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PRESIDENT'S MALARIA INITIATIVE

Malaria Operational Plan (MOP)

**KENYA
FY 2010**

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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 Services
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

Kenya is responding well to the increased investment in malaria control interventions. The preliminary 2008-09 Demographic Health Survey (DHS) results demonstrate significant progress in malaria control in Kenya. Specifically:

- The proportion of households with at least one ITN increased from 6% in the 2003 DHS to 54% in the preliminary 2008-09 DHS findings.
- The proportion of children under-five sleeping under an ITN the previous night increased from 5% in the 2003 DHS to 51% in the preliminary 2008-09 DHS results.
- By 2007, the proportion of pregnant women who received two or more doses of sulfadoxine pyrimethamine (SP) during their last pregnancy increased from 4% in the 2003 DHS to 15% in the 2008-09 preliminary DHS.

Despite this progress, for Kenya's population of approximately 34 million people, malaria remains the leading cause of morbidity and mortality, accounting for about 30% of all outpatient consultations, 19% of all hospital admissions, and causing a reported 34,000 deaths annually among children under-five years of age. Among Kenya's 72 districts and four epidemiological zones, 30 are malaria-endemic districts that experience stable, year-round malaria transmission with two peak transmission periods (June-August, and late November). An additional 16 districts remain at-risk for malaria epidemics. The total population at risk of malaria is approximately 23 million, or 70% of the population, including an estimated 3.5 million children under-five years of age and 1.3 million pregnant women.

Kenya is a recipient of a Round Four malaria grant from the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) totaling \$162 million over five years (2006-2011). The US Government has a long-standing presence in Kenya working in malaria research and control through USAID, Centers for Disease Control and Prevention, and the Walter Reed Army Institute of Research, and PMI's first two years of investments (totaling \$39.5 million) have significantly increased the role of the USG in malaria control efforts in Kenya. With additional support from the UK's Department for International Development, UNICEF, and other national and international partners, malaria prevention and control interventions are widespread throughout Kenya.

The President's Malaria Initiative (PMI) Year 3 Malaria Operational Plan was developed in close consultation with the Ministry's Division of Malaria Control (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 FY2010 fit in well with the DOMC's new National Malaria Strategy (2009-2017) and build on investments made in Years 1 and 2 to improve and expand malaria-related services. To achieve the goals and targets of the DOMC and PMI, the following major activities will be supported during Year 3 of the Initiative:

Insecticide-treated nets (ITNs): The new 2009-2017 National Malaria Strategy shifts the national ITN policy from targeting vulnerable populations to promoting universal coverage, defined as one net per two people, within prioritized regions of the country by 2010. Kenya is using its Global Fund grant, DfID, and PMI support to significantly scale up ITN distribution throughout malaria-affected provinces. 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. To support this policy, with FY 2010 funding the PMI will procure 2.5 million LLINs and support free routine distribution through ANC clinics. Additionally, PMI will provide logistical support for a planned mass distribution campaign to be funded primarily through a Global Fund Round 9 grant (approval still pending). Since ITN usage remains below the country's 80% target, PMI will continue to work with non-governmental organizations (NGOs) to support 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): Kenya began spraying in 16 malaria epidemic-prone districts in 2007 with support from Global Fund Round 4 funding. During the past two years, PMI supported IRS activities in two of the malaria epidemic-prone districts, as well as in a bordering malaria endemic district. As malaria transition falls in the highland districts, the DOMC is looking to phase-out its IRS program there and shift to spraying in priority endemic districts. This phase-out is set to begin in 2010, with the DOMC request that PMI support this transition. Accordingly, in Year 3, PMI will transition out of the two epidemic-prone districts, while providing enhanced epidemic surveillance and response as well as entomological monitoring in these districts. At the same time, PMI will expand its IRS program to a total of four endemic districts, covering an estimated 250,000 houses and protecting an estimated 1.5 million people.

Intermittent preventive treatment of pregnant women (IPTp): Despite high ANC attendance, the 2008-09 DHS preliminary results confirm continued low coverage of IPTp—only 15% of pregnant women receive two or more doses of SP. In order to improve the uptake of IPTp, PMI will have trained up to 5,100 community health workers in 17 districts in Nyanza and Western provinces by the end of 2009. With FY 2010 funding, PMI will support strengthening the supply chain management system to distribute SP and ensure its availability at ANC health facilities as well as support the roll-out of IPTp policy guidance to trained health workers. 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 are expected to be issued by the end of 2009, and will provide clarity on the use of RDTs as part of case management. To improve diagnostic capacity and quality, PMI has conducted an extensive survey of laboratory diagnostic capacity throughout the country as well as training 77 laboratory technicians in microscopy. With FY 2010 funding, PMI will support the DOMC roll-out of the new diagnostic policies and the strengthening of

diagnostic capacity at national, provincial and district level facilities, including the introduction of RDTs into district and lower-level facilities.

In Year 3, PMI will procure 5.8 million ACT treatments to help ensure adequate supply of ACTs in Kenya throughout the year. In addition, PMI will continue to strengthen the supply chain and logistics systems for malaria drugs to ensure reliable access and a steady supply of these essential antimalarial medications. To ensure that ACTs are properly used and improve the quality of malaria treatment, PMI will help facilitate the DOMC's direct supervision system.

Behavior Change Communication (BCC): With Year 1 and 2 funding, PMI funded a competitive small grants program that engages local NGOs to provide a community-based BCC program designed to provide customized messages related to malaria prevention and control. Through community mobilization, interpersonal communication, and use of mass media and/or local radio stations to disseminate key messages and encourage behavior, these grantees are promoting increased ITN use, prompt diagnosis and treatment for fever, and demand for IPTp among pregnant women. In Year 3, PMI will expand this grants program to add new partners and broaden its geographic coverage. PMI will also support community-based BCC activities with Peace Corps Volunteers, as well as the production of communication materials for use at a national level

Monitoring and evaluation (M&E): The PMI includes a strong monitoring and evaluation component to measure progress towards the project goal and to identify and correct problems in program implementation. The PMI monitoring and evaluation plan ensures that critical gaps in the DOMC M&E strategy and plan are filled and standardizes data collection and reporting. During its first two years, PMI has supported strengthening the health information system, reporting of complementary data from demographic surveillance system sites, and the malaria portion of the 2008-09 DHS. With FY 2010 funds, PMI will continue support to increase the DOMC's M&E capacity and ability to analyze routine data, train two epidemiologists in a field epidemiology and laboratory training program, fund the 2010 Malaria Indicator Survey, and support *in vivo* antimalarial drug efficacy monitoring.

Capacity Building: To achieve PMI targets for coverage of ITNs, IRS, IPTp, and ACTs, PMI will continue its support to the DOMC and the Ministry of Public Health and Sanitation for supervision of malaria activities, the functioning of technical working groups, and effective Global Fund grant management.

The proposed FY 2010 PMI budget for Kenya is \$40 million. Of this amount, 39% will support procurement and distribution of ITNs, 27% will support improved case management including the purchase of ACTs, and 18% will support IRS-related activities. Approximately 5% will support IEC/BCC cross-cutting activities, 5% will support monitoring and evaluation, and 2% will support malaria in pregnancy activities. Approximately 58% of the total budget will be spent on commodities.

PRESIDENT'S MALARIA INITIATIVE

In June 2005, the United States Government (USG) announced a new five-year, \$1.2 billion initiative to rapidly scale-up malaria prevention and treatment interventions in high-burden countries in sub-Saharan Africa. The goal of this Initiative is to reduce malaria-related mortality by 50% in PMI countries. 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 bed nets (ITNs), intermittent preventive treatment of pregnant women (IPTp), and indoor residual spraying (IRS).

The President's Malaria Initiative (PMI) began in three countries in 2006: Angola, Tanzania, and Uganda. In 2007, four countries were added: Malawi, Mozambique, Senegal, and Rwanda. In 2008, eight additional countries (Benin, Ethiopia (one region), Ghana, Kenya, Liberia, Madagascar, Mali, and Zambia) were added to reach a total of 15 countries covered under the PMI. Funding began with \$30 million in Fiscal Year (FY) 2006 for the initial three countries, increased to \$135 million in FY2007 and to \$300 million in FY2008 and FY2009, and will reach \$500 million in 15 countries by FY2010.

In implementing the PMI, the USG is committed to working closely with host governments and within existing national malaria control plans. Efforts will be 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. Country Assessment and Planning visits for the PMI, as well as subsequent evaluations, will be held in collaboration with the Division of Malaria Control (DOMC) and other partners.

During the FY2010 planning visit, members of the PMI team met with the DOMC to identify priorities for funding, guided in part by a stakeholders meeting with partners involved in malaria control. This document presents a detailed one-year implementation plan for FY2010, the third year of the PMI in Kenya. It briefly reviews the current status of malaria prevention and control policies and interventions, identifies challenges and unmet needs, and provides a description of planned Year 3 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 and international partners involved in malaria prevention and control in the country. The total amount of PMI funding requested for Kenya is \$40 million for FY2010.

COUNTRY BACKGROUND

Kenya has a population of approximately 34 million with an annual growth rate of 2.3%. The country is geographically divided into eight provinces. Its original 72 districts have recently been subdivided into 254 new districts. 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.

Figure 1: Map of Kenya



Kenya has approximately 42 ethnic groups, and is a predominantly agricultural economy with a strong industrial base. It is ranked 152 out of 177 countries on the 2006 United Nation's 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 51 years. The HIV/AIDS estimated adult prevalence was 7.4 % in 2007 (KAIS 2007). 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 \$6.40 in 2003-2004 to \$10.90 in 2006-2007. In the recent past, more than one in ten children died before the age of five, with malaria

being the number one killer of children. Since 2003, childhood mortality rates, infant and under-five mortality rates have decreased by over 30%.

