



MEETING REPORT

Eighteenth Meeting of the RBM Partnership
Monitoring and Evaluation Reference Group (MERG)
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Acronyms

ACT	Artemisinin-Based Combination Treatment
API	Annual Parasite Index
BCC	Behaviour Change Communication
CHAI	Clinton Health Access Initiative
CHERG	Child Health Epidemiology Reference Group
CDC	Centers for Disease Control and Prevention
DFID	Department for International Development
DHIS	District Health Information System
DHS	Demographic and Health Survey
DQA	Data Quality Audit
EPI	Expanded Program on Immunization
GDP	Gross Domestic Product
Global Fund	Global Fund to Fight AIDS, TB and Malaria
GMAP	Global Malaria Action Plan
GMEP	Global Malaria Eradication Programme
GMP	Global Malaria Programme (WHO)
HMIS	Health Management Information System
HTC	HIV Testing and Counseling
IGME	Inter-agency Group for Child Mortality Estimation
IHME	Institute for Health Metrics and Evaluation
IPTp	Intermittent Preventive Treatment in Pregnancy
IRS	Indoor Residual Spraying
ITN	Insecticide Treated Net
JHUCCP	Johns Hopkins University Center for Communication Programs
LBW	Low Birth Weight
LEC	Low Malaria Endemicity Countries
LLIN	Long-Lasting Insecticidal Net
LSHTM	London School of Hygiene and Tropical Medicine
M&E	Monitoring and Evaluation
MACEPA	Malaria Control and Evaluation Partnership in Africa
MAP	Malaria Atlas Project
MDG	Millennium Development Goal
MEEDS	Malaria Epidemic Early Detection System
MERG	Monitoring and Evaluation Reference Group
MESS	Monitoring and Evaluation Systems Strengthening
MICS	Multiple Indicator Cluster Survey
MIS	Malaria Indicator Survey
MOH	Ministry of Health
NGO	Non-governmental Organization
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
SP	Sulfadoxine-pyrimethamine
TOR	Terms of Reference
UN	United Nations
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization

Participants

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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. Receive updates from partner organizations
3. Discuss challenges and innovations in measuring case management
4. Review ongoing MERG taskforce work
5. Discuss recent disease burden estimates
6. Discuss measurement of malaria in low-endemicity or elimination settings
7. Discuss MERG business issues

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

1.1 Country perspectives on M&E system strengthening needs

1.1.1 [Tanzania](#)

Renata Mandike-Tanzania NMCP

Though the HMIS was created in Tanzania in the early 1990s, interest in it was lost due to reduced investment, poor quality data, delayed reporting and vertical health programs that had their own health information systems. Since 2008, there has been a renewed interest in HMIS strengthening initiatives in the country. A consortium of funding and implementing partners support the Monitoring and Evaluation Strengthening Initiative.

The current HSSP III monitoring and evaluation strategies include: 1. develop a comprehensive M&E and research strategy for the health and social welfare sector; 2. strengthen integrated systems for disease surveillance (IDSR); 3. strengthen integrated routine HMIS; 4. introduce data aggregation and sharing systems based on ICT; 5. enhance surveys and operational research

Currently, the Ministry of Health and Social Welfare is working hard to coordinate M&E at the national level by reassigning personnel, liaising with program M&E personnel, taking a service oriented approach and trying to get programs to prioritize indicators and data requirements., Work packages have been designed and are currently being implemented to provide strong capacity and strengthened service delivery monitoring and evaluation system. To date, new HMIS tools have been designed and are being tested in five districts with potential scale-up in the future, integrating malaria surveillance requirements. Yet, challenges plague the system, with weak human resources, disconnect between vertical programs and external partners supporting the national system, and poor integration and involvement of local government and local partners. Success relies on everyone supporting the national system, including stakeholders supporting the coordination effort. A long-term strengthening of M&E structures in the Ministry of Health and Social Welfare and the health sector will provide the analytical and coordinating role required.

1.1.2 [Malawi](#)

Misheck Luhanga-Malawi NMCP

The National Malaria Control Program used to have four sentinel sites monitoring trends in malaria morbidity. However, the increased workload for already overextended health workers led to late and incomplete reporting. The NMCP recognizes that real-time data entry increases completeness, accuracy, and timeliness which strengthens malaria M&E systems in Malawi overall.

The Baobab Health Trust, a Malawian NGO that provides technology solutions to meet health care challenges, created several electronic medical record systems. The Baobab AntiRetroviral Therapy (BART) improves completeness, accuracy and timeliness of information related to patients on ART, while the Baobab Out-

patient Diagnosis System allows clinics to uniquely identify and track patients and record primary and secondary diagnosis and patient referrals. The Patient Registration Module allows a user to register new patients, identify returning patients and route patients to points of care, while the HIV Testing and Counseling (HTC) module improves completeness, accuracy and timeliness of information during HTC sessions through standardized processes without retrospective data entry. These systems connect computers to a central database server using LAN, include a UPS backup power system and accommodate low computer literacy users. Service providers are able to enter data directly into the computer, eliminating mistakes from retrospective data entry and delays.

The NMCP plan is to use facilities where Baobab has its electronic medical record system and customize the system to include detailed malaria information, such as fever presentation, malaria confirmation and treatment, use of LLINs during the previous night, pharmacy data, and inventory control. Data for the district health information system (DHIS) would come from this system.

Finally, the NMCP is also interested in improving LMIS using SMS for Life as well as fully implementing DHIS 2.0 (web-based) in all districts, but currently has no funding.

1.1.3 [Uganda](#)

Ebony Quinto-Uganda NMCP

In Uganda, the National Malaria Control Program has many challenges managing the health management information system (HMIS), including a low quality HMIS and lack of clear methodology for dealing with missing data. Capacities for sub-reporting are low with few staff trained on data management tools and processes. There is little to no feedback throughout the reporting system with a lack of strategic use of M&E data for decision making. The composite Global Malaria Database is not yet functional and there is a lack of analysis of support supervision data to inform continuous quality improvement trends.

The current M&E plan in Uganda is awaiting consensus on a new five-year strategic and three-year business plan. Challenges to this plan have been issues with the disaggregating denominator data by project catchment population and tracking the distribution and consumption of medicines and RDTs during weekly surveillance reporting. The NMCP has concerns regarding the monitoring of the quality of services, client satisfaction, adherence to treatment regimens and drug and insecticide resistance. Issues with data dissemination and transparency and budgetary allocations to M&E activities are being addressed.

Avoidance of data reporting has been seen in Uganda. Reasons for this include lack of staff dedicated to data verification and validation and a lack of documented systems for dealing with inconsistencies at all levels of aggregation. Not all of the health facilities have assigned identifiers, which makes it difficult to monitor training processes and numbers, avoid double-counting, and track commodity inventory and stockouts.

A National Malaria Program Review was conducted, in collaboration with RBM and WHO in July 2011, and informed recommendations issued by the Global Fund at the Phase 2 of Round 7 grant, and Round 10 negotiations. This had minimal influence on the research agenda. The outdated malaria risk stratification map combined with the weak routine malaria surveillance systems, especially in-patient and private sector provider data, make it difficult to see if malaria interventions are having a significant impact. This brings into question the quality of the current HMIS. Finally, current epidemic thresholds are based on clinical diagnosis of malaria, but results are likely to change with the wide scale introduction of diagnostics.

1.1.4 [Nigeria](#)

Olusola Oresanya-Nigeria NMCP

In a country where 90% of the population is at risk of malaria and one quarter of the malaria burden in Africa exists, the National Malaria Control Program in Nigeria has a lot of work to do and faces a plethora of challenges at all levels of the health system. At the community level, reporting of malaria data from communities is usually tied to availability of commodities for interventions. When there are stock-outs, data stops flowing. Data collection is left to the mercy of volunteers who are under no obligation to report. The health facility level proves not much better, with poorly motivated, overloaded staff, poor data quality (incomplete, inaccurate, and inconsistent) and a high turn-over of trained staff.

