May be difficult to interpret at the national level unless stratified by urban and rural strata as malaria transmission is most often localized. ➢ May be biased by the seasonality of survey data collection, which is most often done during the dry season when net use is likely at its lowest. ➢ Typically, no information is collected on whether the insecticide used to treat the net is an "approved" insecticide. ➢ No information is collected on whether the net was washed after treatment, which can reduce its effectiveness.

4.2 Core Population Coverage Indicator for Measuring the RBM Technical Strategy of Prompt Access to Effective Treatment (among children under 5 years old)[3]

3. Proportion of Children Under 5 Years Old with Fever in Last 2 Weeks Who Received Antimalarial Treatment According to National Policy within 24 Hours from Onset of Fever

- **Numerator:** Number of children under 5 years old who had a fever in previous 2 weeks who received antimalarial treatment according to national policy <24 hours from onset of fever, within malaria endemic areas.
- **Denominator:** Total number of children under 5 years old who had a fever in previous 2 weeks, within malaria endemic areas.

[3] In areas of unstable or focal malaria transmission, this indicator may also include older age groups as needed.

Purpose

This indicator captures the national-level access to prompt and effective treatment for malaria within malaria endemic areas.

Method of Measurement

This indicator requires data collected from nationally representative household sample surveys within malaria endemic areas. Areas of the country without endemic malaria must be identified so that they may be excluded from this indicator. If questions are to be added on as a rider to a survey, it is important that the survey contain a household listing that captures all women of reproductive age and/or all children under 5 years old who slept within each surveyed household the previous night.

The data for the denominator are obtained in one of two ways, depending on the type of survey used. Some surveys use the household listing procedure when every child under 5 who slept in the house the previous night is identified (MICS). Other surveys ask questions in the women's questionnaire about all their children under the age of 5, thus the denominator is the children of women of reproductive age who slept in the house the night before the survey. The numerator is then obtained by asking all mothers and/or caregivers (depending on survey method) in the household whether any of their children listed have had a fever in the past 2 weeks, and if so, if they were given an antimalarial treatment, and if so, how long after the onset of illness.

Interpretation

This indicator provides a proxy measure for the level of access of children under 5 years old at risk for malaria to prompt and effective treatment for malaria infections, according to national guidelines, at the national level.

Strengths	➢ The limited number of questions required to ascertain data for this indicator can be easily added to any nationally representative sample survey of households. ➢ Comparable across countries given that appropriate and consistent sampling procedures are followed and confounding factors are accounted for.
Limitations	➢ Because of issues of date recall, indicator may not provide reliable estimates of episodes of fever within previous 2 weeks, the length of time after onset of fever before an antimalarial drug was given, or the identity of which specific drug was given. ➢ Fever may not have been the result of a malaria infection. ➢ There is no way of knowing if antimalarial treatments were administered correctly. ➢ Data based solely on the mother's or caretaker's information may miss fostered children or others living in a household without a parent/caretaker. ➢ May be difficult to compare across countries with different antimalarial drug policies.

4.3 Core Population Coverage Indicator for Measuring the RBM Technical Strategy of Prevention and Control Among Pregnant Women

4. Proportion of Pregnant Women Who Slept Under an ITN the Previous Night

- **Numerator:** Number of pregnant women at risk for malaria who slept under a mosquito net the previous night, which has been treated within 12 months or has been permanently treated.
- **Denominator:** Total number of pregnant women who reside within surveyed households within malaria endemic areas.

Purpose

This indicator will be used to measure the level of ITN use by pregnant women at risk for malaria at the national level.

Method of Measurement

This indicator requires data collected from nationally representative household sample surveys. Areas of the country without endemic malaria must be identified so that they may be excluded from this indicator. Because of the small number of currently pregnant women at any given time, a survey designed to collect these data should have an overall sample of ≥5,000 women (to be comparable with DHS surveys). Note that the MICS survey does not currently collect data for this indicator because of restricted sample sizes. If questions are to be added on as a rider to a survey, it is important that the survey contain a household listing that captures all women of reproductive age within each surveyed household. Such surveys should be conducted with sufficient design and sample size to allow comparisons among regions and urban/rural strata at the individual level.

