during the three-year transition phase, as county health structures and malaria control programs become functional and the MCU continues to provide support to ensure continuity of operations and implementation of malaria interventions.

Updates in Strategy

The key updates are related to a mid-term strategic review undertaken in mid-2014 to inform the MCU, partners, donors, and stakeholders and ahead of the next Global Fund for HIV/AIDS, Tuberculosis and Malaria (Global Fund) proposal submission for the new funding model at the beginning of 2015. The revision of the strategy and M&E plan is supported by United Kingdom's Department for International Development (DFID), the World Health Organization (WHO), PMI, and implementing partners.

- Revision of the National Malaria Strategy 2009–2017 with updated time lines for indicators and incorporation of new roles and responsibilities following devolution. The revised NMS is expected to be finalized with costing by September 2014.

- Revision of the Malaria Monitoring and Evaluation Plan 2009–2017 with updated time lines for indicator performance. Although review of the plan has started, the revised M&E Plan is expected to be finalized with costing by the end of 2014.

National Malaria Control Strategy

The GoK remains committed to improving health service delivery and places a high priority on malaria control. The MCU is currently in the process of a mid-term review and revision of the National Malaria Strategy 2009–2017 and is also currently revising the M&E Plan in accordance with the new strategy. The MCU has prioritized malaria prevention and treatment interventions and outlined them in the revised NMS, which has six strategic objectives that together are focused on reaching a two-third reduction of malaria morbidity and mortality by 2017:

- **Objective 1:** To have at least 80% of people living in malaria-risk areas using appropriate malaria preventive interventions by 2017.

- **Objective 2:** To have 100% of fever cases which present to a health worker receive prompt and effective diagnosis and treatment by 2017.

- **Objective 3:** To ensure that 100% of malaria epidemic-prone and seasonal-transmission counties have the capacity to detect and the ability to respond to malaria epidemics by 2017.

- **Objective 4:** To ensure that all malaria surveillance, monitoring and evaluation, and program indicators are routinely monitored, reported and evaluated in all counties by 2017.

- **Objective 5:** To increase utilization of all malaria control interventions by at-risk communities in Kenya to at least 80% by 2017.

- **Objective 6:** To improve capacity in coordination, leadership, governance and resource mobilization at all levels towards achievement of the malaria program objectives by 2017.

Strategies to support the achievement of the revised NMS objectives include adopting a multi-sectoral approach to malaria control, decentralizing malaria control operations to counties beginning in 2013, tailoring interventions to the prevailing epidemiology, and strengthening the malaria control performance monitoring and evaluation system. Given the varied and changing malaria epidemiology, Kenya is targeting appropriate intervention measures for specific malaria-risk areas. The MCU has strategically reprioritized the approved malaria control interventions according to malaria risk, in order to target resources towards achieving the highest impact possible.

Kenya Malaria Control Strategy – strategic approach by intervention

Insecticide-Treated Nets

The GoK has embraced universal ITN coverage as a strategy to ensure that all groups at risk in malaria-endemic and -epidemic counties have access to long-lasting ITNs through various distribution channels. The target for ITNs is to have at least 80% of people living in malaria-risk areas using appropriate malaria prevention interventions by 2017 through: (1) regular rolling mass distribution campaigns, carried out every three years to scale up net ownership, where free ITNs are distributed (one net for every two people) to all targeted geographic areas (i.e., 23 counties); (2) routine distribution, in which pregnant women and children under one year are given free nets through over 3,700 antenatal care (ANC) clinics and Expanded Programme on Immunization (EPI) / child health clinics in 37 counties; and (3) social marketing of nets, which promotes the sale of highly-subsidized ITNs through social marketing channels, particularly in designated rural counties. Commercial sales of ITNs in the private sector are also endorsed by the MCU.

Indoor Residual Spraying

The revised NMS set a target of 80% of Kenyans at risk of malaria using appropriate malaria prevention interventions, including ITNs and IRS. The revised NMS has prioritized IRS for malaria-endemic counties with additional support for capacity building and focal IRS in epidemic-prone counties. To ensure that proper IRS activities are carried out, the MCU and partners identify and train local health personnel who will supervise activities and spray operators who do the actual spraying. Health workers in epidemic-prone counties will also be trained to use malaria surveillance data to determine priorities for focalized IRS activities. The recent change to a non-pyrethroid insecticide for IRS was based on data indicating widespread resistance to pyrethroids in western Kenya.

