MEETING REPORT

20th Meeting of the RBM Partnership
Monitoring and Evaluation Reference Group (MERG)
16-18 January 2013
Harare, Zimbabwe

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Acronyms

ACT	Artemisinin-Based Combination Treatment
ALMA	African Leaders Malaria Alliance
AMFm	Affordable Medicines Facility – malaria
CHAI	Clinton Health Access Initiative
CDC	Centers for Disease Control and Prevention
DFID	Department for International Development
DHIS	District Health Information System
DHS	Demographic and Health Survey
EAG	Easy Access Group
EPI	Expanded Program on Immunization
ESA	East and Southern Africa
ESP	Elimination Scenario Planning
Global Fund	Global Fund to Fight AIDS, TB and Malaria
GMAP	Global Malaria Action Plan
GMP	Global Malaria Programme (WHO)
HMIS	Health Management Information System
IPTp	Intermittent Preventive Treatment in Pregnancy
IRS	Indoor Residual Spraying
ITN	Insecticide Treated Net
LLIN	Long-Lasting Insecticidal Net
M&E	Monitoring and Evaluation
MDG	Millennium Development Goal
MERG	Monitoring and Evaluation Reference Group
MESS	M&E Systems Strengthening
MICS	Multiple Indicator Cluster Survey
MIS	Malaria Indicator Survey
MoH	Ministry of Health
MPAC	Malaria Policy Advisory Committee
MPR	Malaria Program Review
NHIS	National Health Interview Survey
NMCP	National Malaria Control Programme
PCR	Polymerase Chain Reaction
PMI	US President's Malaria Initiative
PSI	Population Services International
RBM	Roll Back Malaria
RDT	Rapid Diagnostic Test
RHIS	Routine Health Information System
SARA	Service Availability Readiness Assessment
SARN	Southern Africa Regional Network
SP	Sulfadoxine-pyrimethamine
SRN	Sub-Regional Network
SSA	Sub-Saharan Africa
TOR	Terms of Reference
UCSF	University of California, San Francisco
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization

Participants

Chair: Richard Cibulskis (WHO)

Participants:

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Fred Arnold	MEASURE DHS
Kwame Asamoa	USAID/PMI/Zimbabwe
Adam Bennett	Tulane University
Christie Billingsley	USAID/PMI/Zimbabwe
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0.0   Meeting Objectives

1. Receive updates from malaria endemic countries and discuss country perspectives on M&E system strengthening
2. Discuss appropriate data collection tools and approaches in different transmission settings
3. Review global reports and indicators 2012
4. Receive updates from partner organizations and MERG task forces
5. Discuss MERG support to address endemic country M&E needs
6. Discuss the role of the MERG
7. Discuss MERG administrative issues

1.0   Updates from malaria endemic countries and country perspectives on M&E system strengthening

1.1   Zimbabwe
Andrew Tangwena-Zimbabwe NMCP

Andrew Tangwena presented on Zimbabwe's strategic goals: to reduce malaria incidence from 95/1,000 in 2007 to 20/1,000 by 2013 and to lower malaria deaths by at least 50% of 2006 levels. One major objective that supports Zimbabwe's strategic goals is M&E system strengthening at all levels.

Prior to 2005, Zimbabwe had a strong and efficient health information system in place, but struggled with a lack of resources from 2005-2009. Since then, the program has regained momentum and in 2012 collates information at the health facility, district, provincial, and national levels. About 97% of health facilities possess cell phones for weekly reporting to the district level, and there is an average of 70% completeness in facility reporting. Partnerships have improved reporting through the launch of an integrated National Health Information Survey (NHIS) system, which provides data on malaria morbidity, mortality, and commodities consumption. Zimbabwe has also benefited from standardizing reporting tools across intervention areas (combination of paper-based and electronic), rolling out sentinel surveillance alongside community case management, and regularly assessing availability of malaria commodities.

Zimbabwe is currently faced with the following M&E challenges: cost of malaria analysis, stratification mapping, issues with data quality, quality of community case management, a sub-optimal malaria database, lack of clear indicators for the declining malaria situation, and a disconnect between data demand and reporting requirements. Future plans may include: developing a malaria business plan and a new national strategic plan; conducting an impact evaluation and a malaria program review (MPR); and looking into insecticide resistance monitoring and sustainable malaria financing.

1.2   Angola
Ricardo Yava Luvundo-Angola NMCP

Malaria is major problem in Angola, accounting for 51% of deaths in 2010. Nearly three decades of violence (during which time, only 40% of the population had access to services) left a shattered health system at the war's end in April 2002. Since then, the NMCP has worked to improve access to care, build infrastructure and partnerships, increase malaria case notification,

and implement new guidelines for diagnosis and treatment. There has been increased quality in reporting.

Following an assessment in October 2012 and an M&E systems strengthening (MESS) workshop, Angola is restructuring the M&E program in 2013. A new M&E strategic plan for 2011-2015 structure will include community-level malaria interventions for the first time. The program has also made M&E tools available at all levels, distributed an M&E guidelines manual, and trained 60 provincial and municipal officers on a new malaria early warning system. The program is also planning to use Global Fund Round 10 money to conduct additional training on data management for M&E, support new M&E support systems for health facilities, use mobile phone technology in reporting linked to the NMCP website, and evaluate new community-level interventions.

Strengths of Angola's current system include strong surveillance, several partners spanning diverse genres such as academic and commercial telecommunications, and sentinel surveillance on effectiveness of interventions. The national program is looking to address the following weaknesses: poor utilization of data, sub-par completeness and accuracy of data (this is the target of the new mobile phone reporting system), limited human resources for sentinel surveillance, lack of database for operations research, and a lack of integration of operations research projects at the national level.

1.3 Mozambique
Guilhermina Fernandes-Mozambique NMCP

Guilhermina Fernandes presented Mozambique as a malaria endemic country with a lack of health structure and human resources. Malaria-related morbidity and mortality have been steadily decreasing since 2006. Based on preliminary 2011 DHS data, however, coverage for both IRS and IPTp is just 19%. This is attributed to a lack of funds for IRS and incomplete reporting for IPTp in 2011. A new system ensuring weekly collection of routine IPTp data is now in place to address the reporting issue.

The NMCP completed a MPR in 2010, which identified several points for improvement: a weak system to consolidate programmatic data, lack of an NMCP database, lack of TORs for M&E staff, no plan for population-based surveys or operational research, and lack of awareness regarding responsibility for data management apart from the M&E team.

The MPR had a significant influence on the program and reshaped the malaria M&E plan in order to meet these needs, including an improved data collection and management system. In 2012, provincial malaria focal points with an M&E responsibility were appointed, TORs were defined, and a district malaria form was developed to facilitate aggregating district-level malaria data including use of RDTs and ACTs. Provincial trainings are ongoing; however, three provinces are still in need of funds to conduct said training. Although Mozambique receives money from the Global Fund, Ms. Fernandes is unsure whether any of these funds are being directed towards M&E.

1.4   Swaziland
Simon Kunene-Swaziland NMCP

Swaziland has progressed towards malaria elimination using a 4-pronged malaria elimination strategy comprising: case management, integrated vector management, surveillance and epidemic preparedness, and health education. Two key impact indicators are used to measure progress: laboratory-confirmed malaria cases seen in health facilities and laboratory-confirmed malaria deaths seen in health facilities. The laboratory-confirmed malaria deaths indicator may have been set too low (0.5 per 1000 population at risk), which makes it appear as though the program is not succeeding. However, several outcome indicators show that there has been considerable progress.

In order to strengthen the M&E system, Swaziland utilized GIS data for spatial analysis, which has helped target households in malaria-prone areas for distribution of vector control tools. Swaziland has also employed a mobile phone system for immediate reporting of positive cases to NMCP. The household location and contact information of the case are noted and reported by the health facility, and both the household and all residents within 1km are screened and surveyed. This strategy has a focus on full coverage rather than targeting specific groups such as children and pregnant women. The NMCP has the resources need to carry out these activities.

A MESS workshop was organized in June 2012 to assess the program's abilities to collect, analyze and report accurate, valuable and high quality M&E data. The workshop identified strengths, including that the NMCP has the necessary resources and skills for M&E data collection and reporting, data collections systems are functional, indicators are appropriate, immediate disease reporting system bypasses error-prone intermediate levels, and confidentiality of sensitive data is maintained. Swaziland has worked on addressing challenges including lack of alignment with the strategic plan (updated July 2012), mismatch between the health management information system (HMIS) and the immediate reporting system, incomplete treatment and diagnosis data, and lack of SOPs.

1.5   Discussion of country perspectives on M&E system strengthening (no slides)
Samson Katikiti-ALMA

Samson Katikiti led a discussion based on the preceding four country presentations. The first point of discussion revolved around what support countries need, aside from financial, to improve M&E systems. Endemic country participants requested clarification around the role of the MERG and how it can support country programs, sensible and useful indicators, adoption of protocols that suit country programs, capacity building to address lack of human resources, database development, and technical assistance to evaluate the impact of specific programs.

Regarding the integrated disease surveillance and response, endemic countries reminded participants that national programs are at different points and working at different speeds. The group must not slow progress by introducing new systems that can't be fully supported in country.