The post election conflicts in Kenya in late 2007 and early 2008 affected many service delivery areas including health. The resulting displacement of large populations and attendant social and economic uncertainties jeopardized the implementation of many malaria control activities. In addition, the upheaval during this period led some development partners to withhold funds, further delaying the implementation of activities. Since the formation of a coalition Government, planning and implementation of activities has proceeded well during 2009.

HEALTH SYSTEMS INFRASTRUCTURE & HEALTH SERVICE DELIVERY

The Government of Kenya (GOK) is committed to improving health service delivery and remains committed to malaria control. This is reflected in several key policy documents, including the Second National Health Sector Strategic Plan (NHSSP II): 2005-2010, the Annual Operational Plan Five and the new National Malaria Strategy (2009-2017). The vision of the National Health Sector Strategic Plan II is to provide an efficient and high quality health care system that is accessible, equitable, and affordable for every Kenyan. As part of support of this vision and the key pillar of NHSSP II, the Kenya Essential Package for Health represents the integration of all health programs into a single package that focuses on the improvement of health at different phases of the human development cycle and through service delivery at six different levels of the health care system. Malaria prevention and treatment are key components of the Kenya Essential Package for Health.

In order to address malaria morbidity and mortality burden in Kenya, the Government has prioritized malaria prevention and treatment interventions in its health strategies. In 2009, the Government revised and updated its National Malaria Strategy with the primary objective of reducing the 2007 malaria morbidity and mortality rates by two-thirds by 2017. Kenya's National Malaria Strategy directly contributes to the Millennium Development Goals of reducing child and maternal mortality.

Formal Health Facilities and Providers

There are six service delivery levels defined in the Kenya Essential Package for Health:

- Level 1, the community level;
- Levels 2 and 3, the dispensaries, health centers and maternity/nursing homes, which primarily handle health promotion activities and preventive healthcare services, but also some curative services; these facilities provide the bulk of health care services; and,
- Levels 4-6, the primary, secondary, and tertiary hospitals, which focus mainly on the curative and rehabilitative aspects of the service delivery package.

In 2009, the Division of Health Management Information Systems (HMIS) published a list of health facilities. Of the 6,000 facilities on record, approximately 67% are public sector facilities, of which 74% are managed by the Government of Kenya and 26% by non-governmental organizations (NGOs) or faith-based organizations (FBOs). One-third of health facilities registered in Kenya are managed by the private sector.

The lack of health professionals remains one of the greatest challenges facing the health sector. In 2003, there were 4,813 physicians (15.3/100,000 population) and 9,869 registered nurses (33.1/100,000 population) working in the public sector. While the population-to-nurse and population-to-physician ratios are within the World Health Organization (WHO) norms, these figures hide the large disparity in population-to-provider ratios between rural and urban areas. In 2004, a human resource mapping and verification study (MOH, December 2004) found that 47% of dispensaries had just one community nurse and one or two support staff, while 3% had only support staff that were not qualified to administer drugs. Provincial and district hospitals were found to be overstaffed with nurses, and there was a discrepancy in the staffing of doctors at district hospitals, with about half having fewer than six (12 are required), while others had more than 20.

Management and Organization

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. 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, the MOPHS has a goal of "*reducing malaria incidence to 15% through utilization of cost-effective control measures*". The DOMC is part of the MOPHS. 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 district health management teams (DHMTs). By having DHMTs set local priorities and manage all health activities, the two Ministries continue to promote ongoing decentralization efforts.

The Community Health Strategy

The National Health Sector Strategic Plan of Kenya outlines the implementation of community health services as the top priority of the MOPHS and its development partners. The MOPHS Community Strategy details how health services will be delivered to the village level. The strategy establishes quotas for community health workers (CHWs) and their supervisors, community health extension workers (CHEWs) and addresses specific issues, including terms of references for both groups and budgetary

implications. The strategy also promotes the right of Kenyans to demand appropriate services from all providers.

The MOPHS places high priority on its community-based strategy, which is designed to “ensure that Kenyan communities have the capacity and motivation to take up their essential role in health care delivery”¹. To facilitate this vision, CHWs communicate health messages, mobilize their communities, and promote utilization of health services. The MOH has established a system where one CHW serves 20 households (or 100 people) and is supervised by a CHEW, thus linking the community to the formal health system. This system has not yet been fully implemented across all health sectors.

MALARIA SITUATION IN KENYA

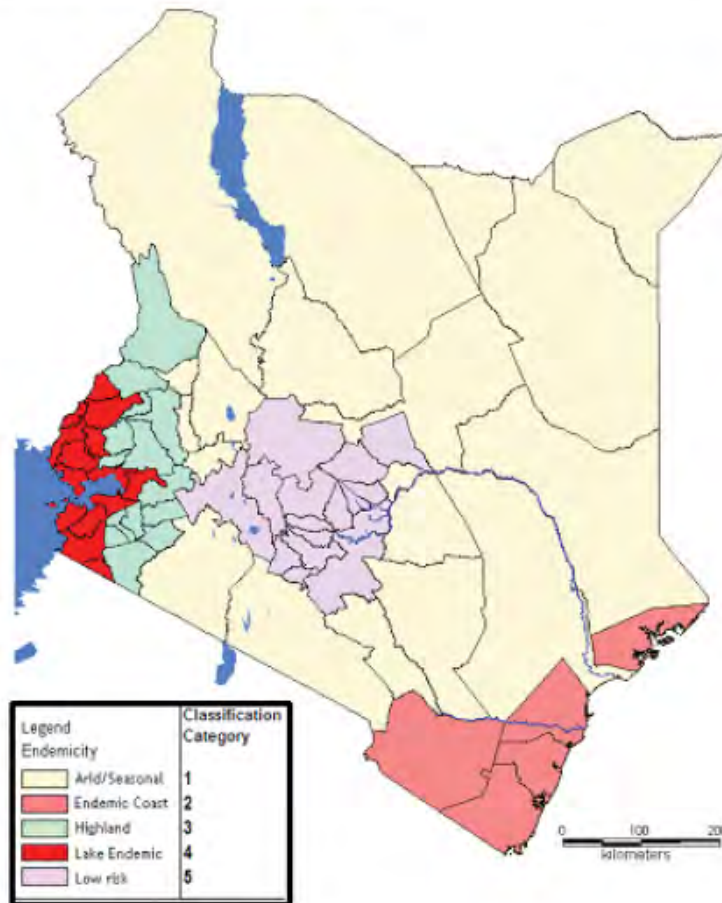
With more than 70% of the Kenya’s population living in areas where malaria is transmitted, malaria is the leading cause of morbidity and mortality in Kenya. Malaria is responsible for approximately 30% of out-patient visits (requiring more than eight million out-patient treatments each year), and 19% of all hospital admissions. At least 14,000 children are hospitalized annually for malaria, and there are an estimated 34,000 deaths among children under-five each year. Annually, an estimated six thousand pregnant women suffer from malaria-associated anemia, and four thousand babies are born with low birth weight as a result of maternal anemia. Economically, it is estimated that 170 million working days are lost each year because of malaria illness.

Kenya has four malaria epidemiological zones: 1) *endemic areas* along the shores of Lake Victoria and the south coast where malaria transmission is perennial but peaks from June to August and again in late November; 2) highly populated *epidemic-prone areas* in the highlands; 3) *epidemic-prone areas* in the arid/semi-arid lowlands which are sparsely populated; and 4) *very low risk or transmission-free areas* in the highlands above 2,000 meters. Transmission in the epidemic-prone/seasonal areas is highest from April through June.

¹ “Taking the Kenya Essential Package for Health to the Community”, Kenya Ministry of Health, June 2006.

Figure 2: Malaria Zones in Kenya

Figure 1.1: Malaria zones in Kenya



CURRENT STATUS OF MALARIA CONTROL

Kenya is recording progress towards achieving national, regional and global targets. This is evidenced by preliminary results of the 2008-09 Demographic Health Survey (DHS) and final results of the 2007 Malaria Indicator Survey (MIS), which are summarized in Table 1, below.

Table 1: Summary of Selected Malaria Indicators

Intervention	2003 Kenya DHS Pre-PMI Baseline Figures	2007 Kenya MIS Baseline Figures	2008-2009 Kenya DHS (Preliminary data)
Proportion of children under five years old with fever in the last two weeks who received treatment with an antimalarial according to national policy within 24 hours of onset of fever.	11%	16%	—
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.	--*	4%	—+
Proportion of households with at least one ITN.	6%	49%	54%
Proportion of children under five years old who slept under an ITN the previous night.	5%	40%	51%
Proportion of pregnant women who slept under an ITN the previous night	4%	33%	53%
Proportion of women who received two or more doses of sulfadoxine pyrimethamine (SP) during their last pregnancy in the last two years.	4%	12%	15%
Indoor residual spraying (IRS) (Proportion of targeted houses adequately sprayed with a residual insecticide in the last 12 months)	--*	N/A**	N/A**
All cause under-five mortality	114 per 1000 live births	--	74 per 1000 live births***
<p>* Data not available from 2003 DHS ** The DOMC has been targeting hot spots in the 16 highland districts through Global Fund and PMI support. In 2007, approximately one million houses were sprayed during this effort. The coverage of targeted houses reached cannot be determined from the information we have. ***The 2008-09 Kenya DHS has provided baseline data for all-cause under-five mortality. + The final DHS report, due for publication in October 2009, will be further disaggregated to provide data on the proportion of febrile children under-five who received ACT treatment within 24 hours. NOTE: The 2007 Kenya MIS (June-July 2007) provides baseline data for the coverage indicators.</p>			

Evaluation of Coverage with Malaria Control Interventions:

The 2003 DHS reported that 22% of households in Kenya owned a bed net of any type with only 6% owning an ITN. In contrast, the 2007 MIS reported an increase in the proportion of households owning at least one ITN to 49%, while the preliminary report for the 2008-09 DHS documents a further increase to 54%. The use of ITNs, measured as proportion of children under five years and pregnant women who slept under an ITN the night before the survey was respectively: 4% and 5% in the 2003 DHS; 40% and 33% in the 2007 MIS; and 51% and 53% in the 2008-09 DHS preliminary results.

