This Malaria Operational Plan has been endorsed by the U.S. Global Malaria Coordinator and reflects collaborative discussions with national malaria control programs and partners in country. If any further changes are made to this plan, they will be reflected in a revised posting.

PRESIDENT'S MALARIA INITIATIVE

Malaria Operational Plan

KENYA
FY 2011

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ABBREVIATIONS

ACT	Artemisinin-based combination therapy
ANC	Antenatal care
AL	Artemether-lumefantrine
BCC	Behavior change communication
CDC	Centers for Disease Control and Prevention
CHEW	Community Health Extension Workers
CHW	Community health workers
DfID	Department for International Development (UK)
DHMT	District health management teams
DHS	Demographic and Health Survey
DOMC	Division of Malaria Control
DRH	Division of Reproductive Health
DSS	Demographic Surveillance System
FBO	Faith-based organization
FANC	Focused Antenatal Care
FY	Fiscal Year
Global Fund	The Global Fund for HIV/AIDS, Tuberculosis and Malaria
GOK	Government of Kenya
HMIS	Health Management Information System
IEC	Information, education and communication
IMaD	Improving Malaria Diagnostics
IPTp	Intermittent preventive treatment in pregnancy
IRS	Indoor residual spraying
ITN	Insecticide-treated bednet
KEMRI	Kenya Medical Research Institute
KEMSA	Kenya Medical Supplies Agency
LLIN	Long-lasting insecticide-treated bednet
LMIS	Logistics Management Information System
M&E	Monitoring and Evaluation
MIAS	Malaria Information Acquisition System
MIP	Malaria in pregnancy
MIS	Malaria Indicator Survey
MOPHS	Ministry of Public Health and Sanitation
NGO	Non-governmental organization
PEPFAR	President's Emergency Plan for AIDS Relief
PMI	President's Malaria Initiative
PPB	Pharmacy and Poisons Board
PCV	Peace Corps Volunteer
RBM	Roll Back Malaria
RDT	Rapid diagnostic test
SP	Sulfadoxine-pyrimethamine
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USG	United States Government
WHO	World Health Organization

EXECUTIVE SUMMARY

Malaria prevention and control are major foreign assistance objectives of the U.S. Government (USG). In May 2009, President Barack Obama announced the Global Health Initiative (GHI), a six-year, comprehensive effort to reduce the burden of disease and promote healthy communities and families around the world. Through the Global Health Initiative the USG will invest $63 billion over the next six years to strengthen healthy and productive lives, building upon and expanding the USG's successes in addressing specific diseases and issues.

The President's Malaria Initiative (PMI) is a core component of the GHI, along with HIV/AIDS, maternal and child health, and tuberculosis. The PMI was launched in June 2005 as a 5-year, $1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions and reduce malaria-related mortality by 50% in 15 high-burden countries in sub-Saharan Africa. With passage of the 2008 Lantos-Hyde Act, funding for PMI has now been extended through FY 2014. Programming of PMI activities follows the core principles of GHI: encouraging country ownership and investing in country-led plans and health systems; increasing impact and efficiency through strategic coordination and programmatic integration; strengthening and leveraging key partnerships, multilateral organizations, and private contributions; implementing a woman- and girl-centered approach; improving monitoring and evaluation; and promoting research and innovation. Kenya is a GHI plus country.

The malaria situation in Kenya is changing. A decline in the burden of malaria in Kenya has been observed in recent years resulting in low malaria transmission intensity in most parts of the country. However, moderate to high levels of transmission remain in certain endemic zones. Consequently, as part of the Division of Malaria Control's (DOMC) 2009-2017 National Malaria Strategy, prevention and control interventions are now focused in those districts with the highest malaria endemnicity rather than diffused and provided equally throughout the country.

Kenya's Round Four malaria grant from the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) is coming to an end in January 2011. Kenya has been unsuccessful in the last four grant applications. At the time of writing, Kenya's Round 10 application is being finalized for submission; if successful, this grant would begin funding activities no earlier than the last quarter of 2011. The gap in Global Fund grants that will occur in 2011 places particular pressure on other donors to prioritize the most critical malaria control measures and continue to fund life-saving interventions.

The PMI 2011 Malaria Operational Plan was developed in close consultation with the Ministry's DOMC and with participation of numerous national and international partners involved with malaria prevention and control in the country. The activities that PMI is proposing for FY 2011 are matched with identified needs and priorities described in the DOMC's National Malaria Strategy (2009-2017) and build on investments designed to improve and expand malaria-related services during the first three years of PMI funding. The proposed FY 2011 PMI budget for Kenya is $36 million.

To achieve the goals and targets of the DOMC and PMI, the following major activities will be supported with FY 2011 funding:

Insecticide-treated nets (ITNs): The 2009-2017 National Malaria Strategy promotes universal ITN coverage, defined as one net per two people, within prioritized regions of the country. Routine distribution of ITNs to sustain coverage for pregnant women and children under one year of age also remains a priority. Kenya is using its Global Fund Round 4 grant, DfID, and PMI support to significantly scale up ITN distribution throughout the country. Current distribution strategies include free or highly-subsidized ITNs provided through antenatal care (ANC) clinics, routine and mass ITN distributions through the expanded program on immunization services, child health action days, community-based initiatives and retail outlets. In 2008, household ownership of ITNs was 56%, while proportions of children under five years and pregnant women who slept under a net the previous night were 47% and 49% respectively.

By the end of 2010, PMI will have purchased a total of 2.8 million ITNs and distributed 1.3 million to support the routine free distribution to vulnerable populations, as well as providing one million free ITNs for the planned 2010-2011 rolling universal coverage mass distribution campaigns. To continue supporting the national ITN policies, with FY 2011 funding PMI will procure 1.5 million LLINs for free routine distribution through ANC clinics. Additionally, PMI will provide 500,000 LLINs and logistics support for a planned rolling mass universal campaign to begin in late 2010. PMI will continue to work with non-governmental organizations (NGOs) on community-based information, education and communication/ behavior change communication (IEC/BCC) campaigns to increase demand for and correct usage of LLINs.

Indoor residual spraying (IRS): The Government of Kenya's IRS program in epidemic-prone districts is ending in 2010, and transitioning towards districts with higher malaria transmission rates. PMI has supported the national IRS program since 2008. Annually, PMI targets key districts in Western and Nyanza Province and protects over 1.2 million people annually. With FY 2011 funding, PMI will spray in ten endemic districts[1], covering an estimated 747,321 structures and protecting an estimated 1.4 million people. Additionally, PMI will support entomological monitoring and provide enhanced epidemic surveillance and response in districts transitioning away from IRS programs.

Intermittent preventive treatment of pregnant women (IPTp): The 2008-2009 Demographic and Health Survey (DHS) results showed continued low coverage of IPTp—only 15% of pregnant women receive two or more doses of SP, despite high ANC attendance (86% of women attend ANC two or more times during their pregnancy). A pilot study conducted in 2010 confirmed that implementation of a new, simplified IPTp policy increased IPTp uptake in targeted districts. Since 2008, PMI has trained approximately 7,000 community health workers on focused antenatal care/malaria in pregnancy, reached 40,000 women with educational messages, and worked with the DOMC to strengthen pre-service curriculum for health workers as well as to simplify provider guidelines on how and when to provide IPTp. With FY 2011 funding, PMI will support implementation of the revised IPTp

[1] These ten endemic districts reflect the reorganized district structure. The geographic coverage of these ten new districts are the same as the three districts referenced in previous MOPs.

policy in public health facilities in priority districts. PMI will also strengthen community-based behavior change and social mobilization activities that are designed to increase client demand for ANC and IPTp services.

Case management: National policy guidelines for malaria diagnosis were issued in 2010, and clearly articulate the role of RDTs as part of effective case management. Since 2008, PMI has trained 77 microscopists while also procuring and distributing 80 microscopes. By the end of 2010, PMI will also procure and distribution 700,000 rapid diagnostic tests (RDTs) as part of its support in rolling out the DOMC's new diagnosis policy. From 2008 through May 2010, PMI has delivered approximately 9 million treatments of artemether-lumefantrine (AL) to Kenya and distributed them to almost 5,000 health facilities nationwide. With FY 2011 funding, PMI will procure 1.5 million RDTs and support their roll out in low-risk Central Province and seasonal transmission and low transmission areas in Coast Province. In addition, PMI will support training to strengthen microscopy practices nationally. Additionally, PMI will procure 7.8 million treatments of AL to help ensure adequate supply of ACTs in Kenya throughout the year. PMI will also continue to strengthen the supply chain and logistics systems to ensure reliable access and a steady supply of these essential medications. To ensure that AL is properly used and to improve the quality of malaria case management, PMI will help strengthen the DOMC's direct supervision system.

Behavior change communication (BCC): Through community mobilization, interpersonal communication and use of mass media and/or local radio stations to disseminate key messages and encourage behavior, PMI is promoting increased ITN use, prompt diagnosis and treatment for fever, and demand for IPTp in targeted prioritized communities. Within priority districts, PMI is supporting community level BCC through community mobilization, interpersonal communication, and use mass media and/or local radio stations to disseminate key messages and encourage priority behavior. With FY 2011 funding, PMI will continue to support this cross cutting BCC investment at community and national levels.

Monitoring and evaluation (M&E): The PMI includes a strong M&E component to measure progress towards the national goal to control malaria transmission and to identify and correct problems in program implementation. The PMI M&E plan ensures that critical gaps in the DOMC M&E strategy and plan are filled and helps to standardize data collection and reporting. During its first three years, PMI has supported pre-service epidemiology training, *in vivo* antimalarial drug efficacy monitoring, and the 2008-2009 DHS and the 2010 Malaria Indicator Survey (MIS). With FY 2011 funds, PMI will continue support to increase the DOMC's M&E capacity and ability to analyze routine data as well as conducting ongoing program monitoring for specific interventions, including: epidemiologic surveillance in IRS districts to inform scale back timelines and to track epidemic detection; continuous monitoring of malaria in pregnancy activities, and monitoring quality of care for malaria case management; and the logistics management information system to assess for stockouts.

Also, PMI will continue its support to the DOMC and the Ministry of Public Health and Sanitation for supervision of malaria activities and to strengthen the DOMC's capacity to effectively manage and administer its Global Fund grants by creating tools to collate and

report required data while also increasing capacity within the Ministry to more effectively manage and administer grants from the Global Fund.

Health Systems Strengthening and Integration: In line with GHI principles, PMI has reinforced its efforts to build capacity and integrate across programs. PMI/Kenya strengthens the overall health system by improving governance in the pharmaceutical sector; strengthening pharmaceutical management systems, expanding access to essential medicines, and improving service delivery in the different intervention areas. In 2009, PMI supported the implementation of the malaria commodity LMIS, emergency AL distribution to avoid a stockout, and drug quality monitoring. PMI also trained CHWs in Focused Antenatal Care and Malaria in Pregnancy, supported training and supervision of health workers in IPTp, and trained laboratory technicians in malaria diagnosis. In 2010, PMI is working with Walter Reed, DOMC and Office of the Chief Medical Technologist to implement a quality assurance/quality control system for malaria diagnostics. To build human resource capacity and improve service delivery, PMI continues to train health workers at the facility and community levels.

GLOBAL HEALTH INITIATIVE

Malaria prevention and control is a major foreign assistance objective of the U.S. Government (USG). In May 2009, President Barack Obama announced the Global Health Initiative (GHI), a six-year, comprehensive effort to reduce the burden of disease and promote healthy communities and families around the world. Through the GHI, the United States will invest $63 billion over six years to help partner countries improve health outcomes, with a particular focus on improving the health of women, newborns and children. The GHI is a global commitment to invest in healthy and productive lives, building upon and expanding the USG's successes in addressing specific diseases and issues.

The GHI aims to maximize the impact the United States achieves for every health dollar it invests, in a sustainable way. The GHI's business model is based on these key concepts: implementing a woman- and girl-centered approach; increasing impact and efficiency through strategic coordination and programmatic integration; strengthening and leveraging key partnerships, multilateral organizations, and private contributions; encouraging country ownership and investing in country-led plans and health systems; improving metrics, monitoring and evaluation; and promoting research and innovation.

PRESIDENT'S MALARIA INITIATIVE

The President's Malaria Initiative (PMI) is a core component of the GHI, along with HIV/AIDS, maternal and child health, and tuberculosis. The PMI was launched in June 2005 as a 5-year, $1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions and reduce malaria-related mortality by 50% in 15 high-burden countries in sub-Saharan Africa. With passage of the 2008 Lantos-Hyde Act, funding for PMI has now been extended through FY2014 and, as part of the GHI, the goal of the PMI is to achieve a 70% reduction in the burden of malaria in the original 15 countries by 2015. This will be achieved by reaching 85% coverage of the most vulnerable groups — children under five years of age and pregnant women — with proven preventive and therapeutic interventions, including artemisinin-based combination therapies (ACTs), insecticide-treated nets (ITNs), intermittent preventive treatment of pregnant women (IPTp), and indoor residual spraying (IRS).

In implementing this Initiative, the U.S. Government is committed to working closely with host governments and within existing national malaria control plans. Efforts are coordinated with other national and international partners, including the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund), Roll Back Malaria (RBM), the World Bank Malaria Booster Program, and the non-governmental and private sectors, to ensure that investments are complementary and that RBM and Millennium Development goals are achieved.

During the FY 2011 planning visit, members of the PMI team met with the Department of Malaria Control (DOMC) to identify priorities for funding, guided in part by a stakeholders meeting with partners involved in malaria control. This FY 2011 Malaria Operational Plan (MOP) presents a detailed implementation plan for the fourth year of the PMI in Kenya, based on the PMI multi-year strategy and the Department of Malaria Control's (DOMC)

National Malaria Strategy (NMS) 2009-2017. This MOP briefly reviews the current status of malaria prevention and control policies and interventions, identified challenges and unmet needs, and provides a description of planned FY 2011 activities with progress to date under the PMI. The document was developed in close consultation with the DOMC and with the participation of many national an international partners involved in malaria prevention and control in the country. The total amount of PMI funding requested for Kenya is $36 million for FY 2011.