Several country presentations mentioned mobile technology, so the group was questioned about what support the MERG can lend. Zimbabwe has been using phone technology in its rapid system to stop outbreaks. As the country approaches elimination, the NMCP is interested in using it for case detection and to regulate commodities. They have engaged private sector mobile

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phone companies, but need to strengthen this for cost effectiveness. Other disease programs in Zimbabwe have expressed interest in replicating this model. Angola mentioned that despite an existing strategic document about the issue, it has been a challenge to integrate a new mobile program into the broader health system.

2.0   Appropriate data collection tools and approaches in different transmission settings

2.1   [Malaria surveillance bulletin for programmes in East and Southern Africa (ESA)](link)
Khoti Gausi-WHO

A 2008 WHO/AFRO meeting generated interest in making data more readily available. Countries were initially encouraged to produce national, in-country bulletins, but this was not possible for all countries and could not account for critical border issues.

The 2012 East and Southern Africa (ESA) regional surveillance bulletin was published using program data from 17 geographic entities. In order to enable timely sharing of information across borders, the data may come from a variety of sources and does not undergo the extensive review and validation process used for HMIS data. There are some issues with completeness of data and delays in reporting, as shown in the presentation's graphics. Using Malawi as an example, Dr. Gausi explained that even when data are complete, there may be remaining issues "behind the data" that could be improved.

Dr. Gausi hopes there will be two bulletins issued in 2013 and that the bulletin will eventually be a quarterly publication.

2.2   [Finding asymptomatic carriers-hotspots and hotpops (hot populations)](link)
Roly Gosling-UCSF

Malaria elimination efforts have been "shrinking the map" from both the north and south so that malaria endemicity remains highest around the equator. Roly Gosling argues that surveillance and response to cases will be critical to eliminating malaria in these areas.

Malaria at low endemic/pre-elimination levels is highly clustered, both geographically in "hotspots" and demographically in hot-populations or "hot-pops." Hotspots (identified in red) are heterogeneous, unlike foci, which would be the entire square of houses depicted. Hotspots become more discrete in lower transmission settings, and when transmission is low enough, it becomes concentrated in hotpops rather than a geographically defined area. Hotpops may be identified by a common occupation or travel pattern in which individuals are exposed to malaria away from their homes. Transmission, therefore, must be addressed in order to identify asymptomatic cases and ultimately, reach malaria elimination.

Dr. Gosling uses the "malaria iceberg" analogy to show that RDTs and microscopy identify patent infections and screening identifies patent and asymptomatic infections. Although new technologies, such as polymerase chain reaction (PCR), address sub-patent infections, we don't yet know much about the effect of this. Contrary to old dogma, we actually need stronger systems in low transmission settings in order to address the proportionately higher sub-patent carriage and achieve elimination. Passive case detection alone will not be enough.

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2.3 **A tool for evaluating active surveillance for malaria control and elimination**
Roly Gosling-UCSF

Active surveillance is commonly used outside of Africa, but there are only a few programs in Africa engaged in active surveillance (South Africa, Zambia, Swaziland, and a pilot in Zanzibar). Active surveillance can either respond to high risk areas/groups (proactive case detection) or respond to cases (reactive case detection). Both forms of active surveillance are resource intense and have additional issues, such as the size of the screening radius. Additionally, we are still unsure about how effective these methods are in preventing transmission and detecting additional cases.

An evaluation tool is in the works to document key operational, technical and financial components of Case Investigation and Reactive Case Detection activities, identify strengths and gaps in the current surveillance activities, and ultimately improve program performance. A first draft of key indicators was completed, but after a request for simplification, a second draft is now open to suggestions. The tool will be generic and adaptable to several countries.

2.4 **Elimination scenario planning tool**
Mike Lynch-WHO

WHO and partners (CHAI, Imperial College, Global Health Group) have worked on developing an Elimination Scenario Planning (ESP) tool in response to a need for strategic malaria elimination and control planning. The ESP tool has two main components: a manual, which reviews key concepts in elimination planning and outlines what is possible to achieve, and a malaria transmission model.

The model is designed for an African setting with *P. falciparum* malaria and is currently available online through Imperial College. The model establishes a baseline transmission level and allows the user to explore the effect of different combinations of interventions. Future development plans for the software include adding a component for assessing the costs of different combinations of interventions and the financial feasibility of elimination. It can be adapted for control settings by manipulating the target end level, and therefore could be used for overall program planning.

The model was fitted to historic parasite prevalence data and will continue to be validated going forward. The original model relies on ITN ownership as a proxy of use. The current online interface is not set up to work from a given target of malaria transmission backwards towards a recommended combination of interventions. The model could be used to identify false assumptions when Malaria Indicator Survey (MIS) data does not match expectations based on interventions.

The manual and software were evaluated in 2012. The manual is currently being revised and finalized, with a goal of dissemination in early 2013. An article describing the model has also been published in Plos Medicine. Those interested in getting involved with the tool can get in touch with Dr. Lynch.

2.5 [The transition from household surveys to routine surveillance to measure the epidemiology of malaria](#)
Abdisalan Noor-KEMRI-Wellcome Trust

The problem of the epidemiological measurement of malaria under declining transmission is not new and was an issue during the Global Malaria Eradication Project. A 1960 study by Yekutiel compared the results of malariometric surveys and case detection procedures in six countries. This study clearly demonstrated higher case detection from surveillance in very low transmission countries. A paper by Hay et al published in the Lancet Infectious Disease (2008) synthesizes more recent information on what metrics to use in different transmission settings. A graph in that article shows that as transmission decreases, the various metrics have different results. As countries approach 3% (or 2% according to the Hay article) prevalence, they should consider employing case detection.

Dr. Noor suggested that the tools used to estimate malaria burden are not necessarily the same as what one should use to measure transmission. The need for a functioning routine surveillance system is not predicated on the prevalence of a specific disease. Household surveys are done, in part, because of weak healthcare systems and routine surveillance systems in Africa although they also afford an important opportunity to collect data on several demographic and health issues outside of routine surveillance systems. Although there have been improvements in HMIS (DHIS 2, mHealth, etc.) in the last decade, several bottlenecks persist, and these improvements have probably been outstripped by simultaneous declines in malaria risk and burden.

Data quality and declining transmission are not uniform across all areas in a country, but declining transmission means prevalence estimates from household surveys may have decreasing precision. Additionally, poor retrospective routine data and changing case definitions have rendered such systems unreliable for measuring change in the past. Community survey prevalence data may be an alternative or additional source for measuring change but has its own challenges.

In the medium term, the best approach is to use mixed-source data to make decisions. This combination of surveillance and household survey data was used in the World Malaria Report and several country-level studies (e.g. Namibia) can also provide sub-national estimates of incidence. The adoption of surveillance techniques should depend on an assessment of the type, quality, and coverage of a country's routine surveillance systems. Countries that have transitioned to hypoendemic transmission should explore sub-national rollout of case detection systems. Dr. Noor requested that we also look into the potential of national health facility test positivity rate surveys in improving our understanding of malaria risk and burden.

2.6 [Accounting for climatic effects on malaria prevalence estimates](#)
Adam Bennett-Tulane University

Climate drivers of malaria prevalence include seasonality in rainfall/temperature in the short term, inter-annual cycles in the medium term, and climate change in the long term (as seen in the Kenya highlands). Most evidence is from incidence time-series, and the climate-transmission linkage is decreasing historically. Zambia has a growing wealth of climate data.

According to MIS data, national rural malaria parasite prevalence in under-fives went from 29% in 2006 to 12% in 2008 to 20% in 2010. To identify if this pattern was due to changes in ITN ownership, El Niño patterns, or something else, Adam Bennett looked at remote sensing satellite and geographic data (including temperature, vegetation, rainfall, altitude, land use, population, and distance to water bodies). This was fed into a non-spatial random-effects model predicting child malaria slide positivity. The team exact matched on transmission, wealth quintile, urban/rural location, and separate models were generated with and without the climate covariates.

The results showed that a combination of lower ITN coverage and climatic factors contributed to the increase in parasite prevalence noted in the MIS 2010 compared to MIS 2008. There was no evidence of ITN efficacy decay, so the majority of the increase appears due to climate. This is consistent with inter-annual El Niño patterns, and since there were similar patterns in sub-national parasite prevalence data in Malawi, there is likely substantial regional influence.

Limitations of the study include that there was no assessment of insecticide resistance or population mobility, there is imperfect detection from the cross-sectional microscopy data, and there was likely confounding of the association between parasite prevalence and climate lags due to the length of malaria infection.

Adam Bennett recommends that researchers consider explicitly adjusting for inter-annual climate variability when evaluating malaria program progress with parasite prevalence data. Where possible, it would also be helpful to improve connections between malaria control program data systems and climate data repositories. Rolling MIS-type data is especially important for clarifying these relationships.

2.7   Health system effects of malaria indicators in Kenya and Tanzania
Rene Gerrets-University of Amsterdam

A proposed study by Rene Gerrets aims to describe the origins of selected malaria indicators and examine the ramifications of their implementation at various levels of the health system. Since the late 1990s, there has been significant expansion of malaria interventions worldwide accompanied by growing demand for more effective monitoring and evaluation. Dr. Gerrets states that the role, content, and number of malaria indicators has both transformed and expanded in this time.

The study is expected to commence in late 2013 or early 2014 and will aim to answer the following research questions: How do pressures to use malaria indicators shape institutional priorities and practices on the ground in settings with weak health infrastructures? How is the indicator boom influencing knowledge production about malaria? And what are some of the unforeseen ramifications of this shift?

