Background:
Several recent developments in malaria control policies and practices have highlighted the need for improved monitoring of malaria case management practices.

- In 2010, WHO recommended universal diagnostic testing of all suspected malaria cases. In response to this policy change, quality malaria rapid diagnostic tests (RDTs) are increasingly available and being scaled up by national malaria control programmes.
- More efficient and rational use of artemisinin-based combination therapies (ACTs) for malaria treatment is needed in order to better utilize finite supplies and to combat the threat of drug resistance.
- Improved case detection as a consequence of increased diagnostic testing is required to help track trends in malaria and direct limited resources where they are needed most.
- In 2012, WHO launched the Test, Treat, and Track Initiative to emphasize the link among these three components of malaria control.

Current approaches to monitoring malaria case management have important limitations, particularly in high-burden countries. National programme data on diagnostic testing, treatment and malaria case surveillance are rarely linked in a way that facilitates tracking of testing and treatment practices. National household surveys are increasingly available; however, the validity of information on diagnostic testing and treatment collected has been questioned. Facility-based surveys can address some of the limitations of programme and household survey data on malaria diagnostic testing and treatment, but their use has been limited and standard approaches for malaria have not been updated recently.

In regards to facility-based surveys, the WHO Global Malaria Programme has recently been engaged with WHO Health Statistics and Informatics (HIS) in refining malaria-related survey tools used in the WHO Service Availability and Readiness Assessments (SARA). In addition to ensuring that currently malaria-related information is appropriately captured, GMP had explored adding a malaria quality of care module to the SARA in order to obtain more reliable data on malaria case management.

The meeting on monitoring malaria case management brought together experts and WHO technical staff to share current knowledge and practices on this topic, with a particular focus on facility-based surveys currently coordinated by WHO.

Purpose of the WHO informal consultation on monitoring malaria case management:
The objectives of the meeting were to:

- Update WHO technical staff in malaria and health statistics on current practices and available tools for collecting data on malaria diagnostic and treatment so that they may provide better global and country-level advice on monitoring malaria case management.
- Review strengths and limitations of currently available data on key malaria indicators for monitoring malaria diagnostic testing and treatment.
- Review current approaches for assessing malaria diagnosis and treatment through facility-based surveys and determine how these may fit into ongoing WHO service readiness and quality of care assessments.

**Summary of presentations, discussions and conclusions of the meeting:**

**Case management indicators**

The current indicators for monitoring malaria diagnosis and treatment, developed through the work of WHO and RBM partners and endorsed by WHO and the RBM MERG, are derived from household surveys and national malaria control program data. Malaria case management indicators include those that measure facility-level factors, such as stock-outs of diagnostic tests and first-line antimalarials, and patient level indicators that track the extent to which patients are appropriately tested and treated for malaria. The key patient level malaria case management indicators reported in the World Malaria Report are:

- **For diagnostic testing,**
  - The proportion of suspected malaria cases that receive a parasitological test (from program data)
  - The proportion of children under 5 years old with fever in the last two weeks who had a finger or heel stick (from household survey data)

- **For treatment,**
  - The proportion of confirmed malaria cases that receive first-line antimalarial treatment according to national policy (from program data)
  - The proportion receiving first-line treatment among children under 5 years old with fever in the last two weeks who received any antimalarial (from household survey data).

An important limitation of programme derived indicators is that the elements of each indicator are not recorded directly and therefore must be derived from other available information. Although data completeness has been improving, the extent of possible reporting bias favoring better performing facilities is uncertain. For both testing and treatment indicators derived from household surveys, a small number of countries have a survey done each year. However, recall bias is a concern. In a recent study in Zambia, the sensitivity and specificity of caregivers recalling that a finger/heel stick was done was 61.9%, and 90.0% respectively. The sensitivity for recalling that an ACT was given was 81.0%, while the specificity was 91.5%. In addition, the treatment indicator cannot be reliably linked to the result of testing to know if those treated truly had malaria.