Challenges at the LGA level include inadequate capacity and funding for M&E, poor supervision of health facilities and paper-based reporting. There is poor integration with other disease programs, since M&E for malaria is systematically vertical. Data analysis at this level is very limited. Poor supervision of LGAs and facilities and a varying degree of capacity for M&E at the state level continues to provide challenges. Data management at this level is rudimentary and there is little integration with other disease control programs.

Finally, there are significant challenges faced at the national level. Since malaria M&E is largely donor-driven, there are limited resources. While there are over 24,000 health facilities in Nigeria, currently only 8,000 of them actively report and only 70% of these reports are submitted on time and complete. There are weak links with the HMIS; exchanging data between partners and the national M&E and HMIS units is difficult. Private sector data and secondary facilities are missing from this system. Currently, there is not an electronic database for data management. Unconfirmed malaria cases are often reported as malaria cases.

1.1.5 [Kenya](#)

Jacinta Opondo-Kenya NMCP

Recently, there have been two M&E system strengthening assessment (MESS) workshops for malaria, TB, and HIV in Kenya. The second MESS assessment was conducted in April 2011, assessing the M&E plan, management unit capacity and data reporting systems. The system strengthening needs for the M&E plan include disseminating the M&E plan fully at the sub-national level, providing an M&E budget in all district and provincial plans, and strengthening district level integrated supportive supervision. In terms of the system strengthening for the management unit, a training plan for data management at all levels is needed with increased capacity for M&E activities and a systematic review for data quality issues and follow-up actions. Data reporting strengthening is needed at the health facility level with systematic verification of reports from lower levels and the community as well as strengthening data and information use at all levels.

In Kenya there has been significant progress in system strengthening to date. A training plan for data for decision making has been submitted within the Global Fund Round 10 budget. M&E trainings at national and sub-national levels have already started. Other current activities include a country wide roll out of DHIS 2.0 (web-based), rollout of a new approach to supportive supervision and an addition of malaria data quality audit (DQA) which was included in Global Fund Round 10 budget.

1.1.6 [Rwanda](#)

Alphonse Rukundo-Rwanda NMCP

Currently in Rwanda, the HMIS has been established and is functioning well at a 98% reporting rate. This system provides data for all routinely collected malaria indicators completely and on time. Data is collected at all levels using standardized tools and is reported to the central level using a software and web-based system. Monthly coordination and quarterly dissemination meetings are organized to share reports and discuss malaria trends at the district level. Though this program is working well, NMCP is facing several challenges. Data quality issues from external and internal audits are perceived. There is limited data on the socioeconomic impact of malaria and the capacity in M&E at the district and health facility levels is low. There is also a discrepancy in population projections between programs and different population growth rates are used. There is limited dissemination of research findings and feedback rarely reaches the local level.

1.1.7 [Prospect of M&E to Strengthen Surveillance in Zanzibar](#)

Abdullah Ali-Zanzibar NMCP

Malaria surveillance is a new field to most living and working in high endemicity malaria settings moving towards low endemicity. Surveillance during the pre-elimination phase is much more difficult, labour intensive and relatively expensive than surveillance needed for control alone. Conducting reactive case detection is a challenge. Additionally, there is a lack of culture for regular data analysis and mapping of cases especially at the peripheral level among the health care providers. Action is needed to address these challenges.

Current M&E systems rely on periodic surveys (MIS, HFS, DHS,) and quarterly field/supervisory visits. The surveillance systems have both passive and active elements. Passive surveillance includes monthly HMIS reporting, with which there are major challenges. All public facilities report weekly using the Malaria Epidemic Early Detection System (MEEDS). The implementation of malaria case notification is now underway. Zanzibar is moving into a phase when active surveillance will be needed. This will include both re-active and proactive case detection. Surveillance activities have shown that malaria incidence and the malaria test positivity rate have declined substantially since 1999 and that confirmed cases are now limited to a number of hot spots.

Zanzibar aims to continue to test all fever cases and treat to cure and rapidly report for timely surveillance while shifting to individual malaria case based surveillance with 24 hour notification and 48 hour rapid response and containment with line listing weekly of all malaria cases. The NMCP hopes to regularly update malaria stratification maps at lowest administrative level and identify malaria foci within districts and in health facility catchment areas and to establish capacity in districts and at community level to conduct surveillance and target activities to identify and eliminate malaria foci. Additionally, there is a need to develop specific strategies for malaria control in travelers and seasonal labor and other mobile populations.

1.2 Malaria Intervention Scale-up and Associated Impact on Morbidity and All-cause Mortality among Children in Tanzania, 2000-10

Renata Mandike-Tanzania NMCP

Since 2000, Tanzania's malaria control policy has successfully achieved several important milestones with increased funding from international donors that has peaked at 140 million USD in 2010. Currently, an impact assessment is being conducted in Tanzania and Zanzibar to determine if malaria-related deaths among children under 5 years were reduced by 50% by 2010. The principles of this impact evaluation are to evaluate the impact of all combined malaria interventions and combined efforts of Tanzania and all donors and partners (not just PMI contributions). The impact assessment was mainly based on secondary data analysis of nationally –representative household surveys, demographic sentinel surveillance and to a limited extent routine health facility data. and review of existing reports and records from donors and NMCP. . The framework for the assessment took into consideration the causal pathway of child survival and the direction of causality with the assumption that commitments to malaria program inputs and outputs have led to improved malaria intervention coverage and reductions in malaria morbidity and mortality have contributed towards reduced all cause mortality in children. Over time changes of other fundamental determinants of child survival such as vitamin A supplementation, breast feeding etc , were also assessed

The Lives Saved Tool (LiST) model was used to estimate the number of deaths averted in under-five children by specific intervention in the context of multiple health intervention scale-up. Results show that insecticide treated net (ITN) use has doubled in the whole population since 1990, increasing to more than 60% in under-five year olds and over 55% in pregnant women in 2010. Equity analysis results show that in 2004/5 ITN use among children under five and pregnant women was higher in urban and wealthier groups and when the mother or woman had a higher level of education. Improvements were seen in 2007/8 and by 2010 Tanzania reached equitable ITN use regardless of residence (urban/rural), wealth status, or education level. All equity ratios approached 1.0 by 2010. Intermittent preventive treatment in pregnant women (IPTp) coverage in Tanzania has languished. While very slight improvements have been seen in IPT-1 coverage, the IPT-2 coverage estimate from the most recent household survey in 2010 actually declined from 2007/8. Coverage for IPTp2 is still less than 30%. In terms of early and appropriate malaria treatment at household level, there are limited indications that treatment with a recommended first-line antimalarial is improving. At time of the impact evaluation, indoor residual spraying (IRS) had not yet been sufficiently scaled-up in Tanzania to influence morbidity and mortality at the national level.

As demonstrated by HMIS and Demographic Surveillance sites, there have been general declines in parasitemia across many locales in Tanzania over the study period. For children under five, data from nationally representative surveys show that severe anemia decreased by almost 50%: from 11% in 2004 to 6% in 2010. The most dramatic decline was observed among the younger children 6-23 months of age; this age group has historically been at greater risk for malaria-induced anemia than older children. In 2004, severe anemia was a major problem for rural children (12%) than urban children (7%). Nonetheless, equity is improving; by 2010, severe anemia prevalence was similar for urban and rural children (6% and 5%,

respectively). Overall under-five mortality decreased from 148 per 1000 live births during the 1995-1999 period to 81 during the 2006-2010 period, roughly a 45% relative decline. The most marked mortality decline was observed in the postneonatal age group (57%).

On the socioeconomic front, Tanzania has experienced tremendous growth since 2000. Gross domestic product (GDP) per capita is a measure of population wealth and is often a macroeconomic determinant of health. A 1% annual increase in GDP per capita is associated with about one half of 1% reduction in under-5 mortality. In Tanzania GDP per capita has grown from around \$300 in 1999 to over \$500 in 2009.

Applying the documented relationship between growth and all-cause under-5 mortality reductions, we could expect the improvement in GDP per capita during the last decade to perhaps account for a reduction in ranging from 18 to 27%. However, the actual reduction in under-5 mortality rate over the last 10 years is 46%. Many other contextual factors were examined during the evaluation, but the study team has concluded that the 45% reduction in all-cause under-5 mortality (1999–2010) in Tanzania was in part due to reductions in malaria-specific mortality that resulted from improvements in malaria intervention availability and uptake, particularly between 2005 and 2010.