The data for the denominator are obtained from a series of questions asked of all women of reproductive age in the household about their current pregnancy status. The data for the numerator are then obtained from a listing of these women that slept under a mosquito net the previous night, in combination with information on current pregnancy status and whether the net had been treated with insecticide within 12 months or had been permanently treated.

Interpretation

This indicator provides a direct measure of ITN use by pregnant women at risk for malaria at the national level.

Strengths	➢ The limited number of questions required to ascertain data for this indicator can be easily added to any nationally representative sample survey of households. ➢ Presence of a net is typically verified at time of interview. ➢ Comparable across countries given that appropriate and consistent sampling procedures are followed and confounding factors are accounted for.
Limitations	➢ Difficult to capture all pregnant women in a household survey because many women either don't know they are pregnant or do not want to divulge this information during early pregnancy. ➢ Large sample size required to obtain precise estimates. ➢ May be some bias if reluctance to discuss pregnancy is also associated with first births, adolescents, and other demographic factors. ➢ May be difficult to interpret at the national level unless stratified by urban and rural strata as malaria transmission is most often localized. ➢ May be biased by the seasonality of survey data collection, which is most often done during the dry season when net use is likely at its lowest. ➢ Typically, no information is collected on whether the insecticide used to treat the net is an "approved" insecticide. ➢ No information is collected on whether the net was washed after treatment, which can reduce its effectiveness. ➢ May be misleading at the national level as malaria transmission is most often localized.

5. Proportion of Women Who Received Intermittent Preventive Treatment for Malaria During Their Last Pregnancy

- **Numerator:** Number of women at risk for malaria who received 2 or more doses of a recommended antimalarial drug treatment to prevent malaria during their last pregnancy that led to a live birth within the last 2 years.[4]
- **Denominator:** Total number of women surveyed at risk for malaria who delivered a live baby within the last 2 years.

Purpose

This indicator will be used to measure the national-level use of IPT to prevent malaria during pregnancy among women at risk for malaria.

[4] The currently recommended drug is SP.

Method of Measurement

This indicator requires data collected from nationally representative household sample surveys. Areas of the country without endemic malaria must be identified so that they may be excluded from this indicator. If questions are to be added on as a rider to a survey, it is important that the survey contain a household listing that captures all women of reproductive age within each surveyed household, as well as a female questionnaire to collect data on previous births and antenatal care. Additionally, because of the limited number of women who delivered a live baby within the previous 2 years, care should be taken to ensure such surveys are conducted with sufficient sample size and designed to allow comparisons among regions and urban/rural strata at the individual level.

Data from the women's questionnaires for all women who delivered a live baby within the last 2 years within surveyed household is used to calculate the denominator. The numerator is derived from the number of women who mention taking an antimalarial for prevention (NOT treatment) during their most recent pregnancy (from among all listed births to women in the last 2 years). Note that in the DHS and MIS surveys, data from the women's questionnaire includes all births within the previous 5 years, from which the child's date of birth can be used to limit these to the last pregnancy that resulted in a live births within the previous 2 years.

It is important to differentiate between a treatment dose for prevention (as prescribed for IPT) and actual treatment of an existing malaria infection. Although it is extremely difficult to differentiate in the context of a survey interview, the latter is curative care, and does not count as standard IPT procedure. Similarly, women taking weekly chloroquine prophylaxis are not considered to be covered by IPT.

Interpretation

This indicator provides a proxy measure for the proportion of pregnant women at risk for malaria who receive IPT during pregnancy, at the national level.

Strengths	➢ The limited number of questions required to ascertain data for this indicator can be easily added to any nationally representative sample survey of households. ➢ Comparable across countries given that appropriate and consistent sampling procedures are followed and confounding factors are accounted for. ➢ Data collected from a national-level survey gives a more accurate perspective on coverage of IPT interventions than data obtained through routine facility-based information systems.
Limitations	➢ Retrospective questions about IPT given during previous pregnancy may be subject to recall bias. ➢ Difficult to determine at what stage during pregnancy IPT was given. ➢ May be misleading at the national level as malaria transmission is most often localized. ➢ May not provide reliable estimates for what type of antimalarial was given because of poor recall.