Malaria in Pregnancy (MIP)

The 2010 National Guidelines for the Diagnosis, Treatment and Prevention of Malaria in Kenya emphasize the integration of MIP in the overall ANC package for maternal health that includes ITNs, prompt diagnosis and treatment of fever due to malaria, and behavior change communication to promote early ANC attendance and uptake of prevention measures. Since

2009, when the MCU adopted a policy to provide (IPTp) with at least two doses of sulfadoxine-pyrimethamine (SP) in moderate-to-high transmission counties, IPTp has been included in the ANC and MIP package of interventions in 14 malaria-endemic counties. The 2010 MIS results showed improved, though continued low, coverage of IPTp; only 25% of pregnant women receive two or more doses of SP despite high ANC attendance (i.e., 86% of women attend ANC two or more times during their pregnancy). There has been renewed attention to MIP with WHO guidelines released in 2012. The MCU, working with the Reproductive Health Unit, reviewed the national guidelines in 2013 and identified areas of discordance with WHO recommendations and gaps in data collection and reporting. This led to a renewed emphasis on MIP activities in 2013 and 2014, including IPTp in the 14 malaria-endemic counties and a revised MIP activity plan for 2015–2017 in order to meet the goal of 85% IPTp2 coverage in targeted counties.

Case Management

The 2010 National Guidelines for the Diagnosis, Treatment and Prevention of Malaria in Kenya recommend diagnosis-based treatment as part of effective case management. The revised NMS target for case management is to ensure that 100% of all fever cases receive a parasitological diagnosis, by microscopy or rapid diagnostic test (RDT), and effective treatment by 2017. To support this objective, Kenya started rolling out RDTs to community, dispensary and health centers in early 2014 following long stockouts in 2013, provides first-line AL for treatment in all public health facilities, and supports national in-service training for diagnostics and case management. Artesunate injection for treatment of severe malaria was introduced in the public health system in 2014 with support from partners and donors.

The revised NMS target for community case management is to have at least 80% of self-managed fever cases (i.e., persons with fever who seek care outside of the traditional healthcare system from pharmacies or informal drug outlets) receive prompt and effective treatment by 2017. To support this objective, the MCU is working with the MoH and partners to make RDTs and AL available to community health volunteers (CHVs) to discourage use of informal drug outlets by persons with fever and through creation of customer demand and subsidy schemes to encourage diagnosis prior to treatment in the private sector. To improve home management of malaria, the revised NMS proposes that CHVs receive training and supportive supervision for malaria case management, prevention, behavior change communication, record keeping and reporting. Both RDTs and artemether-lumefantrine (AL) will be integrated into the CHV kit, and all CHVs will be linked to the nearest health facility for resupply of commodities, supervision, monitoring and referral.

Surveillance, Monitoring and Evaluation, and Operational Research

Surveillance, monitoring and evaluation and operational research are vital assessment elements for tracking the progress of malaria control activities. The MCU has a comprehensive M&E Plan to accompany the revised NMS, which recommends the frequency and methodology of monitoring key program indicators for each of the interventions in order to better assess and inform program implementation. The M&E framework and plan will be revised in mid- to late-2014 so that it is in line with the revised NMS strategy to ensure that all malaria surveillance, monitoring and evaluation, and program indicators are routinely monitored, reported and evaluated in all counties by 2017.

With the Kenya Health Information System's District Health Information System 2 (DHIS2) platform operational since 2010, the MCU and all partner efforts to collect and report surveillance and routine health facility data will be based on this system to consolidate data collection and improve reporting efforts. Historically, malaria surveillance data from epidemic-prone districts (i.e., sub-counties) was collected via the weekly Integrated Disease Surveillance and Response (IDSR) system. In late 2013, the stand-alone IDSR system was incorporated into the DHIS2 platform and renamed eIDSR. To meet the revised NMS strategy to ensure that 100% of malaria epidemic-prone and seasonal-transmission counties have the capacity to detect and the ability to respond to malaria epidemics by 2017, the MCU began the roll out of the malaria surveillance curriculum in the last half of 2013. The MCU uses the data from DHIS2 to produce the quarterly malaria surveillance bulletins, the annual malaria report, and inform program decisions and reporting requirements.

Operational research is carried out to provide data and trend analysis to facilitate decision making and determine the most appropriate approaches for interventions. Operational research has included studies in the following areas: social behavior in malaria control; entomology and vector behavior; changes in malaria transmission trends; piloting school-based malaria parasite control; insecticide resistance; therapeutic efficacy of malaria medications; malaria vaccine trials; malaria early warning systems; malaria in pregnancy; and cost-effectiveness analysis of control interventions.

Advocacy, Communication and Social Mobilization

The national target is to strengthen advocacy, communication and social mobilization to increase utilization of all malaria control interventions by at-risk communities in Kenya to at least 80% by 2017. Communication is a cross-cutting activity that plays a role in each of the malaria control interventions. Social mobilization and communication activities ensure that beneficiaries have correct and timely information about the use and importance of each malaria prevention and control intervention. Implementation of behavior change communication (BCC) activities will focus on the involvement of health providers and CHVs in malaria prevention and control activities. Additional emphasis will be placed on using interpersonal communication (IPC) approaches delivered by CHVs, community-based organizations and special interest groups to target hard-to-reach populations and deliver personalized messaging. Traditional channels of communication (e.g., television, radio, print, mobile phones) will be used, particularly during the upcoming 2014–2015 mass ITN campaign.