The proposed study sites are Tanzania and Kenya. Within each country, two districts will be purposefully selected in consultation with the NMCPs for detailed ethnographic investigations on the practice of indicator generation in four health facilities. An additional eight purposefully selected districts in each country will be chosen for a rapid assessment of the practice of indicator generation at the district level. These methods will be accompanied by a stakeholder analysis at the district, national, and international level and secondary data collection from a variety of written sources.

The study indicators include: one impact indicator measured every 3-5 years in surveys (deaths attributed to malaria among children younger than five years of age) and two output indicators measured every 3-6 months through facility records and/or surveys (slide/RDT positivity rate; percentage of pregnant women receiving at least two doses of IPTp at ANC clinics).

2.8   Local continuous MIS surveys
Anja Terlouw-LSTM

Continuous surveys are cross-sectional surveys where data are collected over several years by permanent teams. These surveys support timely local decision-making and create an opportunity to integrate quality management, involving staff in monitoring and improving quality control efforts. A potential weakness of these surveys is sustainability without proper long-term buy-in health leaders and donors. Nonetheless, continuous surveys may serve as one additional method we can stack to understand the larger picture.

In 2007, Malawi adopted the 'Scale up for Impact' approach to reach universal coverage through scaling up of ACTs, IPTp, LLINs, and IRS. By 2011, the effort comprised seven districts, including Chikhwawa, where progress was evaluated as part of a research program that explores complementary approaches for M&E at subnational levels.

Anja Terlouw's research involves 50 villages using a continuous, cross-sectional survey using monthly data collection. The standard MIS questionnaire and indicators were used, but the process allowed for district-level estimates, unlike the national MIS, and spatial analysis of where specific cases occur, unlike HMIS. The rolling study occurred in the period between data collection for the national MIS in 2010 and 2012, and the process was kept as practical and simple as possible.

Although ITN coverage, as expected, remained relatively stable over time, the continuous MIS data show real change in IRS coverage after spraying occurred in March/April 2011. There is some fluctuation in coverage indicators due to households refusing the spraying, but the tapering of coverage after 12 months indicates that reporting is fairly accurate. The research team also tracked changes in impact indicators (parasitemia and anemia) after IRS; while there is the expected seasonal fluctuation, there does not seem to be major change in anemia before and after the IRS campaign.

These data also allow for spatial analysis, whereby hotspots are indentified. When compared with geographic data for IRS and ITN coverage, an association between low coverage of prevention measures and higher malaria prevalence can be seen. Researchers also discovered valuable information relating to malaria prevention and control, such as lack of awareness that the bednets were long-lasting or misperception that IRS kills all types of mosquitoes.

Although the research team is aware that the wide confidence intervals and small sample size of this research may be criticized in academic settings, the data may be helpful for programmatic decision-making. The next steps will be to: scale up the area to cover a population of 100,000; explore community engagement in M&E and implementation; and assess a 'Plan-Do-Check-Act' approach for quality control. The research team will also explore the role of geospatial modeling, including developing local burden maps.

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2.9   Evaluation in Easy Access Groups
          Anja Terlouw-LSTM

Dr. Terlouw presented on behalf of Sanie Sesay on easy access groups (EAG), a tool for monitoring temporal changes in malaria transmission and uptake of control interventions. In a community, key at-risk groups or large population groups cluster, for example at churches or markets, and are therefore easily accessible. The research team is currently assessing the following EAGs: children attending Expanded Program on Immunization (EPI) clinics (plus their mothers and siblings), mothers attending ANC clinics, and pediatric trauma cases admitted to hospital. An additional district market pilot survey is planned as a future EAG.

The study methods consist of two continuous surveys. One was a facility-based survey in Chikhwawa District Hospital and the other a population-based monthly household survey of 50 villages within a 15km radius of the Chikhwawa District Hospital. Easy access sampling at EPI clinics has been compared to household survey results in a research study by Mathanga et al published in *Malaria Journal*.

From May 2011 to April 2012, 576 households contained children aged 6-59 months in the MIS and 317 households in the EPI survey. A total of 689 and 331 children aged 6-59 months were surveyed in the MIS and EPI survey, respectively. In the EPI EAG, there is overestimation of younger age groups, as EPI targets younger children, and also slightly higher representation of richer quintiles. The EAG yielded similar but higher values for both coverage and impact indicators. Although there were no significant differences in uncorrected parasite prevalence, estimates shifted after correction.

Overall, surveillance in the EPI EAG is feasible but may be potentially biased due to health facility utilization rates for outcome indicators and age structure for impact indicators. However, the level of bias may be acceptable to guide local programmatic decisions. Hybrid sampling strategies combining EAG and targeted population sampling may be able to overcome this.

Future work will involve retelling the EAG experience in the malaria literature, comparing seroprevalence to antimalarial antibodies between EAGs and MIS, evaluating the trauma and ANC EAGs, and looking into spatiotemporal comparisons and hybrid sampling strategies. The research team is also considering linking up with a health economist to complete some cost effectiveness analyses.

The group discussed implications of this work. No changes have yet occurred in local or national decision making during this period although the country has been briefed. The next step is to find ways of collaborating to identify and address areas of low coverage. One challenge is that IRS equipment is usually out of the community by the time that these hotspots are identified.

3.0   Global reports and indicators 2012 and 4.0 updates from partner organizations and MERG task forces

3.1   P&I Series Reports
Eric Mouzin-RBM

There are three types of Progress and Impact Series reports: overview reports, thematic reports, and country reports. To date, eight thematic reports have been published, with the most recent one focused on Defeating malaria in Asia, the Pacific, Americas, Middle East and Europe (see following presentation). The most requested publications are Country Funding and Resource Utilization (which may be worth updating), Business Investing in Malaria Control, and A Decade of Partnership and Results. A report on maternal and newborn health is scheduled for this year but may not be released until 2014.

Country reports on Senegal, Zambia, Mainland Tanzania, Nigeria, and Swaziland have also been released. These reports have received a lot of media attention and political support. Around 1,000 copies of the report are allocated for in-country use and are quickly disseminated; anecdotal evidence suggests they have been useful advocacy tools. In Swaziland, the president and several ministers were included in the November 2012 launch and are now aware of key talking points. Additional reports for Angola, Madagascar, Malawi, and Zanzibar are currently scheduled.

There are plans in place to make the reports available online with search features and easier to use graphics in 2013. There are no current plans to compile lessons learned from publishing the first several reports; however, this is an idea that may be considered in the future. Please contact Eric to be placed on the P&I distribution list or with relevant updates.

3.2   P&I Series Report: Defeating malaria in Asia, the Pacific, Americas, Middle East and Europe
Richard Cibulskis-WHO

The latest thematic report of the P&I series was launched in November 2012 and focuses on malaria outside of Africa. Authored by the Global Malaria Programme (GMP), the document comprises two volumes: a policy brief and a detailed progress report.

International funding for malaria control has risen by more than eight-fold since 2003. There have also been large increases in the number of LLINs, RDTs, and ACT courses delivered. However, the number of people protected by IRS, the most common form of vector control outside of Africa, has remained stable. Thirty-four of 51 countries outside of Africa have reduced case numbers by more than 50% since 2000. Most of these decreases have been in smaller countries that have fewer than 30,000 annual cases. Four countries have been certified as free of malaria since 2007 (Armenia, Morocco, Turkmenistan, and the United Arab Emirates).

Further progress is possible, but there are major challenges. As malaria decreases, it is increasingly concentrated in more difficult to reach populations, epidemics are more likely, and *P. vivax* malaria becomes more prominent. Additionally, there is evidence of emerging artemisinin resistance in Southeast Asia and resistance to insecticides in 23 out of 51 countries. Future funding for malaria control in the Americas, Europe, Asia, and the Pacific is also threatened.

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The report urges us to increase investment by global donors and governments in malaria control, elimination, and research, increase access to preventive interventions, scale up diagnostic testing, treatment, and surveillance, fight drug and insecticide resistance, and strengthen regional cooperation. There is a proposal to create a body similar to the African Leaders Malaria Alliance (ALMA) for this region.

3.3   WHO update
Richard Cibulskis-WHO

A series of 10 case studies on malaria elimination is being produced by the GMP and Global Health Group (at UCSF) to provide lessons learned for other malaria programs. The first four were launched in October 2012 and are available online: Cape Verde, Sri Lanka, Turkmenistan, and Mauritius. Three more reports will be launched in June 2013, and the final three will be released in December 2013.

A new Malaria Policy Advisory Committee (MPAC) came into operation at the start of 2012, after approval by the WHO Director-General of its terms of reference and membership. Its mandate is to provide strategic advice and technical input to WHO on all aspects of malaria control and elimination, as part of a transparent and timely policy-setting process that is responsive to a rapidly changing malaria landscape. The MPAC also involves a number of Technical Expert Groups (standing) and Evidence Review Groups (time-limited), including the Malaria Burden Estimation Evidence Review Group, which will meet in January 2013.

The Situation Room tracks financing and flow of commodities in 10 priority countries to prevent potential bottlenecks in program implementation. Its steering committee comprises GMP, WHO/AFRO, RBM Secretariat, ALMA, and the United Nations Special Envoy for Malaria, who meet biweekly via teleconference. A tracking system has been developed so the group can collate information on program coverage, cases, and deaths.

An update to the 2010 draft manual on undertaking MPRs is currently being edited and will be field tested in early 2013 before being finalized.