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APPENDIX: ADD-ON HOUSEHOLD QUESTIONS FOR MEASURING CORE INDICATORS FOR POPULATION COVERAGE

The recommended survey methodology for collecting the five core Roll Back Malaria indicators is either the Demographic and Health Surveys (DHS) or the Multiple Indicator Cluster Survey (MICS). This is because both surveys employ a rigorous sampling design that is representative at the national level and provides comparability over time and across countries. These surveys are only conducted periodically (every 4 to 5 years), so if a country needs to obtain data on the core malaria indicators in the interval between large national surveys, the Malaria Indicator Survey (MIS) is the recommended survey methodology. The MIS survey is designed to collect data that is comparable with the DHS and MICS surveys. If resources for data collection are limited and an MIS survey is not feasible, some national-level indicators can be measured by adding a series of questions to other types of household surveys such as living standards surveys (a list of such surveys is available on page 7 of this document). The caveat in this situation is that every effort must be made to ensure that the data collection methods meet the requirements for a nationally representative household survey. Suggestions for a minimum set of questions required to obtain the necessary data for the five core indicators are presented in this appendix along with a discussion of the relevant issues that must be considered when adding questions onto another host survey.

There are several basic requirements for identifying a survey to which malaria indicator questions could be added. The survey must be a household-level survey that is designed to collect nationally representative data (similar to the DHS, MICS, or MIS surveys). This means that the sampling frame for the survey is based on a complete enumeration of primary sampling units across the entire country. Details regarding sampling procedures can be found in the DHS, MICS, and MIS Sampling Guides, as well as other resources. If possible, the host survey should include a household schedule that collects basic demographic information on all individuals who usually reside in the household or who slept in the household the previous night. This listing provides the necessary information to select the target individuals for the various indicators such as children under 5 years old or women of reproductive age. An example of a household schedule, based on the DHS survey, is provided below.

SAMPLE HOUSEHOLD SCHEDULE

Now we would like some information about the people who usually live in your household or who are staying with you now (to be asked to the household respondent).

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	ELIGIBLE WOMEN	CURRENTLY PREGNANT?
	Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with the head of the household.	What is the relationship of (NAME) to the head of the household?*	Is (NAME) male or female?	Does (NAME) usually live here?	Did (NAME) stay here last night?	How old is (NAME)?	CIRCLE LINE NUMBER OF ALL WOMEN AGE 15-49	FOR ELIGIBLE WOMEN, ASK: Is (NAME) currently pregnant?
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
01		☐☐	M F 1 2	YES NO 1 2	YES NO 1 2	IN YEARS ☐☐	01	YES NO/DK 1 2
02		☐☐	1 2	1 2	1 2	☐☐	02	1 2
03		☐☐	1 2	1 2	1 2	☐☐	03	1 2

This is only an example and should include spaces for additional household residents
*Please see the MIS for listing of codes for Q.3.

CORE INDICATORS

1. Proportion of Households with at least One ITN

Requirements for rider survey

The survey must be a household-based survey with a respondent reasonably knowledgeable of household bednet ownership and use.

Suggested questions

This indicator has two components—ownership of a net and whether the net was treated with insecticide. It is recommended that the survey use the full set of questions to ascertain treatment status, in addition to ownership, as ITNs are a key strategy for malaria prevention. There are two basic options for collecting the necessary information for this indicator.

- **Suggested Question Format Using a Net Roster (from DHS module):** The first option makes use of a net roster based on the DHS malaria module below and requires the following information: 1) a listing of all bednets in the household; 2) details on net treatment; and 3) a listing of each household resident that slept under each net the night before the survey. In conjunction with the household schedule, the net roster will also provide all necessary information for constructing the indicators for the proportion of children under 5 years old who slept under an ITN the previous night and the proportion of pregnant women who slept under an ITN the previous night (data and sample size permitting).

To be asked to the household respondent.