BACKGROUND

Kenya's 2009 population is approximately 39.4 million people, with an estimated population growth of 2.8% per year.[2] Children under five years of age account for about 16% of the total population[3]. Geographically, the country falls into two main regions: lowland areas, both coastal and around lake basins, and highland areas on both sides of the Great Rift Valley. Kenya has approximately 42 ethnic groups, and is a predominantly agricultural economy with a strong industrial base. It is ranked 147 out of 182 countries on the 2009 United Nations Human Development Index, which measures life expectancy, adult literacy and per capita income. Life expectancy in Kenya has seen an overall downward trend since the late 1980s, but has recently increased to 58.9 years[4]. The HIV/AIDS estimated adult prevalence is 6%[5]. The total expenditure on health increased from 4.1% of the gross domestic product in 2004 to 7.9% in 2007. The per capita health expenditures in Kenya have also risen from $9 in 2000 to $14 in 2007.[6] There has been a remarkable decline of 36% in under-five child mortality from 115 deaths per 1,000 live births recorded in the 2003 Kenyan demographic and health survey (DHS) to 74 deaths per 1,000 observed in the 2008-2009 DHS.[7]

Kenya is geographically divided into eight provinces, which in 2009 were further divided into 254 districts. Malaria control efforts under the PMI Years 1, 2 and 3 were organized around the long-standing old district structure of 158 districts, which had prioritized 72 districts for targeted interventions. However, given this new organizational structure, starting with this FY 2011 MOP, PMI will refer to the new district structure, but notes that the geographic coverage and total population targets do not change with this year's plan (while the number of districts PMI supports in this operational plan increase). This organizational change will marginally increase operational costs, as there are more administrative units and district health management teams (DHMTs) to equip, train and support.

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[2] Kenya National Bureau of Statistics (KNBS) and ICF Macro. 2010. *Kenya Demographic and HealthSurvey 2008-09*. Calverton, Maryland: KNBS and ICF Macro. Page 28
[3] Ibid, page 38
[4] Ibid, page 28
[5] Ibid, page 239
[6] WHO Global Health Observatory—Kenya Profile. www.apps.who.int/ghodata last accessed on June 28, 2010
[7] KNBS and IFC Macro, page 129

Ministry of Health

Following the signing of National Accord and Reconciliation Act of 2008, and as part of Government's re-organization process, the Ministry of Health was split into the Ministry of Public Health and Sanitation (MOPHS) and the Ministry of Medical Services (MOMS). The role of MOPHS is to provide focus on public health and preventive measures and leadership in ensuring that public health policy objectives are implemented. The strategic goals and priority investments of each Ministry are designed to ensure that adequate human, infrastructure, and financial resources are available to support program implementation. In addition, within its 2008-2012 Strategic Plan, the MOPHS has a goal of "*reducing malaria incidence to 15% through utilization of cost-effective control measures.*" Although each of the Ministries have different functions, they work closely together to avoid duplication of efforts. At the central level, both Ministries oversee, govern and facilitate health activities, while passing on more responsibility for service provision and supervision to the provincial and DHMTs. By having DHMTs set local priorities and manage all health activities, the two Ministries continue to promote ongoing decentralization efforts.

The DOMC is part of the MOPHS, and is staffed by technical professionals who are seconded from other departments and divisions in the ministry. The division has six technical units (vector control, diagnosis and case management, malaria in pregnancy, epidemic preparedness and response, advocacy communication and social mobilization, and surveillance, monitoring and evaluation). Each unit has a focal point and one or more technical officers. The DOMC is facing challenges in overseeing the country's malaria control program. In 2009, the MOPHS supported a Malaria Program Performance Review which found that the DOMC is strong in its structure and functioning at the central level, but it has a weak coordinating capacity at provincial and district levels. This results in a lack of support for the delivery of malaria control interventions as well as for monitoring and evaluation.

Figure 1: Political Map of Kenya

MALARIA SITUATION IN KENYA

All four species of human *Plasmodium* occur in Kenya. *Plasmodium falciparum,* which causes the most severe form of the disease, accounts for 98% of all malaria infections. The major malaria vectors are members of the *Anopheles gambiae* complex and *Anopheles funestus.*

The country has stratified its 254 districts into four malaria epidemiological zones with diversity in malaria transmission and risk determined largely by altitude, rainfall patterns[8] and temperature. The zone descriptions and populations at risk are:

[8] The country's two rainy seasons are the long rains in April to June, and the short rains from October to December. Actual rainfall over the course of a season can be unpredictable in both volume and time of arrival, and regions throughout the country experience droughts as well as floods.

- **Endemic:** Of the total Kenyan population, 29% lives in a malaria endemic zone. Endemic zones include areas around Lake Victoria in western Kenya where malaria transmission is high and intense throughout the year with a *P. falciparum* malaria prevalence between 20% and 40%. The DOMC is also including in this zone districts in Coast Province, even though the area has seen a recent decrease in malaria (currently carrying an estimated malaria risk classification of less than 5%) because this reduction is not yet stable and the risk for a resurgence of malaria burden in the area remains.

- **Epidemic-prone:** In the western highlands, malaria transmission is seasonal with considerable year-to-year variation. These highlands are considered epidemic-prone areas where temperature increases and rainfall variation can impact vector breeding and malaria transmission. Approximately 20% of Kenyans live in these areas and have a malaria prevalence ranging from 1% to less than 5% but with some areas experiencing prevalence between 10% and 20%.

- **Seasonal transmission:** About 21% of the Kenyan population lives within the arid/semi-arid zone in Northern and South Eastern parts of the country which experiences short periods of malaria transmission during the rainfall seasons (malaria prevalence less than 5%).

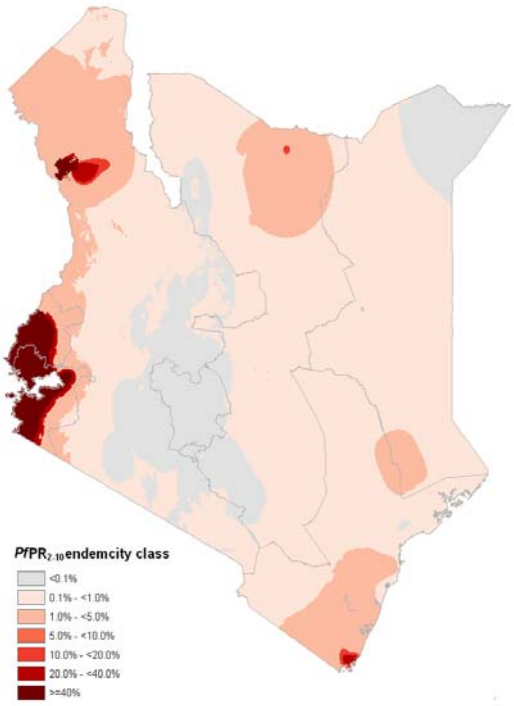
- **Low-risk**: i.e. central highlands of Kenya where 30% of Kenyans live, there is little to no disease transmission.

Malaria Epidemiological Profile

The malaria situation in Kenya is changing. The country's endemicity map (Figure 2) was updated in 2009, and depicts the current malaria transmission intensity for the entire country, with high transmission intensity in endemic zones highlighted by the dark shaded areas.

Among Kenya's total population of thirty-nine million people, 70% live in endemic, epidemic or seasonal transmission areas where they are at risk of malaria. The majority of this at-risk population lives in areas of low or unstable *P. falciparum* transmission where the *P.falciparum* parasite prevalence is less than 5%. This includes several areas, most notably along the Coast, that have transitioned recently toward low, stable, endemic conditions. However, an estimated 4 million people (10% of the population) live in areas of Kenya where the parasite prevalence is estimated to be $\geq$ 40% and malaria remains a serious risk.

Figure 2: 2009 Kenya Malaria Endemicity Map[9]



Kenya's Evolving Risk Profile

It is traditionally considered that much of the low-risk of malaria transmission in Kenya is due to natural geography (altitude or arid locations). However, through the assembly of limited outpatient and more comprehensive hospital inpatient data[10] there is strong evidence that many previous malaria at-risk areas are transitioning towards low, stable endemic conditions. Given the varied and changing malaria epidemiology, Kenya is targeting appropriate intervention measures for specific malaria risk areas. Figure 3, below, compares the changes in Kenya's endemicity map from 2001 to 2009, and notes the shift towards focusing interventions on key geographic areas for the highest impact. The DOMC has strategically reprioritized the approved malaria control interventions according to malaria risk, in order to target resources towards achieving the highest impact possible.

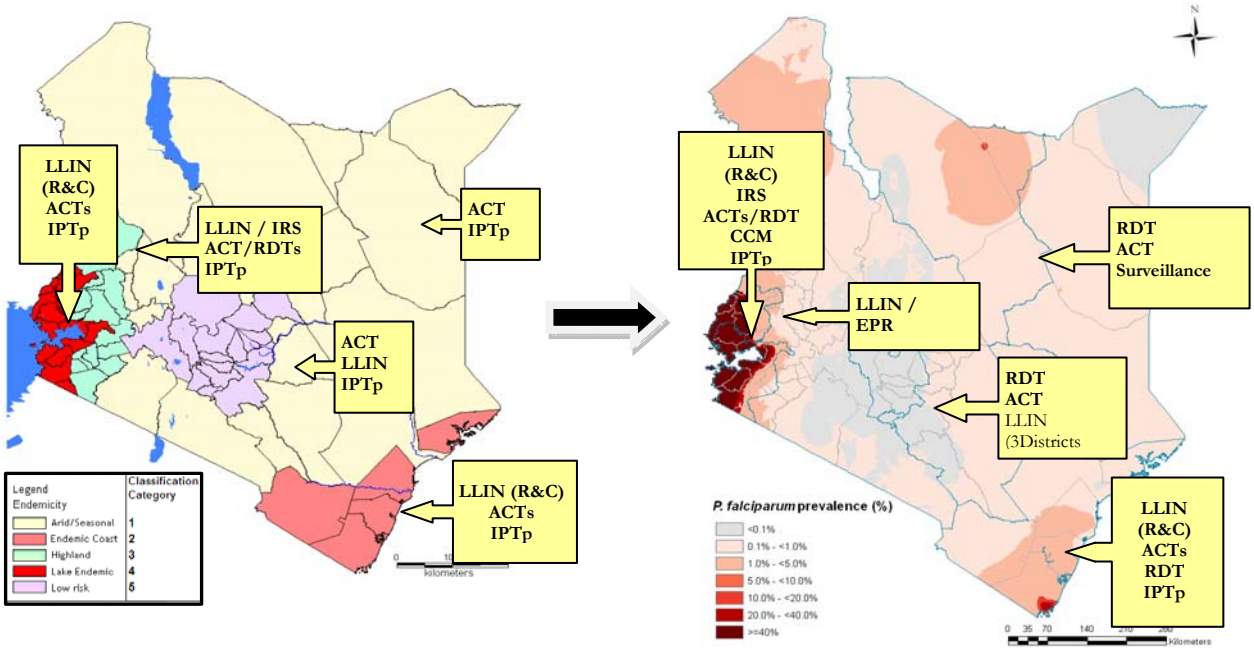
[9] Ibid, page 9

[10] Snow RW, Okiro EA, Noor AM, Munguti K, Tetteh G, Juma E. *The coverage and impact of malaria intervention in Kenya 2007-2009*. Division of Malaria Control, Ministry of Public Health and Sanitation, December 2009

Figure 3: Kenya's Changing Malaria Epidemiology, 2001-2009

Kenya's 2001 Endemicity Map, by key interventions

Kenya's 2009 Endemicity Map, by key interventions



National Malaria Control Plan and Strategy

The Government of Kenya (GOK) is committed to improving health service delivery and places a high priority on malaria control. In order to address malaria morbidity and mortality burden in Kenya, the Government has prioritized malaria prevention and treatment interventions and outlined them in the 2009-2017 National Malaria Strategy. The 2009-2017 National Malaria Strategy has six strategic objectives:

1) **Objective 1:** By 2013, to have at least 80% of people living in malaria risk areas using appropriate malaria preventive interventions

2) **Objective 2:** To have 100% of fever cases which present to a health worker access prompt and effective diagnosis and treatment by 2013

3) **Objective 3:** To ensure that all malaria epidemic-prone districts have the capacity to detect and preparedness to respond to malaria epidemics annually

4) **Objective 4:** To strengthen surveillance, monitoring and evaluation systems so that key malaria indicators are routinely monitored and evaluated in all at–risk malaria districts by 2011

5) **Objective 5:** To strengthen advocacy, communication and social mobilization capacities for malaria control to ensure that at least 80% of people in areas at risk of malaria have knowledge on prevention and treatment of malaria by 2014

6) **Objective 6:** By 2013, to strengthen capacity in program management in order to achieve malaria programmatic objectives at all levels of the health care system

Strategies to support the achievement of NMS objectives include adopting a multi-sectoral approach to malaria control, decentralizing malaria control operations to the province and district, targeting interventions to the prevailing epidemiology, and strengthening the malaria control performance monitoring system.

CURRENT STATUS OF MALARIA INDICATORS

Main Data Sources

In Kenya, coverage with effective interventions and the ensuing health impact are measured largely through household surveys; routine surveillance and demographic surveillance sites provide additional data for supplemental analyses.

The 2008-09 DHS and 2007 MIS provide evidence that Kenya is recording progress in achievement of national targets (Table 1). As of the writing of this MOP, an MIS planned for June-September 2010 is on schedule and underway. The survey will provide an update on the status of key malaria control indicators and reflect the inputs from PMI's first two years of program implementation.

Table 1: Summary of Selected Malaria Indicators

Intervention	2003 Kenya DHS Pre-PMI Baseline Figures	2007 Kenya MIS PMI Baseline Figures	2008-2009 Kenya DHS
Proportion of children under five years old with fever in the last two weeks who received treatment with ACTs within 24 hours of onset of fever	N/A	4%	4%
Proportion of households with at least one ITN	6%	49%	56%
Proportion of children under five years old who slept under an ITN the previous night	5%	40%	47%
Proportion of pregnant women who slept under an ITN the previous night	4%	33%	49%
Proportion of women who received two or more doses of sulfadoxine-pyrimethamine (SP) during their last pregnancy in the last two years	4%	12%	14%
All cause under-five mortality	114 per 1000 live births	--	74 per 1000 live births
NOTE: The 2007 Kenya MIS (June-July 2007) provides baseline data for the coverage indicators. The 2008-09 Kenya DHS has provided baseline data for all-cause under-five mortality.			

Both the MIS and DHS provide national estimates of malaria indicators. While the MIS reports data by epidemiologic zone, the DHS reports data on the basis of provinces and not by epidemiologic zone. During 2010, PMI will provide support to the DOMC for the further analysis of 2008-09 DHS data by epidemiologic zone. This will be an important activity given the varying epidemiologic settings in Kenya and the need to pay attention to sub-national coverage and trends while undertaking evidence-based planning and targeting of resources to maximize impact.