1.3 Strengthening Malaria Impact Evaluations Issues for MERG to Consider

Peter McElroy

During the process of conducting the evaluation of impact of malaria control efforts in Tanzania, a number of issues arose. In creating its guidance on evaluation of impact, the MERG should consider these issues as well as the lessons learned from the evaluation. Some have questioned why more geographic stratification was not done in the Tanzania evaluation. Results were geographically stratified urban vs. rural for anemia and all-cause under-5 mortality. Mortality was then broken down by age groups (6-23 and 24-59 months) within these areas. If MERG can agree on sub-group analyses of impact measures, these may help provide a more sensitive assessment of true impact.

The relationship between mortality reductions and wealth should also be explored by the MERG. Data for two wealth-related determinants of mortality are available for many countries. A country's economic well-being can be measured through gross domestic product (GDP) per capita and household wealth can be broken into wealth quintiles for survey data. Dr. McElroy asked if these two determinants of mortality could be analyzed in a standardized fashion by combining together all DHS data using time-to-event (survival) analysis.

When making assumptions about causality there is a need to specify how fundamental and proximate determinants affect intermediate outputs, outcomes (coverage) and impact. To do this appropriately across different countries a critical list of core factors should be agreed to rather than selectively chosen by each country team, identifying which are confounders and which are effect modifiers. By attempting to summarize the effect of too many contextual factors no definitive conclusions can be reached.

As DHS and MIS data contain non-sampling error across surveys. Child mortality should be based on synthesized estimates based on all available data. The Inter-agency Group for Child Mortality Estimation (IGME), Institute for Health Metrics and Evaluation (IHME) and other alternative estimates exist. Steve Lim looked at some interesting ways to look at all-cause child mortality across countries, but within one country you will find disappointing and mixed results.

There have been some questions raised about the use of all-cause under-5 mortality as an impact measure for malaria. This is more questionable in places where the pattern of disease burden has changed. WHO tries to associate malaria prevention methods with all-cause under 5 mortality every year and struggles with it and it has even been rejected by peer reviewers. Consensus around all-cause under-5 mortality is related to evidence that malaria control contributes to results in this area. Malaria-specific mortality will underestimate reductions and is difficult to measure.

There are several other issues that should be considered by the MERG. The target audience of these evaluations should be defined. There is also the need to consider the desired frequency of evaluations and the needed staffing to carry out analyses in the context of the anticipated levels of funding to do impact evaluation.

1.4 [Roll out of new approach to malaria support supervision in Kenya](#)

Jacinta Opondo-Kenya NMCP

Malaria in Kenya accounts for one-third of outpatient cases and 15-20% of inpatient admissions. Support supervision for malaria is essential for effective monitoring. Previously coordination for this activity was done at the national level. The Kenya National Malaria Strategy 2009 – 2017 supports decentralization of malaria control activities to the regions, provinces and districts. The Division of Malaria Control identified need for standardized approach, tools and reporting formats for doing this and recognized that they would need to build capacity at various levels for effective malaria control activities. Development of the support supervision manual and tools was done through a consultative process at among partners and other stakeholders with feedback from provincial health directors with funding from USAID.

The new approach utilizes planning tools, integrated supervision checklists, supervision score sheets and a reporting and feedback template. These tools were pretested and rolled out to facilities. A majority of the supervisors were able to use the standardized tools according to the protocol. The tools were able to highlight the weak areas that program needed to address and findings from the supervision were used to improve malaria control activities. Some challenges to using the tools exist; there are competing priorities for time and funding. There is a need to retrain some provinces on support supervision to ensure the guidelines are followed and to move away from paper based tools to electronic data collection e.g. mobile phones, PDAs. Resources should also be mobilized within the regions to allow them to conduct quarterly supervision.

2.0 Updates from partner organizations

2.1 [World Malaria Report 2011](#)

Richard Cibulskis-WHO

The 2011 World Malaria Report was released on 13 December 2011. It provides an annual reference on the status of global malaria control & elimination. The principal data source for this document comes from national programs in 106 endemic countries. This report summarizes key malaria targets & goals, documents trends in financing, intervention coverage and malaria cases and deaths, updates malaria burden estimates for the past decade, and presents profiles for 99 countries with ongoing transmission.

Financing for malaria programs increased over between 2000 and 2011. While funding for malaria has continued to rise, it still falls short of the over US\$ 5 billion required annually, and is projected to remain at these levels or decrease before 2015. The scope for increasing international funding for malaria appears limited, but rapid economic growth in many malaria endemic countries suggest that greater domestic financing is possible. Financial transactions taxes offer potential to raise significant amounts but the feasibility of adoption is questionable. Cost savings are also possible. The largest potential savings from increasing the life of long lasting insecticidal nets (LLIN) and reducing the price of rapid diagnostic tests (RDT). Diagnostic testing is also increasingly important as malaria control succeeds.

The World Malaria Report also presents information to demonstrate the improved coverage of malaria control interventions and changes in disease burden since 2000. Ownership and use of ITNs, along with IRS coverage and access to diagnostic testing and treatment has increased markedly over the past decade. Forty-three (43) countries show a greater than 50% decrease in malaria cases since 2000, and eight show decrease of 25-50%. Armenia was certified free of malaria. However, programs still fall short of achieving universal access to preventive measures, diagnostic testing and treatment. The majority of high burden countries are unable to provide evidence of impact. Additionally, resistance to antimalarial medicines and insecticides is a major threat.

2.2 [Progress & Impact Series- Decade of Progress Report](#)

Holly Newby-UNICEF

The Progress and Impact (P&I) Series report – A Decade of Progress in Malaria- was released at the Global High-Level Event in September 2011 and received a great deal of press coverage. The report provides a history of the RBM Partnership and highlights progress in malaria since 2000. It presents evidence of impact at the global level and more specifically in sub-Saharan Africa. Holly Newby highlighted some key figures and

findings presented in the report. She discussed the growing commitment to malaria programs which has been evidenced through changes in global policies and strategies, the creation of partnerships, and increased financing and coverage of interventions.

Modeling demonstrates that over the past decade over one million deaths among children under age five have been averted during 2001-2010. The report also factors in population growth when considering the successes of malaria control. Population growth over the decade (2000-2012) has averaged at 15% for all malaria endemic countries and 28% in sub-Saharan Africa. Without malaria control scale up, a substantial increase in malaria burden (both malaria cases and deaths) would have been expected due to population increase alone.

The report also discusses the differences in coverage of interventions between urban and rural areas. For example, across countries and time IPTp coverage has been higher in urban rather than rural settings.

The progress in data availability was also highlighted as a key achievement of the efforts of the M&E community. With regards to survey data availability, only a few countries had national level survey data on ITN use by children under five in 2000, by 2010, most countries had two data points and a few already had three.

2.3 [RBM P&I Series: Country Reports](#)

Eric Mouzin-RBM Secretariat

The May 2009 RBM Board created an Oversight Subcommittee to provide strategic direction and Board oversight to the reporting effort- To report on progress towards the 2010 Universal Coverage targets outlined in the Global Malaria Action Plan (GMAP), culminating in a UN high level event in September 2011 and to produce interim updates to track progress toward these goals. The May 2011 RBM Board approved the continuation of the Progress and Impact Series in order to address the contribution of malaria control to the Millennium Development Goals (MDG) and track progress towards the newly adopted RBM goals for 2015. The board also approved the creation of a P&I Unit at the RBM Secretariat to support this effort. A workplan for the unit was adopted during the December 2011 RBM Board.