3.4   MACEPA update
Rick Steketee-PATH/MACEPA

PATH's Malaria Control and Evaluation Partnership in Africa (MACEPA) is based in Zambia and also works in Ethiopia, Kenya, and Senegal. The partnership supports the scale up of country malaria interventions and helps countries identify elimination and malaria-free zones.

MACEPA employs three steps for progress towards malaria elimination zones: (1) improved surveillance at the clinic level, (2) population-wide parasite identification and clearance, and (3) pushing malaria surveillance to the community level. Step 1 focus indicators show up on a dashboard graphic at facilities, allowing them to compare their progress with other facilities. Facilities can also discern information about malaria burden and stock management from these indicators. Step 2 complements current interventions and is rolled out in combination with at least one vector control strategy. This step focuses on reducing transmission in control areas by addressing parasite reservoirs, especially among asymptomatic community members. Step 3

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involves community-based surveillance. Cases from passive surveillance and active surveillance are registered and eventually fed into the District Health Information System (DHIS).

Some areas of Zambia are at the control phase, whereas others have eliminated malaria. Clinics or districts are the unit of elimination for Zambia, which may suggest that it is time for a paradigm shift in the elimination spectrum. WHO does not want to get involved in sub-national certification, so countries would need to do this on their own with peer review from neighboring countries. There has been discussion on creating a document on how to do this. Dr. Steketee does not advocate for subnational certification, but does believe that this process of eliminating malaria in facilities and districts will eventually get countries in a position to begin discussions of a final push towards country-wide elimination.

3.5   **World Malaria Report 2012**
       Richard Cibulskis-WHO

The World Malaria Report 2012 was released on December 17, 2012. It is an annual reference publication on the status of global malaria control and elimination, incorporating data from 2011 and 2012. The report summarizes key malaria targets and goals in addition to documenting trends in financing, intervention coverage, and malaria cases and deaths. Profiles for the 99 countries and areas with ongoing transmission are also included in the report.

Fifty of the 99 countries with ongoing transmission are on track to reduce their malaria case incidence rates by 75% by 2015, in line with RBM targets. Elimination of malaria in the European Region appears attainable by 2015. An estimated 1.1 million malaria deaths were averted during the past decade, and 58% of these lives were saved in the ten countries with the highest malaria burden, indicating that progress is being made where it matters most. There has also been major progress in the delivery of RDTs and ACTs.

However, the number of LLINs delivered to countries in sub-Saharan Africa dropped from 145 million in 2010 to 66 million in 2012 and the proportion of the population protected by IRS remained constant. Unless there is a substantial scale-up of vector control activities in 2013, we can expect resurgences of malaria. At US$2.3 billion, funding for malaria is well below the US$5.1 billion needed to reach internationally-agreed global malaria targets. Drug and insecticide resistance also remain a concern, and if left unchecked, could threaten the remarkable progress made during the past 10 years.

The last decade has shown just how powerful our existing tools are at saving lives, but access remains limited. The challenge now is to sustain and extend those gains to ensure that everyone at risk of malaria has access to prevention, diagnostic testing, and treatment for malaria.

In compiling the report, several weaknesses in M&E systems are evident. Recent household survey data are not always available, so ITN coverage needs to be modeled for many country years. These estimates may be problematic when mass campaigns are done. Routine data on diagnostic testing is not reported reliably for many countries, and estimates may be biased as countries with better systems report more completely. It is also difficult to track the extent to which confirmed malaria cases receive an antimalarial medicine since test results are not usually linked to the treatment given. A reliable assessment of trends can be made in 58 countries out of 99 with ongoing transmission using data submitted to WHO. These countries account for only 34 million or 15% of total estimated cases in 2010, leaving out many of the high-burden countries.

The group discussed possibilities for future reports, including addressing drug quality and counterfeits. It would be useful to examine which countries are conducting drug testing and what their data is showing. Although WHO does not have anything to date on this topic, the report could be a vehicle to highlight work by others.

The group also discussed the balance between reporting country-level data and regional aggregation. For example, members of the group would be interested in seeing more data about care-seeking behavior at the country level since there is so much diversity within regions. The current report includes regional profiles (Africa is divided into four regions on pages 70-77) in addition to country profiles. WHO is also starting to work on more detailed country-level reports using the World Malaria Report as a base. Verified data from Sub-Regional Networks (SRNs) may be useful in addressing lacks of data in the development of future reports.

3.6   [Update on Household Survey Indicators for Malaria Control Manual](#)
Elizabeth Ivanovich-MEASURE Evaluation

Three revisions to the Guidelines for Core Population-Based Indicators have been released to date (2004, 2006, 2009). Several drafts of the document, now titled Household Survey Indicators for Malaria Control, have been produced by MEASURE Evaluation with feedback from the Task Force; it is now undergoing the WHO publication approval process and is expected to be released in early 2013.

There are a number of new indicators for vector control and case management as follows:
Proportion of households with at least one ITN for every two people
Proportion of population with access to an ITN in their household
Proportion of population who slept under an ITN the previous night
Proportion of children under 5 years old with fever in the last 2 weeks for whom advice or treatment was sought
Proportion receiving ACTs (or other appropriate treatment according to national policy) among children under five years old with fever in the last two weeks who received any antimalarial drugs

All of these new indicators can be calculated from previous survey data. As such, they have been included in recent publications, including the World Malaria Report.

The group discussed the branding and approval process of the document, which has caused some delay in its release. All parties expect that the document will be released soon, particularly for the sake of country use.

[Update on Malaria Indicator Survey Package](#)
Fred Arnold-MEASURE DHS

The RBM MERG Survey and Indicator Guidance Task Force completed the revision of the MIS Basic Documentation for Survey Design and Implementation. This is a comprehensive package of tools for providing guidance for carrying out household-level surveys to assess core malaria indicators. Recommendations in the package are based on field-tested questions and methods.

All MERG members were invited to review the draft materials, and at least two MERG members reviewed each chapter of the package. The package has been finalized and is now ready for distribution. It will be available through various venues online, relevant listservs, on flash drives for NMCPs, and Word and Excel versions may be requested. Please contact Dr. Arnold with any additional ideas for distribution.

Although the package is currently only available in English, there is a French translation of the questionnaires. MEASURE DHS and the MERG will look into funding translation of additional documents so that there can be at least a more substantial French package.

The group discussed the possibility of WHO or the MERG encouraging countries to make MIS data available for additional analyses. Eight countries have not made MIS data available, but may consider doing it now that Swaziland has taken the lead.

3.7   Survey updates
        DHS/MIS update
        Fred Arnold-MEASURE DHS

Dr. Arnold provided a list of recent, expected and ongoing DHS and MIS surveys, as summarized in the table below.

	Released in 2012	**Expected release soon**	**Planned or ongoing fieldwork**
Malaria testing	Cameroon DHS 2011 Burkina Faso DHS 2010-11 Ethiopia MIS 2011 Liberia MIS 2011 Angola MIS 2011 Senegal DHS/MICS 2010-11 Rwanda DHS 2010 Nigeria MIS 2010	Côte d'Ivoire DHS 2012 Malawi MIS 2012 Tanzania MIS/AIS 2011-12 Benin DHS 2011-12 Mozambique DHS 2011-12 Equatorial Guinea DHS 2011 Guinea DHS 2012	Sierra Leone MIS 2013 Gambia DHS 2013 Burundi MIS 2012 Senegal Continuous Survey
Malaria questions (no testing)	Burundi DHS 2010-11 Zimbabwe DHS 2010-11	Congo Brazzaville 2011 Niger DHS 2012 Comoros DHS 2012 Gabon DHS 2012	Rwanda MIS 2013 Mali DHS 2013 Namibia DHS 2013 Togo DHS 2013 Zambia DHS 2013

Please contact Dr. Arnold if you know of other MIS surveys not mentioned here. In addition to these household surveys, Service Provision Assessment (SPA) surveys are ongoing/continuous in Senegal and planned in Bangladesh, Ethiopia, Haiti, Malawi, and Tanzania in 2013.

Dr. Arnold also briefly compared IPTp trends among all 45 DHS/MIS surveys and among just the 27 most recent surveys in each country. The average percentage of women receiving any sulfadoxine-pyrimethamine (SP) for prevention was much higher than the average percentage of women receiving three or more doses of SP. These percentages are similar for the older and newer surveys, suggesting that there has not been much change over time.

The group discussed the survey schedule and coordination among funders, country programs, and implementers. Although DHS is often completed every five years, the government planning process serves as a starting point for scheduling surveys. MICS is a bit less flexible since they

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are completed in rounds. MIS are generally conducted during high transmission season in order to glean the most useful information for country planning. There have been attempts to move towards continuous surveys in countries such as Peru and Senegal, and this type of survey may be introduced in additional countries if the continuous surveys are found to work well in a variety of country contexts.

MICS 4/5 update
Liliana Carvajal-UNICEF

Since 1995, over 230 Multiple Indicator Cluster Surveys (MICS) have been completed in over 100 countries. Between 2009 and 2012, 65 MICS 4 surveys were completed, including 8 surveys in east and southern Africa, 12 surveys in west and central Africa, and 3 surveys in northern Africa. Those with malaria modules are summarized in the table below. Survey reports and/or data are now available online at www.childinfo.org, which has updated search features.