Evaluation of Impact of Malaria Control

The 2008-09 DHS report documents a remarkable decline in under-five mortality rates (74 per 1000 live births) compared to the rates observed in the 2003 DHS (115 per 1000 live births) and the 1998 DHS (112 per 1000 live births). Though a thorough analysis of the factors contributing to this decline has yet to be done, the decline in mortality has coincided with increases in ownership and use of ITNs, an intervention which has been shown to reduce malaria-specific child mortality.

The 2007 MIS recorded low national parasite prevalence of 3.5% in children aged 1-59 months. In addition, the survey found only 4% of children aged 6-59 months had severe anemia, one possible consequence of malaria. These estimates vary significantly by epidemiologic zone and are being used by the DOMC for targeting of interventions.

A PMI-supported impact evaluation of malaria interventions and the WHO-sponsored rapid impact assessment, both planned to take place in the second half of 2010, will examine verbal autopsy data from DSS sites and analyze and present data on impact indicators by epidemiologic zone.

MALARIA CONTROL FUNDING SOURCES

Although the DOMC's NMS budget request for the 2011-2012 implementation year is approximately $119 million, the available funding to the DOMC, from all sources, for the FY 2011 implementation period (October 2011-September 2012) falls far short of the need. An analysis of known bilateral and multilateral donors (Table 2) shows that during the period in question (shaded) the confirmed contributors to malaria control will be from DfID and PMI, with the AMFm support ending by July 2012. Based on this analysis, the PMI Kenya team has concluded that its FY 2011 budget ($36 million) will be needed to fill significant priority gaps, leaving little flexibility to meet less essential yet still important activities. As discussed in the following sections, the FY 2011 budget and activities were developed in light of available donor funding.

Table 2: Malaria control donor funding & contributions, by USG fiscal year and quarter
(shaded quarters indicate when PMI's FY 2011 funding will be available)

Donor Source	**2010**		**2011**				**2012**			
	Q3	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
Global Fund										
Round 4 (Reprogrammed)	**4.5 m ITNs**									
Round 10 (est.)										**TBD**
DfID										
FY 2010	**$1.39 million for TA plus 1.5 million ITNs**									
FY 2011				**$1.39 million for TA plus 1.5 million ITNs**						
FY 2012										**$1.4 million for TA plus 1.5 million ITNs**
PMI										
FY 2009	**$19.7m**									
FY 2010		**$40 million**								
FY 2011						**$36 million**				
FY 2012 (est.)										**TBD**
AMFm *(using GF R 4 funds)*		**~32 million ACT Txs**								

Global Fund: The Malaria Round 4 Grant's Phase 2 (Years 3, 4, and 5) is valued at approximately $80 million, with approximately $26 million for Year 3 implementation disbursed in October 2009. In light of the failure of Kenya's Global Fund Round 9 application, the DOMC decided to reprogram Years 4 and 5 of its Round 4 Grant, in order to meet essential prevention and treatment gaps before the grant ends in January 2011. The majority of the remaining funds are being used to support rolling mass ITN distribution campaigns in targeted districts. It is estimated that there will be enough funding to purchase approximately 4.5 million LLINs for distribution beginning in the 4th quarter 2010 and carried through into early the first two quarters of 2011.

DfID: The UK's Department for International Development (DfID) has renewed its commitment to supporting malaria control in Kenya for another five years. Its current malaria workplan (2010-2015) focuses on supporting: 1) annual in-country ITN distribution using routine (1.225 million ITNs) and social-marketed (300,000 ITNs) distribution channels; and 2) annual support (~$1.4 million/year) to WHO to implement priority areas of the National Malaria Strategy and support the DOMC.

Affordable Medicines Facility—Malaria (AMFm): The funding for the AMFm proposal is from the Global Fund's Round 4 grant, which had a budget of $18,329,872 for ACT procurement. With this level of funding approximately 32 million ACTs will be procured and distributed to public sector facilities with an additional 1.1 million ACTs for community-level distribution. Implementation of the AMFm will be from June 2010-July 2012. Notably, there will be an overlap of only six months of stock (approximately 5.3 million treatments) with PMI's FY 2011 implementation period. Therefore, PMI estimates that there will be a nine-month gap in ACT stocks during the FY 2011 implementation period.

World Bank: While no new World Bank funding is available for malaria control support in Kenya, there is an opportunity to reprogram existing World Bank grants. The purpose of the reprogramming exercise would be to procure 2.3 million ITNs for the rolling universal campaign. This request is still being processed, but final confirmation of the total number of nets available has not yet been made.

EXPECTED RESULTS—YEAR FOUR (FY 2011)

By the end of 2012, PMI together with other partners will have achieved the following key results:

Prevention:

- Approximately 2.7 million ITNs (of which PMI will provide 1.5 million LLINs) will have been distributed to children under-five and pregnant women through ANC and child welfare care clinics.
- Approximately 10 million ITNs (of which PMI will provide 1.5 million with FY 2010 and FY 2011 funding) will have been distributed during targeted universal coverage campaigns in priority districts.

- At least 85% of targeted houses in the four districts supported by PMI for IRS will be sprayed (Pending final counts of the targeted districts, PMI estimates that up to 747,321 houses will be targeted, protecting up to 1.4 million people.); and
- Intermittent preventive treatment with SP in pregnant women will have been enhanced by supporting implementation of the IPTp policy by health workers and community mobilization in all malaria endemic districts.

Treatment:

- Up to 7.8 million treatments of artemether-lumefantrine (AL) will be procured and distributed.
- The new malaria diagnosis strategy will be rolled out and support provided for introduction of RDTs in priority districts.
- Supply chain distribution systems will be strengthened to improve drug distribution, quantification of drug consumption, and stock monitoring.

PREVENTION ACTIVITIES

Insecticide-Treated Bednets

Background

Under the 2009-2017 Kenya National Malaria Strategy the DOMC has set a 2013 target of universal coverage of LLINs, defined as one net per two people, in conjunction with increasing use of those nets to 80%, within prioritized regions of the country. Universal coverage is to be achieved through multiple distribution channels including mass distribution of LLINs to all households every three years, routine distribution to pregnant women and children under one year, and social marketing of nets at subsidized prices. While the national policy supports only the distribution and sale of LLINs, local manufacturers are still producing untreated nets. Consequently, Population Services International, with DfID support, is bundling these locally manufactured nets with a long-lasting retreatment kit and selling them at a subsidized price through its retail outlets. The MOPHS also supports strategies to promote development of a sustainable ITN market. Table 3 summarizes the national distribution strategies by approach.

Table 3: National Net Distribution Strategies, by approach				
	Target Population	***Target Areas***	***Method***	***Current Donors***
Mass distribution	1 ITN for every 2 people	Nationwide; prioritized by malaria endemic provinces	Free of charge	World Bank, DfID, PMI
Routine distribution to ANC and child welfare care clinics	Pregnant women and children under one	Endemic, epidemic and low-risk districts	Free of charge	DfID, PMI
Routine distribution to Comprehensive Care Clinics	HIV/AIDS infected persons	Nationwide, but prioritized by HIV/AIDS endemic provinces	Free of charge	PEPFAR and Global Fund
Commercial sector sales	Those who can afford commercial price nets	Urban centers	Bundled nets sold for KSH 100 ($1.50) in rural shops and kiosks	Financed by private sector. DfID (provision of retreatment kits through PSI)
Social marketing to communities	Children one to five years of age	Rural areas	LLINs sold for KSH 50 ($0.75) at health clinics	DfID

Data from MIS and DHS surveys have shown the considerable progress in access to ITNs. The DOMC estimates that between 2001 and 2009, approximately 15 million nets were distributed, although many of the nets distributed since 2001 are over three years old and are no longer in use. ITN ownership and use has steadily increased over time. The 2008-09 DHS documents household ownership of ITNs at 56%, while proportions of children under five years and pregnant women who slept under a net the previous night were 47% and 49% respectively.

The DOMC continues to support routine distribution of LLINs to pregnant women and children through ANC clinics. An estimated 2.7 million nets per year are needed, with 1.2 million provided by DfID. DfID will also continue to provide retreatment kits for commercial sales of nets as well as subsidies for nets distributed through social marketing.

In addition, the DOMC estimates that 10.6 million nets will be needed to achieve universal coverage in a single mass campaign. However, without Global Fund support the DOMC has elected to conduct a rolling mass campaign, beginning in September 2010 and continuing through 2011, targeting high malaria burden districts in western Kenya (Nyanza and Western Provinces) in the first year as well as some districts in Coast Province. The Global Fund, PMI and the World Bank have committed nets to the mass campaign with a shortfall that is expected to be covered in 2011 from other partners including the private sector.

Table 4: October 2011-September 2012 Universal ITN Coverage Gap Analysis	
A. Total ITNs needed, based on routine and sub-national universal coverage targets established by the DOMC	13,343,063
B. Total ITNs in country from 2010 contributions (best data estimate)	11,815,000
C. Total ITNs gap to reach coverage targets (universal coverage in priority areas and national coverage for pregnant women/children under one) *(a less b)*	1,528,063
D. Total ITNs needed to support new pregnancies and births	2,709,264
E. Total requirement for ITNs to reach universal coverage in FY 2011 *(sum of c+d)*	4,237,327
F. Estimated number of ITNs in FY 2011 from other partner funding	1,200,000
G. PMI contribution for ITNs in FY 2011	2,000,000
H. Remaining ITN gap to reach universal coverage in FY 2011 *(e less f+g)*	1,037,327
Assumptions a. Universal coverage target is one ITN per two people b. ITNs need replacement every 3 years c. Total population at risk in endemic, epidemic and seasonal transmission zones targeted for universal coverage is approximately 27 million d. Mass distribution is quantified using the WHO recommended calculation: 1 net for every 1.8 persons in endemic and epidemic provinces e. Routine nets: for pregnant women through ANC in all malarious areas (divide population by 4.5%) f. Routine nets: children under 1 in all malarious areas through child welfare care clinics (divide Endemic+Epidemic+Seasonal population by 4.0%)	

Progress to Date

From 2008 through May 2010, 1.3 million nets were procured and distributed with PMI funds. In 2010, PMI committed 1.5 million nets to the routine ANC delivery system. With 1.2 million nets from DfID, the needs for this delivery system were fully met. In 2010, PMI also procured 1 million nets to support the rolling mass campaign that will begin at the end of the year. PMI is also providing funding for campaign logistic support and to conduct a post-campaign evaluation about three months after the end of the campaign. In addition, PMI is promoting the increased use of ITNs through national and community-based communication activities (which are discussed in detail in the behavior change communication section below).

Proposed FY 2011 PMI Activities: *($13,000,000)*

1. *Procure LLINs for Routine Distribution*: Fill 50% of the ITN gap for routine distribution by purchasing 1.5 million LLINs to distribute free-of-charge to pregnant women and children under one through the ANC and child welfare care clinics. *($8,250,000)*

2. *Logistics and Program Support for Routine Distribution:* Provide logistical support, including transportation and storage of nets, for distribution of the 1.5 million LLINs within the national routine distribution system. *($1,500,000)*

3. *Procure LLINs for Universal Campaign*: Procure 500,000 LLINs for distribution to support the 2011 phases of the rolling mass campaign, closing 33% of the remaining mass distribution gap. (*$2,750,000*).

4. *Logistics and Program Support for Universal Campaign:* Provide the DOMC with logistical assistance to implement the distribution of LLINs free-of-charge through a rolling sub-national mass campaign (*$500,000*).

Indoor Residual Spraying

Background

Through 2010, the DOMC has targeted sixteen highland, epidemic-prone districts in Western Kenya.[11] As ITN coverage has expanded throughout Kenya, malaria prevalence has fallen sharply, particularly in the highland districts that had been targeted for IRS activities in the previous Kenya national strategy. Following the current 2009-2017 Kenya National Malaria Strategy, the DOMC is phasing-out IRS in the highland, epidemic-prone districts while increasing IRS activities in endemic districts, particularly those bordering the highlands. According to the national strategy, IRS should be implemented for at least 3 years while ITNs are scaled up to achieve universal coverage, after which IRS may be phased out. One lowland district bordering these endemic districts has already been sprayed with PMI funds in 2008 and 2009. Surveys showed a greater than 50% reduction in malaria and anemia prevalence 12 months after the initial round of IRS. Beginning in May of 2010, PMI implemented IRS in an additional 10 lowland districts[12] along Lake Victoria which border highland, epidemic-prone districts. These districts are located in areas with some of the highest *P. falciparum* prevalence rates in the country. Recent national data[13] indicates that malaria prevalence in these areas is not decreasing and remains high in spite of multiple interventions, including the scale up of ITNs. While IRS is expected to reduce the malaria prevalence burden in the targeted districts, heightened surveillance is needed to monitor progress.

As 2010 is the last year of IRS in the highlands, the DOMC is shifting to an epidemic surveillance and response system to detect rising cases of malaria and respond using a combination of targeted IRS and improved case management. The details of this are described in the section on Epidemic Preparedness and Response, below.

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[11] These 16 highland districts have been administratively subdivided into 37 new districts as part of the GOK reorganization process described on page 9 of this operational plan. For sake of clarity and consistency with previous MOPs, references to PMI supported districts in previous years will use the "old district structure" while future work in districts will use the "new district structure." Unless noted, the district quantification changes will refer to the same geographic distribution and does not indicate an increased intervention.

[12] These 10 districts previously were administratively 3 districts including one that was previously targeted for IRS by PMI.