**Review of health facility assessments**

The methodology and results of recent SARA were reviewed, as well as those of a similar facility-level survey, the Service Provision Assessments (SPA). SARA evaluates minimum standards for service delivery at health facilities across a range of health problems. It also includes a data verification module to verify reliability of facility reporting. For malaria, SARA includes an assessment of the availability of ITNS for distribution, diagnostic tests and antimalarials, as well as the presence of staff appropriately trained in malaria. The SARA and SPA conduct a similar inventory of available health services. The SPA also includes a patient caretaker exit interview, a health worker interview, and observations of clinical encounters and patient re-examination. (These are also components of the WHO Health Facility Survey tool used to evaluate Integrated Management of
Childhood Illness guidelines.) Seven SARA were conducted during 2012 and several have been conducted or are planned for 2013. The goal is to institutionalize SARA as part of annual health sector review and planning process, so they would be conducted annually. The SPA methodology is currently being reviewed and a less intensive protocol is going to be piloted in the near future.

**Recently conducted health facility based surveys for malaria case management**

The US President’s Malaria Initiative (PMI) has supported 6 facility-based surveys in recent years (including one SPA), in Angola, Benin, Ghana, Malawi, Rwanda, and Uganda. Five of these surveys included an assessment of health worker performance through observed encounters and patient re-examination, from which information on key patient-level malaria case management indicators could be derived. Definitions for several indicators such as those for stocks were not consistent across surveys and measurement of health worker performance added substantially to the complexity of the surveys in which it was done.

In Zambia, results of a health facility-based and a household survey conducted during 2011-2012 were combined to track the extent of appropriate case management, from identification and testing of suspected malaria cases to provision and adherence of appropriate treatment for confirmed malaria cases. This approach can help identify key steps in case management which need attention from program managers. In this case, relatively high test positivity among those not seeking care and moderate rates of testing suspected cases appeared to be a more important bottle-neck than use of first line treatment among those with confirmed malaria.

The Kenya National Malaria Control Program, with technical assistance provided by the Kenya Medical Research Institute, has conducted national health facility-based surveys twice yearly since 2010 in order to track malaria case management practices during scale-up of malaria diagnostic testing (primarily through increased availability of malaria rapid diagnostic tests). The primary tool for assessing quality of care was an exit interview of patients or their caretakers, without observation or re-examination of the patient. The exit interview utilized patient responses and information from patient facility cards for diagnostic testing results and treatments prescribed. Relying on interviews reduced the cost and complexity of the surveys significantly while producing useful information for programme assessment.

**Key points in discussion and conclusions:**

The limitations of current case management indicators were acknowledged. Ultimately, routine monitoring needs to be improved; however, the need for better information on malaria case management is acute. We should be able to employ more focused, facility-level surveys in the short term while improving routine systems for the long term. These activities are not mutually exclusive, and, in fact, could provide complementary information going forward. Better information on case management indicators improves program management at many levels. For instance, more accurate measures of the number of suspected cases would improve quantification for diagnostic tests.

Extensive feedback was provided for specific malaria related questions in the SARA tool, including those for diagnosis and treatment as well as preventive services for malaria in pregnancy (distribution of ITNs and intermittent preventive treatment, i.e. IPTp) offered through antenatal clinics. Changes will be reflected in new versions of the tool to be used in future SARA. In addition to providing information on availability and provision of malaria case management, the SARA data verification module can provide information on facility reporting that can be used to assess the quality of malaria surveillance.
From description of SARA methodology and understanding of various approaches to health facility-based surveys, it appears feasible to add a quality of care module to the existing SARA. An exit interview of patients or their caretakers, similar to the approach used in recent surveys in Kenya, can collect sufficient information for key malaria case management indicators on diagnostic testing and treatment. The protocol, survey tool, and logistics of this quality of care module for SARA need further development. Developing a protocol for this quality of care module includes consideration of impact on other aspects SARA and potential burden to national programmes.

WHO GMP, working with WHO HSI and KEMRI, will draft a protocol and survey tool to be shared with meeting attendees and other partners. When completed, the quality of care module will be piloted in an upcoming SARA. If successful, malaria endemic countries conducting SARA would be encouraged to include this module. Development of a stand-alone health facility survey protocol for malaria indicators, apart from a SARA, could be considered, but would depend on the outcome of SARA module.