West and Central Africa	CAR 2010 Chad 2010 DR Congo 2010 Gambia 2010	Ghana* 2010-2011 Guinea Bissau 2010 Mali 2009-2010 Mauritania 2011	Nigeria 2011 Sierra Leone 2010 Togo 2010
Eastern and Southern Africa	Kenya* 2009, 2011 Madagascar* 2012	Somalia* 2011 South Sudan 2010	Swaziland 2010

*Subnational

The fifth round of MICS (MICS 5) was officially launched by UNICEF in October 2012. Additional modules and new technologies for MICS 5 were piloted in Bangladesh in 2012, and survey instruments and supporting documents are expected to be finalized in early 2013. Care of illness questions have been modified for this round to emphasize care seeking behavior and community case management in closer harmonization with DHS and MIS.

3.8   When to conduct DHS/MICS and/or MIS (no slides)
Liliana Carvajal-UNICEF

There is increasing concern among stakeholders about expressed interest in pulling malaria modules out of scheduled DHS or MICS to make room for or make an argument for an MIS in the same year. This has happened in Ethiopia, where the sampling framework was modified to include elevation data, which would have been difficult for the DHS survey to do. However, there are no confirmed reports of this occurring in other countries.

Among the things that we lose by taking the malaria modules out of DHS and MICS is the linkage with other child and maternal health indicators that are included in larger surveys, thereby limiting the ability for secondary analyses across other areas of health. This may also constrain survey use at the program level.

The MERG agreed early on that the MIS would be a survey to "fill gaps" in countries without sufficient recurrent data. Currently, MICS is available every three years and DHS, while typically scheduled every five years, has often been available more frequently. In this scenario, some countries have a survey every one to two years.

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The main interest in MIS is the data collection during peak transmission periods rather than during dry season (as is typical for DHS and MICS). The concern is that the malaria indicators collected during dry season are not necessarily indicative of program progress compared to data collected during peak transmission period. However, not all indicators are sensitive to seasonality. The ones that would be most affected by seasonality are ITN use, parasitemia, and anemia. Parasitemia is the main area of interest for MIS. However, the interpretation of parasitemia needs to be done with caution.

Several questions were posed to the group: Are population-based, cross-sectional surveys the best choice for collecting parasitemia data to "monitor" programs? How frequently do we need parasitemia data from population-based surveys? Given that facility-based data is gaining interest, how do we fit that in as well if we are thinking about facility surveys? These are questions that MERG needs to help answer and provide guidance around in the current context of frequent surveys.

PMI has issued guidance about this topic to country programs. UNICEF and PMI will draft a document addressing this issue and will circulate it to MERG members. MERG may consider issuing a separate statement on the issue, beginning with the history of the malaria community fighting to get malaria questions into the DHS and to get funding for malaria data collection.

3.9   Implications of revised WHO guidance on IPTp coverage indicators
Erin Eckert-USAID

Rollout of SP has not been as successful as expected, despite a 20-year history. This has often been explained through suggestions that women are not reporting to the health system, and therefore without ANC visits, SP cannot be administered. This is not supported by survey data (ANC coverage is usually much higher than IPTp coverage) and unjustly puts the onus on women rather focusing on service provision. However, "missed opportunities," when women report for ANC but do not receive SP, are well documented in sub-Saharan Africa, with the exception of Zambia.

WHO recommendations on IPTp were recently revised to provide detailed information on SP provision. The new guidance states that "All pregnant women in areas of stable malaria transmission should receive at least two doses of IPT after quickening. The World Health Organization recommends a schedule of four antenatal clinic visits, with three visits after quickening (when the mother first notes fetal movement). The delivery of IPT with each scheduled visit after quickening will assure that a high proportion of women receive at least two doses. IPT-SP doses should not be given more frequently than monthly."

Indicators have been revised, with the main new indicator measuring the percentage of women having a live birth in the last 2 years who had IPTp 1, 2, 3, and 4 times in their most recent pregnancy (tabulate each dose separately). Additional indicators have been proposed to address "missed opportunities", but require further discussion before publication and use.

Survey measurements of IPTp indicators
Kathryn Andrews-ALMA

Since women should only be receiving IPTp at ANC visits, comparing IPTp doses to ANC visits is a way to examine whether the bottleneck in scaling up IPTp is due to pregnant women not

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getting enough ANC, or not getting enough IPTp during ANC visits. Kathryn Andrews found 52 surveys with information on number of ANC visits and looked at indicators related to IPTp doses, ANC visits, and the combination of the two. A missed opportunities indicator assesses tangible room for improvement but must also be considered with ANC coverage since, for example, low missed opportunities could indicate high IPTp coverage or low ANC coverage.

Prevalence of ANC visits and IPTp doses varied considerably by country. However, prevalence of at least four ANC visits was low, as was prevalence of four doses of IPTp. There was also surprisingly low variability in receipt of IPTp from the poorest to richest wealth quintile.

The current indicator calculates prevalence using the percentage of women who received IPTp during ANC visits during their last pregnancy, which could be up to five years prior. Since the year of pregnancy is not necessarily the same as the year of the survey, Ms. Andrews proposed calculating IPTp for each calendar year based on when each child was born. The resulting time series allow us to track change over time. Although variation in IPTp coverage hasn't been drastic in past years, that may change in the future, particularly with the new WHO recommendations. The calendar year is more sensitive to variation over time, whereas using the survey year dilutes the change that we want to measure. Challenges of using the calendar year include deciding what to do with multiple data points per year (since each survey yields approximately five years' worth of data points), smaller sample sizes, and recall bias.

The next steps are to finalize a list of indicators that can be used to evaluate progress on IPTp and to decide whether to use the survey year or calendar year.

The group discussed the need to account for women that may be counted as missed opportunities since SP is contraindicated for HIV+ women taking cotrimoxazole. Discussions are underway to address this issue, possibly by deriving a proxy for individuals based on aggregate data from DHS on HIV prevalence among women. It was also mentioned that IPTp is not given in areas of the country that are free of malaria, but this is not considered in coverage indicators, thereby biasing results towards low coverage and perhaps sending out the wrong message to stakeholders. A systematic way of reporting coverage by where interventions are rolled out needs to be developed; perhaps sub-national analysis could be considered. Adding IPTp to the ALMA scorecard was suggested as a way to highlight this issue to MoH. The group also discussed the need to include data from MICS surveys in the analysis and to look at the issue of ANC by skilled provider.

3.10   Assessing the validity of the diagnosis and treatment questions in the MIS/DHS/MICS in Zambia
Adam Bennett-Tulane University

To assess progress in scale-up of RDTs and ACTs, malaria control programs increasingly rely on national household surveys to assess the proportion of children <5 with fever in ≤2 weeks who received an effective antimalarial within 1-2 days from fever onset. However, what is really needed under current control efforts is the proportion of children <5 with fever in ≤2 weeks with a confirmed malaria parasite infection who received an effective antimalarial within 1-2 days from fever onset. Caregivers are now asked by surveys if a child received finger/heel stick (as a proxy for malaria diagnosis), but they are not currently asked about the result of malaria diagnostic test. These indicators are subject to a caregiver's recall of what happened during a fever episode and there is the potential for information bias. The indicators and their means of

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measurement have yet to be validated against a gold-standard to assess accuracy of a caregiver's recall.

The aim of this study is to assess the effect of recall on accuracy of measuring a primary coverage indicator for malaria diagnosis and treatment collected from household surveys. The objectives of the study include: compared to a gold-standard of direct observation of a child's care for a fever at health facility, 1. assess caregivers' accuracy of recalling if child received a finger/heel stick for malaria diagnosis up to two weeks after the visit date; 2. assess mother/caregivers' accuracy of recalling the result of malaria diagnostic test up to two weeks after the visit date; 3. assess mother/caregivers' accuracy of recalling if malaria treatment was given, including the type of antimalarial given, up to two weeks after the visit.

The study took place in five rural, public, out-patient health facilities in Kaoma District, Western province, Zambia covered by a new rapid malaria reporting system. The target population included 18-49 year old mothers/caregivers of children under five who were taken to outpatient clinic with fever. The study methods are comparable to DHS, MIS and MICS to a large degree; it used a modified DHS/MIS women's questionnaire to ascertain details of diagnosis and treatment sought by mothers or caregivers. The study measured sensitivity and specificity of mother/caregivers' recall of: whether a child with fever received a finger/heel stick for malaria diagnosis; results of malaria diagnostic test and; antimalarial treatment given to the child.

A prospective case-control study design was used to meet the specific objectives of this study. The study identified mothers/caregivers living in the households of children 1-59 months with suspected malaria fevers who were taken for care at selected health facilities. Details of diagnostic results and treatment were captured during the clinic visit (to serve as gold standard against which accuracy of recall could be assessed). Mothers/caregivers identified were asked if they could be followed-up at their home within two weeks, where they were asked questions related to their recall of the care their child received during the clinic visit.