[13] Snow RW, Okiro EA, Noor AM, Munguti K, Tetteh G, Juma E. *The coverage and impact of malaria intervention in Kenya 2007-2009*. Division of Malaria Control, Ministry of Public Health and Sanitation, December 2009

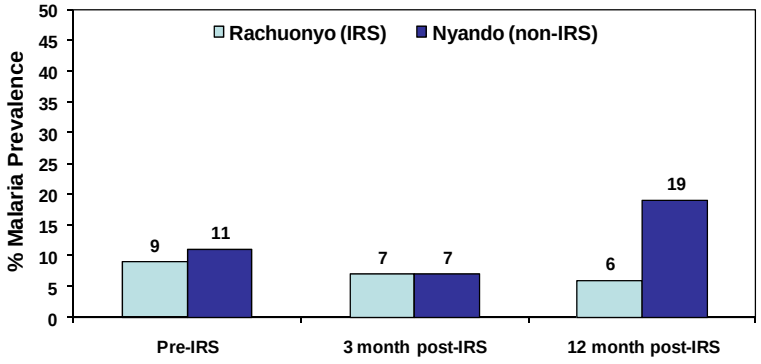
Progress to Date

In June 2008, PMI launched its IRS program in two highland districts and one neighboring endemic district. A total of 364,941 houses were sprayed (98% of those targeted for spraying) and 1,257,941 people were protected. PMI provided technical assistance to the DOMC to refine its IRS strategy for epidemic-prone areas in the highlands of western Kenya. PMI also provided partial support to the DOMC IRS campaign by training 1,452 local residents and district health staff to conduct and oversee spraying activities in 14 districts, protecting 1.8 million people. PMI logistical support for the DOMC's campaign included payment of allowances to spray operators and technical support to the DOMC to train supervisors on planning, implementing, monitoring, and evaluating spray operations.

In 2009, PMI again undertook IRS activities in the same three districts (two highland and one endemic district). During this time 517,051 house units were sprayed (97% of houses targeted for spraying) and 1,435,272 people were protected. Spray operations for 2010 began in May and included one endemic district (now divided into two districts) that were already sprayed by PMI in 2008 and 2009 as well as eight districts for a total of ten targeted districts under the new districting scheme. In the 2010 spray round, an estimated 747,321 houses and 1,444,066 people are targeted.

In addition, PMI and other donors provided support for surveillance and monitoring to document the effectiveness of IRS in areas with high ITN coverage. Entomological surveys showed high susceptibility of the major malaria vector and wall bioassays indicated the insecticide remained effective for at least eight months. As noted in Figure 4, twelve months after the first round of IRS and four months after the second round of IRS, malaria prevalence across all age groups in the lowland IRS district (Rachuonyo District) was approximately 67% lower than that observed in a neighboring, unsprayed district (Nyando District). In related work supported by the Malaria Consortium, an incidence cohort that was followed in the same two districts showed a 58% decline in the incidence of new infection. These declines were observed in the context of moderate net ownership and use—one year after the initial spray round, 46% of all people in Nyando District and 48% of all people in Rachuonyo district reported sleeping under an ITN the previous night.

Figure 4: Malaria prevalence in two lowland, endemic districts in Western Kenya before and after implementation of IRS in Rachuonyo District



Insecticide resistance monitoring has been conducted at eight sites in western Kenya. Moderate to high levels (from 26% to 84%) of DDT and pyrethroid resistance have been detected in *An. gambiae* in sites near the Uganda border. Currently, *An. gambiae* is rare or even absent along the lake shore, including the districts where PMI has been conducting IRS operations. The predominant mosquito species in these areas is *An. arabiensis* and this species remains susceptible to all four classes of insecticides available for IRS. However, there is the threat of resistant populations of *An. gambiae s.s.* and *An. funestus* expanding to and rebounding in areas where they are currently under control.

Proposed FY 2011 PMI Activities: *($7,492,100)*

In FY 2011, PMI will spray ten endemic districts and provide support to the DOMC to monitor disease trends in both highland areas where IRS is being phased out and in lowland areas where IRS is being scaled up. Specific activities include:

1. *IRS Implementation:* Support IRS in ten endemic districts (estimated to reach 747,321 houses) with a target of 85% coverage in all districts. This is approximately the same number of households that PMI has sprayed in the last three years. ($7,300,000);

2. *Epidemiological Surveillance:* Support epidemiological surveillance and monitoring in endemic IRS districts to provide information that the DOMC can use to make decisions on the best strategy for IRS. The surveillance will include disease burden monitoring (for which the methodology will be determined in subsequent discussions with the PMI/Kenya and PMI/M&E teams). This activity will be designed to monitor malaria burden over time and to provide the DOMC with data that will guide the scale down of IRS in the wake of universal LLIN coverage. (*This activity is budgeted under the M&E section*)

3. *Insecticide Resistance Monitoring:* Given the expansion of IRS in lowland areas of western Kenya and the detection of low levels of insecticide resistance in border areas near Uganda, PMI will continue insecticide resistance monitoring in ten sites in western Kenya and expand to include new endemic districts targeted for spraying by PMI in FY 2011. Standard entomological indicators will also be collected as part of routine monitoring in areas where IRS is being conducted. ($180,000);

4. *Technical Assistance:* Support one visit from CDC to provide technical assistance in the entomological monitoring of IRS activities ($12,100).

Intermittent Preventive Treatment of Pregnant Women

Background

Kenya's malaria in pregnancy (MIP) program is based on a close working relationship between the Division of Reproductive Health (DRH) and the DOMC. The DRH manages program implementation while the DOMC is responsible for technical oversight. Prevention of MIP is an integral component of the focused antenatal care (FANC) approach in Kenya. The 2008-2009 DHS showed that 92% of women in Kenya receive antenatal care from a medical professional during pregnancy; however, only 15% of women obtain care in the first trimester and 52% before the sixth month of pregnancy. Overall, only 47% of pregnant women make four or more antenatal visits during pregnancy with the median gestational age at first visit being 5.7 months. While ANC visits provide an opportunity for prevention of malaria in pregnancy, it is essential that other approaches such as community sensitization are utilized to increase the uptake of IPTp.

The first-line treatment for malaria in pregnancy is oral quinine in the first trimester of pregnancy and artemether-lumefantrine (AL) or oral quinine in the second and third trimesters. The DOMC recommends diagnosis by blood smear. It also recommends that pregnant women receive ferrous sulfate (200mcg) and folic acid (5mg) at their second and third ANC visits, and that signs and symptoms of anemia are evaluated during their first and fourth ANC visits.

The recently revised National Guidelines for the Diagnosis, Treatment and Prevention of Malaria in Kenya (May 2010) emphasize the integration of MIP in the overall antenatal care package for maternal health that includes: IPTp, LLINs, prompt diagnosis and treatment of fever due to malaria, and health education.

IPTp with sulfadoxine-pyrimethamine (SP) has been a policy in Kenya since 1998. According to the national guidelines:

- IPTp is recommended in areas of high malaria transmission
- IPTp should be administered with each scheduled visit after quickening to ensure that women receive a minimum of two doses of SP
- IPTp should be given at an interval of at least four weeks
- IPTp should be given under directly observed therapy

The uptake of IPTp in Kenya has remained low. The 2007 MIS national results showed that only 25% of women received IPTp1 and 12% received IPTp2 while the 2008/2009 DHS data showed that 36% of women received at least one dose of IPTp and 14% received at least two doses. The 2009-2017 National Malaria Strategy has a 2013 target of 80% of people living in malaria risk areas using appropriate malaria prevention interventions – including IPTp among pregnant women.

In 2008 and 2009, PMI supported the DOMC to develop a methodology for distributing simplified policy guidelines on MIP to health workers in three malaria endemic districts to improve the uptake of IPTp. The process involved orientation of core members of the

District Health Management Teams (DHMTs) on the IPTp guidelines with an emphasis on administering IPTp during each ANC visit after quickening unless SP had been taken the prior four weeks. During supervisory visits to ANC facilities, ANC staff was observed assessing some patients and was provided feedback on provision or non provision of IPTp.

A significant increase in IPTp uptake was observed in the areas where the simplified guidelines were disseminated. In three divisions within Nyanza Province, pregnant women receiving one dose of IPTp increased from 48% to 76% (Asembo division), from 44% to 67% (Gem division) and from 39% to 66% (Karemo division). In the same areas, 48%, 44%, and 39% of pregnant women, respectively received two doses of SP (Ouma P, Calhoun, L, 2010). This PMI-supported study also showed that SP was available in over 80% of the health facilities. Based on these results, the DOMC with the support of PMI is in the process of developing a plan to roll out and scale up the dissemination of the simplified MIP guidelines to all 55 malaria endemic districts in the country.

Progress to Date

In 2008 and 2009 PMI has procured a total of 840,000 SP treatments for IPTp. During the same period, an estimated 7,000 CHWs were trained on FANC/MIP in Nyanza and Western province. An estimated 39,498 women in 12 districts in Nyanza and Western Provinces were reached with information on the prevention and treatment of malaria through community BCC activities. PMI is also continuing to support BCC/IEC at the community level for prevention of malaria in pregnancy and the training/sensitization and supervision of health working using simplified guidelines in 55 endemic districts. PMI support will also ensure strengthened monitoring of MIP including ensuring improved reporting.

PMI has also supported a review of the pre-service curriculum to include IPTp as an essential part of all pre-service training targeting clinicians and nurses. To date, the clinical officers training curriculum at the Kenya Medical Training College (KMTC) and the Kenya Methodist University (KeMU) has been updated and the process initiated to update the nurses and laboratory technologists' curriculum. This has been accompanied with sensitization of tutors to improve their knowledge on MIP. The updated curricula will ensure that MIP is an integral part of pre-serve training - thus reducing the need to update health practitioners on MIP through in-service training, as is currently the practice.

PMI has also supported the production of 3,000 simplified guidelines on FANC/MIP and their distribution in endemic districts. As discussed above, this three-pronged approach of dissemination and orientation on the new guidelines, emphasis on ensuring availability of SP, and BCC activities is having an impact on improving the uptake of IPTp2, in target divisions in Nyanza Province. Upon successful completion of this pilot, the simplified guidelines will be rolled out to all districts in Western, Nyanza and Coast provinces in line with the national strategy of targeting IPTp in endemic areas.

Proposed FY 2011 PMI activities: *($450,000)*

PMI will support the following activities:

1. *IPTp Implementation in target endemic districts:* Continue support for the implementation of the simplified IPTp guidelines in all 55 target malaria endemic districts. This activity will build on the gains achieved in Year 2 and 3 in the roll out of these guidelines ($450,000);

2. *Malaria in Pregnancy Monitoring:* Support monitoring MIP activities in targeted endemic districts by the DHMTs and DOMC with technical support of CDC, and implementing partners. The activities will include specific monitoring of MIP interventions in targeted endemic districts by the DHMTs, the DOMC with technical support of CDC, and implementing partners. The activities will include specific monitoring of MIP interventions – especially the uptake of IPTp where new guidelines are disseminated and ensure that the DHMT has information available to take corrective action where needed. (*This activity is budgeted under the M&E section*)

3. *Behavior Change for Malaria in Pregnancy:* Strengthen community interventions by supporting targeted community BCC and social mobilization to increase demand for and uptake of IPTp *(This activity is budgeted under the BCC section)*

CASE MANAGEMENT

As part of the overall effort to achieve malaria elimination in Kenya, a key objective of the 2009-2017 National Malaria Strategy is to scale up access to prompt[14] and effective treatment to at least 80% of the population by 2015, and then to sustain that level. In support of this objective, there is a national commitment to ensuring that first-line antimalarials (ACTs) are accessible in the private sector through subsidy schemes and at all public health care levels, including the community health workers. With the decreasing prevalence of parasitemia in many parts of the country, the strategy emphasizes laboratory diagnosis for age groups presenting with clinical symptoms of malaria at all levels of the health system, except the community level, and in all epidemiological zones.

Malaria Diagnosis

Background

Following adoption of a laboratory diagnosis-based malaria treatment policy, the DOMC has produced a fourth revision of the National Guidelines for Diagnosis, Treatment, and Prevention of Malaria in Kenya (MOH, 2010). Although the new guidelines recommend that the diagnosis of malaria in public health facilities should be based on the detection of parasites in the blood, it stresses that under no circumstances should a patient with suspected malaria be denied treatment, nor should treatment be delayed for lack of a

[14] Defined as receiving effective treatment within 24 hours of onset of fever or clinical symptoms of malaria

parasitological diagnosis. It also encourages clinicians to endeavour to confirm malaria even after presumptive treatment has been administered.

Ensuring that all public health facilities have the ability to undertake parasitological diagnosis is proving to be a huge undertaking for the DOMC. The plan calls for RDTs being used as the primary method of malaria diagnosis at dispensaries and health centers. While microscopy remains the gold standard for diagnosis at sub-district /district, provincial and national referral hospital, the DOMC also plans to procure and distribute rapid diagnostic tests (RDTs) for use in these same facilities, especially when microscopy is not feasible. However, no RDTs will be provided to community health workers (CHWs) at the community level until 2013 by which time the DOMC anticipates that dispensaries and health centers would have gained experience in RDT use and be able to properly supervise RDT use by CHWs at the community level. Until 2013 therefore, CHWs will continue to stock and provide ACTs to patients presumptively.

Since 2006, case management trainings targeting clinicians and laboratory staff have incorporated a module on RDT use but only epidemic-prone districts had been supplied with RDTs. To support the use of RDTs, beginning in the 2nd half of 2010, the DOMC intends to procure and distribute RDTs on a national scale. It is assumed that there will be 43.5 and 46 million fever cases presenting in 2011 and 2012 respectively that will require a diagnostic test to be performed. The country target for diagnostic coverage in 2011 is 25% (all through health facilities) with 5% being RDTs (approx 2.2 million RDTs). Diagnostic coverage in 2012 will be 25% with 10% being RDTs (approx 4.6 million). PMI is the only donor currently procuring and distributing RDTs to help the DOMC begin the roll out of its diagnosis-based malaria treatment policy. Until sufficient funds are available through the Global Fund for nationwide RDT roll out and use, PMI will help support a more limited RDT roll out. Whilst rolling out RDTs on a limited scale, the DOMC will continue to offer quality malaria diagnosis at facilities that offer microscopy services by strengthening microscopy capabilities and producing and disseminating appropriate job aids and standard operating procedures.

In support of this, as the DOMC strengthens malaria diagnosis at community and public health facility levels it is putting in place a malaria reference laboratory to coordinate laboratory-based parasitological and entomological testing at national and sub-national levels. Through this reference laboratory, the DOMC will support all malaria intervention areas, including case management and malaria in pregnancy, vector control, epidemic preparedness and response, and surveillance, monitoring, evaluation and operational research. Support for this laboratory comes from the Government of Kenya and malaria stakeholders.

PMI support for malaria diagnosis in Kenya to date has been in line with DOMC priorities. Initially, the DOMC's focus was to increase the availability of microscopes and increase the quality of microscopy. With the adoption of RDTs in Kenya, PMI support will be targeted towards ensuring rational use of ACTs through diagnosis in low-risk malaria areas as well as providing RDTs for surveillance in low-risk, seasonal transmission and endemic districts in Coast Province which are currently demonstrating low parasite prevalence rates.