The proportion of women who received two or more doses of sulfadoxine-pyrimethamine (SP) during their last pregnancy has stagnated. The rate was 4% in the 2003 DHS; this increased to 12% as reported by the 2007 MIS and only increased to 15% in the 2008-09 DHS preliminary results.

Case management practices for malaria remains weak. The 2003 DHS showed that among those reporting a fever in the two weeks before the survey, only 11% of children under-five had taken antimalarial drugs the same or following day, in accordance with national policy. Further, the 2007 MIS found that although the national malaria treatment policy (2006) recommends prompt treatment with an ACT, only 4% of children under-five received an ACT treatment within 24 hours. Preliminary findings of the 2008-09 DHS shows that among those reporting a fever in the two weeks before the survey, 12% of children under-five had taken an antimalarial drug the same or following day².

Indoor residual spraying is targeted towards 16 epidemic-prone districts. Since 2008, the IRS program has been extended to include one endemic district supported by PMI funding. In 2008, the percentage of targeted house units sprayed by PMI in three districts was 98% with 1,257,941 people protected by the intervention. In 2009, the number of people protected in the same three districts rose to 1,435,272 when PMI conducted IRS in 97% of targeted house units.

Evaluation of Impact of Malaria Control:

The preliminary DHS 2008-09 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 records low parasite prevalence of 3.5% in children aged 1-59 months, documenting low exposure to infection by the malaria parasite. In addition, the survey found only 4% of children aged 6-59 months had severe anemia, one possible consequence of malaria.

MALARIA CONTROL FUNDING SOURCES

Although there are several contributors funding malaria control efforts in Kenya, including PMI and DfID, the bulk (78%) of donor financing comes from the Global Fund. Additional funding sources include UNICEF, the GOK and other donors.

There were some initial implementation delays in Kenya's Round 2 Global Fund grant. Phase 1 and 2 were approved, which released a total of \$27,700,377. Of this amount,

² The final DHS report, due for publication in October 2009, will be further disaggregated to provide data on the 5 of children under-five who received ACT treatment within 24 hours.

17% (\$4,640,447) was disbursed. The remainder of the grant disbursement was suspended on account of performance issues. Kenya's Round 4 grant totals \$162,173,085. The Phase 1 budget (\$81,749,756) has been approved, and 93% (\$76,103,617) of it has already been disbursed. After extensive delays, in mid-2009, the DOMC received conditional approval to begin disbursing the Round 4, Phase 2 grant. Conditions are being addressed and the DOMC is optimistic that disbursements will begin in October 2009.

The Global Fund Round 4 grant is a five-year agreement (2006-2011) with the following objectives:

1. Purchase and distribution of artemether-lumefantrine (AL) as well as training of health workers to implement the new drug policy. Under this grant, Kenya should be able to cover a substantial portion of ACT needs through all five years of the grant;
2. Reduce morbidity and mortality due to epidemics through a) establishing an early epidemic warning system and epidemic detection and response systems; b) conducting IRS in high risk areas; and c) improving management of malaria cases in epidemic situations;
3. Procurement and distribution of long-lasting insecticide-treated nets (LLINs) to children under five and pregnant women;
4. Improve community participation in malaria prevention and treatment; and,
5. Build capacity for effective implementation through developing human resources, strengthening health management systems, improving coordination and partnership among all implementers, strengthening monitoring and evaluation, and strengthening drug supply and stock management at the health facility level.

The disbursement of the Global Fund Round 4, Phase 2 funds were delayed from 2007 to late 2009 due in part to deficiencies in reporting on two indicators: ACT consumption among adults and the number of persons reached by IEC but also due to a low burn rate of Phase 1 funds which led to the DOMC requesting a no-cost extension of Phase 1. More recently, funds were delayed because the DOMC needed to provide clarifications to the Global Fund Secretariat on ACT quantification and procurement planning. All the mentioned bottlenecks have been removed and the funds are now expected to be released in the fourth quarter of 2009. The IRS activities in Global Fund Round 4 were under-budgeted in key areas such as payroll for spray operators; it is unclear if the DOMC will be able to reprogram some of the activities or contribute additional funding to fully support this intervention.

On June 1, 2009, Kenya submitted a proposal for the Global Fund's Round 9. The country will be notified of the status of this latest grant application by December 2009. If the grant is successful, it is anticipated that funds will become available for disbursement in the last quarter of 2010, and that activities will begin in early 2011. The GOK is requesting support for a comprehensive malaria control approach targeting high malaria transmission areas and vulnerable populations. The approach will complement the priorities identified in the new Malaria Control Strategy. This MOP was written with the

assumption that the Round 9 application is approved. If it is not approved, then it will be necessary to make programmatic adjustments in coordination with the DOMC.

On July 1, 2009, following its selection as an eligible applicant to the Affordable Medicines Facility for malaria, Kenya submitted a proposal to the Global Fund for Phase 1 of the AMFm program. Kenya is applying to be part of a two-year pilot program, of which the long-term viability has not yet been determined. The facility is a financing mechanism designed to expand access to affordable ACTs through the public, private, and NGO sectors by negotiating a lower price for ACTs and then establishing a buyer co-payment. This will enable the buyer to pay US\$0.05 for each course of ACTs in comparison to the current average cost of approximately \$0.90. The host grant for Kenya's application is the Global Fund Round 4 grant; funds budgeted under Phase 2 for ACT procurement in the grant will be reprogrammed for payment of the originally planned number of ACTs at a cost of \$0.05 per treatment. The DOMC intends to use the savings made on ACT procurement for implementation of supporting interventions to increase ACT access. It is hoped that by participating in the AMFm program there will be no decrease in the number of ACTs procured from what was planned under the Global Fund Round 4 grant, as any negative deviation might lead to increased ACT stock-outs.

GOALS AND TARGETS OF THE PRESIDENT'S MALARIA INITIATIVE

The goal of PMI is to reduce malaria-associated mortality by 50% compared to pre-PMI levels in targeted countries. By the end of 2010, PMI will assist Kenya to achieve the following targets in populations at risk for malaria:

- More than 90% of households with a pregnant woman and/or children under-five will own at least one ITN;
- 85% of children under-five will have slept under an ITN the previous night;
- 85% of pregnant women will have slept under an ITN the previous night;
- 85% of houses in geographic areas targeted for IRS will have been sprayed;
- 85% of pregnant women and children under-five will have slept under an ITN the previous night or in a house that has been sprayed with IRS in the last 6 months;
- 85% of women who have completed a pregnancy in the last two years will have received two or more doses of IPTp during that pregnancy;
- 85% of government health facilities will have ACTs available for treatment of uncomplicated malaria; and
- 85% of children under five with suspected malaria will have received treatment with ACTs in accordance with national malaria treatment policies within 24 hours of onset of their symptoms.

EXPECTED RESULTS—YEAR THREE

By the end of Year 3, the PMI together with other partners will have achieved the following key results:

Prevention:

- Approximately 3 million ITNs (of which PMI will provide 2.5 million LLINs) will have been distributed to children under-five and pregnant women.
- 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 250,000 houses will be targeted, protecting up to 1.5 million people.); and
- Intermittent preventative treatment with SP in pregnant women will have been enhanced by rolling out IPTp policy guidelines to health workers and by supporting community mobilization in all malaria endemic districts to support the uptake of IPTp.

Treatment:

- Up to 5.8 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 rapid diagnostic tests supported in priority districts.
- 100 microscopes (with accompanying reagents and consumables) will be procured and distributed to priority diagnostic facilities.
- Supply chain distribution systems that will be strengthened to improve drug distribution, quantification of drug consumption data, and stock monitoring.

INTERVENTIONS

PREVENTION ACTIVITIES

Insecticide-Treated Bednets

Background

The new Kenya National Malaria Strategy (2007-2017) shifts the national ITN policy from targeting vulnerable populations to promoting universal coverage, defined as one net per two people, in conjunction with increasing use of those nets to 80%, within prioritized regions of the country by 2010. The DOMC has overseen the training of approximately 6,400 service providers on the use of LLINs to prevent malaria. The MOPHS, working with partners including NGOs, FBOs, other community-based organizations, the commercial sector and bilateral and multilateral organizations, promotes a comprehensive approach for distributing ITNs to priority regions of the country. DfID has been a primary supporter of the ITN social marketing campaign for

many years (2002-2008); however, the next round of DfID funding will likely be at reduced levels.

Kenya currently has a multifaceted ITN distribution strategy, which includes providing free or heavily subsidized ITNs through routine distribution channels to vulnerable groups, subsidized distribution via commercial outlets and rural community based net sales and periodic mass campaigns where free nets are given to targeted groups. PMI channels the majority of its nets through ANC clinics free of charge to pregnant women and children under one. Table 2, below, summarizes the national distribution strategies by approach.