Sensitivity and specificity, along with 95% confidence intervals, were estimated using standard methods in Stata. Sensitivity and specificity were disaggregated by child, caregiver and household characteristics. The results showed that very few child, caregiver, household or visit characteristics were associated with sensitivity, specificity, or accuracy of caregiver recall of these events. Notable associations included:
- Slightly increased sensitivity of recall of finger/heal stick for girls (AOR = 1.10)
- Slightly lower sensitivity for recall of lab test result for younger children (<2 years)
- Slightly lower sensitivity for recall of malaria diagnosis and specificity and accuracy of recall of positive malaria diagnosis for one vs. two weeks between clinic visit and survey interview (AORs all around .90)
- Increased sensitivity of recall of malaria diagnosis (AOR = 1.41) and accuracy of ACT given (AOR = 1.17) for those that received lab test vs. those that didn't (clinic observed)

Not much else was associated with accuracy of caregiver recall of diagnosis and treatment. In this setting, sensitivity and specificity of caregiver recall of finger/heel stick, test result, and malaria diagnosis were poor (63-77%). Specificity was better for finger/heal stick and test result (~90%) but poor for malaria diagnosis (75%). Sensitivity and specificity were reasonable for caregiver recall of ACT (or any antimalarial) given. Lab diagnosis appears to improve recall of malaria diagnosis and ACT treatment. Results from surveys should continue to be used for ascertaining coverage of children with fever in ≤2 weeks that receive ACTs. However, it is not
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recommended that surveys be used for estimating malaria diagnosis in order to restrict indicators of ACT coverage to children with laboratory confirmed malaria.

3.11   Facility-based indicators on case management and malaria in pregnancy
Facility-survey data collection for case management and MIP
Erin Eckert-USAID

Erin Eckert delivered a presentation on proposed facility-based indicators for malaria in pregnancy. Since previous SPAs have not been user-friendly for malaria indicators, a team has been working to standardize data to make it more useful for the malaria community. For example, having an indicator on service readiness may be of interest for program planners thinking about scale-up and whether facilities are equipped to offer diagnostic testing. The proposed indicators draw on WHO's Service Availability Readiness Assessment (SARA), but unlike SARA, are malaria specific. Proposed indicators are:

1. Percent of facilities that offer antenatal care services
2. Among facilities offering antenatal services, percent that have:
    • LLINs for distribution to ANC clients.
    • SP in stock
    • Personnel trained in malaria in pregnancy
    • IPTp protocol available/displayed on site
    • NO stockout of SP lasting longer than 3 days in the last 3 months
3. "Service Readiness for Malaria in Pregnancy" indicator
    Numerator: # of ANC facilities with LLINs, SP, and personnel trained in MIP
    Denominator: # of facilities offering ANC
4. Percent of facilities that offer sick child services
5. Among facilities offering sick child services, percent that have:
    • Microscopes and consumables in stock.
    • RDTs in stock
    • Personnel trained in malaria diagnostics
6. "Service Readiness for Diagnostics" indicator
    Numerator: # of facilities providing sick child services with microscopes and consumables, RDTs, personnel trained in diagnostics
    Denominator: # of facilities offering sick child services
7. Percent of facilities that offer sick child services
8. Among facilities offering sick child services, percent that have:
    • All components of diagnostic readiness.
    • ACTs (first line) in stock
    • Personnel trained in malaria case management
9. "Service Readiness for case management" indicator
    Numerator: # of facilities providing sick child services with all the diagnostic readiness components AND ACTs (first line drug) and staff trained in malaria case management
    Denominator: # of facilities offering sick child services
10. Number/percent of ALL health facilities with……XXX….in stock on the day of the survey

11. Number/percent of ALL health facilities that have had a stockout of greater than 3 days during the last 3 months for:
- 1st line treatment by presentation
- Other ACT
- SP
- Artesunate monotherapy, etc.
- Other non-artemisinin monotherapy
- Injectable artesunate
- Rectal artesunate
- Oral quinine
- Injectable quinine

The next steps will involve pilot data collection in Malawi, Tanzania, and possibly Ethiopia in 2013. Beyond that, tabulation plans will be revised, and the results will be reviewed by the Data Sources and Indicator Task Force, who will report back to MERG next year.

Development of Diagnosis and Treatment Indicators
Mike Lynch-WHO

Mike Lynch reviewed the revised GMAP objectives and targets and T3: Test. Treat. Track., a new WHO initiative. He also presented WHO-recommended diagnosis and treatment indicators from Universal Access to Diagnostic Testing (2011), the World Malaria Report (2011 and 2012), and the "blue table," which links GMAP targets to indicators. Better direct measurement of core indicators for monitoring progress towards GMAP targets regarding case management is needed.

The Data Sources and Indicator Task Force reviewed existing diagnosis and treatment indicators, adding two: (1) the proportion of test-positive cases who receive anti-malarials and (2) the proportion of suspected malaria cases who receive anti-malarials (presumed malaria cases). The proportion of all treatments that are ACTs also has been considered as an interim indicator.

There are mixed views on measuring treatment practices from household surveys. The Survey and Indicator Task Force plans to draft a document that describes facility-based diagnostic and treatment indicators in more detail. Although the process has yet to begin, the document is expected to be similar to the Household Survey Indicators and Surveillance Manuals. The Task Force is also exploring health facility surveys as a strategy for obtaining information although this would reflect only public-sector diagnosis and treatment. They are also considering adjustments to the SPA or a lighter, more readily applied tool.

The Surveillance manuals do provide some guidance on community-level reporting, and the group discussed the issue of looking at health facility data within a broader context of the district-based health system. WHO and UNICEF have released a joint strategy on case management that can serve as a baseline for further discussion on community management. Some countries also report on clients treated in the community although this data is quite limited. However, most countries are not encouraging separate data collection on community case management since data is generally compiled at first-line health facilities.

The group also gave feedback on the World Malaria Report. Figures like "47% of cases are confirmed in the African region" are difficult to explain and back with rigorous data, so the team

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may want to reconsider how this information is presented and explained in future editions. Many countries provide data on diagnosis, which is then validated by the AFRO team, so WHO may consider including revising its statement that there is a lack of data to there are concerns about the quality and consistency of the data. WHO has received feedback that the report is too complicated from some, but not detailed enough for others and is working hard to find the right balance.

3.12 **Evaluation of the AMFm**
Fred Arnold-MEASURE DHS

The Affordable Medicines Facility – malaria (AMFm) aims to contribute to malaria mortality reduction and delay resistance to artemisinin through increasing the availability, affordability, market share, and use of quality-assured ACTs. In order to reach these goals, AMFm has engaged in price negotiations with ACT manufacturers, facilitated the commitment of USD 336 million in buyer subsidies at the top of the global supply chain, and supported interventions to ensure effective ACT scale-up.

The cross-country evaluation of AMFm utilizes a pre- and post-test design comprising outlet surveys on ACT availability, price, and market share, secondary household survey data on ACT use, and documentation of key contextual factors. The endpoint assessment, conducted after the financing platform was in place and functional, also included documentation of the AMFm implementation process in addition to a remote area study and AMFm logo study. Success metrics were designed to determine how 'success' would be assessed in relation to the AMFm outcomes and operationalized.

The evaluation found that AMFm was a "game changer" in the private for-profit sector, with large changes found in availability, price, and market share in only a few months. This effect was similar in both rural and urban areas, and there was considerable penetration of co-paid ACTs in remote areas of Kenya and Ghana. However, AMFm had a limited impact in the private for-profit sector in Madagascar and Niger. Reasons for this may include the lack of a full-scale mass media campaign, unfavorable political/economic context, and the structure of the for-profit antimalarial sector, where ACTs were not allowed for sale.

There were fewer fundamental changes to the public sector antimalarial supply although four pilots showed increases in ACT market share. The public sector continued to struggle with challenges related to procurement and grant requirements. Overall, longer duration of implementation appears to be correlated with performance.

Findings on ACT use were mixed across countries. Challenges in interpreting the data include that household surveys were not optimally timed for the evaluation and that household data was not available for the two strongest performing pilots in the outlet surveys (Kenya and Ghana).

The Global Fund has decided to integrate AMFm into core grant management and financial processes in 2013. At that point, eligible countries will be able to make their own decisions regarding how to allocate funding from their core Global Fund grants although there will no longer be a separate fund with external donor contributions to cover co-payments. The AMFm model may be further modified to include RDTs in the future.

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3.13   DFID investments in M&E (no slides)
Alastair Rob-DFID

DFID has increased malaria-related spending from £140 million in 2008 to over £250 million in 2011 and plans to continue investing where they see a need and where there is value for money. The DFID malaria program is currently being audited to assess whether UK taxpayers' money is being properly spent. DFID is open to sharing information about financing of existing and past programs with WHO and other partners. The MERG's work helps make the case for securing funding from DFID and other donors and prioritizing high-burden countries and those that have high receptive risk of malaria. DFID is also supporting work beyond its historical bilateral presence, as it is a significant contributor to the Global Fund.

Although investments in malaria have been very successful in reducing malaria in Africa over the last decade, Alastair Robb argues that advances are remarkably fragile, requiring funders to be more intelligent in managing investments. A recent independent review looking at strategic data use found that:
1. Data is being produced, but it is not always available or easy to collate.
2. There is a need for support with translating data into policies and strategies (knowledge translation)
3. Malaria programs have been separated from national strategic planning process.
4. There is a growing interest in looking across borders and sharing best practices.

DFID wants to help countries identify their needs and help make information more available and accessible. Countries want better access to carefully collated information and help translating the data and adapting global norms to suit local context. They also want tools and skills to negotiate investments and safe spaces to discuss both failures and successes.

The group discussed the challenges partners have faced with the "value for money" concept. Despite the increase in cost of malaria control associated with decreasing malaria burden, there is good evidence that sustaining effective malaria control is a high-impact intervention and a "best-buy" in public health. DFID is currently assessing value for money of malaria control and proposes that additional work by MERG may assist this process by developing indicators for value for money.