Progress to Date

In June 2008, PMI partnered with the DOMC to train 77 laboratory technicians drawn from all provinces in Kenya on microscopic diagnosis of malaria. These technicians are currently being used as trainers for malaria diagnostics courses sponsored by all donors. In addition, in 2008, PMI purchased 80 binocular microscopes.

In February 2009, PMI funded a much needed national laboratory assessment in collaboration with the DOMC, Ministry of Medical Services, and implementing partners. The assessment which was conducted in 20% of the public and FBO-run laboratory facilities in the country (1,192 out of 6,034), identified gaps for the attainment of proficient malaria diagnosis nationwide as follows:

- Laboratories lack standard operating procedures, reference manuals and bench aids related to malaria.
- Refresher training coverage of laboratory staff in malaria diagnostics has been low, with just over a quarter of laboratories receiving such training.
- Major malaria diagnostic commodities were in short supply.
- The level of supportive supervision was low, with just over half the laboratories having received one visit in the past year. Facilities managed by FBOs received fewer support supervisory visits than government facilities.
- There is a shortage of laboratory staff according to recommended norms across all levels of health care, but especially at the health center level.
- Laboratory rooms are poorly designed and are too small in many health facilities.
- Turnaround time for blood slide examination within the laboratory appears to be reasonable.
- There is a shortage of microscopes across all levels of care.
- Few facilities were performing malaria parasite identification and density determination, and less than 10% of facilities had quality assurance procedures.

The PMI microscopes were distributed in 2010 on the basis of the assessment findings to facilities in malaria endemic districts (56) and to where malaria outbreaks were anticipated due to the *El Nino* phenomenon (21 districts). Two microscopes were also donated to the national reference laboratory.

Also as a result of the assessment, diagnostic strengthening activities including the review, finalization and distribution of guidelines for laboratory diagnosis of malaria, standard operating procedures for malaria diagnosis, and job/bench aids. To further improve upon the quality of malaria diagnosis, PMI and its implementing partners are currently working with the DOMC and Office of the Chief Medical Technologist to implement a quality assurance/quality control system for the laboratory diagnosis of malaria. A major component of this system is the provision of supportive supervision and on-the-job training of health facility laboratory and clinical staff. Supervisors, some of whom are drawn from the pool trained by PMI in 2008, are equipped to undertake supervisory visits and while in the field assess staff capabilities, provide on-site remedial action, conduct internal and external quality assurance of malaria smear preparation and reading, and ensure quality control of reagents and equipment.

In January 2010, PMI supported two DOMC staff to attend the WHO accredited course on microscopy in Kenya. The two officers are being utilized as part of the national level training team supporting outreach supervision as part of QA/QC and will also support the operation of the malaria reference laboratory. The QA/QC system utilizes existing microscopy capacity at the district, provincial and national level for supportive supervision of hospitals, health centers and dispensaries and on-the-job (OJT) or out reach training (as necessary).

During the next 12 months, PMI will procure and distribute 700,000 RDTs to public health facilities as part of support to the DOMC roll-out of RDTs in three out of the four epidemiologic zones; 200,000 RDTs will serve the epidemic-prone and seasonal transmission districts with 500,000 RDTs distributed for use in Central Province, which is a low-risk malaria zone. In addition, PMI will support the training and supervision of laboratory and clinical staff such that they will be able to handle, read and use diagnostic findings in a quality assured fashion. PMI and the DOMC will monitor the RDT roll-out process and learn experiences that will be used to guide interventions aimed at improving health worker adherence to RDT results. In addition to supporting the roll out of RDTs, over the next 12 months, PMI will continue to support the DOMC to maximize the already available diagnostic capacity by procuring and distributing 100 microscopes, reagents and consumables and by strengthening capacity for malaria microscopy at the national, provincial, district and health facility levels. PMI will contribute to DOMC-led quality assurance and control for microscopy through implementation of supportive supervision and on-the-job training schemes.

Proposed FY 2011 PMI Activities: *($2,212,100)*

In Year 4, PMI will support the following malaria diagnostic activities:

1. *Procurement of RDTs:* In support of DOMC's RDT scale-up plan, procure and distribute 30% of the required RDTs to dispensaries and health centers in low-risk Central Province and seasonal transmission and low transmission areas in Coast Province. This will be done in coordination with other partner contributions; the main partner being the Global Fund which will provide approximately 56 million RDTs for use in low-risk and seasonal transmission areas between 2011 and 2016. *($1,500,000)*

2. *Implementation Support for RDT Rollout:* Provide funding for supportive supervision, refresher training, and monitoring of implementation, including implementation of QA/QC system, to ensure adherence to DOMC RDT policy guidelines in the same districts. The QA/QC system utilizes existing microscopy capacity at district, provincial and national level for supportive supervision of hospitals, health centers and dispensaries and on-the-job or outreach training (as necessary). *($400,000)*

3. *Capacity Building and Strengthening Microscopy:* Strengthen capacity for malaria microscopy through supportive supervision and on-the-job training at the national, provincial, district and health facility levels in collaboration with the Ministry of Medical Services and DOMC. The DOMC coordinates all its diagnostic partners to

ensure that there is no duplication of effort and interventions are in line with the national strategy. PMI support through its implementing partners will be within the overall coordination arrangement. *($300,000)*

4. *Technical Assistance:* Support one CDC TDY to provide technical assistance for malaria diagnostics *($12,100)*

Malaria Treatment

Background

Kenya is in its fourth year of implementation of providing artemether-lumefantrine (AL) as the first-line treatment[15] for uncomplicated malaria. Aside from emphasizing the adoption of a diagnosis-based malaria treatment policy, the revised National Guidelines for Diagnosis, Treatment, and Prevention of Malaria in Kenya (MOH 2010) calls attention to the following changes from previous editions:

1. Introduction of the dispersible formulation of AL and guidance on its use in children < 24 kgs
2. Introduction of a second ACT, dihydroartemisinin-piperaquine (DHA-PPQ), as the second line treatment of uncomplicated malaria in all age groups and for treatment failure
3. Confirmation of continued efficacy of SP for intermittent preventive treatment in pregnancy and restriction of its use in highly malaria endemic districts
4. Authorization of the use of artemisinin-based combination treatment (ACT) at the community level for effective malaria case management.

With support from the Global Fund Round 4 grant, PMI and DfID, the DOMC has been able to provide training on the malaria treatment guidelines to approximately 20,000 health workers. In addition, to date approximately 55 million AL treatments have been procured and distributed to all public health facilities using funds from the Global Fund since 2006 and PMI since 2008.

The DOMC has prioritized efforts to ensure accurate quantification of AL and other antimalarial drugs, evidence-based planning and appropriate distribution of AL stocks among facilities, good inventory management to avoid wastage of drugs through leakage and expiry, supervision/monitoring of availability of antimalarials, and information sharing through a logistics management information system. Ensuring an uninterrupted supply of AL to public health facilities has been a challenge during the past two years due primarily to slow Global Fund/MOH procurement and delivery processes.

The DOMC has received support from WHO and PMI to establish and maintain a post-marketing surveillance system and undertake pharmacovigilance (PV). The post-market surveillance system is being implemented by the Pharmacy and Poisons Board (PPB) and its

[15] Except in the first trimester of pregnancy

National Quality Control Laboratory and is permitting strengthened surveillance and removal of antimalarials of poor quality that might be entering the market. Voluntary reporting of adverse drug reactions to antimalarials is also being undertaken by the PPB following the roll out of PV guidelines and reporting tools and the sensitization of health workers. In order to continuously monitor the efficacy of current antimalarials in use and to replace them if needed, the DOMC has established sites to undertake *in vivo* drug efficacy monitoring to test the sensitivity of AL and examine efficacy of new ACTs molecules such as DHA-PPQ.

The DOMC is now ready to scale up appropriate malaria treatment in the private sector and at the community level. Beginning in July 2010, the DOMC will be implementing the Affordable Medicines Facility for malaria (AMFm), a two-year pilot program designed to expand access to affordable ACTs through the public, private, and NGO supply chains by providing ACTs at a unit cost of US$0.05 in comparison to the current average costs of $0.24, $0.46, $0.60 and $0.91 for the four AL weight bands. Under this pilot, approximately 32 million treatments will be procured and distributed through public sector facilities with an extra 1.1 million treatments intended for distribution to the community. There is the expectation that five currently registered private sector suppliers of ACTs will access AL at the same cost of $0.05 and distribute them through private hospitals, clinics, pharmacies and retailers[16]. The host grant for Kenya's application is the Global Fund Round 4 grant; however AMFm will be implemented through July 2012 while all other aspects of GF R4 end in January 2011. The DOMC expects to implement community case management of malaria (CCM) in Western and Nyanza Provinces by integrating with the country's Community Strategy (MOH, 2006), which aims to bring health services closer to the population through community health workers[17]. The DOMC is hoping to ensure that by 2013, 80% of all fever cases receive prompt and effective treatment, while 100% of all fever cases who present to health facilities receive parasitological diagnosis and effective treatment.

PMI support for malaria treatment has been to provide adequate ACTs alongside Global Fund ACT provision and to provide support to supply chain strengthening to ensure an uninterrupted supply of ACTs to all public health facilities. PMI will provide support to the planned roll out of CCM to Western and Nyanza provinces in the form of support to quantification, ACT distribution, supply chain strengthening, drug quality monitoring and malaria supervision.

Progress to Date

Pharmaceutical Management

To date, substantial progress has been made in the area of pharmaceutical management in Kenya with PMI support. PMI procured large volumes of AL both on a planned and emergency basis which has alleviated stockouts at the facility level. Beginning in 2008 through May 2010, PMI delivered approximately 9 million treatments of AL to Kenya and distributed them to almost 5,000 health facilities nationwide.

[16] The current POM status of ACTs in Kenya makes this allowable by the PPB.

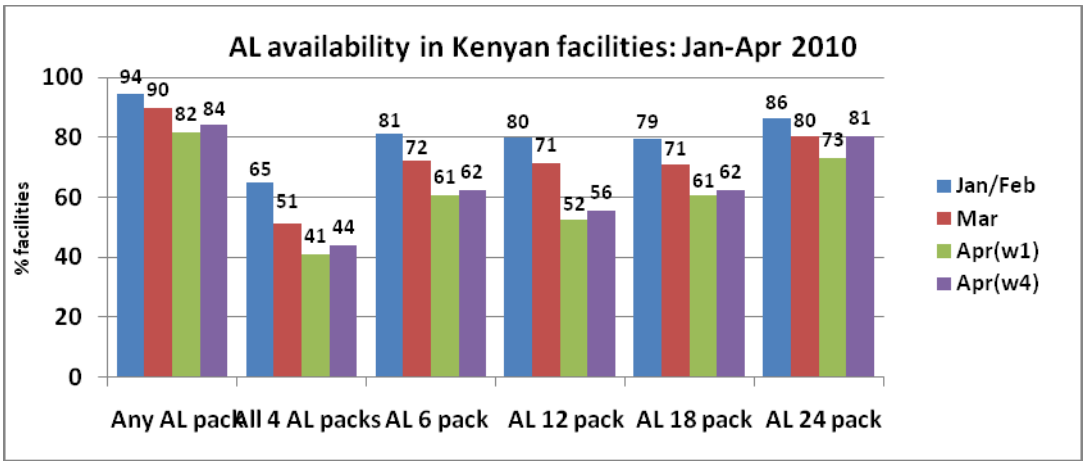
[17] As per PPB regulations, trained CHW may dispense ACTs

Another major accomplishment has been the implementation of the malaria commodity logistics management information system (LMIS). This system monitors availability of antimalarials and their respective consumption rates and was rolled out with PMI support in 2008 in response to a Global Fund requirement. This LMIS is fully operational in all districts in Kenya. Currently on a monthly basis an average of 52% of facilities expected to provide reports on LMIS indicators do so. This is an improvement from 11% expected facilities reporting at the beginning of PMI support in the month of June 2008. PMI is sponsoring monthly meetings of the drug supply management subcommittee to plan and monitor the stock situation for antimalarials.

Careful analysis of the LMIS stock and consumption data coupled with epidemiologic data has led to a rationalization of the AL distribution throughout the country. This analysis has led the DOMC and the Kenya Medical Supplies Agency (KEMSA), the parastatal charged with the procurement, warehousing and distribution of public health commodities, to limit the AL treatment distribution to areas of low prevalence and increase the availability and heighten monitoring in high prevalence areas.

These efforts have improved the availability of AL at the facility level, particularly in highly endemic areas. PMI has also supported two end use verification facility surveys which assessed the availability of malaria commodities at the end-user level, as well as provided a snapshot of how malaria was being diagnosed and treated at a given set of health facilities. In order for the end use surveys to accurately guide the detection and correction of issues surrounding programmatic implementation, the DOMC requested that it be merged with a quality of care survey conducted by KEMRI/Wellcome Trust. By integrating these two surveys the DOMC is able to integrate the data and use the findings to make improvements to case management. The coordination of DOMC, Wellcome Trust and PMI on this effort has allowed the previously pilot-scale quality of care survey to become a nationally representative survey. PMI has contributed to this effort by providing: technical assistance for the protocol development, with particular focus on the drug management component; support to train research assistants on drug management component data collection; logistical and financial support for data management; support for supervision of field work by the DOMC; and support for report writing, printing and dissemination.

The recently completed quality of care survey (fielded between December 2009 and January 2010) was a baseline survey and subsequent quality of care surveys will be undertaken twice a year in a sample of 176 health facilities. The aim will be to monitor temporal changes between different surveys over the next three years with respect to the availability of malaria case management commodities and the quality of outpatient malaria case management practices at public health facilities. The survey revealed that although availability of AL was high at 94%, gaps existed in other critical aspects for effective case management such as availability of malaria diagnostics, exposure to in-service training and case management practices which need to be given attention in order to reach the 2013 target of 100% of all fever cases who present to health facilities receiving parasitological diagnosis and effective treatment.



PMI is supporting annual national quantification exercises to ensure that the AL requirements are being properly forecasted. The latest quantification exercise conducted in June 2009 determined AL stock requirements for July 2009 - June 2010. Extrapolation of the quantification requirements and a stock situation analysis undertaken during MOP planning calculated the country requirements through September 2012.