There are three types of reports including: overview reports, country reports and specific topic area reports. To date, nine reports have been released as part of the RBM P&I series, including: Country Funding and Resource Utilization; World Malaria Day 2010: Africa Update; Saving Lives with Malaria Control: Counting Down to the Millennium Development Goals; Focus on Senegal; Mathematical Modeling to Support Malaria Control and Elimination; Business Investing in Malaria Control; Economic Returns and a Healthy Workforce; A Decade of Partnership and Results; Eliminating Malaria; and Focus on Zambia. Country specific reports on Mainland Tanzania and Nigeria are scheduled to be released during the first half of 2012 and reports on Angola, Malawi, Rwanda, Swaziland and possibly DRC and Madagascar are scheduled for the rest of 2012.

2.4 [P&I Series: Eliminating Malaria: Learning from the Past, Looking Ahead](#)

Richard Cibulskis-WHO

The P&I series report on malaria elimination was released on 15 October 2011. It is organized into five sections: 1. Before Global Malaria Eradication Programme; 2. Global Malaria Eradication Programme 1955-1972; 3. Progress 1973 – late 1990's; 4. Progress during the RBM decade 2000-2010; 5. Future opportunities.

Before Global Malaria Eradication Programme malaria was avoided by not living in marshy areas and preventing rice cultivation near settlements. Traditionally, extracts of quinine bark (Cinchona) and wormwood (Artemisia annua/ Quinhaosu) were used to control fever. There was little understanding of the disease until the parasite was discovered 1880 and transmission by mosquitoes was discovered 1887. Early control strategies relied on environmental management. Mosquito nets were introduced in the early 1900s. Between WW1 and WW2 elimination took place in northern countries in western Europe by focal mosquito control, microscopic diagnosis and quinine treatment. DDT was discovered 1939 and the development of chloroquine followed in the early 1940s.

The Global Malaria Eradication Programme (GMEP) occurred from 1955 to 1972 and relied on spraying with DDT and malaria case detection and treatment with chloroquine. Resistance to DDT was reported the early

1950s, followed by chloroquine resistance. This program was not endorsed in the AFRO region because of: “the physical, economic and developmental difficulties in Africa, combined with the high endemicity and prolonged transmission”. In 1969 GMEP covered 1.4 billion people (40% of world total). The strategy was not ultimately effective where mosquitoes bite and rest outdoors and in most remote areas and there were resurgences where programs faltered.

Programs began to falter in 1973. Reduced funding resulted in resurgence in countries such as India, Pakistan, Madagascar, Sri Lanka, Turkey. The movement away from the goal of eradication aimed for controlled stable equilibrium where immunity was maintained and there was access to health care for those who fall sick. During this period, many more developed countries eliminated malaria, but re-introduction of the disease occurred in some regions.

By the late 1990s some new malaria control tools were developed including: ITNs, and artemisinin combination therapies (ACT). As a result of renewed global commitment to malaria control the RBM Partnership was founded in 1998. The principal focus RBM was Africa. The creation of the Global Fund in 2002 provided a mechanism through which funds for malaria control could be disbursed to malaria endemic countries.

Additionally, in 2011 and 2012 by WHO Global Malaria Program (GMP) and Global Health Group, University of San Francisco will create country elimination reports that will document progress towards elimination. These reports will identify best practices and serve as advocacy materials. They utilize a common data collection protocol, report content and outline. Reports are scheduled for Cape Verde, Mauritius, Reunion, Namibia, Turkey, Philippines, Turkmenistan and Sri Lanka.

2.5 [ACTwatch update](#)

Kathryn O’Connell-PSI Kenya

ACTwatch is a 5 year, 7 country project funded by the Bill and Melinda Gates foundation with the objective of providing policy makers with evidence on trends in availability, price, and use of antimalarials. PSI, London School of Hygiene and Tropical Medicine and Ministries of Health (MoH) work in partnership to implement this project. ACTwatch has completed a number of research studies to determine what affects access to antimalarials. These include outlet surveys carried out by PSI which examine the trends in the availability, volumes and price of antimalarials. London School of Hygiene and Tropical Medicine (LSHTM) has implemented supply chain studies which look at the determinants of the price and availability of antimalarials at different levels of the supply chain. PSI also conducts household surveys to examine the trends in the levels of use of different antimalarials and determinants of use. Additionally, there were three other studies for AMFm conducted in Kenya, Tanzania and Zanzibar. ACTWatch will end in 2012.

2.6 [DHS/MIS update](#)

Fred Arnold-MEASURE DHS

Malaria indicator surveys (MIS) are widespread. There are 28 countries with MIS surveys or DHS/MICS surveys with malaria parasitemia testing. Two countries have had 3 surveys (Zambia and Senegal), six countries have had 2 surveys (Angola, Ethiopia, Kenya, Liberia, Rwanda, and Tanzania) and the remaining 20 countries have had only one survey. Approximately 75 DHS and MICS surveys contain anemia testing and many more have questions on malaria interventions. MIS and DHS surveys contain the same information on malaria interventions. The main difference is that the MIS is fielded for 3-6 weeks in the high transmission season and the DHS fieldwork usually takes 3-4 months, typically in the dry season. If you want to look at malaria trends over time, it is important to compare surveys that take place at same time of year.

A number of MIS were conducted by organizations other than MEASURE DHS. Despite repeated requests, none of these surveys have made their data publicly available. Discussion in the MERG strongly urged people responsible for these surveys to provide data and documentation to Lia Florey so that it can be made available on the www.malariasurveys.org website.

2.7 [UNICEF Data Collection Activities](#)

Holly Newby-UNICEF

Round 4 of MICS surveys will conclude in 2012; a list of these surveys was presented. MICS5 fieldwork will start as early as the end of this year and run until the end of 2014. A global pilot survey will be conducted in March-April and final survey tools will be available by mid-2012. As much as possible, UNICEF will keep all modules comparable with MICS4.

A combined list of UNICEF and MEASURE DHS surveys will be circulated by Elizabeth Patton.

2.8 [Global Fund M&E requirements: Value for Money, Counterpart Financing, Periodic Reviews & Transitional Funding Mechanism](#)

Eline Korenromp-Global Fund

Value for Money continues to be emphasized by the Global Fund. A Value for Money Checklist for grant signing, introduced during Round 10 negotiations in 2011, guides and documents the due diligence in the core VFM dimensions: program strategy, effectiveness, efficiency/economy, and funding additionality.

The [Policy on eligibility criteria, counterpart financing requirements, and prioritization of proposals for funding from the Global Fund](#), as ratified at the [25th Board meeting](#) requires that countries at the time of accessing new funding or at grant renewal, meet a minimum threshold determined by their socio-economic status. The policy stipulates that a minimum level of government's contribution to the national disease program should be reached, as a share of government plus Global Fund financing. The minimum thresholds are set at 5 percent for LICs, 20 percent for Lower LMICs, 40 percent for Upper LMICs, and 60 percent for UMICs

Countries must furthermore demonstrate that this government contribution to the National Disease Program and to the overall health sector increases each year of the grant. ((Dr. Korenromp reviewed the formula for calculating counterpart financing.)) In cases where countries have weak expenditure data systems, they can include a request of up to \$50,000 in their grant budgets to conduct a disease spending assessment.

National malaria control programs have reported budget & expenditure by funding source to WHO since 2008. WHO-GMP validates by in-depth expenditure studies in selected countries. The Global Fund Secretariat then triangulates these data with those reported by Country Coordinating Mechanisms (CCMs) to assess compliance with Counterpart Financing thresholds, and also to estimate cost-per-service, as another measure of Value-for-Money/efficiency.

Dr. Korenromp provided an update on the Global Fund *Evaluation strategy for 2011-2016*. Supported programs are encouraged to conduct periodic National Program Reviews and Impact Evaluations in time to inform Periodic Reviews for 3-yearly funding renewal. In 2012, periodic reviews are scheduled for Bangladesh, China, Cambodia, Gambia, Guinea-Bissau, Myanmar and Tanzania.

In addition, the Global Fund secretariat directly supports 8-10 independent ((, consultant-led)) evaluations per year. For malaria, Niger and Ghana had such consultant-led evaluations in 2011. Three to four more independent evaluations will occur in 2012; for which countries are selected based on burden, disbursement levels, maturity of grants, program management/implementation history, and readiness for evaluation. The Global Fund M&E toolkit – 2011 version aims to guide M&E system development, and indicator/target setting for grant Performance Frameworks. Compared to 2004, 2006 & 2009 versions it re-aligns with WHO-GMP & RBM-MERG, case management guidelines and 2012 surveillance guidelines. There is a reduced number of indicators, with more emphasis on outcome and impact and less emphasis on output. It promotes strengthening of routine surveillance and recognizes that HIS and household surveys complement each other.