An ITN implementation framework was developed in 2007 by the DOMC and its partners. Based on this framework, Kenya is moving to a system of free distribution of ITNs, ultimately using the Kenya Medical Supplies Agency (KEMSA) as the distribution mechanism for ITNs. If that approach is adopted, a careful transition plan will have to be developed, with continued support for Population Services International’s clinic program in the interim. Currently, KEMSA is not responsible for the procurement and distribution of ITNs but will begin to take on responsibility for approximately 10% of the ITNs distributed. In 2009 a pilot exercise was conducted with KEMSA supplying ITNs to select districts in Western province; the results of this exercise are being analyzed and will be shared with donors before the end of 2009.

Table 2: National Net Distribution Strategies, by approach

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	Requested in Global Fund Round 9 proposal-not yet implemented
Routine distribution to ANC and child welfare care clinics	Pregnant women and children under one	Endemic, epidemic and low risk districts	Free of charge	Global Fund, 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

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 demand creation to ensure the development of a sustainable ITN market. The MOPHS encourages coordination of the distribution of free/highly subsidized ITNs to avoid undermining commercial sector efforts.

Data from key MIS and DHS surveys are documenting the considerable progress made in increasing access to ITNs. The DOMC estimates that since 2002, approximately 14 million nets have been distributed through various mechanisms, although 40% of these nets were conventional, untreated nets (the DOMC estimates that one-quarter of these have subsequently been treated in the last 12 months). As noted previously, ITN ownership and use has steadily increased over time. The 2008-09 DHS documents that household ownership of ITNs is 54%, while proportions of children under five years and pregnant women who slept under a net the previous night are 51% and 53% respectively.

To achieve full coverage among the pregnant women and children under five years of age target groups, the DOMC estimates that three million nets will be needed in 2010 for routine distribution through the antenatal care (ANC) and child welfare care clinics. However, the ITNs distributed in the 2007 mass distribution campaign are now nearly three years old, and the DOMC recognizes the need to replace these nets with another sub-national mass campaign in 2010 that targets malaria-endemic provinces. The DOMC estimates a total of 10.7 million nets will be needed for this campaign. Some ITNs will be available in 2010 for this effort, but there are not yet sufficient commitments to support a campaign. The DOMC is applying for funding in its Global Fund Round 9 application to purchase the necessary ITNs. The ITN gap is detailed in Table 3, below.

Table 3: 2010 Universal ITN Coverage Gap Analysis

A. Total 2010 ITNs needed, based on routine and sub-national universal coverage targets established by the DOMC	13,700,000
B. Total ITNs in country as of 2008 (best data estimate)	5,699,637
C. Total ITNs gap to reach coverage targets (universal coverage in priority areas and national coverage for pregnant women/children under one) (<i>a less b</i>)	8,000,327
D. Total ITNs needed to support new pregnancies and births	2,700,000
E. Total ITNs needed to replace nets distributed in 2007	2,200,000
F. Total requirement for ITNs to reach universal coverage in 2010 (<i>sum of c+d+e</i>)	12,900,327
G. Estimated number of ITNs in 2010 from other partner funding	3,000,000
H. PMI contribution for ITNs in 2010	2,500,000
I. Remaining ITN gap to reach universal coverage in 2010 (<i>f less a+b</i>)	7,400,327
Assumptions	
a. Universal coverage target is one ITN per two people	
b. ITNs need replacement every 3 years	
c. Total population: 34,000,000	
d. 23,000,000 population at risk malaria and five per HH (MOP)	
e. 1,350,000 number of new pregnancies at risk of malaria	
f. 5,760,000 children under-five all areas	

Progress to Date

In 2008, PMI initiated its support for increasing ITN ownership and use in Kenya by providing 60,000 replacement LLINs as part of the national ITN retreatment campaign. In 2009, an estimated 2.6 million free ITNs were distributed through the ANC program, of which 550,000 were purchased and distributed with PMI funds. USAID/Kenya's HIV/AIDS program supplied an additional 150,000 ITNs for people testing positive for HIV/AIDS as part of the basic care package. By the end of 2009, PMI will have procured an additional 670,000 ITNs that will be distributed through ANC and child welfare care clinics in 2010.

Proposed FY 2010 PMI Activities: (\$15,650,000)

1. Fill most of the ITN gap for routine distribution by purchasing 2.5 million LLINs to distribute free-of-charge to pregnant women and children under one through the ANC and child welfare care clinics. This assistance will enable DfID and Global Fund to support the planned 2010 sub-national mass distribution campaign within malaria endemic provinces. (*\$12,500,000*)
2. Provide programmatic and logistics support for distribution of the 2.5 million LLINs within the national routine distribution system. (*\$2,500,000*)
3. Provide DOMC assistance in implementing the planned 2010 sub-national mass campaign, as needed. While it is anticipated that all of the ITNs needed for the campaign will be covered through the Global Health Round 9 grant funding, PMI anticipates providing support for the campaign in alternative ways, including logistical costs and/or post-campaign evaluations. PMI remains open to supporting the mass campaign by redirecting ITNs from routine distribution channels, as needed. (*\$650,000*).

Indoor Residual Spraying

Background

Sixteen districts are currently targeted by the DOMC for IRS in western Kenya³, with a total population of approximately 6.5 million people. Within these districts, PMI currently supports IRS in two of them and the DOMC program covers the remaining 14. In 2007, the GOK targeted 1.1 million houses in these districts for IRS. Due to shortage of funds in 2008, fewer than 400,000 houses were sprayed by the DOMC in their 14 highland districts. PMI funds targeted the entire population in the remaining two highland districts (in addition to a third nearby endemic district) in 2008 and 2009. For 2009, the GOK spray program was delayed due to the late disbursement of Global Fund

³ These 16 highland districts have been administratively subdivided into 37 new districts as part of the GOK reorganization process described on page 6. For sake of clarity and consistency with previous MOPs, we are continuing to refer to the GOK spray districts in their original quantification.

Round 4, Phase 2 money. By the end of the 2009 spray season, no structures had been sprayed. Once funds are released, the DOMC will target identified hot spots based on the epidemic thresholds in the highland districts. The Global Fund Round 4 support for IRS activities in the highland districts continues through 2011, at which point the GOK plans to end its spraying program in these districts.

As ITN coverage has expanded throughout Kenya, malaria disease has fallen sharply, particularly in areas such as the highland districts that are currently targeted for IRS activities according to the Kenya national strategy. As transmission falls in these areas, the DOMC is looking to phase-out IRS in the highland, epidemic-prone districts while increasing IRS activities in endemic districts, particularly those bordering the highlands. The initial phase-out is set to begin in 2010 with the DOMC requesting PMI to target four lowland, endemic districts (including one district PMI has been supporting for the past two years) and to end its spraying program in two highland, epidemic districts. The DOMC will take up focal spraying in malaria hot spots in these two districts as is currently being done in the fourteen other highland districts. The DOMC expects to conduct a final round of IRS in its targeted sixteen highland districts in 2011 after which the malaria prevention strategy in these areas will include universal coverage with ITNs and surveillance and response for epidemics. It is anticipated that the DOMC will need assistance to develop adequate systems for epidemic surveillance and response programs in the transitioning highland districts, which is discussed further in the Epidemic Preparedness and Response section, below.

Progress to Date

In June 2008, PMI launched its IRS program in two highland districts and one neighboring endemic district, which resulted in 364,941 sprayed house units (98.1% of house units targeted for spraying) and protected 1,257,941 people. 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 targeted districts (two highland and one endemic district) during the months of April-June 2009. During this time, 517,051 house units were sprayed (96.6% of house units targeted for spraying) and 1,435,272 people were protected.

In addition, PMI provided support for enhanced surveillance and monitoring in both highland and lowland districts to document the effectiveness of IRS in areas with high ITN coverage. Insecticide resistance monitoring has already been conducted at ten sites in four lowland districts in western Kenya: one district where IRS is being conducted by PMI, one district where ITN coverage has already reached PMI targets and in two other districts. This surveillance and monitoring activity showed that there was a clear impact on mosquito densities in two of the three PMI IRS districts. Data gathered before and

after spray operations indicate that the incidence of clinical malaria as measured in health facilities dropped by approximately 50% in sprayed districts 2-3 months after IRS was completed. Data on parasite prevalence and anemia in the communities are currently being analyzed and will be provided to PMI by the end of 2009.

Proposed FY 2010 PMI Activities: (\$7,154,200)

In FY 2010, PMI will spray four endemic districts (one old and three new districts) while the DOMC will be responsible for spraying the 16 highland districts using Global Fund Round 4 money. Specific activities will take place to:

1. Support IRS in four endemic districts (estimated to reach 250,000 houses) with a target of 85% coverage in all four districts. (\$6,800,000);
2. Support enhanced epidemiological surveillance and monitoring in both highland and lowland districts to provide information that the DOMC can use to make decisions on the best strategy for IRS (\$150,000);
3. Given the presence of molecular markers throughout western Kenya and the expansion of IRS in lowland areas of western Kenya, PMI will continue insecticide resistance monitoring in ten sites in western Kenya and expand to include new endemic districts targeted for spraying by PMI (\$150,000);
4. Conduct an Environmental Monitoring Assessment (\$30,000);
5. Support two visits from CDC to provide assistance in implementing IRS activities (\$24,200).

Epidemic Preparedness and Response

Background

Of the 16 epidemic-prone districts in Kenya, three are in Nyanza Province, eleven are in Rift Valley Province and two in Western Province. Four other districts in the North Eastern Province experience epidemics, usually associated with heavy rains and flooding. The total population in these districts is 6.6 million. Historically, Kenya relied primarily on case management for the control of epidemics, but began implementing preventive measures in 1998 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, as described in the previous section. In 2008 and 2009, PMI supported IRS in two of these districts. The DOMC plans to spray targeted areas in the two epidemic-prone districts that will be phased out of the PMI IRS program 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 2011. As Kenya now refocuses its IRS program on endemic districts, the DOMC is developing an epidemic preparedness and response program to facilitate the monitoring of disease levels and responding to outbreaks as they occur.