TABLE 5—Quantification of ACT need through September 2012

	Number of Treatments
Estimated Average Monthly Consumption of ACTs	1,300,000
Projected Need October 2009—September 2010 (12 months)	15,600,000
Projected Need October 2010—September 2011 (12 months)	15,600,000
Projected Need October 2011—September 2012 (12 months) [A]	14,820,000
Sources of Funding for October 2011 – September 2012:	
PMI FY 2010 MOP [B]	0
Global Fund Grant, Round 4 (moved to AMFm)	0
AMFm *(Sept 2011-July 2012)*	5,338,996
PMI contribution for ACTs for Oct 2011 – Sept 2012 period	9,481,004
Remaining projected gap from October 2011 through September 2012	1,681,004

NOTES:

A. By October 2011, it is expected that added diagnostic coverage from use of RDTs in public sector facilities will be 5%. This is expected that there will be more rational use of ACTs and as such the previous year's quantities have been cut by 5%.

B. Due to delays in anticipated GF funding for ACTs, all of PMI/Kenya's FY 2010 ACT allocation, scheduled to be used over an 18-month period, was used over a 12 month period to fill gaps and avert stock outs.

PMI support to pharmacovigilance began in 2008 and support to the establishment of the post market surveillance system began in October 2009. In addition in 2010 and 2011, PMI is supporting *in vivo* drug efficacy testing in two selected sites in Western Kenya. The new post-market surveillance system is allowing Kenya to routinely provide evidence-based data on antimalarial quality and present data to policy makers for appropriate action and

enforcement of medicine quality. Over the next 12 months, PMI will considerably scale up the post-market surveillance system and provide continued support for the implementation of PV. In addition, support to drug efficacy monitoring will allow the evaluation of efficacy of two ACTs dihydroartemisinin-piperaquine (DHA-PPQ) and artemether-lumefantrine (AL), by determining cure-rates on day 14 and 28 in children aged 6 - 59 months with uncomplicated *P. falciparum* malaria. Results of *in vivo* testing will assist in validating the choice of ACT combination.

Training and Supervision
As part of malaria case management improvement, in 2008 PMI supported the training on the new malaria treatment guidelines of 3,200 health workers ear-marked by the DOMC to receive training through PMI support. The Global Fund and DfID provided support for health worker training on the same guidelines in 2009. In 2009 PMI continued its support for health worker training and expanded training to include a focus on strengthening supervision and ensuring adherence to the updated malaria treatment guidelines. In addition, PMI supported the inclusion of the national malaria treatment guidelines into pre-service curriculum at all the major universities and health worker training facilities.

In 2010, with all of the initial training completed, PMI will support the strengthening of supportive supervision and on-the-job training of health workers. It is anticipated that over the next 12 months, through the strengthening of the district supervision system, PMI will have helped improve the quality of malaria case management by staff in public sector health facilities in Western and Nyanza Provinces where the DOMC is initially strengthening the district supervision system. It is expected that this will result in high coverage of prompt and effective treatment in the most malaria endemic provinces.

Proposed FY 2011 PMI Activities: *($9,440,000)*

In Year 4, the PMI will undertake the following activities in support of malaria treatment:

1. *AL Procurement*: Procure and distribute up to 7.8 million AL treatments and severe malaria drugs, as needed, to fill in supply gaps in the public sector through September 2012. If the roll-out of community-based treatment is successful during 2011, PMI will provide some of these treatments for the support of this effort in the home-based management of malaria targeted malaria endemic districts *($8,190,000)*;

2. *KEMSA Strengthening Support*: As the national supplier of medicines, including AL to the public sector health facilities in Kenya, PMI will support KEMSA to strengthen supply chain management, warehousing, and financial management and information systems. PMI will also provide support to transition the management and ownership of the malaria LMIS, which is currently managed through PMI's technical assistance partner, KEMSA and the DOMC. *($250,000)*

3. *Pharmaceutical Management Strengthening*: Unlike the activity 2 which is focused at the national level, this activity will target lower levels of the antimalarial supply chain from district to facility level in the highly endemic districts. Key activities will include heightened monitoring of AL and SP availability in the high endemic districts, improving LMIS reporting rates, end-use verification/monitoring of

availability of key antimalarial commodities at the facility level, technical and financial support to the DOMC, Division of Pharmacy and district pharmacists to ensure effective quantification of drug needs, procurement, distribution and supervision of stock monitoring, on-the-job training and collection of antimalarial drug consumption data gathering. *($350,000)*

4. *End Use Verification:* Monitor quality of care for malaria case management and the LMIS to assess stockouts through the end use verification tool. ((*This activity is budgeted under the M&E section*)

5. *Drug Quality Monitoring*: Strengthen antimalarial drug quality monitoring through the provision of technical, strategic and operational support to the PPB and DOMC. This activity will support improved quality assurance of antimalarials and strengthening of pharmacovigilance *($200,000)*

6. *Case Management Supervision*: Support the DOMC to strengthen malaria supervision and on-the-job training for case management at all levels of the public health care system. *($450,000)*

EPIDEMIC SURVEILLANCE AND RESPONSE

Background

Of the 16 epidemic-prone areas in Kenya (currently divided into 37 districts under the new organizational structure), three are in Nyanza Province, eleven are in Rift Valley Province and two in Western Province. Four other seasonal transmission districts in the North Eastern Province experience epidemics, usually associated with heavy rains and flooding. The total population of these districts is 6.5 million. Historically, Kenya relied primarily on case management for the control of epidemics, but, over the last several years, the DOMC has been implementing preventive measures in these districts with the help of various partners.

Indoor residual spraying in the 16 epidemic-prone areas was started in 2006, supported through the Global Fund Round 4 grant. In 2008 and 2009, PMI supported IRS in two of these districts. The DOMC plans to spray targeted areas in these two epidemic-prone districts as the PMI supported IRS program transitions to endemic districts in 2010. These two districts and the 14 other epidemic-prone districts in the DOMC IRS program will be sprayed for the last time in 2010 as the DOMC also moves to endemic districts. However malaria surveillance will continue in the epidemic-prone districts as part of overall integrated disease surveillance and responses will be focalized. Malaria rates have fallen in the North Eastern districts as ITN coverage has increased, which has raised concern about an increased risk for epidemics in these districts. As Kenya now refocuses its IRS program on endemic districts, and addresses the consequences of decreasing malaria in seasonal districts, the DOMC has refined its surveillance, epidemic preparedness and response program.

Progress to Date

The malaria surveillance and response system for the epidemic-prone districts, managed by the Division of Disease Surveillance and Response, is an important part of Kenya's 2009-2017 M&E plan. Epidemic thresholds for malaria have been set for four to six sentinel facilities in each of these districts. PMI has supported the DOMC and the Division of Disease Surveillance and Response (DDSR) in PMI-supported districts to establish these thresholds and to make use of data collated locally for planning. Health centers submit data to districts on a weekly basis, and districts then transmit the data to provincial and national level by text message. Data is reviewed at the district level and case counts above preset thresholds are investigated by the district health officer.

Proposed FY 2011 PMI activities: *($200,000)*

During Year 4, PMI will support the government to strengthen its malaria surveillance and epidemic preparedness and response capacity through the integrated disease surveillance system within districts previously targeted for IRS spraying. Specifically, PMI will support the following activities in Year 4:

1. *Implementation of surveillance, epidemic preparedness and response:* The DOMC, working with the DDSR, will lead the implementation of the Epidemic Preparedness and Response plan for the epidemic-prone and seasonal districts, including improving malaria surveillance, updating and refining the national epidemic response plan as needed, supporting the mapping of epidemic-prone areas, identification and training of health care workers in health facilities on epidemic preparedness and responses and generally enhance their capacity on malaria surveillance. Specific targets will be included in the activity workplan and will include measures of number of district health officers trained in epidemic response as well as timeliness and completeness of district reports. (*This activity is budgeted under the M&E section*)

2. *Establishing Epidemic Preparedness Stockpile:* In addition to maximizing ITN ownership and use in epidemic-prone districts through support of routine and mass ITN distribution described in the ITN section, PMI will support the procurement of supplies for epidemic response stockpiles in the epidemic-prone districts, including RDTs for diagnostics and ACTs and severe malaria medicines for large-scale treatment, if needed. Supplies not used for epidemic response will be recycled through routine distribution channels to avoid expiry. *($200,000)*

BEHAVIOR CHANGE COMMUNICATION

Background

In-country malaria partners have an agreed upon a set of core prevention strategies, behaviors, and target groups that are incorporated into a national malaria prevention strategy. It is widely accepted that BCC is important in ensuring that prevention and treatment interventions are maximized by communities. A National Communication Strategy for Malaria has been adopted and put into action. There are full-time BCC staff

personnel at the DOMC, as well as an information, education and communication (IEC) technical working group in the DOMC that coordinates BCC efforts among donors.

BCC efforts at the community level face particular challenges. Only limited community-level BCC activities have been carried out. NGOs working in malaria BCC currently report that their staff and volunteers are overstretched, due to limited funding and high demand for malaria information and prevention. Additionally, local BCC programs are faced with high community expectations of service provision such as free net distribution, over which the BCC programs have little control.

Progress to Date

Given these challenges, in 2009, PMI funded a competitive small grants program that engaged local NGOs to provide a community-based IEC/BCC program designed to provide customized messages on increasing ITN use, seeking prompt treatment for fever, and increasing the uptake of IPTp among pregnant women. Three NGOs were selected through this competitive process and started activities in twelve districts, eight in Nyanza Province and four in Western Province. These NGOs are engaging in community mobilization, interpersonal communication, and use of mass media and/or local radio stations to disseminate key messages and encourage priority behavior. The grants were awarded in June 2009, and baseline data collection is underway. Intervention activities are scheduled to continue through June 2010. PMI has continued to provide technical support to the grantees in order to continue to build the local BCC capacity for intervention design, message development and monitoring of activities. In the second half of 2010, PMI will be focusing on increasing the reach of its community-based IEC/BCC program and reaching more at risk populations with its critical messages.

Proposed FY 2011 PMI Activities: *($1,000,000)*

PMI anticipates supporting the following activities:

1. *Targeted Community Based IEC-BCC Efforts in both Endemic and Epidemic Prone Districts:* Expand community-based IEC/BCC efforts by increasing outreach to priority population's especially pregnant women and children under five years through different strategies and channels of communication. Messages and mode of dissemination will be dependent on the venue and target group. In hospitals, at the ANC clinics, interpersonal communication will be used as well as in homes during home visits by community health workers, while Barazas will be held in villages and during public gatherings where messages are delivered through public address systems. During these forums skits and dramas will also be used to entertain and deliver messages on malaria control in a more humorous manner in order to:
    - Increase LLIN ownership and promote correct and consistent use of LLINs;
    - Promote early and regular ANC attendance by pregnant women to increase the proportion of women using IPTp; and
    - Increase early and appropriate health-seeking behavior and prompt management of fever ($700,000)

2. *National IEC/BCC Efforts:* With the DOMC issuing its new malaria control strategy, and revising its policies regarding IPTp and RDTs (among others), it requires assistance with national level IEC efforts. PMI will support national-level IEC message development and dissemination on key malaria control interventions on the new policies. PMI will also support the DOMC to conduct donor coordination, undertake advocacy-related activities, including regular review meeting with donors working in the malaria constituency to monitor and advice on their progress in malaria control interventions i.e. ensuring that malaria control remains as a national priority.($300,000)

CAPACITY BUILDING AND HEALTH SYSTEMS STRENGTHENING

Background

At the national level, the DOMC staff currently consists of four physicians, one PhD entomologist, four public health officers, three clinical officers, two pharmacists, two nurses, and various other support staff. These officers are assigned as focal point persons to the following interventions: vector control, monitoring and evaluation, advocacy communication and social mobilization, epidemic preparedness and response, malaria in pregnancy, case management and diagnostics, and program management. In the spirit of decentralization of malaria control operations, malaria focal persons at the district and provincial level have been designated and trained in malaria management (including decision-making, planning, budgeting, supervision, and M&E). The malaria focal points are staff within the Ministries of Health who take additional responsibility to support malaria control activities. Further trainings are needed as new strategies, policies, and guidelines are being rolled out.

As part of its core responsibilities, the DOMC is required to conduct supervisory field visits to assess how interventions are being implemented. Generally, supportive supervision tends to occur in an ad hoc manner without appropriate training, reporting or ensuring that the delivery of services improves as a result of the visit. Recent experiences, particularly at the district level, have shown that while monitoring and supervision of other health programs occurs regularly, it does not for the malaria control program. The continuing training of malaria focal persons in the field should improve this process and shift the responsibility from the DOMC national staff. However, a lack of funds and logistical issues will continue to challenge districts and provinces to provide adequate supervision.

The DOMC technical working groups (TWGs) serve as a way of engaging key partners and overseeing implementation of programs. Currently there are six TWGs, including: vector control; surveillance, monitoring, evaluation and operations; and case management. The groups comprise of all key partners working in a specific technical area with the DOMC acting as the secretariat. The groups meet quarterly or on an ad hoc basis based on emerging issues. The TWGs report regularly to the Malaria Interagency Coordinating Committee. Continued support to the TWGs is important, especially for those TWGs that are less active.

Progress to Date

DOMC Capacity Building
PMI support to the DOMC has been to assist the DOMC to fulfill its responsibilities in conjunction with other partners. PMI's DOMC capacity building efforts work towards a stronger GOK and a more sustainable malaria control program PMI is providing TA and support to supportive supervision and evaluation of various activities. Previous PMI support to the DOMC has included supervision of trained health workers to reinforce the training and to ensure that health workers are in compliance with the new treatment guidelines. Building on work in previous years in M&E, PMI currently supports the DOMC to ensure timely collection of quality Health Information Management Systems (HMIS) malaria data.

Through support to the TWGs, PMI strengthens policy dialogue and supports the development of appropriate tools, interventions, guidelines, strategies and policies that promote effective integrated management of malaria, pharmaceutical system strengthening and program monitoring. The PMI Advisors assisted in writing the Kenya Malaria Program Performance Review and the current National Malaria Strategy (2009-2017), both of which were published in 2009. PMI is currently assisting the DOMC in writing the Global Fund Round 10 proposal with input from the PMI Advisors.