1.1	Does your household have any mosquito nets that can be used while sleeping?	YES .... 1 NO .... 2 → Skip to next section		
1.2	ASK RESPONDENT TO SHOW YOU THE NET(S) IN THE HOUSEHOLD. IF MORE THAN THREE NETS, USE ADDITIONAL QUESTIONNAIRE(S).	NET # 1 OBSERVED .... 1 NOT OBSERVED.......... 2	NET #2 OBSERVED .... 1 NOT OBSERVED 2	NET #3 OBSERVED .... 1 NOT OBSERVED.......... 2
1.3	How long ago did your household obtain the mosquito net? IF LESS THAN 1 MONTH, RECORD '00'.	MOS AGO [ ][ ] MORE THAN 2 YEARS AGO.......... 95	MOS AGO [ ][ ] MORE THAN 2 YEARS AGO.......... 95	MOS AGO [ ][ ] MORE THAN 2 YEARS AGO 95
1.4	OBSERVE OR ASK THE BRAND OF MOSQUITO NET. *THE CODING FOR THIS QUESTION SHOULD BE COUNTRY SPECIFIC. <u>BRANDS</u> A: B: C: D: E: F:	'PERMANENT' NET[1] BRAND A .... 11 BRAND B .... 12 DK BRAND...... 18 (SKIP TO 1.8) 'PRETREATED' NET[2] BRAND C .... 21 BRAND D .... 22 DK BRAND...... 28 (SKIP TO 1.6) OTHER BRAND E .... 31 BRAND F.......... 32 DK BRAND.......... 38 NOT SURE.......... 98	'PERMANENT' NET[1] BRAND A .... 11 BRAND B .... 12 DK BRAND...... 18 (SKIP TO 1.8) 'PRETREATED' NET[2] BRAND C .... 21 BRAND D .... 22 DK BRAND...... 28 (SKIP TO 1.6) OTHER BRAND E .... 31 BRAND F.......... 32 DK BRAND.......... 38 NOT SURE 98	'PERMANENT' NET[1] BRAND A .... 11 BRAND B .... 12 DK BRAND...... 18 (SKIP TO 1.8) 'PRETREATED' NET[2] BRAND C .... 21 BRAND D .... 22 DK BRAND...... 28 (SKIP TO 1.6) OTHER BRAND E .... 31 BRAND F.......... 32 DK BRAND.......... 38 NOT SURE.......... 98
1.5	When you got the net, was it already treated with an insecticide to kill or repel mosquitoes?	YES .... 1 NO.......... 2 NOT SURE.......... 8	YES .... 1 NO.......... 2 NOT SURE 8	YES .... 1 NO.......... 2 NOT SURE.......... 8
1.6	Since you got the mosquito net, was it ever soaked or dipped in a liquid to repel mosquitoes or bugs?	YES .... 1 NO.......... 2 NOT SURE.......... 8 (SKIP TO 1.8)	YES .... 1 NO.......... 2 NOT SURE .... 8 (SKIP TO 1.8)	YES .... 1 NO.......... 2 NOT SURE.......... 8 (SKIP TO 1.8)
1.7	How long ago was the net last soaked or dipped? IF LESS THAN 1 MONTH, RECORD '00'.	MOS AGO [ ][ ] MORE THAN 24 MONTHS AGO .... 95 NOT SURE 98	MOS AGO [ ][ ] MORE THAN 24 MONTHS AGO ....95 NOT SURE 98	MOS AGO [ ][ ] MORE THAN 24 MONTHS AGO.......... 95 NOT SURE.......... 98
1.8	Did anyone sleep under this mosquito net last night?	YES ....1 NO..........2 NOT SURE.......... 8 (SKIP TO 2.1NEXT SECTION)	YES .... 1 NO..........2 NOT SURE ....8 (SKIP TO NEXT SECTION2.1)	YES ....1 NO..........2 NOT SURE.......... 8 (SKIP TO NEXT SECTION2.1)

1.9	Who slept under this mosquito net last night? RECORD THE RESPECTIVE LINE NUMBER FROM THE HOUSEHOLD SCHEDULE.	NAME _____ LINE NO. ☐☐ NAME _____ LINE NO. ☐☐ NAME _____ LINE NO. ☐☐	NAME _____ LINE NO. ☐☐ NAME _____ LINE NO. ☐☐ NAME _____ LINE NO. ☐☐	NAME _____ LINE NO. ☐☐ NAME _____ LINE NO. ☐☐ NAME _____ LINE NO. ☐☐

[1] "Permanent" is a pretreated net that does not require any further treatment.
[2] "Pretreated" is a net that has been pretreated, but requires further treatment after 6–12 months.