Progress to Date

By the end of 2009, through the engagement of a consultant, PMI will have supported the establishment of a written and budgeted plan for transitioning out of the spraying program by strengthening a viable Epidemic Preparedness and Response system for these targeted districts.

Proposed FY 2010 PMI activities: (\$400,000)

During Year 3, PMI will support the government to strengthen its epidemic and response capacity within districts previously targeted for IRS spraying. Specifically, PMI will support the following activities in Year 3:

1. Operationalization of the written Epidemic Preparedness and Response plan and implementation of this completed strategy for the targeted districts where IRS is scheduled to phase out after the 2011 spray season. (\$200,000)
2. In addition to maximizing ITN ownership and use in epidemic prone districts through support of routine and mass ITN distribution, as described in the ITN section, PMI will support the procurement of supplies for epidemic response stockpiles in the targeted districts, including RDTs for diagnostics and ACTs for large-scale treatment, if needed. Supplies not used for epidemic response will be recycled through routine distribution channels. (\$200,000)

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 has been incorporated as an integral component of the focused antenatal care (FANC) approach in Kenya. The DOMC estimates that approximately 80-90% of women attend one or more ANC clinic visits, but that many of these visits occur late in pregnancy.

The first-line treatment for clinical 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 MOPHS 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 national policy for the prevention of MIP has three key strategic approaches:

- All pregnant women attending ANCs receive at least two doses of IPTp with SP;
- Provision of ITNs to pregnant women;
- Effective treatment of fever cases with the recommended antimalarial drugs.

IPTp with SP has been a policy in Kenya since 1998. The national policy includes:

- Administering a dose of SP with each scheduled visit after quickening to ensure women receive at least two doses during their pregnancies.
- SP should be administered at intervals of at least four weeks.
- Women known to be HIV-infected or with unknown HIV status living in areas of high HIV prevalence (estimated as affecting less than 10% of pregnant women) should receive at least three doses of SP.
- Pregnant women who are HIV positive and are on daily cotrimoxazole chemoprophylaxis are not to be given SP because of an increased risk of side effects.

With the support of Global Fund Round 2, Phase 2 grant, which began on October 1, 2003, Kenya procured SP for IPTp. Although MIP interventions were not included in Global Fund R4, the Government continued to procure SP for MIP with the support of PMI. To date, however, the uptake of IPTp has remained low. One of the major challenges in increasing the uptake of SP for IPTp appears to be the availability of SP at health facilities. This appears to be linked to supply chain issues rather than the levels of SP stock at KEMSA. With the change in national malaria treatment policy, KEMSA does not regularly distribute SP to public health facilities since it is no longer considered part of the essential drug kit. Provinces and districts are encouraged to collect the drug on demand at national stores. Many DHMTs do not have the transportation necessary to collect the SP. In addition, where SP is available at the health facilities, it is dispensed through pharmacies instead of ANCs, which further compounds the problem of access among pregnant women. Other challenges that have been noted as contributing to the low IPTp uptake include service provider attitudes and practices as well as community beliefs. To date, there is no pre-service training on malaria in pregnancy. The process of documenting the use of IPTp also remains weak. Although the registers used at ANC clinics record the provision of IPTp1 and IPTp2, there is no mechanism for tracking individual client re-visits and receipt of IPTp.

The national target for 2006 was to ensure that at least 60% of pregnant women in malaria endemic areas receive IPTp1 and IPTp2; however, the 2007 MIS results showed that only 25% of women received IPTp1 and 12% received IPTp2, despite efforts to train health workers. In 2006, for example, the DOMC prioritized training on FANC/MIP in 51 malaria-affected districts. Community reproductive health training, which includes MIP, has also been conducted by the DRH with support from the DOMC as well as UNICEF, WHO, AMREF, and PMI implementing partners. Training materials have been developed both for facility staff and community health workers, and training has been taking place at provincial, district and lower-level facilities. The consistently low levels of IPTp uptake have caused the DOMC and Provincial Health Teams to re-consider the value of continued training of health workers without apparent change in service provider practices. In the recent past, there has been an emphasis on strengthening the role of

CHWs in BCC within the context of the community strategy to increase awareness and promote behavior change among pregnant women and on demand creation for IPTp. The National Malaria Strategy (2009-2017) underscores the role of CHWs in IEC/BCC and referral of pregnant women to ANC. In 2008, the DOMC with the support of PMI distributed policy guidelines on MIP to health workers in selected districts. The DOMC is currently documenting the process to determine if an improved IPTp uptake is occurring, which would then trigger a scale-up to endemic districts. The WHO is also supporting the DOMC to re-evaluate its MIP interventions, identify the specific gaps, and define specific interventions for strengthening MIP interventions and increasing IPTp. The findings are expected to be available by end of October 2009.

In addition to the provision of IPTp, the national MIP policy endorses providing free LLINs to all pregnant women at antenatal clinics, as is discussed in the ITN section, above.

Progress to Date

In 2009, PMI procured a total of 840,000 treatment doses of SP, 280,000 treatments of which have been delivered and are scheduled for distribution. By the end of 2009, PMI will have trained an estimated 5,100 CHWs in 17 districts in Nyanza and Western Provinces, complementing DfID and WHO community-based training efforts. The training course includes FANC/MIP, IEC/BCC sensitization and messaging for the recipient communities. PMI is also supporting the training of health facility workers on FANC/MIP in 29 districts. In order to further strengthen the systems for delivering IPTp, PMI is supporting a pre-service curriculum review, a stakeholder meeting to develop consensus on the delivery of IPTp, and printing and distribution of materials. Additional community-level BCC activities promoting IPTp uptake are being undertaken through sub-grants to local NGOs in response to DOMC stated MIP priorities (described in further detail in the Behavior Change Communication section, below).

Proposed FY 2010 PMI activities: (\$875,000)

During Year 3, PMI will support the government to strengthen its MIP program. Specifically, PMI will support the following activities in Year 3:

1. Support the strengthening of supply chain management to distribute SP and ensure its availability at ANC health facilities (costs covered in the Case Management section, strengthening the supply chain management activity);
2. Support the roll out of IPTp policy guidance to health workers in malaria endemic districts. This activity builds on the pilot facility-level interventions designed to strengthen IPTp delivery in targeted areas of Nyanza Province; (\$375,000)
3. Strengthen community interventions by supporting targeted community behavior change communication and social mobilization to increase demand for and uptake of IPTp (\$500,000).

CASE MANAGEMENT

A key objective of the Kenya National Malaria Strategy 2009-2017 is to scale up access to prompt and effective treatment (defined as receiving treatment within 24 hours of onset of fever) to at least 80% by 2015, and then to sustain treatment at that level. To ensure prompt and effective treatment, the DOMC is committed to ensuring that all health care workers follow the diagnosis protocols as described below and that all patients with fever are tested for malaria with rapid diagnostic tests (RDT) or microscopy. The DOMC is further committed to ensure that first line antimalarials are available at the community level, health facilities (public and private), drug outlets, and the informal sector.

Malaria Diagnosis

Background

The National Guidelines for Diagnosis, Treatment, and Prevention of Malaria in Kenya (MOH, 2006) describe the recommended management of uncomplicated malaria as follows:

- For children under-five years old:
 - In highly endemic areas, any child with a fever or history of fever should be presumptively treated for malaria. The use of parasitological diagnosis is not a prerequisite for treatment.
 - In low endemic areas, any child with fever or a history of fever in the absence of measles, upper respiratory tract infection, or any other identifiable cause of fever should be presumptively treated as malaria. The use of parasitological diagnosis is recommended wherever possible.
- Children five-years of age or older and adults
 - In all patients with fever or a history of fever the use of parasitological diagnosis is recommended
 - At health facilities where malaria laboratory diagnosis (microscopy or RDTs) are not available, patients with a fever or history of fever in whom the health worker strongly suspects malaria and has eliminated other possible causes of fever should be presumptively treated as malaria

In order to properly implement the national guidelines, the DOMC is working to ensure that diagnostic capacity, equipment and reagents are in place at facility level to test patients with fever for malaria with either RDTs or microscopy. While there has been a focus on malaria microscopy, the development of national guidelines on the procurement and use of RDTs is currently underway and will be available for stakeholder input by October 2009. Upon finalization of the national RDT guidelines, stakeholders including PMI will support the development of an RDT implementation plan to guide the introduction of RDT malaria diagnosis into the national malaria control program. Funding for RDT procurement, logistics, health worker training, sensitization/IEC,

quality assurance, monitoring and supervision in the public sector is expected to come from donors.

Progress to date

In June 2008, PMI partnered with Walter Reed and the DOMC to train 77 laboratory technicians/technologists drawn from all provinces in Kenya on microscopic diagnosis of malaria. The trained technicians are to be used as trainers for future malaria diagnostics courses sponsored by the GOK. PMI purchased 80 binocular microscopes which will be distributed to 80 facilities identified in the laboratory assessment, described below, as needing them most.

In February 2009, PMI funded a much needed national laboratory assessment, in collaboration with the DOMC, Ministry of Medical Services, and partners from the consortium implementing the Improving Malaria Diagnostics (IMaD) project. Twenty percent of the public and FBO-run laboratory facilities in the country (1,192 out of 6,034) were visited. The assessment identified several major problems with laboratory services for malaria:

- 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 centre 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 in 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.

Diagnostic strengthening activities planned for the second half of 2009 include the review and finalization of standard reference materials such as guidelines for laboratory diagnosis of malaria, standard operating procedures for malaria diagnosis, and job/bench aids. These materials will be distributed to all public sector laboratory staff.