Contributions to Health System Strengthening
PMI strengthens the overall health system by improving governance in the pharmaceutical sector; strengthening pharmaceutical management systems, expanding access to essential medicines, and improving service delivery in the different intervention areas. PMI supported the implementation of the malaria commodity LMIS, emergency AL distribution, and drug quality monitoring. PMI is working with the DOMC and Office of the Chief Medical Technologist to implement a quality assurance/quality control system for malaria diagnostics. To build human resource capacity and improve service delivery, PMI has continued to train health workers at the facility and community levels. Specifically, PMI trained 7,000 CHWs in Focused Antenatal Care/Malaria in Pregnancy (FANC/MIP), supported training/sensitization and supervision of health workers in IPTp, and trained laboratory technicians in malaria diagnosis. PMI has also supported the review of the pre-service curriculum to include IPTp as an essential part of all pre-service training.

Proposed FY 2011 PMI Activities: *($300,000)*

PMI will use Year 4 funds to continue to improve the DOMC's technical capacity, help it fulfill its leadership role, enhance the role of the technical working groups, improve management of the Global Fund grants, and increase donor coordination. Health systems strengthening activities are incorporated into activities funded in the different intervention areas. Specifically, PMI will fund the following:

1. *PMI Direct Technical Support to DOMC:* Provide technical support by USAID and CDC PMI Advisors to the DOMC. These Advisors will spend a portion of their workweek with the DOMC and will have a workstation within the DOMC offices to effectively integrate into the national team. *(no additional cost)*

2. *DOMC Capacity Building:* Support to improve the DOMC's technical capacity to fulfil its role in support to implementation and supervision. PMI's funding will enable the DOMC focal point persons to supervise and track malaria prevention and control activities carried out in priority districts. Support for these supervision activities will be undertaken in collaboration with other Ministry of Health officers to create synergy and strengthen the overall malaria program management. *($200,000)*

3. *Support the DOMC Technical Working Groups:* To ensure that the TWGs are regularly meeting and are effective and efficient, PMI in collaboration with other development partners will lead efforts to ensure the technical working groups are strengthened and hold regular meetings. (*$25,000)*

4. *Attendance of DOMC staff at technical consultative meetings.* Assist DOMC focal point persons to keep abreast with the latest developments and advances in the field of malaria control through attending key technical meetings (such as the East Africa Roll Back Network or inter-country meetings organized to discuss monitoring and evaluation). Attendees will be expected to make presentations and share key technical updates with other DOMC members. *($25,000)*

5. *Support to Improved Effectiveness of Global Fund Grant Management:* Strengthening DOMC and Ministry capacity for effective Global Fund grant management. One of the major contributors to Kenya's problems with the Global Fund mechanism is a weakness in the reporting system and documentation of achievements from specific indicators that need to be reported to the Global Fund. The TA proposed will facilitate the development of tools that will collate and enhance the reporting of the information required by the Global Fund. Through this process the capacity of personnel in the DOMC will be enhanced to more effectively manage and administer grants from the Global Fund. *($50,000)*

6. *Health Systems Strengthening in Supply Chain Management, Health Worker Training, Laboratory Strengthening, and District-level Supportive Supervision:* Described in other sections.

COMMUNICATION AND COORDINATION WITH OTHER PARTNERS

There are a number of very active partners in malaria control in Kenya, including research institutions, NGOs, WHO, the private sector and development partners that work closely with the DOMC and each other through both formal and informal structures. PMI is an integral partner with the DOMC and actively participates in all technical and other partner related activities.

A malaria subgroup under the Interagency Coordination Committee is convened by the head of the DOMC on behalf of the Director of Public Health. It includes the MOH, NGOs, faith-based organizations, the private sector and development partners. This group meets quarterly with additional interim meetings occurring as needed. There are also several technical working groups led by the DOMC around particular issues. These include the Drug Policy Technical Working Group, which was convened to help implement Kenya's

drug policy change; a formal IEC working group which comprises representatives from various departments of the MOPHS and stakeholders to assist in the implementation of the IEC strategy and plan; a Malaria in Pregnancy working group; an integrated Vector Control working group; and a Surveillance, Monitoring, Evaluation and Operational Research working group.

MONITORING & EVALUATION

Background

Framework for monitoring and evaluating the Kenya NMCP
The Division of Malaria Control uses the logic model for monitoring and evaluation of its malaria control interventions. Effective monitoring and evaluation of the program has been prioritized in the NMS 2009-2017 as an essential function of DOMC program management in assessing progress made towards achieving set program objectives and targets.

The DOMC has an M&E unit which is mandated to coordinate the generation of information on the progress of malaria intervention implementation as well as evaluation of health impacts. The unit is equipped with the requisite hardware and software to enable data compilation, analysis and storage in an M&E database. The unit consists of one epidemiologist, one clinician, one health records information officers and an information and communications technology (ICT) systems specialist all working to ensure routine monitoring, evaluation, supervision, data auditing for quality, data dissemination and use.

Since 2009, the DOMC and its stakeholders have been using one comprehensive national M&E framework (DOMC M&E plan, 2009-2017) to enable transparent and objective management of information on the national malaria control activities. Kenya has a large number of stakeholders with the interest and capacity to conduct effective surveillance, monitoring, evaluation and operational research. Key M&E stakeholders (drawn from government, universities, research institutions, private sector, donor, non-governmental agencies) are organized into a surveillance, monitoring, evaluation and operations research working group to collectively provide guidance to M&E activities. Overall malaria data flow within the M&E framework is from the community to the district, provincial and national levels, as well as to DOMC partners. The M&E plan articulates the program objectives by intervention area; lists key indicators; highlights required data and data sources; reviews the institutional arrangements for gathering, analyzing, and reporting data, and for investing in capacity building; and states the ways in which M&E findings will be fed back into decision making. The costed M&E work plan is used for M&E advocacy, communications and resource mobilization.

Data Sources and Reporting Systems
The types and sources of data for DOMC M&E indicators include:

1. Routine service reporting and national surveillance from the Health Management Information System (HMIS); the Logistics Management Information System; the Integrated Disease Surveillance and Response system (IDSR); and district, provincial and national administrative systems.

2. Routine sentinel surveillance information from selected sites prospectively monitoring different parameters. These include five sites monitoring antimalarial drug quality and two sites monitoring antimalarial drug efficacy. With decreasing malaria risk in the country, health facilities in sentinel districts established in 2000 to represent the four different epidemiologic zones are no longer routinely used by the DOMC/KEMRI Wellcome Trust to collect retrospective data on implementation and health impact of malaria control interventions.

3. Routine demographic sentinel information from Kenya's Demographic Surveillance system (DSS) sites in Kisumu (population of 135,000 managed by KEMRI/CDC) and Kilifi (population of 220,000, managed by KEMRI/WT). In the absence of functional national vital registration systems, these sites monitor birth and death rates; but in addition monitor mortality and morbidity rates, socio-economic indicators, and conduct verbal autopsies to ascribe probable causes to all deaths. Data from the DSS sites is provided to the DOMC quarterly as per agreements.

4. Non-routine DOMC activity information on ITN, IRS, IPTp and case management activities, generated and transmitted vertically following activity implementation by the DOMC and implementing partners using Global Fund, DfID/WHO and PMI funds.

5. Non-routine survey information gathered from health facilities, schools, communities and households e.g. DHS, MIS, MICS, national census.

6. Non-routine information from ongoing malaria-related research and special studies including operational research.

While the DOMC uses routine information to track changes in program performance over time, for impact and outcome measurements of the program and population-based coverage are estimated through facility and household surveys and routine surveillance (HMIS, DSS).

Notable strengths of the Kenyan malaria M&E system include the organizational structure of the M&E unit; M&E partnerships; the presence of a comprehensive M&E system and costed M&E plan; and presence of an M&E database to store routine and activity data as well as data from surveys and evaluations.

The main weakness is the incompleteness, delays and poor quality of routine surveillance data made available through the HMIS. In addition, with the varied epidemiology of malaria in Kenya, sample sizes for household and health facility surveys need to be very high if you want sub-national estimates.

The DOMC implements most of the malaria M&E activities through funding from the Global Fund and PMI. Available funding is targeted towards achieving:

1. Improved functioning of M&E unit resources (existing technical capacity, available hardware and software capability, satisfactory information dissemination)
2. Coordination of malaria M&E within the country

3. Improved data flow from all data sources
4. Data quality assurance
5. Using data for decision making

Progress to Date

PMI has supported the measurement of the outcome and impact indicators listed below by providing support for the malaria component of the 2008-2009 Kenya Demographic and Health Survey and the 2010 Malaria Indicator Survey:

Indicators:

- All cause under-five mortality
- Proportion of households with at least one ITN.
- Proportion of children under five years old who slept under an ITN the previous night.
- Proportion of pregnant women who slept under an ITN the previous night
- Proportion of women who received two or more doses of sulfadoxine-pyrimethamine (SP) during their last pregnancy in the last two years.
- Proportion of children under five years old with fever in the last two weeks who received treatment with ACTs within 24 hours of onset of fever.

In addition, PMI has provided technical assistance to support malaria M&E coordination, improved data flow, data quality assurance and use of data for decision making. Between May and October 2009, PMI helped the DOMC develop a costed M&E plan which has introduced accountability, transparency, responsibility and is providing guidance to M&E implementation in a standardized and coordinated way. Prior to development of the plan, PMI provided support to activities deemed to be priority activities by the DOMC:

- In 2007, PMI supported the establishment of a malaria data repository at the DOMC which houses a wide range of activity implementation data as well as routine malaria data obtained from sources external to the DOMC such as the HMIS, LMIS and the Division of Disease Surveillance and Response. In 2008, PMI began providing support to strengthen the quality of data acquired through HMIS. In 2008 and 2009, PMI worked with KEMRI/CDC to generate complementary data from the DSS on malaria morbidity and mortality and support costs associated with employing a statistician to enable the timely provision of DSS data to the DOMC.

- PMI supported the malaria component of the 2008-2009 DHS which has provided estimates of malaria outcome and baseline impact indicators, all-cause mortality and malaria-specific mortality for children less than five years of age.

- In 2009, to further investigate the changing epidemiology in Kenya and to help the DOMC identify evaluation priorities for 2010, PMI supported an analysis of existing grey and published data which yielded a comprehensive review of the malaria situation in Kenya (DOMC 2009). The review has served as an initial support in the

planned RBM and PMI impact evaluation exercise scheduled to take place in Kenya in the near future.

Since October 2009, PMI has been providing support to malaria M&E within the framework of the National Malaria M&E Plan (2009-2017). From January 2010, PMI has provided financial and technical support to module design and will support field work, data analysis and report writing through December 2010 for the Malaria Indicator Survey. Support provided by PMI for reporting complementary data on malaria-related morbidity and mortality in the DSS is also currently ongoing. In addition, PMI, in collaboration with WHO, has been supporting *in vivo* antimalarial drug efficacy monitoring. PMI is also providing support to the DOMC's acquisition of routine data through the malaria information acquisition system (MIAS) and for strengthening the quality and timeliness of data from various data sources.

Using PMI FY 2008 and FY 2009 funds re-programmed from sentinel site support as well as FY 2010 M&E funds, it is anticipated that in the next 12 months PMI will support:

- Improved DOMC capacity to provide technical leadership in the area of malaria M&E and to provide direction to donors and implementing partners. This will be achieved through PMI provision of training in program management; information management including data analysis, use and dissemination. In addition, PMI would have provided funding for two health workers to undertake CDC's Field Epidemiology Training Program which will second them to the DOMC's M&E and MIP unit for a minimum two year commitment.

- Implementation of the national M&E plan and effective use of data by supporting specific activities within the national malaria M&E plan, including: supporting the development and implementation of a data quality strategy; strengthening the surveillance system; undertaking epidemiological surveillance and monitoring in both highland and lowland districts; implementing national- and district-level supervision and on-the-job training for health workers; conducting analyses and updating presentation of national and sub-national level data to demonstrate progress; strengthening malaria data management; and disseminating use of M&E data.

- The 2011 PMI impact evaluation

Proposed FY 2011 PMI Activities: ($912,100)

In Year 4, PMI will continue to support malaria M&E within the framework of the National Malaria M&E Plan (2009-2017) as follows:

1. *M&E implementation*: Continue support for implementation of the national M&E plan by providing technical assistance to increase the capacity of existing DOMC M&E staff and to ensure that data is used for program improvements. PMI will

work with the DOMC to develop a detailed implementation plan which will list sub-activities by cost, objectives and expected products. Activities will be monitored by the DOMC's M&E team and PMI within the overall monitoring of the M&E plan. Specific activities are listed below. *($350,000)*

- Conduct a national M&E workshop to refresh key M&E stakeholders on the fundamental concepts and practical approaches to malaria M&E. The workshop will aim to achieve data use mapping, a process which will determine whether or not all stakeholders listed in the M&E plan are using information collected through the M&E framework for decision making and program improvements. This process will identify opportunities for information use, lead to better data quality, and ultimately strengthen program service delivery.
- Provide support to the strengthening of routine surveillance systems including contributing to the review and incorporation of relevant malaria indicators into HMIS and the Division of Disease Surveillance and Response (DDSR) systems to heighten surveillance in different epidemiologic settings. The DOMC uses the DDSR information to prevent and manage epidemics.
- Support the improvement of the quality of data collected through routine systems.
- Support the DOMC to analyze and present data for incorporation into quarterly reports, briefs for policy makers and journalists and for updates on DOMC website.
- Support the DOMC to achieve an updated situational analysis of epidemiological data to guide programming.
- Organize an annual malaria review meeting for stakeholders.
- Support DOMC thinking around operations research and evaluation design.

2. *Monitoring of interventions*: Support M&E activities for specific intervention areas which are fully described under the relevant technical sections: *($550,000)*

    a. Monitor human malaria infections in IRS districts to inform DOMC's intervention strategy and when to scale down IRS activities ($150,000, *see the full activity description in the IRS section);*

    b. Conduct continuous monitoring of malaria in pregnancy activities, specifically monitoring the effect of implementation of revised IPTp policy. ($50,000, *see the full activity description in the IPTp section)*

    c. Support epidemiologic surveillance in highland and seasonal transmission districts for epidemic detection ($200,000, *see the full activity description in the ESR section)*

    d. Monitor quality of care for malaria case management and the LMIS to assess stockouts through the end use verification tool ($150,000)

3. *Technical Assistance:* Support one CDC TDY to provide technical assistance for routine surveillance and M&E capacity building *($12,100)*

STAFFING AND ADMINISTRATION

Two health professionals have been hired as Resident Advisors to oversee the PMI in Kenya, one representing CDC and one representing USAID. In addition, an additional health professional, a full time FSN staff member, has been hired to join the PMI team. All PMI staff members are part of a single inter-agency team led by the USAID Mission Director. The PMI team shares responsibility for development and implementation of PMI strategies and work-plans, coordination with national authorities, managing collaborating agencies and supervising day-to-day activities.