- **Suggested Question Format without a Net Roster (from MICS module):** If it is deemed there is insufficient room to add in the full net roster to the 'host' survey, a second option based on the below MICS malaria module can be used to obtain information on a single bednet within the household. Please note that if this option is used to obtain these data, additional questions will then be required to ascertain the necessary information for the indicator for the proportion of children who slept under an ITN the previous night.

ITN MODULE		**TN**
This module is to be administered once for each household visited.		
TN1. DOES YOUR HOUSEHOLD HAVE ANY MOSQUITO NETS THAT CAN BE USED WHILE SLEEPING?	Yes ..... 1 No 2	2⇨NEXT MODULE
TN2. HOW MANY MOSQUITO NETS DOES YOUR HOUSEHOLD HAVE? *If 7 or more nets, record '7'.*	Number of nets ..... ___	

ITN MODULE		TN
TN3. IS THE NET (ARE ANY OF THE NETS) ANY OF THE FOLLOWING BRANDS: *[Note: Insert brand names of the different types of nets available in the country]* *Read each brand name, show picture card, and circle codes for Yes or No for each brand. If possible, observe the net to verify brand.* LONG-LASTING TREATED NETS: BRAND A? BRAND B? PRE-TREATED NETS: BRAND C? BRAND D? OTHER NETS: BRAND E? BRAND F? ANY OTHER BRAND OF NET? AN UNNKOWN BRAND OF NET?	Y N DK Long-lasting treated nets: Brand A ..... 1 2 8 Brand B ..... 1 2 8 Pre-treated nets: Brand C ..... 1 2 8 Brand D ..... 1 2 8 Other nets: Brand E ..... 1 2 8 Brand F ..... 1 2 8 Other brand ***(SPECIFY BRAND)*** _____ 1 2 Unknown brand 1 2	
TN4. *Check TN3 for brand of net(s). Go through the above list in order until **one** box is checked and follow instructions:* *1. ☐ Long-lasting treated net (brand A or brand B) mentioned? ⇨ Go to Next Module* *2. ☐ Pre-treated net (brand C or brand D) mentioned? ⇨ Go to TN6* *3. ☐ Other net (brand E, brand F or any other net, or an unknown brand) mentioned? ⇨ Continue with TN5*		
TN5. WHEN YOU GOT THE (MOST RECENT) NET, WAS IT ALREADY TREATED WITH AN INSECTICIDE TO KILL OR REPEL MOSQUITOES?	Yes ..... 1 No ..... 2 DK/not sure 8	
TN6. HOW MANY MONTHS AGO WAS THE (MOST RECENT) NET OBTAINED? *If less than 1 month ago, record '00'.* *If answer is "12 months" or "1 year", probe to determine if net was obtained exactly 12 months ago or earlier or later.*	Months ago ..... __ __ More than 24 months ago ..... 95 Not sure 98	
TN7. SINCE YOU GOT THE NET(S) HAS IT (HAVE ANY OF THESE NETS) EVER BEEN SOAKED OR DIPPED IN A LIQUID TO KILL/REPEL MOSQUITOES?	Yes ..... 1 No ..... 2 DK 8	2⇨NEXT MODULE 8⇨NEXT MODULE
TN8. HOW LONG AGO WAS THE MOST RECENT SOAKING/DIPPING DONE? *If less than 1 month, record '00'.* *If answer is "12 months" or "1 year", probe to determine if net was treated exactly 12 months ago or earlier or later.*	Months ago ..... __ __ More than 24 months ago ..... 95 Not sure 98	

2. Proportion of Children Under 5 Years Old Who Slept Under an ITN the Previous Night

Requirements for rider survey

The survey must be a household-based survey. If the net roster is to be used, the information must come from a respondent reasonably knowledgeable of household bednet ownership, as well as which household residents slept under which net the night before the survey interview (as in the DHS module). If a net roster is not used, this information may be obtained from the mother or caregiver of each child within the household (as in the MICS module).