To further improve the quality of diagnostic capacity within the country, PMI is also working with the DOMC and Office of the Chief Medical Technologist to develop a quality assurance/quality control system for malaria laboratory diagnosis. A major component of this system will be the provision of supportive supervision and on-the-job training of health facility laboratory staff by laboratory technicians/ technologists trained

in 2008 with PMI funding. Supervisors will 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.

Proposed FY 2010 PMI Activities: (\$1,700,000)

PMI will participate in the finalization of the new RDT guidelines and in planning for the roll out of RDTs nationwide during Year 3. Specifically, PMI will support the following to malaria diagnosis activities in Year 3:

1. Provide support to the DOMC for roll-out of the new RDT Guidelines in malaria-endemic districts. Activities will include procurement and distribution of 500,000 RDTs; training of laboratory and clinical staff to handle, read and use diagnostic findings; supervision and on-the-job training for RDT use; support to quality control and assurance at all levels. (*\$800,000*)
2. Strengthen capacity for malaria microscopy at the national, provincial and district level in collaboration with the Ministry of Medical Services and DOMC. This activity is intended to increase the capacity of institutions at the different levels to oversee and monitor implementation of the national strategies. Technicians from national, provincial and district level institutions will be trained to supervise diagnostic activities of lower level facilities in the country. (*\$300,000*)
3. Continue to ensure improvement of microscopy diagnosis at lower level health facilities through the provision of supportive supervision and on-the-job training by national/provincial/district level technicians and technologists trained during Years 1 and 2 of PMI. Using check lists, supervisors will 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. (*\$300,000*)
4. Procure and distribute 100 microscopes, reagents and consumables to support malaria diagnosis. (*\$300,000*)

Malaria Treatment

Background

Since September 2006, Kenya has been implementing artemether-lumefantrine (AL) as the first-line treatment for all cases of uncomplicated malaria except in the first trimester of pregnancy. The recommended second-line treatment is oral quinine which is also the treatment of choice for a first trimester pregnancy. Parenteral quinine is recommended for severe malaria and injectable artemether, injectable artesunate, or artesunate suppositories as pre-referral care for severe malaria.

The DOMC has received funding from the Global Fund Round 4 grant, DfID, PMI, and other donors to provide training on case management under the revised policy to reach 20,000 targeted health workers in government, mission and private sectors. A cascade

training approach has been used which more recently has incorporated the use of a harmonized case management curriculum. Although training is ongoing, recent studies continue to document weak case management practices, a pattern which is recognized as a barrier to attainment of prompt and effective treatment. It is clear that more vigorous supervision and on-the-job training support from DHMTs to improve case management is needed if high coverage with ACTs is to be achieved. In addition, strengthened malaria diagnostic capabilities and use of results by health workers, constant availability of antimalarial drugs, and sustained IEC/BCC have been recognized as essential parameters for effective case management.

All treatments of AL are provided through donor support. Under the Global Fund Round 4 Phase 1 grant, Kenya received almost \$16 million for the procurement of AL. In 2006, AL procurement and roll-out ran smoothly. In October 2006, a survey of case-management of febrile children at the clinic level documented that 98% of out-patient department facilities reported no stock-out of AL during the preceding six months. However, since November 2007, challenges with the Global Fund's AL procurement and reporting policies coupled with the 2007-2008 post-election violence in Kenya have resulted in country-wide stock outs of AL. The delay in the Global Fund's AL procurement was due to the Global Fund requirement that the DOMC move away from single-sourcing of AL to issuing an open tender, which extended the procurement timeline considerably. An open tender was finally conducted and Ajanta Pharma, a manufacturer of generic AL, was awarded the contract.

Ajanta Pharma, contracted to supply 12.3 million AL treatments, has been unable to meet its obligations for timely delivery resulting in an unfilled supply chain. In both July/August 2008 and February/March 2009, PMI procured emergency shipments totaling 3.7 million treatments of AL to close the requirement gap and help prevent AL stock-outs. A PMI-funded end-use monitoring of availability of antimalarial commodities at facility level conducted in November 2008, revealed that 71% of facilities visited had stocks for at least one weight band of AL treatment, down from the 98% found in the 2006 survey described above. Over 29% of facilities included in the 2008 end-use monitoring survey were stocked out of all weight bands. This stock-out is attributed to the fact that when AL treatments do arrive in country, they are held at KEMSA's central warehouses until the next scheduled delivery to a health facility, which may be as long as three months. Plans are therefore underway to discuss with KEMSA how PMI can support distribution of AL outside of the routine schedule. It is believed that if a costed annual distribution plan is developed, more regular AL distribution can be achieved and stock-outs will be eliminated.

The DOMC is committed to ensuring high antimalarial drug quality and is working closely with the Pharmacy and Poisons Board (PPB), the Drug Regulatory Authority in Kenya and the National Quality Control Laboratory. A range of antimalarial medicines of varying quality are still available on the Kenyan market. The DOMC has been working with the PPB to strengthen its surveillance of antimalarial drug quality and enforcement capacity. PMI is providing support to strengthening of the post-market surveillance system through the sampling and rapid testing of antimalarial samples using mini-labs.

Poor quality samples will be sent to the National Quality Control Laboratory for further batch testing and subsequent action by the PPB. Voluntary spontaneous adverse drug reaction monitoring of antimalarials also falls under the mandate of the PPB. National pharmacovigilance guidelines and reporting tools are available to health workers and working with the DOMC, a module from the national pharmacovigilance curriculum is being used for case management training.

While AL is still scheduled as a prescription only medicine in Kenya by the PPB, there is growing interest in expanding access to ACTs through the private sector and several pilot projects are underway in Kenya to gather data which can be used to justify a change in AL scheduling to over-the-counter. Initial results from the pilot projects have guided the DOMC in its decision to elect to use the government's Community Health Strategy to expand access to ACTs and other malaria prevention and treatment services. In addition, as mentioned earlier, the DOMC is attempting to further expand access to ACTs and has submitted a proposal for access to the Affordable Medicines Facility for Malaria.

Progress to Date

As described above, to alleviate the 2008/2009 stock-out situation, PMI procured 3.7 million treatments of AL, which have been distributed to almost 5,000 health facilities. The procurement of an additional 4.7 million treatments began in July 2009 and will be in Kenya before the last quarter of 2009. The DOMC is currently receiving SP and quinine from the Government of Kenya and has stated that it does not need additional support for procurement of these commodities from PMI. PMI is monitoring the situation and will provide additional SP and severe malaria drugs as needed by the DOMC to fill in supply gaps in the public sector.

Ongoing pharmaceutical and supply chain strengthening activities provided by PMI include end-use verification/monitoring of availability of key antimalarial commodities at the facility level. Regular supervisory/monitoring visits began in 2009 and are taking place twice a year to a random sampling of health facilities and regional warehouses to detect and trigger further action on selected critical areas such as: ACT (or other drug) stockouts; expiration dates of ACTs at health facilities; leakage; anomalies in ACT use; and verifying consumption/quantification assumptions.

In 2009, PMI continued its support for drug management, supply chain logistics, inventory management and in-country planning and distribution of AL stocks. The necessity for additional support in 2009 to distribute SP is being monitored and will be provided as needed.

In order to gather routine consumption data for quantification, distribution planning and reporting on the Global Fund indicator, PMI supported the proactive collection of district-level consumption data. Through PMI support, the DOMC's interim tracking system is being linked to a more robust logistics management information system that also successfully serves the needs of the other seven MOH divisions. Training for all health facilities on use of this system has just been completed and consumption data on

AL and other antimalarials is currently being forwarded to the national level from the districts. PMI is sponsoring monthly meetings of the drug supply management sub-committee to plan and monitor the stock situation for antimalarials. PMI is supporting an annual national quantification exercise to determine the antimalarial drug requirements for Kenya.

A quantification exercise funded by PMI in June 2009 identified the need for a procurement of buffer stock treatments to fill the pipeline as well as provided an analysis of AL stocks and requirements for July 2009-June 2010. PMI's procurement of 4.7 million treatments of AL in 2009 will help fill the pipeline so that shocks from delayed deliveries can be absorbed by the system.

Extrapolation from the results demonstrates the country requirements from September 2009 through March 2011 (shown in Table 4 below).

TABLE 4—Quantification and Need for ACTs through March 2011

	Number of Treatments
Estimated Average Monthly Consumption of ACTs ^A	1,300,000
Projected Need September 2009—September 2010 (12 months) ^B	27,346,288
Projected Need September 2010—March 2011 (6 months)	13,673,144
Current Sources of Funding:	
Remaining GF Rd 4 Funding Year 3 (2009-2010)	14,260,140
Year 4 (2010-2011)	15,400,952
Remaining PMI Funding ^C	4,771,269
<i>Projected gap through March 2011 (18 months of ACTs)</i>	<i>6,587,071</i>
NOTES:	
A. 2009-2010 figure without buffer stock	
B. Includes buffer stock	
C. Remaining FY 2008 and FY 2009 funding (Year 1-2) for ACTs	

Over half of the 20,000 health workers in the country have been trained on the new malaria treatment guidelines. Training is ongoing with support from the Global Fund, DfID and PMI, which is supporting training 3,200 health workers in 2009. As the DOMC is likely to achieve its training target in 2009, PMI plans to strengthen supportive supervision and on-the-job training of health workers in the public sector and private sector. In addition, PMI is supporting the inclusion of the national malaria treatment guidelines into pre-service curriculum at all the major universities and health worker training facilities.

In October 2009, PMI will begin to provide support to strengthen drug quality and post market surveillance through the procurement of self-contained kits that permit limited on-site testing of medication (Minilabs[®]) and training of technicians on evaluating drug quality.