A *Transitional Funding Mechanism* (TFM) replaces a full Round 11 call for proposals; the deadline for submissions is March 31 2012 applications are available [HERE](#). TFM grants will fund continuation of essential

prevention, treatment and/or care services to existing grantees if no alternative funding or reprogramming possible. TFM grants, which last two years, will be decided based on iterative proposal review, to ensure high impact and strategic investments.

3.0 Challenges and innovations in measuring case management

3.1 Update: Case Management Indicators

Mike Lynch-WHO

Case management indicators will be revised in the new edition of the RBM Core Population-based Malaria Indicator Guidelines. The diagnostic indicator will remain the same. The treatment indicators, including “Proportion of children under 5 years old with fever in last 2 weeks who received antimalarial treatment according to national policy within 24 hours from onset of fever” are problematic because there is currently a scale up of diagnostic testing and move away from presumptive treatment of fever. Additionally, the indicator could decrease even if the proportion of malaria cases treated with appropriate antimalarials increases, making the indicator difficult, if not impossible, to interpret. New indicators include: “Proportion of children under 5 years old with fever in the last 2 weeks for whom advice or treatment was sought” and “Proportion receiving ACTs/first line drugs among children under five years old with fever in the last two weeks who received any antimalarial”. Initially the treatment seeking indicator was intended to measure treatment sought from an appropriate provider. The group discussed the challenges of defining an appropriate provider, especially in contexts where distribution of ACTs through shops and home based care is promoted by programs. Ultimately, it was decided to include all providers and suggest that the indicator be disaggregated by type of provider in survey reports so that the information could be interpreted within each country context. This decision will be formalized in the final guidance document.

Dr. Lynch presented some figures showing these indicators, which can be collected using the current MIS questionnaire. He concluded by stating that the new indicators are reasonable as they are consistent with new case management paradigm, available from household surveys and vary over time. However, there are still some issues to resolve including the indicator metrics (numerator and denominator). It would be ideal to measure treatment of confirmed malaria cases, but this would require alternative data sources for facility derived information.

3.2 Measuring malaria services and case management in Service Provision Assessment (SPA) Surveys

Fred Arnold-MEASURE DHS/ICF International

The RBM MERG has traditionally focused on data collection through nationally-representative household surveys (primarily DHS, MICS, MIS). These surveys provide valuable information on key malaria interventions and often measure all-cause under-5 mortality and the prevalence of anemia and malaria. However, household surveys are not ideal for the collection of case management information in the context of increasing emphasis on diagnosis. Service Provision Assessment (SPA) Surveys are conducted in formal sector health facilities and provide information about the overall service environment and functioning of components of the health system that may affect the delivery and quality of services. The surveys examine the extent to which facilities are prepared to provide health services to clients and whether they follow generally accepted standards of care. The surveys also provide a picture of the infrastructure, resources and support systems which are available in facilities; this includes infection control items, equipment, diagnostics, service guidelines and trained staff. There is also a section in the questionnaire which gathers information on clients’ and service providers’ satisfaction with the service delivery environment.

There are four standard questionnaire types: Facility Audit; Health Worker/Provider Interviews; Observation Checklists and Client Exit Interviews. It is possible to add country-specific modules and questions to capture specific indicators of interest and the tool can be used to estimate service readiness indicators (including malaria). The nationally-representative sample usually includes 300-600 public and private facilities; in some countries the tool is used as a facility census. To date there have been SPA surveys in 11 countries, some of which have had multiple surveys. The questionnaires have been streamlined to be more user-friendly. Previously, neither the facility nor individuals interviewed were identified in the data set, but now facilities are identified (subject to their consent) as governments may find this to be more useful.

A variety of malaria-related information is gathered through SPA surveys. The inventory questionnaire malaria section gathers information on the availability and frequency of malaria services; whether malaria is diagnosed at the facility (blood tests and RDTs); observation of presence and validity of RDTs; provision of treatment for malaria; and the availability of national guidelines or other guidelines for diagnosis and treatment of malaria. The lab/diagnostic section ascertains the availability of microscopes, glass slides, malaria RDTs, Giemsa stain, field stain, and Acridine orange. The pharmacy section checks the availability and validity of antimalarial medicines. The Sick child observation examines fever reported as a symptom, physical exams, diagnosis of malaria, and treatment of malaria. Finally, the health worker interview asks health workers about their role in malaria diagnosis and testing and receipt of in-service training on the diagnosis or treatment of malaria or IPTp.

While the survey is already overburdened, some useful information needs have been proposed, including: RDT availability in the health facility; RDT use in observed sick child consultation; RDT adherence in observed sick child consultation; health worker training in RDT use and new malaria treatment guidelines; RDT stock-outs; registry reviews and caregiver reporting of test results in exit interviews.

3.3 Validation of questions in standardized household surveys for assessing caregivers' recall of diagnosis and antimalarial treatment for their children at health clinics

Thom Eisele-Tulane University

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 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 (malaria diagnosis), but they are not currently asked if they recall result of malaria diagnostic test. These indicators are subject to a caregiver/mother’s recall of what happened during fever episode and there is the potential for information bias. These indicators and their means of measurement have yet to be validated against a gold-standard to assess accuracy of a mother’s recall.

The aim of this study is to assess the effect of recall on accuracy of measuring 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 mother/caregiver’s accuracy of recalling if child received a finger/heel stick for malaria diagnosis, up to 2 weeks after visit date; 2. assess mother/caregiver’s accuracy of recalling result of malaria diagnostic test up to 2 week after visit date; 3. assess mother/caregiver’s accuracy of recalling if malaria treatment was given, including the type of antimalarial given, up to the second week after the visit. Results from this study will allow the measurement and interpretation of standardized indicators on malaria diagnosis and treatment in children with fevers to be improved.

The study measures sensitivity and specificity of mother/caregivers’ recall of: whether child with fever received a finger/heel stick for malaria diagnosis; results of malaria diagnostic test and antimalarial treatment given to the child. Exact matching will be used to stratify respondents by potential confounding factors, which include household socioeconomic status, child’s age, mother’s age and mother’s education. If statistical power allows, a logistic regression model will be used to assess how individual and household-level factors influence mothers recall of diagnosis and treatment, while controlling for potential confounding factors. The protocol is currently seeking IRB approval and data collection is expected to start in March 2012.

The group provided a number of comments to Dr. Eisele on his study. Abdisalan Noor mentioned that in Sudan, questions on types of diagnostics and medications were included in MIS. Estimates resulting from the survey were only slightly higher than facility quality of care survey estimates. This may have been because some individuals may have received test for something else and confused it, but it was surprising how close these numbers were.

Dr. Eisele was asked whether he thought that the study would be biased towards a positive result since people will be told that someone will be asking them questions in a few days. He replied that he recognized this issue but that study participants were required to receive this information by the IRB.

It was also suggested that there may be some prospects for joining forces with other disease areas which would be interested in similar work such as pneumonia and diarrhea.

3.4 Discussion of challenges and innovations in measuring case management

Holly Newby-UNICEF

The group discussed the SPA and other facility surveys. It was recognized that SPA surveys and data had been underutilized for malaria and that these surveys are also be useful for HIV, TB and MCH. Richard Cibulskis mentioned that a health facility census with basic information is often more useful for management purposes. WHO has a service availability mapping which is data heavy and it is not used often and is moving on to the Service Readiness and Availability Assessment (SARA) which is more similar to a census, but has more information.

CDC is soliciting resident advisors for information on any facility surveys conducted or upcoming. Steve Yoon is willing to collect this information from a wider group and put together a list for circulation to the MERG.