3.14   The Global Fund approach to evaluation and M&E investment
Ryuichi Komatsu-Global Fund

Ryuichi Komatsu provided an update on the Global Fund approach to evaluation and M&E investment, aligned to the Strategy 2012-2016: Investing for Impact. A high level panel of recommendation advised the Global Fund to focus on outcomes (rather than inputs) and to improve data quality in the field. This has resulted in an attempt to simplify indicators and focus on the output, outcome, and impact indicators that are most needed. Findings from the evaluations that have been conducted will be used to improve the way that Global Fund finances grants, which will hopefully be one of the major points for the new funding model.

The Global Fund's evaluation approach focuses on impact and outcomes, builds a system of partner and country reviews, and strengthens country data systems. Strategic investment in data systems is based on identified gaps in existing data systems. Improving these systems will allow

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for better impact measurement and adaptability across disease components and varying country contexts. The Global Fund is also using a common framework with partners to strengthen the ability of country systems to analyze impact and complete joint assessments as much as possible.

Global Fund grants will allocate 5-10% of funding to M&E, including 7% to strengthen national data systems for reporting, surveys, and program reviews. In the future, the Global Fund foresees working with WHO on a health sector review and data quality review to avoid duplication of efforts.

3.15 Experience of PMI evaluations
Steve Yoon

PMI is currently funding impact evaluations based on the RBM MERG Framework for Impact Evaluations. The purpose is to assess the original PMI objective of reducing malaria-related deaths in children under five years old. The evaluations will be conducted in 15 focus countries between 2010 and 2014 and will evaluate the impact of combined malaria control interventions and efforts of host country governments and partners. These evaluations utilize a variety of existing data sources, including household surveys (DHS, MICS, MIS), DSS sites, health facility and HMIS data, weather data, and malaria mortality and risk models (LiST).

PMI faces challenges in measuring malaria mortality, mostly as a result of low coverage of vital registration systems and the fact that many deaths occur outside health facilities. As such, all-cause child mortality will be used as a measure of impact. The evaluation will conclude whether it is plausible that scale up of malaria control interventions reduced mortality.

A technical advisory group meeting is looking into improving the evaluation design, increasing analytical rigor, and building in country capacity to conduct evaluations. The team faces challenges with accessing primary datasets and the ambivalence of some NMCPs about the impact evaluation. Other challenges are technical and include the review and editing process, climate analysis, and assessing economic impact.

The Tanzania evaluation has been completed and will be published on the PMI website in the coming weeks. Reports on Malawi and Angola are being finalized (preliminary results can be viewed in the slide presentation), and the evaluations in Rwanda, Senegal, and Ethiopia are underway.

3.16 Guidance for program impact evaluation
Erin Eckert-USAID

Increased funding for malaria control in the past decade in SSA has led to scale up of key interventions and a growing need to assess the effect of this scale up on malaria burden. The RBM partnership developed a guidance document for tracking progress and showing results (Rowe et al, 2007). There is need to update this guidance, and so a decision was made at the RBM Expert's Consultation on Mortality Measurement in April 2010 to revise this document.

The objectives of the framework document for evaluating the impact of malaria control programs in malaria endemic countries are to: (1) review and update the evaluation framework, (2) make recommendations for evaluating impact of the scale-up of malaria control interventions, and (3) summarize recent experience (such as the PMI impact evaluations) and data on morbidity and

mortality measurement from various methods and data sources. The target audience of this document is the staff of NMCP, MoH, and funding agencies, in addition to individuals with background and understanding of M&E. The document is meant to be a menu of options, allowing countries to pick and choose methods based on the situation and data available in country. It is not intended to be an exhaustive resource on statistical modeling techniques.

From the last MERG meeting to date, the document is being restructured and will now include a section on entomology. New sections are being drafted, other sections are undergoing editing, and a manuscript is underway for submission to a peer reviewed journal. The document is expected to be launched in April 2013.

3.17 Routine Health Information System Strengthening
Steve Yoon-CDC

Malaria surveillance and M&E data includes community-based data sets (DHS, MIS, MICS), facility-based data sets (HMIS, HFS) and other programmatic data sets. In thinking about M&E priorities for malaria, it is necessary to consider what information to collect, how to collect it, and how the data should ultimately be used. Due to changing malaria epidemiology, increased human capacity and improved diagnostics, and expanded malaria resources, Steve Yoon proposes a focus on facility-based data.

Routine health information systems (RHIS), comprising human capacity, forms, information technology, and standards, should be malaria focused, phased, and have a measurable impact. The goal of RHIS strengthening activities is to improve the quality and use of routine malaria data in order to monitor changes in temporal and spatial distribution of malaria burden. These data would ultimately be used to strengthen national programs and improve health outcomes. The process will be led by the NMCP and will focus on measurable outcomes. It will focus on malaria, but will also be part of a broader routine health information system activity.

There are three phases to RHIS strengthening. Phase one involves planning activities such as stakeholder buy-in, situational analysis, prioritizing problems, and workplan development. Malaria indicators, data tools, data transmission, data use, and data quality will be examined. Phase two is implementing the strengthening activities, which CDC proposes to do in Tanzania in mid-2013. Phase three will involve the PMI team evaluating the impact of the activities, which is scheduled for November 2013.

The group discussed a need to harmonize efforts and share experiences since both LSTM and Global Fund have plans to conduct similar work. One way to do this would be to resuscitate the routine systems task force—please contact Steve Yoon if you are interested in being involved with this. PMI also agreed to propose a focal point for updates.

3.18 M&E Assessments
Mike Lynch-WHO

Joint evaluations of 8-20 national programs will occur in 2013 and 2014. These will be systematic assessments of the performance of national M&E and disease surveillance, spanning several health areas, including malaria. The results will be used for development of M&E investment plans, as part of the malaria strategic planning process. The surveillance checklist tool is nearly finalized, and Dr. Lynch will keep the MERG apprised on progress.

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3.19   Other activities (no slides)
Capacity Building Task Force
Elizabeth Ivanovich-MEASURE Evaluation

The MERG is looking for someone with experience offering TA to countries to lead this task force. The group will function mainly as a community of practice to connect individuals involved in capacity building and circulate information regarding: upcoming capacity building activities, best practices, and opportunities for collaboration. The group discussed the need maintain tailored goals and reasonable expectations for this group since the issues are complicated and long standing. Khoti Gausi was nominated to serve as co-chair of this group with Elizabeth Ivanovich.

An original assessment found bottlenecks with human resources, which lead to the development of the in-person and online M&E of Malaria courses offered by MEASURE Evaluation. Participants in these courses are followed up with at 3 and 6 months after completion to assess progress and troubleshoot. A longer term evaluation of the project is expected in the future.

Morbidity Task Force
Richard Cibulskis-WHO

This task force has not met since the last MERG meeting and the group discussed whether it makes sense to maintain this group, particularly in light of the establishment of an Evidence Review Group on malaria burden estimation by WHO. Simon Kunene suggested that the task force could address severe malaria and the challenges around measuring transmission.

ACTwatch update
Steven Poyer

The first phase of the ACTwatch project ended in 2012. This included two rounds of household surveys and three rounds of outlet surveys. Outlet survey reports were published for all countries involved besides DRC, and other reports are currently being finalized. ACTwatch 2 is waiting on the finalization of funding agreements, but is hoping to continue until 2015. The team is discontinuing household surveys but will continue the outlet surveys and conduct more operations research. They will also be working on a new project to scale up access and use of RDTs in the private sector. Kate O'Connell has stepped down as Principal Investigator of ACTwatch, but Steve Poyer will remain and hopes to continue his involvement with the MERG.

5.0   MERG support to address endemic country M&E needs (no slides)

The Southern Africa Regional Network (SARN) report specified M&E as a challenge in all of its national programs, and this is expected to be similar to findings in other regions of Africa as well. MERG members discussed various endemic country needs related to M&E of malaria, including help with selection of indicators that can be used for advocacy, prioritization of needs, analysis of indicators, and use of information generated.

There are also a lot of issues with available information systems. The MERG talks a lot about surveys, but national programs complain that survey cycles often do not match program planning cycles, suggesting that gaps remain in communication with country programs.

Utilizing regional networks

Regional networks work directly with the country programs and may be able to provide additional value to countries than they are currently providing. The MERG should be closely linked with the networks to help in the provision of TA and to better understand M&E needs.

Human resources

Group members discussed how the difficulty in funding training of eager students to the PhD level is sustaining a gap in high-level epidemiologists and statisticians. MEASURE Evaluation provides master-level training programs, both online and in person. PMI is funding the field epidemiologist training program, but it is not being implemented in all countries where there is a need. This is one way that funding partners can help. The point was raised that it may be difficult for country programs to fund or advertise training if they do not also guarantee a position after completion.

The issues with human resources do not end with training, however. Some countries do not have an M&E focal point, while others suffer from high turnover, both in survey work and longer-term positions. It is a challenge to keep good people, and the MERG could consider supporting people to want to stay in the field. It was also recognized that human resources is not a unique problem to M&E or malaria.

Reporting

Angola, which has partnered with PMI and the Global Fund since 2006, has identified its M&E bottleneck: the lowest of the country's three administrative levels, where health officers are overburdened with reporting requirements. What they are looking for are new technologies to enable facility-based workers to better report to the regional and national levels.

Funding

M&E advocates do not always have a strong voice among stakeholders and are therefore vulnerable to shrinking resources. This is part of the reason that Global Fund recommends that 5-10% of each grant be spent on M&E.