Proposed FY 2010 PMI Activities: (\$9,090,000)

In Year 3, PMI will continue to build on its Year 1 and 2 efforts to strengthen case management by procuring ACTs to alleviate in-country shortages, supporting trained health workers through enhancement of national and district-level supervision and on-the-job training, and strengthening pharmaceutical management and supply chain systems. Specifically, the PMI will undertake the following activities:

1. Procure up to 5.8 million AL treatments and severe malaria drugs, as needed, to fill in supply gaps in the public sector for 18 months (\$7,540,000);
2. Pharmaceutical and supply chain strengthening activities which will include support to the distribution of AL and SP, end-use verification/monitoring of availability of key antimalarial commodities at the facility level, technical and financial support to the DOMC, Division of Pharmacy (DOP and district pharmacists to ensure effective planning and coordination of drug needs, procurement, distribution and supervision of stock monitoring, on-the-job training and antimalarial drug consumption data gathering as well as rational use. (\$750,000);
3. Strengthen antimalarial drug quality monitoring through the provision of technical, strategic and operational support to the PPB and DOMC. This activity will support the detection (using Minilabs[®]) and removal by the PPB of substandard and counterfeit antimalarials. (\$200,000);
4. Support the DOMC to strengthen the district supervision system. Support will include the development of an integrated malaria supervision plan and operationalization of the plan at provincial and district level. Implementation of this activity is expected to improve the quality of malaria case management by staff at the public sector health facility level and result in high coverage of prompt and effective treatment. (\$600,000)

BEHAVIOR CHANGE COMMUNICATION

Background

Within Kenya, the policy environment is highly conducive to supporting behavior change communication (BCC) programming. 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 is a full-time BCC staff person at the DOMC, as well an information, education and communication (IEC) technical working group in the DOMC that coordinates BCC efforts among donors.

BCC efforts at the community levels face particular challenges. There has been only limited community-level BCC in malaria prevention or treatment. NGOs working in malaria BCC currently report that their staff and volunteers are overstretched, due to

limited funding and 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 operating 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 ten districts within the Nyanza and Western provinces. These NGOs will engage in community mobilization, interpersonal communication, and use 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.

Proposed FY 2010 PMI Activities: (\$2,070,000)

An evaluation of the effectiveness of the first year grant cycle will be conducted to determine any adaptations that may be necessary for increased impact of interventions in the expansion in Year 3. Assuming that the results indicate that expansion would continue to be an effective intervention, PMI anticipates supporting the following activities:

1. Expand community-based IEC/BCC efforts by scaling up the small grants program and including additional targeted districts to:
 - a. Increase LLIN ownership and promote correct and consistent use of LLINs;
 - b. Promote early and regular ANC attendance by pregnant women to increase the proportion of women using IPTp; and
 - c. Increase early and appropriate health seeking behavior and prompt management of fever *(\$1,700,000)*

2. 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 production and dissemination of IEC materials to facilitate communication of new and/or revised DOMC policies and key messages for national-level dissemination, for provincial-level health care workers, local DHMTs, level 2 and 3 facilities, and/or targeted communities. PMI will also support the DOMC to conduct donor coordination, undertake advocacy-related activities to ensure that malaria control is sustained as a national priority, and support national malaria-related activities. *(\$345,000)*

3. Support six Peace Corps Volunteers in malaria endemic districts to undertake community-mobilization IEC/BCC activities (\$25,000, complete discussion included in the Peace Corps and Malaria Collaboration section, below).

SURVEILLANCE, MONITORING & EVALUATION

Background

Kenya's National Malaria Strategy 2009-2017 aims to strengthen surveillance, monitoring and evaluation systems so that key malaria indicators are routinely monitored in all malarious districts in Kenya. The recent development of a malaria monitoring and evaluation (M&E) plan for the DOMC and its partners is intended to ensure effective monitoring of performance. Data collection systems used by the DOMC include routine data collection systems, sentinel surveillance, activity monitoring, household surveys, health facility evaluations, and other operational research.

Routine Data Collection Systems

Routine data collection is largely through the HMIS which is the primary healthcare monitoring system for the MOPHS. HMIS is charged with the responsibility of collecting, collating, analyzing, publishing and disseminating health data to all stakeholders (both public and private) for evidence-based decision making. The information is reported monthly from health facilities to the districts which consolidate and transmit it to the provincial level electronically via a file transfer protocol. The province then submits this data to the national level. At national level the HMIS Unit analyzes the data and produces routine reports for all the health programs, including the DOMC. The HMIS system has harmonized tools and a list of health indicators which were developed through a consultative process with other health programs. For malaria control, five indicators are included:

- number of nets distributed to pregnant women and children under-five years;
- proportion of pregnant women receiving IPTp1 and IPTp2;
- number of houses sprayed;
- case fatality rate due to malaria; and
- stock-outs of tracer drugs (AL in the case of malaria).

Deficiencies of the HMIS include incompleteness and lack of timeliness in data collections. This is due to inadequate reporting forms at collection centers, insufficient funding for supervision, and inadequate staff to compile the data at the peripheral facilities. At the central level there has been a problem of late reporting and consequently delays in processing and reporting the information. HMIS is attempting to address these issues as detailed in the "Annual Health Sector Status Report 2005-2007". The DOMC will continue to rely on the HMIS for collecting various routine data points in the area of malaria and will provide the necessary support to ensure availability and sufficient feedback of the HMIS data.

Other routine systems include 1) an Integrated Disease Surveillance System managed by the Division of Disease Surveillance and Response, which uses thresholds set at sentinel facilities in each target district to facilitate detection of malaria and other diseases and to allow the Division to facilitate appropriate responses to malaria outbreaks; 2) an IRS monitoring system which was recently developed and has spray operators collect daily, weekly and monthly IRS data (coverage, population protected by IRS, net coverage/use) during the spraying season; 3) an ITN/LLIN Tracking System for nets distributed through ANCs and child welfare care clinics. This is being expanded to capture data on ITNs distributed through campaigns; 4) a Logistics Management Information System (LMIS) which collects data on ACT consumption; 5) a pharmacovigilance system which monitors and reports voluntary spontaneous adverse drug reactions to the use of medicines including antimalarials.

Sentinel Surveillance System

Four sentinel sites were selected and established in 2000 by the DOMC, Malaria Public Health & Epidemiology Group and KEMRI. The sentinel sites in Bondo (lakeside endemic), Kwale (coast endemic), Makueni (semi arid) and Kisii/Gucha (epidemic) represent the major malaria epidemiological zones in Kenya. These sites have been used by the DOMC to monitor implementation of malaria control interventions and their health impacts, though continued activities at these sites is not clear. These sites are neither supported by PMI nor set up to collect malaria indicator data for PMI. The absence of PMI supported sentinel sites in Kenya results in a data gap regarding ongoing measures of malaria morbidity and mortality for program management and advocacy, as well as information on how best to increase use of malaria diagnostics and appropriate case management.

Demographic Surveillance System

A Demographic Surveillance System site near Kisumu in western Kenya was established for continuous demographic monitoring of a geographically-defined population (135,000). The population has been monitored since 2001 as a collaborative effort between CDC and KEMRI. A similar site was set up in Kilifi, on the coast, by the Wellcome Trust and KEMRI collaboration. These sites monitor: birth rates; mortality and morbidity rates; socioeconomic indicators; and conduct verbal autopsies to ascribe probable causes of all deaths. In addition, all known pregnancies and pregnancy outcomes are recorded, and the site in Kisumu also collects entomological inoculation rate data (ongoing since 1990). Data was collected on community parasitemia and anemia prevalence in 2003, again in 2006, and is now collected annually to measure impact of DOMC interventions, such as introduction of AL. As part of the DSS in Kisumu, there is also a health facility component. At each health facility, fevers are assessed and proper treatment given. Every child admitted has a routine blood smear done and questionnaire filled out and all diagnoses and treatments are recorded. PMI has supported collection and timely reporting of malaria-related morbidity and mortality data from the KEMRI/CDC DSS as a source of complementary data for PMI program planning.

In addition to the two DSS sites, there are a number of well-established groups conducting ongoing malaria-related research and surveillance activities in Kenya which provide data on malaria. In the past, the malaria-related technical working group chaired by DOMC has been a forum for partners to share results of their work. However, resources to collect and summarize available data for these meetings have been lacking, and consequently, DOMC officials and other implementing partners have noted that information from these activities has not been utilized to its fullest potential.

Activity Monitoring Systems

The annual malaria business plan is the tool used by the DOMC to plan and budget for its activities, as well as to gain buy-in from the donors and implementation partners. The DOMC uses a Malaria Information Acquisition System (MIAS) to facilitate development of the annual plan, to regularly monitor the activities implementation and to record and report on performance.

Population-based Surveys

The DOMC uses population-based surveys to measure outcomes and impact of the implementation malaria control interventions during the life of the plan. The most recent DHS in Kenya was conducted in 2008. An MIS was conducted in June and July 2007, funded primarily by DfID and WHO. This survey demonstrated some improvements in malaria indicators compared to a DHS conducted in 2003. The next MIS is scheduled for 2010 and the next population-based survey in Kenya with a mortality component will be the DHS scheduled in 2013.

Health Facility Evaluations

In collaboration with the Division of Child Health, the DOMC plans to commission health facility surveys every three years to monitor the quality of malaria control service delivery. The most recent survey was conducted in 2006 with one planned for the last calendar quarter of 2009. Other health facility surveys will be commissioned to answer relevant specific questions as identified by the DOMC.