The group decided that it would be helpful to hold a meeting, perhaps in conjunction with the Survey and Indicator Guidance Task Force and Case Management Working Group to discuss collecting and using facility information. Specifically, this could focus on indicators regarding interventions that occur at the facility level (IPTp and case management) for which population-based survey data may not be adequate. It may also be useful to reach out to the child health community to see what can be gained from their experiences.

4.0 Ongoing MERG taskforce work

Morbidity Taskforce

4.1 Using district-level routine data on confirmed malaria cases to evaluate the ITN program: an example from Zambia 2009-2010

Thom Eisele-Tulane University

As countries in Africa move towards malaria elimination strategies, use of routine malaria data for surveillance, monitoring, and evaluation is becoming increasingly important. Routine health management information system (HMIS) are a potentially under-utilized data source for examining sub-national trends in malaria burden over time and space and evaluating program performance. However, lack of accurate malaria diagnosis, inconsistent reporting, and limited healthcare access has limited usability of HMIS data for rigorous malaria program evaluation. HMIS out-patient data is typically analyzed as simple trends over time and does not account for difference/changes in rainfall and temperature, HMIS completeness and access to care or treatment seeking behavior.

Since 2006, Zambia has been scaling-up rapid diagnostic tests (RDTs) to improve diagnostic accuracy. Health facility reporting has also improved over this same time the number of facilities reporting has increased from 1,327 in 2006 to 1,610 in 2010. Starting in 2009, facilities have reported both clinical and parasitologically-confirmed positive (by RDT or microscopy) malaria cases through HMIS on monthly basis. Differences in incidence risk largely due to heterogeneity across districts. To assess how ITNs are associated with differences in incidence Dr. Eisele first used a Poisson model accounting for climate, completeness of reporting and access to care and smooth for spatial and temporal autocorrelation.

Some conclusions have been drawn at this point. Each additional mean ITN per person was associated with a 62% reduction in confirmed malaria case incidence (i.e. going from 0.25 ITNs per person to 1.25 ITNs per person) after accounting for climate, HMIS reporting and access/treatment seeking. There are valid and useful ways routine HMIS and malaria program data can be used for program evaluations, especially as access to diagnostic and treatment improve; this must account for climate, HMIS reporting, treatment access and treatment seeking behavior to mitigate known bias of HMIS data. These type of analysis will be critical in helping to validate evaluations of full-coverage malaria control programs using an ecological (*i.e. plausibility*) study design.

Future analysis will attempt to account for spatial and temporal autocorrelation using a conditional autoregressive model (CAR) in Bayesian framework. Analysis will become more robust with inclusion of more years on observation of confirmed malaria cases (at least 2011). IRS will be included- perhaps stratified analysis limited to districts targeted for IRS. Dr. Eisele will include 2011 data and resolve some modelling issues before publishing.

Capacity Building Taskforce

4.2 [Capacity Building Taskforce Update](#)

The capacity building task force held a conference call in November 2011. Based on discussion during the call, a draft Terms of Reference (TOR) document will be drafted and circulated. The task force will function mainly as a community of practice as a sub-group of M&E listserv to connect individuals involved in capacity building and circulate information regarding: upcoming capacity building activities, best practices, and opportunities for collaboration. Membership is open to anyone who has an interest. To become a member, contact Elizabeth Patton at: epatton@icfi.com.

Some recent and ongoing M&E capacity building activities that are being conducted by members of the RBM partnership include annual Regional M&E of Malaria Workshops for SSA in English and French run by MEASURE Evaluation and local training partners (Centre de Reserche en Sante de Nouna and School of Public Health, University of Ghana), an online training, and an Malaria M&E Training of Trainers conducted by Malaria Consortium, ACTMalaria, SEARO, MEASURE Evaluation in Lao PDR in October 2011. Applications for the 2012 M&E of Malaria Workshops in English and French are currently being accepted and can be accessed [HERE](#).

Some of the meeting participants participated in these workshops in past years. Misheck Luhanga participated two years ago in Ghana and found it to be very useful and comprehensive covering both theory and practice. He stated that he uses a lot of skills he learned in his work in NMCP Malawi. Sola Oresanya participated in the Ghana workshop last year. She said that the fact that the workshop is tailored to malaria is more useful than a general M&E course. The exercise of development an M&E plan during the workshop was the most helpful component in her opinion, considering that Nigeria was in the process of drafting an M&E plan. The capacity to do this didn't exist at the NMCP before her attendance at the workshop, but after the workshop they did not need to hire a consultant to develop the M&E plan as they had done in the past. Nigeria was able to use the plan that they finalized after the workshop in the application for renewal of their Global Fund grant.

Economics Taskforce

4.3 [Economics Taskforce Update](#)

Nichola Cadge-DFID

Policy-makers are interested in the economics of malaria control across geographical areas and different transmission settings. Since the 17th MERG meeting which focused on economic issues related to malaria, the economics task force has begun to reconstitute. Members include: Nichola Cadge, Iain Jones, Deborah McFarland, Andrew Jones, Sonali, Stephen Resch, Richard Cibulskis and Michael White. The group has had several conference calls and has created a draft TOR document to guide their work.

According to the draft TOR, the task force would map the existing work, synthesize key policy lessons, prioritize research gaps for further study and disseminate findings. It will focus on key areas where it can add value rather than a broad-based review of all economic research attributed to malaria. The objectives of the task force include: identifying knowledge gaps and proposing options on how these can be addressed to MERG and RBM partners; providing an expert economic perspective on policy and operational questions; endorsing recommendations for policy, research, methodologies and operational responses; and supporting the dissemination of economic data related to malaria control. Some priority areas have been identified in the [draft TOR](#). A few items on list of priorities that seem more broad may need to be removed.

Membership in the taskforce will be limited to a small core group of 8-10 individuals, but topic specialists will be brought in for work on specific issues. There will be two to three face-to-face meetings in 2011 and 2012. These will be supplemented by regular teleconferences. The task force hopes to produce working papers and policy briefs based on their work.

Routine Systems Taskforce

4.4 Update of WHO surveillance guidelines

Richard Cibulskis-WHO Global Malaria Programme

The WHO Surveillance Guidelines are currently being revised to provide guidance on disease surveillance and operations. Surveillance guidelines have not been issued since the 1950/1960s, yet tools and strategies have changed. This guidance focuses on surveillance, routine information systems and decentralized analysis and provides guidance on interpretation and use. It aims to cover all stages of the malaria transition and covers strategies for data collection, setting up systems and using data for program management.

These guidelines are being developed by WHO with help from MERG members and will be launched in March/April 2012. There will be two volumes (i) programs in control phase (ii) programs in elimination phase. The contents include: 1. overview of malaria surveillance in different phases of malaria control; 2. key concepts in malaria surveillance; 3. data recording, reporting, analysis and use; and 4. establishing surveillance systems.

These guidelines are most helpful for those developing surveillance systems. WHO is currently discussing a strategy to help countries implement these guidelines with partners and hopes to have clear strategy by the end of the year.

Survey and Indicator Guidance Taskforce

4.5 Update to Guidelines for Core Population-Based Malaria Indicators

Elizabeth Patton-MEASURE Evaluation/ICF International

Three revisions to the Guidelines for Core Population-Based Indicators have been released to date (2004, 2006, 2009). The Survey and Indicator Guidance Task Force met in April 2011 to discuss the fourth update of the document. Several drafts of the document have been produced by MEASURE Evaluation with feedback from the Task Force; it is now in final draft form and is expected to be released sometime in March or April 2012.

There are a number of new indicators for vector control and case management as follows:

Core

- 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 from a health facility or provider
- Proportion receiving first-line treatment according to national policy among children under five years old with fever in the last two weeks who received any antimalarial drugs

Supplemental

- Proportion of Households with at least one ITN for Every Two People and/or Sprayed by IRS within the Last 12 Months

No changes to the questionnaires were needed to add or revise these indicators. It is recognized that the case management indicators are not getting at the information that would be most helpful, which the percentage of malaria cases which are treated according to national guidelines. However, there is currently no way of

collecting this information through surveys. It may be necessary to consider other tools to collect data on treatment of confirmed malaria cases.