Malaria Program Reviews (MPRs)

WHO is currently developing a manual on how to do MPRs, but MERG members are unaware of an existing mechanism to ensure the quality of these reviews. Perhaps MERG can develop a mechanism for reviewing MPRs and assessing how well they identify country HR needs, or create a template for country programs. The Monitoring and Evaluation Systems Strengthening Tool, which systematically looks at gaps in the M&E system, was useful for some country programs, including Swaziland, in developing a costed M&E plan. Discussing the ideas with the RBM Secretariat would allow MERG members to find out what would be most useful.

6.0   Role of the MERG
         Thomas Teuscher-RBM

The MERG's TOR and Memorandum of Understanding (MOU) include guidelines on its role, intellectual property, and branding. In light of recent discussions that have resulted from a lack of clarity on specific issues such as the publications process, participants in this session discussed a need to better define the role of the MERG and MERG task forces.

It was proposed that the most effective way to identify and update MERG roles is during the MERG workplan development process. This will help the group prioritize MERG action, i.e. be responsive to country needs, as the TOR are broad enough to be responsive to changing external requirements.

Publication process
With regard to the publication process for MERG documents, such as the updated household indicators, the group reviewed the RBM Secretariat hosting MOU with WHO on branding, intellectual property, and communications. The following passages from the MOU were highlighted:
1. Branding: "It is understood that the Partnership will wish to develop a distinctive physical depiction of its identity, such as branded colors, graphic elements and a logo which would identify the Partnership to all audiences. In the use of its branding, the Partnership Secretariat agrees to incorporate and clearly reflect the hosting and administrative arrangement with WHO (such as with the phrase, "hosting arrangements are provided by the World Health Organization"). The use of the Partnership name and emblem is confined to its use by the Partnership Secretariat; Partnership members may not use the name and emblem unless given prior permission by the Partnership Executive Director, but have the right to present themselves as members of the Partnership."
2. Intellectual Property: "Any copyright notice would appear as follows: 'World Health Organization (providing hosting arrangements for the Roll Back Malaria Partnership).'"
3. Communications: "It is understood that the Partnership Secretariat may conduct communications on issues related to the implementation of the work plan as authorized by the Board (including publications, meetings, circulation of documents and other information such as advocacy products, web or news materials.)"

It therefore appears that the Partnership, through its Executive Director, is empowered to produce its own brand identity as long as the products figure in approved workplans. As RBM is not a legal entity, WHO will defend intellectual property rights on behalf of the Partnership as required.

With regard to use of International Standard Book Numbers (ISBN), it was clarified that the 10-digit number serves to uniquely identify books and book-like products published internationally. Since the purpose of the ISBN is to establish and identify one title (or edition of a title) from one specific publisher, the ISBN is unique to that edition. This allows for more efficient marketing of products by booksellers, libraries, universities, wholesalers, and distributors. An ISBN Agency assigns ISBNs at the direct request of publishers, e-book publishers, audio cassette and video producers, software producers, and museums and associations with publishing programs. There are over 160 ISBN Agencies worldwide, and each ISBN Agency is appointed as the exclusive agent responsible for assigning ISBNs to publishers residing in its country or geographic

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territory. An ISBN is assigned to each edition and variation (except reprintings) of a book; for example, an e-book, a paperback, and a hardcover would each have a different ISBN.

Through this recall of principles, it was demonstrated that mutual adherence to these provisions will facilitate future production of MERG documents.

Responding to country needs

Over the course of the 20th RBM MERG meeting, several members emphasized that country needs should be the starting point in determining MERG activities. Within the MERG there is a need to learn and share how a country program can run a successful M&E program in addition to providing support for surveillance and reporting activities.

In order to get country programs more involved with the MERG, suggestions were made to: 1. have consistent representation from endemic countries through appointed positions to the MERG; 2. fully explain to country representatives what the MERG does and what role it can play in supporting country programs and SRNs; and 3. create a template for country presentations in future meetings so that content and discussion is better targeted.

Partner alignment

2013 is expected to be a critical year, as various partners are making more resources and opportunities available. The MERG can serve as a dedicated forum for discussing proposed activities in order to prevent duplication of efforts and improve efficiency. The MERG intends to address country needs, not donor needs, by coordinating approaches and harmonizing activities.

Issuing guidance

The MERG is not intended to implement activities, which is what partners do individually. However, the MERG may develop and distribute guidance on how to conduct M&E activities (such as household surveys and surveillance) and how to put standards and guidelines into practice, in addition to identifying needs for strengthening. The MERG convenes and liaises with interested partners to address key implementation issues, and then ensures execution of the agreed upon solutions. Future challenges include operationalizing that guidance and developing the necessary country capacity.

Country programs and MERG members have requested guidance on additional routine data issues including how to: 1. factor community case management into M&E plans; 2. use facility-based indicators; 3. compile country-level information for MDG reporting and assess validity; 4. conduct an impact evaluation; and 5. develop a best business case proposal using indicators and a framework. MERG could address these requests.

Costed M&E plans

Several countries (11 of 16 in ESA) have either started or completed a costed M&E plan to direct resources. The five PMI countries which have plans are using them to develop proposals and advocate for additional malaria resources. The Global Fund is trying to ensure that those countries with costed plans are funded so they can use them. The quality of the plans varies since they are completed at the country level without support of technical partners. However, these plans are available on the RBM website and should be linked to from the MERG website as well.

MERG membership

Several attendees cited the challenge in getting consistent attendance from endemic country representatives. The group will adopt a new strategy of appointing fixed regional representatives to attend MERG meetings. These representatives will be selected in conjunction with the SRNs and will be expected to take on active roles in both the MERG plenary meetings and task forces.

Opportunities for further collaboration

Another issue raised is how MERG interacts with other entities. For example, other groups like the Trans-Kunene Malaria Initiative and Elimination 8 also discuss cross-border issues, but this information is not necessarily shared with or discussed by MERG. The current TOR states that MERG is to provide support to other working groups. The RBM Secretariat is responsible for knowledge management and must consider how to feed our discussions into other working groups.

Addressing internal failures

The MERG has had trouble staying committed to some of its own goals and timelines. Having dedicated time to reflect on delays will allow the group to learn from mistakes and implement improvements. MERG members must keep in mind the cascade effect of their actions on partner implementation plans and also the work countries can complete. It is better to issue a first draft followed by a second draft with improvements/revisions than to delay issuing a first draft at all. At least in the first scenario, implementing agencies have something to use as a starting point.

MERG members are urged to streamline group decision-making and keep the group accountable to its timelines at each meeting. To improve communication and encourage action between MERG meetings, the MERG Secretariat will look into novel ways of regularly updating partners. Additionally, the MERG Secretariat will remember that it is accountable to the RBM Executive Director through the RBM Focal Point.

7.0   MERG administrative issues

7.1   **MERG workplan 2013-2014**
Richard Cibulskis-WHO

Richard Cibulskis provided an overview of the 2012-2013 workplan. The money from the 2012 was not all spent, and he is looking into whether we may be able to recover those funds (~$34,000). An additional $35,000 has been approved for 2013 activities, including dedicated budgets to disseminate MERG products and to sponsor endemic countries to participate in MERG meetings.

7.2   **Plans for upcoming MERG meeting**
Elizabeth Ivanovich-MEASURE Evaluation

The next MERG meeting will take place in New York in June 2013. The location lends itself to a theme of the MDGs. There are MDG indicators for malaria; the group may want to discuss how countries can be assisted in obtaining relevant data. Additional suggestions for the meeting included: 1. having an expert from Columbia University present on climate and malaria, 2. inviting ALMA to discuss the scorecard, and 3. discussing value for money and returns on investment.

8.0   Summary of Agreements and Follow-Up Actions

Action Item	Party Responsible	Tentative Due Date
Publish and disseminate update of Household Indicators for Malaria Control	Indicators and Data sources Task Force	February 2013
Publish and disseminate MIS Package revisions	MEASURE DHS	February 2013
Send MIS reports and data to Lia Florey	MIS implementers	Ongoing
Finalize and circulate guidance for evaluating impact of malaria control programs	Mortality Task Force	April 2013
Create facility indicator manual	Indicators and Data sources Task Force	End 2013
Develop M&E framework alongside GMAP 2	MERG	2014
Finalize and release WHO Surveillance Checklist	M. Lynch	April 2013
Routine systems task force to be revitalized	S. Yoon R. Komatsu R. Cibulskis	Preliminary discussions held 1/18/2013
Contact Elizabeth if you would like to join capacity building task force	E. Ivanovich	Ongoing
Link to costed M&E plans on MERG website	MERG Secretariat	Before next meeting
Update and disseminate current list of surveys	UNICEF and MERG Secretariat	Before next meeting
Add sub-national reporting to 21st MERG meeting agenda and discuss methods for different transmission settings	MERG Secretariat	Ongoing
Coordinate with SRNs to identify regional representatives to attend MERG and identify country M&E needs	MERG Secretariat	Before next meeting
Quarterly MERG updates	MERG Secretariat	Ongoing
Look into new mechanisms for communicating between meetings	MERG Secretariat	Before next meeting
Clarify publications development and approval, and publication process	RBM Secretariat, MERG co-chairs	Before next meeting
Statement on need for and scheduling of MICS/DHS/MIS	UNICEF/PMI	Before next meeting
Look into translating the MIS package to French	MEASURE DHS	Before next meeting