Integration, Collaboration and Coordination

The U.S. Government team in Kenya has developed a strategy that embraces a whole-of-government, multi-layer communication strategy, reflecting all fundamental principles of PMI. The Department of Defense, Department of Health and Human Services/Centers for Disease Control (CDC), Department of State, Peace Corps, U.S. Agency for International Development (USAID) and President's Emergency Plan for AIDS Relief (PEPFAR) have implemented and reported on a large program base for several years. This multi-tiered governance structure allows for full participation across agencies, at all levels, and across technical areas which has resulted in programming responsive to Kenya's needs. Examples include:

- The MCU and PMI have worked closely with the Walter Reed Army Institute of Research's Malaria Diagnostics Center to support and strengthen malaria diagnostic capacity and implement a quality assurance/quality control (QA/QC) program for malaria diagnostics. PMI-supported activities have included the procurement and distribution of microscopes, malaria microscopy training, QA officer training, development and production of the National Guidelines on Parasitological Diagnosis of Malaria and Malaria Vector Surveillance in Kenya (2013) and accompanying microscopy wall charts and job aids, and implementation of the QA/QC program for malaria diagnostics in health facilities.

- The MCU and PMI have partnered with Peace Corps since 2011 to support community-based malaria activities. PMI supported three trained malaria volunteers in 2013–2014 to mobilize volunteers across sectors to plan and incorporate malaria prevention and control activities in the communities where they live and work. The Peace Corps volunteers completed a total of 33 malaria-focused community projects that reached over 60,000 people by June 2014.

- The MCU and PMI have a long-standing relationship with the Kenya Medical Research Institute (KEMRI) - CDC Collaboration. KEMRI and CDC collaborative malaria research has contributed to the development of each of the pillars of malaria prevention and control (i.e., effective case management, IPTp, ITNs, and IRS). Current surveillance and OR activities are focused on epidemiological and entomological surveillance and new medications and treatment strategies to inform national policy, strategies and program implementation.

In addition to U.S. Government integration and collaboration, PMI facilitates coordination of activities among key malaria partners in Kenya, including Global Fund, DFID, Malaria Control and Elimination Partnership in Africa, WHO, Roll Back Malaria Partnership, United Nations Children's Fund, research institutions, non-governmental organizations, private sector, and other donors and stakeholders. PMI is an integral partner to the MCU and actively participates in annual planning and reviews, technical working groups, interagency coordination committees, and other stakeholder-related activities.

Financial support for the MCU's plan comes from three primary sources: PMI, Global Fund and DFID. The five-year Global Fund Round 10 grant, which runs from 2012–2016, has a value of $111 million or $22.3 million per year. The African Medical and Research Foundation (AMREF) received a five-year Global Fund Round 10 grant, which also runs from 2012–2016. The AMREF grant is worth $16 million to support implementation of home-based and community case management of malaria in the endemic counties of western Kenya. In 2014, DFID will provide 800,000 ITNs (down from 1.4 million in 2013) through ANC and EPI/child health clinics and 600,000 ITNs through social-marketing channels, programmatic and OR support through WHO, and $7 million for a one-year extension of the Affordable Medicines Facility – malaria. DFID has withdrawn $40 million in pledged funding to support the IRS program due to concerns about value for money after the transition to a more expensive insecticide class and substantially smaller projected population coverage for the intervention. In addition, the current DFID health development program ends in 2015.

Based on the revised NMS strategy, budget analysis and confirmed contributions from Global Fund and DFID, PMI has concluded that the FY 2015 budget ($32.4 million) should be focused on filling critical program gaps. The confirmed available funding (projected total of ~$60 million in 2015) to support the MCU's annual malaria prevention and control plan falls significantly short of the expected need, which for 2015 is estimated to be approximately $300 million. As addressed in this operational plan, the PMI FY 2015 funded activities have been prioritized after considering the funding available from other donor programs to ensure that the most critical activities are implemented.

PMI Goals, Targets and Indicators

The goal of PMI is to reduce malaria-associated mortality by 70% compared to pre-Initiative levels in the 15 original PMI countries and to reduce malaria-associated mortality by 50% in new countries added to PMI in FY 2010 and later. By the end of 2015, PMI will assist Kenya to achieve the following targets in populations at risk for malaria:

- >90% of households with a pregnant woman and/or children under five years of age will own at least one ITN
- 85% of children under five years of age will have slept under an ITN the previous night
- 85% of pregnant women will have slept under an ITN the previous night
- 85% of houses in geographic areas targeted for IRS will have been sprayed
- 85% of pregnant women and children under five years of age will have slept under an ITN the previous night or in a house that has been protected by IRS
- 85% of women who have completed a pregnancy in the last two years in malaria-endemic regions will have received two or more doses of IPTp during that pregnancy
- 85% of government health facilities have ACTs available for treatment of uncomplicated malaria
- 85% of children under five years of age with suspected or confirmed malaria will have received treatment with ACTs within 24 hours of onset of their symptoms

Progress on Coverage/Impact Indicators to Date

In Kenya, coverage with effective interventions and the health impact are measured largely through national household surveys. The 2008–2009 DHS and 2010 MIS provided evidence of Kenya's progress in achieving national targets (Table 1).