After discussing the case management indicator on care seeking it was decided that the type of provider should not be specified in the indicator since there are initiatives for home-based and community based treatment in some countries. The data from this indicator should present care seeking with cross tab by source of care. As such, each country can use the information that is relevant for the country setting.

Additionally, there are changes to the recommendation on how to measure parasite prevalence through surveys. Prevalence of parasitemia should be based on the results of a high quality RDT in settings where all of the following conditions prevail: *P. falciparum* accounts for nearly all infections (≥ 90 percent); species determination is not necessary (<10 percent of infections are non- *P. falciparum*); and low level infections (<200 parasites/ μl) are uncommon. Prevalence should be based on microscopically examined blood films prepared in the field and read in a quality-controlled laboratory by well-trained microscopists in settings where any of the following conditions prevail: non-*falciparum* malaria or mixed infections account for more than 10 percent of infections; species determination is necessary (>10 percent of infections are non- *P. falciparum*); parasite density is expected to be below 200 parasites/ μl in a substantial proportion of cases. The 200 parasites/ μl cutoff is being used because this is the minimum parasite concentration used by the FIND malaria RDT product testing. Below this level, it is unclear how well RDTs will function. Data on the prevalence of low level infections should come from HMIS data and/or special studies where available.

4.6 [Malaria Indicator Survey Package](#)

Lia Florey-MEASURE DHS/ICF International

The Malaria Indicator Survey (MIS) basic documentation is a comprehensive package of tools for conducting household-level malaria surveys that was prepared by MERG in 2005 and is available on the RBM website. It includes: Introduction and Overview; Questionnaires (household and woman's); Rationale, Interviewer's Manual; Supervisor's Manual; Guidelines for Interviewer Training; Household Listing Manual; Sampling Guidelines; Biomarker Field Manual; Referral Forms; Child Anemia and Malaria Brochure; GPS Manual; and Calculating the Cost of MIS.

Since 2006 there have been several changes made to the main questionnaire. There have been several additions, including: a malaria diagnostic question for febrile children; sections on anemia and malaria measurement; and BCC questions. The IRS spraying question has been reworded to state: "At any time in the past 12 months, has anyone come into your dwelling to spray the interior walls against mosquitoes?" Several questions have been deleted, including questions on: the number of months since spraying and response category on "household member" from question on who sprayed the house; whether a child is still ill with fever and number of days each antimalarial drug taken; and pregnancy status from household questionnaire.

There was a Survey and Indicator Guidance Task Force meeting in April 2011. It was decided that there would be a FAQ document written about the MIS. Volunteers were solicited to review the MIS Package and the FAQ document. A decision was made to disseminate the package to countries using flash drives.

At the 17th RBM MERG meeting, the FAQ document was presented and the topic of RDTs vs microscopy was debated. The latter issue was resolved during a teleconference in November 2011.

The Malaria Indicator Survey (MIS) package is currently being finalized to reflect changes made to the Guidelines for Core Population-Based Indicators. Anyone who would like to review any part of the MIS package or MIS FAQ or add a question to the MIS FAQ document should contact Elizabeth Patton (epatton@icfi.com).

Mortality Taskforce

4.7 RBM MERG guidance for program impact evaluation

Yazoume Ye-MEASURE Evaluation/ICF International

Increased funding for malaria control in the past decade in SSA has led to scale up of key interventions (ITNs, IRS, IPTp, treatment) and there is need for an assessment of the effect of this scale up on malaria burden for further improvements. The RBM partnership developed a guidance document for tracking progress and showing results (Rowe et al., 2007). This document proposed a plausibility design to measure impact of malaria control programs. There is need to update this guidance in light of the 2010 measurement needs and new evidence. A decision was made at the RBM Expert's Consultation on Mortality Measurement in April 2010 to revise this document.

Since the last MERG meeting there have been several phone calls and further revisions to the document. It now has a new title: "A Plan for Evaluating the Impact of the Scale-Up of National Malaria Control Programs in sub-Saharan Africa in the Past Decade". The target audience of this document is the staff of NMCP, MoH, and funding agencies and individuals with background and understanding of M&E. It is not intended to be an exhaustive resource on statistical modeling techniques. Dr. Ye reviewed the various methods used to collect the indicators suggested by this document and some of the pending questions which will need to be resolved before the publication of this document. These include: how to measure the impact of interventions in older age groups considering the fact that interventions are being scaled-up for universal coverage; which indicators to disaggregate; how to combine population and health facility-based estimates under the same evaluation framework; and how to stratify malaria risk.

The mortality task force hopes to launch this document before the next RBM MERG meeting.

5.0 Recent disease burden estimates

5.1 Results from a meta-analysis assessing the association of malaria prevention and pregnancy with low birth weight and neonatal mortality using nationally-representative datasets

Thom Eisele-Tulane University

Trials of malaria prevention in pregnancy (ITN and IPTp) show a reduction in low birth weight (LBW) in the first two pregnancies of 35%. A recent randomized controlled trial (Menendez et al., 2010) also showed IPTp to reduce neonatal mortality by 61% (95% CI 7-84%) across all pregnancies. Yet it is unclear how well efficacy estimates from trials are translating into effectiveness under routine program conditions.

This study aims to assess the association of malaria prevention in pregnancy (ITNs and IPTp) with low birth weight (LBW) and neonatal mortality across national survey datasets in Africa since 2000 using nationally-representative surveys with a birth history and net roster conducted in sub-Saharan Africa after the year 2000. Conditional logistic regression of individual-level matched births was conducted. It accounted for following covariates patterns regarding: mother's age, birth spacing, season, malaria transmission intensity at the primary sampling unit level, sex of the child, whether the child was twin or triplet and skilled birth attendant presence at delivery.

Findings demonstrated significantly lower odds of having had low birthweight infants among women in the first two parities who reported taking two or more doses of SP during pregnancy and/or having owned an ITN during all six months preceding birth compared to women who did not. The findings also showed significantly lower odds of having had a live-born infant die during the neonatal period among women in the first two parities who reported taking one or more doses of SP during pregnancy and/or having owned an ITN during all six months preceding birth compared to women who did not.

The effect of ITNs alone and IPTp alone are similar to exposure to either or both; there was no significant interaction (additive effect) of having both over either. Malaria prevention in pregnancy associated with an 18% reduction in LBW (1st two pregnancies) under routine program conditions across Africa [AOR=0.82; 95% CI=0.723 - 0.919]. Malaria prevention in pregnancy associated with a 21% reduction in neonatal mortality (1st two pregnancies) under routine program conditions across Africa. These results help bolster the 'plausibility' study design of the association of increased malaria prevention interventions with reductions in all-cause child mortality. There is likely still some selection bias in this type of cross-sectional analysis, but exact matching brings the crude odds ratio closer to null in nearly all analyses.

5.2 [Malaria Atlas Project for Africa](#)

Abdisalan Noor-KEMRI-University of Oxford-Wellcome Trust Collaborative Programme

The most famous historical map on malaria endemicity was produced by Lysenko & Semashko in the 1960s. This was based mainly on expert opinion. In 1996 Bob Snow spoke of the need for more maps in an article in *Parasitology Today*. In 1999 MARA project, produced maps on climate suitability and another set on duration of transmission. By 2006, the Malaria Atlas Project (MAP) was formed by Bob Snow and Simon Ha. By 2008 parasite prevalence data points (~5000) were assembled and in 2009 the first global empirical map of malaria risk was produced. Another 10,000 data points were added by 2010. Within the MAP team there was an internal debate on whether to release maps or wait until 2012 to get data from several large African countries. Some members of the MAP team released new maps of 2010 with the available data. MAP aims to have another map on prevalence by late 2014.

MAP is also thinking of creating historical maps of risk as a major of receptivity. As a precursor to investing heavily in historic maps the project created maps of the spatial limits of transmission from 1939 to 2009 map based on a literature review and observed prevalence and incidence of malaria. This map includes all countries in North Africa. The project has now assembled a lot of data and is continuing to do so with the aim of developing maps for the period up to 1959 and 1960-1999, 2000-2011.