Suggested questions

- **Suggested Question Format Using a Net Roster (from DHS module):** If data for this indicator are to be collected via a net roster, information is collected for each net in the household along with a listing of each household resident that slept under each net the night before the survey. See ITN questions above for indicator 1 when using a net roster.

- **Suggested Question Format without a Net Roster (from MICS module):** When a net roster is not used, the necessary data for this indicator may be collected from the below set of questions based on the MICS malaria module. In this case, the necessary data for each child in the household and the net they slept under is obtained from either the child's mother or primary caregiver. As in the indicator above, it is important to know if the net was treated with insecticides so a series of questions around dipping/treating is always recommended.

MALARIA MODULE FOR UNDER-FIVES		ML
1. DID (*name*) SLEEP UNDER A MOSQUITO NET LAST NIGHT?	Yes .....1 No .....2 DK.....8	 2⇨NEXT MODULE 8⇨NEXT MODULE
2. HOW LONG AGO DID YOUR HOUSEHOLD OBTAIN THE MOSQUITO NET? *If less than 1 month, record '00'.* *If answer is "12 months" or "1 year", probe to determine if net was treated exactly 12 months ago or earlier or later.*	Months ago.....__ __ More than 24 months ago .....95 Not sure 98	
3. WHAT BRAND IS THIS NET? *[NOTE: ADAPT CODES FOR THIS QUESTION TO COUNTRY-SPECIFIC BRANDS AVAILABLE. USE THE SAME BRANDS AS IN TN3]* *If the respondent does not know the brand of the net, show pictorials, or if possible, observe the net.* LONG LASTING TREATED NETS: BRAND A BRAND B PRE-TREATED NETS: BRAND C BRAND D OTHER NETS: BRAND E BRAND F	Long lasting treated net: Brand A.....11 Brand B.....12 Pre-treated net: Brand C .....21 Brand D .....22 Other net: Brand E.....31 Brand F.....32 Other net (*specify brand*) _____ 36 DK brand 98	 11⇨NEXT MODULE 12⇨NEXT MODULE 21⇨5 22⇨5
4. WHEN YOU GOT THAT NET, WAS IT ALREADY TREATED WITH AN INSECTICIDE TO KILL OR REPEL MOSQUITOES?	Yes .....1 No .....2 DK/not sure.....8	
5. SINCE YOU GOT THE MOSQUITO NET, WAS IT EVER SOAKED OR DIPPED IN A LIQUID TO KILL/REPEL MOSQUITOES OR BUGS?	Yes .....1 No .....2 DK.....8	 2⇨ NEXT MODULE 8⇨ NEXT MODULE
6. HOW LONG AGO WAS THE NET LAST SOAKED OR DIPPED? *If less than 1 month, record '00'.* *If answer is "12 months" or "1 year", probe to determine if net was treated exactly 12 months ago or earlier or later.*	Months ago.....__ __ More than 24 months ago .....95 DK.....98	

3. Proportion of Children Under 5 Years Old with Fever in Last 2 Weeks Who Received Antimalarial Treatment According to National Policy within 24 Hours from Onset of Fever

Requirements for rider survey

The survey must be household-based and the respondent must be the parent or caregiver for child being discussed. Questions on antimalarials will need to be adapted to specifics of drugs used in the country.

Suggested questions and other considerations

The below questions for obtaining relevant data for this indictor are similar for both the DHS and MICS. However, the format of the questionnaire, and even the wording of the questions, may change slightly depending on whether the person being interviewed is the parent or the primary caregiver of the child. It should also be recognized that these two different formats may yield slightly different samples of children. The 'DHS' format, which questions all women about all their children born within the last five years, will yield a sample representing children only of biological mothers present in the household. The 'MICS' format questions caregivers (whether biological mother or not) for all children less than five years old in the household, thus resulting in information being obtained for all children within the household, regardless of whether their mother is present. Although in most settings the samples are not different enough to raise concern, in areas with large numbers of orphans or child-fostering might produce less biased estimates when using the 'MICS' protocol.