These three PMI professional staff work together to oversee all technical and administrative aspects of the PMI in Kenya, including finalizing details of the project design, implementing malaria prevention and treatment activities, monitoring and evaluation of outcomes and impact, and reporting of results. The USAID staff members report to the Director of the Office of Population and Health at the USAID/Kenya Mission. The CDC staff person is supervised by CDC, both technically and administratively. All technical activities are undertaken in close coordination with the MOH/DOMC and other national and international partners, including the WHO, DfID, the Global Fund, World Bank and the private sector.

Locally-hired staff to support PMI activities either in Ministries or in USAID will be approved by the USAID Mission Director. Because of the need to adhere to specific country policies and USAID accounting regulations, any transfer of PMI funds directly to Ministries or host governments will need to be approved by the USAID Mission Director and Controller.

Proposed USG Component*: ($993,700)*

1. *In-country PMI staff salaries, benefits, travel and other PMI administrative costs*: Continued support for two PMI (CDC and USAID) and one FSN (USAID) staff members to oversee activities supported by PMI in Kenya. Additionally, these funds will support pooled USAID Kenya Mission staff and mission-wide assistance from which PMI benefits. *($993,700)*

Table 1: FY 2011 Planned Obligations Kenya

Proposed Activity	Mechanism	Total Budget	Commodities	Geographic area	Description of Activity
Insecticide Treated Nets					
Procure LLINs for routine distribution	DELIVER	$8,250,000	$8,250,000	Endemic/Epidemic districts	Fill the ITN gap for routine distribution by purchasing 1.5 million LLINs to distribute free-of-charge to pregnant women and children under one through the ANC and child welfare care clinics. Nets are estimated at $5.5 each.
Logistic support to routine LLIN distribution	APHIA II - HCM (PSI)	$1,500,000	$0	Endemic/Epidemic districts	Provide logistical support, including transportation and storage of nets, for distribution of the 1.5 million LLINs within the national routine distribution system
Procure LLINs for rolling mass campaign support	DELIVER	$2,750,000	$2,750,000	Endemic/Epidemic districts	Procure 500,000 LLINs for distribution as part of the rolling mass campaign for universal coverage Nets are estimated at $5.5 each.
Logistic support to mass LLIN campaign	APHIA II - HCM (PSI)	$500,000	$0	Endemic/Epidemic districts	Provide DOMC logistical assistance in implementing the distribution of nets through a mass campaign including contributions to a post-campaign evaluation of the rolling sub-national mass campaign
USAID TDY visit	USAID	$0	$0	Nationwide	Support one visit from USAID to provide assistance in implementing ITN program (Core Funded)
Subtotal		***$13,000,000***	***$11,000,000***		
Indoor Residual Spraying					
IRS implementation and management	IRS2 TO2	$7,300,000	$2,409,000	9 Endemic Districts	Support IRS in ten endemic districts (estimated to reach 747,321 house units) with a target of 85% coverage in all districts, includes emergency focal spraying in epidemic districts (as needed), and TA to DOMC for spray operations.
Entomological monitoring of IRS effectiveness in sprayed districts	CDC IAA (with sub-grant to KEMRI)	$180,000	$0	9 Endemic Districts	Continue insecticide resistance monitoring in ten sites in western Kenya and expand to include new endemic districts targeted for spraying by PMI
CDC IRS TDY visits	CDC IAA (Atlanta)	$12,100	$0	9 Endemic Districts	Support one visit from CDC to provide assistance in implementing IRS activities
Subtotal		***$7,492,100***	***$2,409,000***		

Intermittent Preventative Treatment of Pregnant Women					
Support implementation of FANC/IPTp program	JHPIEGO bi-lateral	$450,000	$0	priority 55 endemic districts in Nyanza, Western and Coast	Support in ensuring improved service provider practice in the implementation of the simplified IPTp guidelines in all target 55 malaria endemic districts. This activity builds on the pilot facility level interventions aimed at strengthening IPTp delivery in targeted areas
Subtotal		***$450,000***	***$0***		
Case Management					
Diagnostics					
Provide support to the DOMC for implementation of RDTs in malaria seasonal and low prevalence endemic districts.	DELIVER	$1,500,000	$1,500,000	targeted district(s)	In support of DOMC's RDT scale-up plan, procure and distribute 30% of the required RDTs to dispensaries and health centers in low-risk Central Province and seasonal transmission and low transmission areas in Coast Province.
Provide support to the DOMC for implementation of RDTs in malaria seasonal and low prevalence endemic districts.	TBD	$400,000	$0	targeted district(s)	Provide funding for supportive supervision, refresher training, and monitoring of implementation, including implementation of QA/QC system, to ensure adherence to DOMC RDT policy guidelines in the same districts.
Strengthen capacity for malaria microscopy at the national, provincial and district level	MVDP (Walter Reed)	$300,000	$0	Nationwide	Strengthen capacity for malaria microscopy through supportive supervision and on-the-job training at national, provincial, district and health facility levels in collaboration with the Ministry of Medical Services (MOMs) and DOMC.
CDC Diagnostics TDY support	CDC IAA (Atlanta)	$12,100	$0	Nationwide	Support one CDC TDY to provide technical assistance for malaria diagnostics
Treatment					
Purchase AL	DELIVER	$8,190,000	$8,190,000	Nationwide	Procure and distribute up to 7.8 million AL treatments and severe malaria drugs, as needed, to fill in supply gaps in the public sector through September 2012. Quantities will meet the estimated stock needs for 6 months.

TA for supply chain management at district level	TBD New Bilateral CA	$350,000	$0	Nationwide	Support to target lower levels of the antimalarial supply chain from district to facility level in the highly endemic districts. Key activities will include heightened monitoring of AL and SP availability in the high endemic districts, improving LMIS reporting rates, end-use verification/monitoring of availability of key antimalarial commodities at the facility level, technical and financial support to the DOMC, Division of Pharmacy and district pharmacists to ensure effective quantification of drug needs, procurement, distribution and supervision of stock monitoring, on-the-job training and collection of antimalarial drug consumption data gathering. The new bilateral mechanism will have staff with expertise in RDT training and use.
TA for supply chain management at national level and in-country drug distribution	New KEMSA Bi-lateral	$250,000	$0	Nationwide	As the national supplier of medicines, including AL to the public sector health facilities in Kenya, PMI will support KEMSA to strengthen supply chain management, warehousing, and financial management and information systems.
Strengthen antimalarial drug quality monitoring and surveillance	USP PQM	$200,000	$0	Nationwide	Strengthen antimalarial drug quality monitoring through the provision of technical, strategic and operational support to the PPB and DOMC. Support improved quality assurance of antimalarials and strengthening of pharmacovigilance
Strengthen malaria supervision for case management	New APHIA plus "Zone 1"	$450,000	$0	Zone 1 (includes 2 provinces -Nyanza and Western)	Support the DOMC to strengthen malaria supervision and on-the-job training for case management in conjunction with the DHMTs
USAID TDY visit	USAID	$0	$0	Nationwide	1 USAID TDY to provide assistance for CM/Drug Procurement (Core Funded)
Subtotal		***$11,652,100***	***$9,690,000***		
Epidemic Preparedness and Response					
Stockpile epidemic response equipment and supplies	DELIVER	$200,000	$200,000	targeted district(s)	Support the procurement of supplies for epidemic response stockpiles in the targeted districts, including, IRS for focal spots, RDTs for diagnostics and ACTs and severe malaria medicines for large-scale treatment, if needed.
Subtotal		***$200,000***	***$200,000***		

IEC/BCC					
Integrated community-based IEC/BCC	TBD	$700,000	$0	targeted endemic districts in Nyanza, Western and Coast	Expand community-based IEC/BCC efforts by increasing outreach to priority population's especially pregnant women and children under five years through different strategies and channels of communication. Messages and mode of dissemination will be dependent on the venue and target group. In hospitals, at the ANC clinics, interpersonal communication will be used as well as in homes during home visits by community health workers, while Barazas will be held in villages and during public gatherings where messages are delivered through public address systems.
National IEC promotion	APHIA II - HCM (PSI)	$300,000	$0	Nationwide	Support national-level IEC message development and dissemination on key malaria control interventions on the new policies, donor coordination, undertake advocacy-related activities, including regular review meeting with donors working in the malaria constituency to monitor and advice on their progress in malaria control interventions
USAID TDY visit	USAID	$0	$0	Nationwide	1 USAID TDY visit to provide assistance for IEC/BCC Program (Core Funded)
Subtotal		***$1,000,000***	***$0***		
DOMC					
Support to DOMC	TBD	$250,000	$0	Nationwide	Provision of technical assistance and capacity building to improve the DOMC's technical capacity to fulfill its role in support to implementation and supervision; ensure the technical working groups are strengthened and hold regular meetings
Strengthen DOMC global fund grant management	Capacity	$50,000	$0	Nationwide	Strengthen DOMC capacity for effective Global Fund grant management and administration to ensure timely and effective implementation of planned activities.
Subtotal		***$300,000***	***$0***		
M&E					
Support for implementation of the National M&E plan	MEASURE Evaluation	$350,000	$0	Nationwide	Continue support for implementation of the national M&E plan by providing technical assistance to increase the capacity of existing DOMC M&E staff and to ensure that data is used for program improvements

Support the end-use verification tool	TBD New Bilateral CA	$150,000	$0	Nationwide	Monitor quality of care for malaria case management and the LMIS to assess stockouts through the end-use verification tool.
Epidemiologic surveillance in endemic IRS districts	MEASURE Evaluation	$150,000	$0	9 Endemic Districts	Support epidemiological surveillance and monitoring in endemic IRS districts. The surveillance will include disease burden monitoring to monitor malaria burden over time and to provide the DOMC with data that will guide the scale down of IRS in wake of universal LLIN coverage.
Implementation of surveillance, epidemic preparedness and response	MEASURE Evaluation	$200,000	$0	Epidemic-prone/seasonal districts	Implementation of the Epidemic Preparedness and Response plan, including improving malaria surveillance, updating and refining the national epidemic response plan, supporting the mapping of epidemic-prone areas, identification and training of health care workers in health facilities on epidemic preparedness and responses and generally enhance their capacity on malaria surveillance.
Support continuous MIP monitoring in endemic districts	CDC IAA (with sub-grant to KEMRI)	$50,000	$0	priority endemic districts in Nyanza, Western and Coast	Support to monitoring of MIP activities in targeted endemic districts, includes specific monitoring of MIP interventions where new guidelines are disseminated with supportive supervision and enhanced community BCC activities
CDC M&E TDY support	CDC IAA (Atlanta)	$12,100	$0	Nationwide	Support one CDC TDY to provide technical assistance for routine surveillance and M&E capacity building
Subtotal		***$912,100***	***$0***		
Staffing and Administration					
USAID and CDC In Country Administration and Staffing	USAID and CDC IAA (Atlanta)	$993,700	$0	Nationwide	USAID and CDC Staffing, support costs, and Mission wide support efforts
Subtotal		***$993,700***	**$0**		
GRAND TOTAL		**$36,000,000**	**$23,299,000**		

Table 2: Kenya Year 4 (FY2011) Budget Breakdown by Partner

Partner Organization	Geographic Area	Activity	Activity Budget	Partner Subtotals
APHIA II - HCM (PSI)	Endemic/Epidemic districts	Logistic support to routine LLIN distribution	*$1,500,000*	**$2,300,000**
		Logistic support to mass LLIN campaign	*$500,000*	
	Nationwide	National IEC promotion	*$300,000*	
New APHIA plus "Zone 1"	Zone 1 (includes Nyanza & Western)	Strengthen malaria supervision for case management	*$450,000*	**$450,000**
DELIVER	Endemic/Epidemic districts	Procure LLINs for routine distribution	*$8,250,000*	**$20,890,000**
		Procure LLINs for rolling mass campaign support	*$2,750,000*	
		Stockpile epidemic response equipment and supplies	*$200,000*	
		Provide support to the DOMC for implementation of RDTs in malaria seasonal and low prevalence endemic districts.	*$1,500,000*	
		Purchase AL	*$8,190,000*	
New KEMSA Bi-lateral	Nationwide	TA for supply chain management at national level and in-country drug distribution	*$250,000*	**$250,000**
USP PQM	Nationwide	Strengthen antimalarial drug quality monitoring and surveillance	*$200,000*	**$200,000**
IRS2 TO2	9 Endemic Districts	IRS implementation and management	*$7,300,000*	**$7,300,000**
MEASURE Evaluation	9 Endemic Districts	Epidemiologic surveillance in endemic IRS districts	*$150,000*	**$700,000**
	Epidemic-prone/seasonal districts	Implementation of surveillance, epidemic preparedness and response	*$200,000*	
	Nationwide	Support implementing the National M&E plan	*$350,000*	
CDC IAA	9 Endemic Districts	Entomological monitoring of IRS effectiveness in sprayed districts	*$180,000*	**$266,300**
	9 Endemic Districts	CDC IRS TDY visits	*$12,100*	
	priority endemic districts in Nyanza, Western and Coast	Support continuous MIP monitoring in endemic districts	*$50,000*	
	Nationwide	CDC Diagnostics TDY support	*$12,100*	
	Nationwide	CDC M&E TDY support	*$12,100*	
JHPIEGO bi-lateral	priority 55 endemic districts in Nyanza, Western and Coast	Support implementation of FANC/IPTp program	*$450,000*	**$450,000**
TBD	targeted district(s)	Provide support to the DOMC for implementation of RDTs in malaria seasonal and low prevalence endemic districts.	*$400,000*	**$400,000**
TBD	targeted endemic districts in Nyanza, Western & Coast	Integrated community-based IEC/BCC	*$700,000*	**$700,000**
TBD	Nationwide	Support to DOMC	*$250,000*	**$250,000**

MVDP (Walter Reed)	Nationwide	Strengthen capacity for malaria microscopy at the national, provincial and district level	*$300,000*	**$300,000**
TBD New Bilateral CA	Nationwide	TA for supply chain management at district level	*$350,000*	**$500,000**
		Support the end-use verification tool	*$150,000*	
Capacity	Nationwide	Strengthen DOMC global fund grant management	*$50,000*	**$50,000**
USAID/CDC	Nationwide	PMI Staffing and Administration expenses	*$993,700*	**$993,700**
				$36,000,000