The 2007 MAP estimates were partly used in the creation of IHME mortality estimates which are scheduled to come out the week following the MERG. The 2010 estimates may have resulted in higher estimates in some countries where new parasite survey data were limited, but to state this definitively would require a closer look. It would probably not be a substantial change.

Dr. Noor was not sure how useful these maps for programmatic decision-making when they do not go down to district level. To create more programmatically useful maps would require the assembly of more data and with more precision at lower geographic levels where decisions are made.

Maps are available on [MAP website](#).

5.3 [CHERG Disease Burden Estimates](#)

Richard Cibulskis-WHO

Dr. Cibulskis reviewed the most recent CHERG estimates. The estimates of number of cases and the number of deaths outside Africa are similar to those published in the 2010 World Malaria Report. However, the number of deaths in Africa is substantially different (710,000 to 596,000). This was caused by a downward revision of the total number of child deaths occurring globally made by the IGME and changes in the assignment in cause of death made by the Child Health Epidemiology Reference Group (CHERG), that affected the proportion of deaths attributed to malaria, particularly at the beginning of the last decade. These methodological changes resulted in an overall lowering of the number of malaria deaths in the African Region of approximately 11% for 2009 and larger percentages in earlier years.

6.0 Measurement of malaria in low-endemicity or elimination settings

6.1 [Parasitaemia testing among all age groups and in low endemicity settings](#)

Abdisalan Noor-KEMRI-University of Oxford-Wellcome Trust Collaborative Programme

Low malaria endemicity countries (LEC) are defined differently by different parties. The Malaria Atlas Project and others characterize these countries as having one clinical malaria case per 10,000 population per annum. There are a number of low endemicity countries in AFRO (Namibia, and countries in the Sahelian belt) and in EMRO (Djibouti, Somalia, Republic of Sudan, Afghanistan and Yemen) that are not yet in elimination. These countries are still in control, but have low endemicity.

There are a number of issues with testing parasitemia through surveys in these settings. As the population has limited antiparasitic immunity, there is no predictable age pattern among infected individuals. Therefore the sample should include all ages. When testing all ages there is an increased frequency of absenteeism, call backs, and refusals. In surveys in high and moderate endemicity settings, sampling is based mainly on intervention indicators. Trying to sample based on changes in infection in low endemicity settings yields very large sample sizes. This, coupled with the need for more testing materials and personnel for testing to cover all age groups, increases the cost tremendously. Even with large samples there are still relatively few cases which can lead to potentially low precision estimates at the Admin1 level.

There are also some ethical considerations of parasitemia testing in these settings. Pregnant women have a different treatment protocol if they test positive for malaria; treatment differs by trimester, type of drugs depend in national guidelines but the recommendation is admission. As there is difficulty assessing pregnancy through verbal history, it becomes necessary to have a clinician or nurse in the survey team. Additionally, there may be an increased need for treatment severe disease as the chances of severe malaria higher in LECs. There is a need to determine the ethical implications of referral vs. transport to nearest in-patient facility.

In Dr. Noor's opinion, it is not worth carrying out parasitemia testing through surveys in LEC unless the money is available to have the needed sample size. There are other alternatives to measuring the impact of malaria control in LEC. A standard MIS could be implemented but PCR results could be used as a measure of impact and together with serology this could provide measures of transmission. HMIS is difficult because the data is usually of poor quality. Sentinel surveillance is an alternative, but is not nationally representative. Testing of infants through EPI would utilize existing infrastructure and provide fairly reliable evidence of the presence of transmission, but there are important ethical issues related to the testing of infants. Another alternative is the use of cross-sectional health facility surveys to test among suspected cases over a few days and ask questions on intervention coverage, age, sex and residence. This would provide reliable information on the slide positivity rate, but may be expensive and may have selection bias.

6.2 [From control to pre-elimination: a case study in South America](#)

Leopoldo Villegas-MEASURE Evaluation/ICF International

There are 23 malaria endemic countries in the Americas. Suriname is the smallest independent country in South America and 80% of its territory is covered by tropical rainforest. Malaria has been a public health problem in Suriname. A successful malaria control program eradicated malaria from the coastal area (1968) and since then malaria transmission has been mainly in communities living in the interior. Cases are highest in border areas, where there is substantial cross border networking, and in mining areas. Since 1958 Suriname's Bureau of Public Health has had a special division dedicated to malaria eradication, the Anti Malaria Campaign. A malaria information system has been set up since 1955. The Annual Parasite Index (API) for the country has been one of the highest in the Amazon region. Suriname received financial support from Global Fund in Rounds 4 and 7. Malaria control activities also receive support from other donors.

A variety of strategies were customized for use in Suriname, including: IRS, LLINs, mobile service delivery, use of RDTs and ACTs, and aggressive IEC/BCC. Results were achieved relatively fast using tailored-based combination of interventions. Malaria cases, API, hospitalizations and deaths decreased significantly between 2003 and 2009. The age of malaria patients has increased alongside the proportion of imported cases. Malaria

pre-elimination has now been achieved nationwide. Suriname is preparing for elimination and is taking into account a number of challenges. There are current financial gaps, which are significant as malaria elimination likely to cost more than controlling it. Additionally, border-malaria needs to be addressed in order to prevent re-introduction; this will require significant cross-border collaboration and specifically the harmonization of treatment guidelines with French Guyana.

7.0 MERG business issues

7.1 [MERG work plan](#)

Richard Cibulskis-WHO

The RBM-funded MERG work plan for 2012 includes \$41,250 of confirmed funding. This is allocated to a toolkit for measuring case management indicators and data quality, sponsorship for endemic country participants to attend MERG meetings and distribution of the Guidelines for Core Population-Based Malaria Indicators.

RBM also budgets for supplementary funds in the case that additional funding becomes available. This funding, of \$335,120 is not confirmed. It includes line items for the World Malaria Report, dissemination of P&I series reports, evaluation of the P&I series and the cost of additional sponsorship for endemic country participants to attend MERG meetings. Dr. Cibulskis was not sure why the World Malaria Report was listed in the budget under supplementary items as no funding for this report was requested through the MERG. A request was made to Eric Mouzin of RBM to provide information regarding how funding allocation occurs at RBM for future reference.

7.2 Upcoming MERG meeting

The next MERG meeting will take place in June 2012 in London, England.

8.0 Summary of Agreements and Follow-Up Actions

Action Item	Deliverable	Person/ Organization Responsible	Tentative Due Date
Finalize update of Guidelines for Core Population-Based Indicators	Published Guidelines for Core Population-Based Indicators	Survey & Indicator TF	April 2012
Sign up and review MIS Package revisions	Published MIS document	MERG Members	March 2012
Send MIS reports and data to Lia Florey	MIS reports and data on malariasurveys.org website	MIS implementers	Ongoing
Circulate joint list of MIS/DHS/MICS surveys	Joint list of MIS/DHS/MICS surveys	E. Patton/L. Carvajal	March 2012
Compile and circulate a list of facility surveys which are complete or in progress	Comprehensive list of facility surveys which are complete or in progress	S. Yoon	March 2012
Finalize Surveillance Guidelines – volunteers for review	Published WHO Surveillance Guidelines	WHO – Routine TF	February 15, 2012
Finalize and circulate guidance for evaluating impact of malaria control programs	Published guidance for evaluating impact of malaria control programs	Mortality TF	June 2012
Conduct meeting to discuss case management indicators	Meeting, report and action items	Survey & Indicator TF	Before next MERG
Explore options for collecting appropriate and useful data on facility-based interventions including case management and IPTp	Meeting, report and action items	E. Eckert, Survey & Indicator TF	Before next MERG
Explore data collection at lower levels of health care system and in low endemicity settings		A. Terlouw	
Explore program managers need for mapping	List of program managers identified mapping needs	A. Noor	Before next MERG
Finalize and circulate TOR for Economics Task Force	TOR for Economics Task Force	Economics TF, N. Cadge	Before next MERG
Contact Elizabeth if you would like to join capacity building task force/CoP	Operational capacity building CoP	E. Patton	Ongoing
The next MERG meeting will take place in June 2012 in London, England	Meeting, report and action items	E. Patton	June 2012