To be asked to each woman of reproductive age (15–49 years old) listed on the household schedule or to the caregivers of all children under 5, depending on the type of survey method used.

3.1	CHECK PREVIOUS QUESTION FROM WOMAN'S QUESTIONNAIRE ASKING ABOUT THE TIMING OF THE MOST RECENT BIRTH: ONE OR MORE BIRTHS IN LAST 5 YEARS ☐ NO BIRTHS IN LAST 5 YEARS ☐		⟶ Skip to next section (or end)
3.2	ENTER IN THE TABLE THE LINE NUMBER AND NAME OF EACH LIVING CHILD UNDER 5 YEARS OLD. (IF THERE ARE MORE THAN 2 CHILDREN UNDER 5 YEARS OLD, USE ADDITIONAL QUESTIONNAIRES). Now I would like to ask you some questions about the health of your children less than 5 years old. (We will talk about each one separately.)	YOUNGEST CHILD LINE NUMBER ..... ☐☐ NAME _____	NEXT-TO-YOUNGEST CHILD LINE NUMBER ..... ☐☐ NAME _____
3.3	Has (NAME) been ill with a fever at any time in the last 2 weeks?	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8 (IF 2 OR 8, GO BACK TO 3.2 FOR NEXT CHILD, OR IF NO OTHER CHILDREN UNDER FIVE, SKIP TO END)	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8 (IF 2 OR 8, GO BACK TO 3.2 IN FIRST COLUMN OF NEW QUESTIONNAIRE, IF NO OTHER CHILDREN UNDER FIVE, SKIP TO END)
3.4	Did (NAME) take any drugs for the (fever)?	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8 (SKIP TO NEXT CHILD OR TO END)	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8 (SKIP TO NEXT CHILD OR TO END)
3.5	What drugs did (NAME) take?[1] RECORD ALL MENTIONED. ASK TO SEE DRUG(S) IF TYPE OF DRUG IS NOT KNOWN. IF TYPE OF DRUG IS STILL NOT DETERMINED, SHOW TYPICAL ANTIMALARIAL DRUGS TO RESPONDENT.	ANTI-MALARIAL SP/FANSIDAR ..... A CHLOROQUINE ..... B AMODIAQUINE ..... C QUININE ..... D OTHER ANTIMALARIAL ..... E _____ (SPECIFY) OTHER DRUGS ASPIRIN ..... F IBUPROFEN ..... G ACETAMINOPHEN ..... H OTHER _____ (SPECIFY) X DON'T KNOW ..... Z	ANTI-MALARIAL SP/FANSIDAR ..... A CHLOROQUINE ..... B AMODIAQUINE ..... C QUININE ..... D OTHER ANTIMALARIAL ..... E _____ (SPECIFY) OTHER DRUGS ASPIRIN ..... F IBUPROFEN ..... G ACETAMINOPHEN ..... H OTHER _____ (SPECIFY) X DON'T KNOW ..... Z
3.6	How long after the fever started did (NAME) first take (NAME OF DRUG FROM Q.3.5)? IF MULTIPLE DRUGS LISTED IN 3.5, NAME ALL DRUGS MENTIONED.	SAME DAY ..... 0 NEXT DAY ..... 1 2 DAYS AFTER THE FEVER ..... 2 3 DAYS AFTER THE FEVER ..... 3 4 OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8	SAME DAY ..... 0 NEXT DAY ..... 1 2 DAYS AFTER THE FEVER ..... 2 3 DAYS AFTER THE FEVER ..... 3 4 OR MORE DAYS AFTER THE FEVER ..... 4 DON'T KNOW 8

[1] Revise list of drugs as appropriate; however, the broad categories must be maintained.

4. Proportion of Pregnant Women Who Slept Under an ITN the Previous Night

Requirements for rider survey

The survey must be a household-based survey. If a net roster is used the household respondent must be reasonably knowledgeable of household bednet ownership as well as which household residents slept under which net the night before the survey interview. The women's questionnaire should target all women of reproductive age (15-49 years old) listed within the household schedule. Each woman is also asked information on her current pregnancy status. Due to the small numbers of women actually pregnant at the time of the survey, the sample size needed to obtain valid information on this question is quite large, typically in the range of at least 5,000 women of reproductive age.

Suggested questions and other considerations

If a net roster is used (as in the DHS), data for this indicator can be obtained from the listing of each net in the household along with a listing of each household resident that slept under each net the night before the survey (see ITN questions above for indicators 1 when using a net roster). Line numbers of persons who slept under a net allow linkage with women who stated that they are currently pregnant in the women's questionnaire. For women of reproductive age, the pregnancy status is also obtained on the household schedule. Please note that it is often difficult to capture all pregnant women in a household survey because many women either don't know they are pregnant or do not want to divulge this information. Please also remember that it is important to know if the net was treated with insecticides so a series of questions around dipping/treating is always recommended.

While information for this indicator is not collected on the MICS due to sample size limitations, it may still be possible to collect information for this indicator on rider surveys that do not contain a net roster by obtaining the pregnancy status of each woman of reproductive age, then asking a series of questions on whether she slept under a bednet the previous night along with questions to determine ITN status. Such questions would be very similar to those used on the MICS module for determining the proportion children under five years old who slept under an ITN the previous night (see questions from the MICS module for indicator 2).

5. Proportion of Women Who Received Intermittent Preventive Treatment for Malaria During Their Last Pregnancy

Requirements for rider survey

The survey must be household-based and the household listing needs to include women of reproductive age (typically 15-49) and questions to determine whether they had a birth recently (typically 2-5 years prior to the survey: within the previous 2 years to be consistent with DHS and MICS).

Suggested questions and other considerations

The below questions for obtaining relevant data for this indictor are similar for both the DHS and MICS. The information needed to know whether a woman had a birth within 2-5 years prior to the survey requires an extensive series of questions. If information is desired about antimalarials taken other than sulphadoxine-pyrimethamine, additional questions may be added as needed.

To be asked to each woman of reproductive age (15–49 years old) in the household, or listed on the household schedule.

2.1	Are you pregnant now?	YES.....1 NO.....2 UNSURE.....8	
2.2	CHECK PREVIOUS QUESTION FROM WOMAN'S QUESTIONAIRE, ASKING ABOUT THE TIMING OF THE MOST RECENT BIRTH: ONE OR MORE BIRTHS IN LAST 2 YEARS ☐ NO BIRTHS IN LAST 2 YEARS ☐		⟶ Skip to next section (or end)
2.3	ENTER THE LINE NUMBER, NAME, AND SURVIVAL STATUS OF THE MOST RECENT BIRTH (within last 5 2 years). Now I would like to ask you some questions about your last pregnancy that ended in a live birth.	LAST BIRTH LINE NUMBER..... ☐☐ NAME _____ LIVING ☐ DEAD ☐	
2.4	When you were pregnant with (NAME OF LAST BIRTH), did you take any drugs in order to prevent you from getting malaria?	YES.....1 NO .....2 DON'T KNOW.....8	⟶ Skip to next section (or end)
2.5	Which drugs did you take to prevent malaria? RECORD ALL MENTIONED. IF TYPE OF DRUG IS NOT DETERMINED, SHOW TYPICAL ANTIMALARIAL DRUGS TO RESPONDENT.	SP/FANSIDAR..... A CHLOROQUINE ..... B OTHER _____ X (SPECIFY) DON'T KNOW..... Z	
2.6	CHECK 2.5: DRUGS TAKEN FOR MALARIA PREVENTION	CODE "A" CIRCLED ☐ CODE "A" NOT CIRCLED ☐	⟶ Skip to next drug, section, or end
2.7	How many times did you take SP/Fansidar during this pregnancy?	TIMES..... ☐☐	