Other Data Collection Activities

The DOMC has an established M&E Unit which has the mandate for coordinating M&E activities. Functions of the unit include data collation and management, surveillance, activity program and financial performance monitoring, operational research, documentation and dissemination. Information generated by the M&E unit is disseminated mostly via the program website www.nmcp.or.ke and also via MOPHS website www.health.go.ke. A quarterly bulletin is developed through DfID support.

Progress to Date

PMI has provided support to strengthen the quality of data acquired by the MIAS. Complementary data from the DSS on malaria morbidity and mortality has been provided to the PMI Kenya team, specifically during the 2010 MOP planning. A format for regular reporting of DSS data is in development. In May 2009, PMI helped the DOMC develop a draft M&E plan which will be finalized and costed by October 2009. PMI has

provided technical support to module design, field work, data analysis and report writing for the 2007 MIS, which was finalized and results disseminated in June 2009. Additionally, PMI supported the collection of malaria data as part of the 2008-2009 DHS, the preliminary results from which will be disseminated in October 2009. PMI support to *in-vivo* drug efficacy testing will begin in early 2010. Through support from WHO, KEMRI is testing AL to ensure drug sensitivity is maintained, as well as periodically examining the drug efficacy of new ACTs such as dihydroartemisinin-piperazine (the latest data for which will be available in March 2010) to guide drug policy improvements by the DOMC.

Proposed FY 2010 PMI Activities: (\$1,787,100)

PMI will support the DOMC's M&E plan through the following activities:

1. Provide technical assistance to increase the capacity of existing DOMC M&E staff, to ensure that effective M&E activities are carried out, and to ensure that M&E data is used for program improvements. (\$200,000)
 - a. Planning, coordination and provision of technical assistance to other DOMC units for development of indicators, identification of data sources, data processing and reporting, use of data for decision making and appropriate feedback.
 - b. Planning, coordination and provision of technical leadership and direction to donors and implementing partners with the aim of ensuring comprehensiveness and cohesiveness of the malaria M&E system to serve the needs of all constituents.
 - c. Organization of an annual malaria review meeting for stakeholders.
 - d. Analysis and presentation of data for incorporation into quarterly reports, briefs for policy makers and journalists and for updates on DOMC website.
 - e. Ongoing assessment of gaps existing in data collected and update of M&E plan.
2. Train two Field Epidemiology and Laboratory Training Program trainees for a two-year secondment, upon graduation, to the DOMC M&E and MIP teams. As there is very low attrition in the MOPHS among the graduates of this program, PMI anticipates that this investment will increase the long-term capacity within the DOMC to be able to carry out appropriate program planning, implementation and monitoring and evaluation. The budget for each trainee includes tuition, stipend, laptop, materials, training, travel, and conferences for the two-year program. (\$100,000)
3. Provide targeted support to the DOMC's acquisition of routine data through the MIAS and strengthen the quality and timeliness of data by the various data sources (HMIS, LMIS, pharmacovigilance system, IDSR, etc). Support the DOMC's collaboration with HMIS officers at the national, provincial and district

- level to ensure quality data collection and reporting. Support the DOMC in data consolidation, analysis and reporting. (\$150,000)
4. Continue *in vivo* drug efficacy monitoring at three established DOMC sites to test the sensitivity of AL and examine efficacy of ACTs. (\$50,000)
 5. Fully fund a 2010 Malaria Indicator Survey to measure national coverage of malaria interventions and disease burden. (\$1,200,000)
 6. Support reporting of complementary data on malaria-related morbidity and mortality in the DSS, to maintain this ongoing measure of program impact. (\$75,000)
 7. Support one CDC TDY to provide technical assistance for HMIS support and M&E capacity building (\$12,100)

CAPACITY BUILDING WITHIN THE DOMC

Background

The DOMC, like other MOPHS programmes, suffers from a lack of adequate human resources. The DOMC has led malaria control efforts that are making notable changes in malaria epidemiological trends. However, to maintain these achievements and to continue reducing the malaria burden in Kenya, the DOMC needs assistance in leading the disease control effort.

The DOMC currently has three physicians, two PhD entomologists, four public health officers, three clinical officers, two pharmacists, two nurses, two accountants 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.

The DOMC, in partnership with Global Fund, DfID, WHO, UNICEF and PMI, has begun to build its capacity in priority intervention areas. The WHO has supported improving M&E capacity by developing tools and data management systems, but much more is needed in order to fully enable the DOMC to adequately monitor and evaluate ongoing malaria control activities.

The DOMC initially organized technical working groups as a way of engaging key partners and overseeing implementation of programs, but the technical working groups have not been active.

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.

Progress to Date

PMI has provided both financial and technical support to the DOMC for the last two years. In 2008 and 2009, PMI supported DOMC supervision activities related to diagnostics and case management. The PMI assistance has focused on strengthening the capacity of the DOMC and ensuring that proper planning and reporting. Supportive supervision has been linked with results based on tools developed by DOMC, PMI and other partners. PMI also supported refurbishing the DOMC's working space to create more conducive working environments; provided a new vehicle to improve management and logistic functions within the Division; and enabled the case management focal person to make supervisory visits to the Coast province. Through PMI's assistance, DOMC has been able to conduct provincial and district planning meetings on M&E reporting mechanisms in both Coast and Nyanza Provinces.

The PMI Advisors continue to work with the DOMCs technical working groups to develop tools and guidelines for the program. This includes assisting with the writing of the Global Fund Round 9 proposal, program review of the national malaria control strategy, and the development of the current National Malaria Strategy (2009-2017).

Proposed FY 2010 PMI Activities: (\$300,000)

PMI will use Year 3 funds to improve the DOMC's technical capacity, fulfil its supervisory role, enhance the role of the technical working groups, improve management of the Global Fund grants, and increased donor coordination. Specifically, PMI will fund the following:

1. Continued provision of technical support by USAID and CDC PMI Advisors to the DOMC. These Advisors will spend significant portion of their work week with the DOMC and will have a work station within the DOMC offices to effectively integrate into the national team. (no additional cost)
2. Supportive supervision of malaria activities. 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 MOPHS officers to create synergy and strengthen the overall malaria program management. (\$150,000)
3. 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)

4. Support for technical working group meetings. 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. (US\$ 25,000)
5. Strengthening DOMC 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. (\$100,000)

PEACE CORPS AND PMI COLLABORATION

Background

Peace Corps Volunteers (PCV) have been working in Kenya for more than four decades and are typically attached to different sectors within government ministries (i.e. education, agriculture, health, water) to provide technical assistance and participate in community based initiatives. In the health sector, PCVs work with health care workers and other development agencies to support interventions designed to control and prevent diseases within their communities. PCVs are primarily engaged in community-based work designed to empower and increase the capacity of local communities to respond to priority health needs by making informed decisions and applying skills learned from the volunteers.

Progress to Date

Since the launch of PMI activities in Kenya in 2008, PMI has been involved in the orientation of different batches of incoming PCVs. In addition, PMI and Peace Corps have discussed how to engage volunteers to support and contribute towards the PMI goal of reducing malaria morbidity and mortality in Kenya.

Proposed FY 2010 PMI Activities: (see IEC/BCC Section above, for total cost)

Currently, Peace Corps has twenty-four volunteers who are assigned to different regions in the country. For malaria control specific activities, the PCVs will work with the respective DHMTs in their assigned regions. As the malaria activities carried out by the PCVs will just be a part of their main responsibilities, the funding provided by PMI will

help the PCVs to fund activities promoting awareness creation and promotion of behavior change. Specifically, PMI will work with six PCVs assigned to malaria endemic regions in support of the following activities:

1. Create awareness and demand for ITN use by sharing information on the transmission and prevention of malaria
2. Participate in mass and routine ITN distribution campaigns at the district level and undertake hang-up and keep up (promoting use) efforts.
3. Promote prompt treatment-seeking practices, for care givers and pregnant women.
4. Promote antenatal care (including IPTp for pregnant women).
5. Undertake community mobilization for indoor residual spraying, in targeted districts where it is being carried out.
6. Undertake school-based activities and non-formal education (organize school competitions on malaria prevention e.g. poster competitions, songs, drama).

HIV/AIDS AND MALARIA

Background

HIV/AIDS and Malaria are among the top ten causes of morbidity and mortality in Kenya. Both diseases are highly endemic and have a wide geographic overlap. The National AIDS Control Council provides policy and technical leadership, including monitoring and evaluation of HIV/AIDS interventions. The specific interventions (prevention, curative, support and care) are implemented by the GOK in partnership with bilateral donors, NGOs, CBOs, and FBOs.

The 2007 Kenya AIDS Indicator Survey estimates the national HIV prevalence in adults at 7.4%, documenting that more than 1.4 million Kenyans are living with HIV/AIDS. A higher proportion of women (8.7%) than men (5.6%) are infected with HIV, while just under 10% of pregnant women are HIV-positive. The distribution of HIV infections is highest in Nyanza Province (with a prevalence is 15.3%), and is closely followed by Coast Province (with 7.9% prevalence). Both of these provinces are also malaria endemic.

Co-infections with malaria and HIV/AIDS exacerbate each infection and make treatment for each much more difficult. Pregnant women suffer particularly serious consequences, increasing the adverse effects of malaria among pregnant women, including anemia and placental malaria infection. Consequently, co-infected pregnant women are more likely to give birth to low-birth-weight babies with increased risk of dying during infancy.

Progress to Date

PMI in Kenya works hand-in-hand with the MOPHS to ensure that all vulnerable groups, including persons living with HIV/AIDS, have access to the proven malaria control interventions. In addition, PMI also closely collaborates with USAID/Kenya's HIV/AIDS

and CDC Kenya's Global AIDS programs. PMI is represented on the HIV project management teams within USAID's Office of Population and Health. As part of implementation of the President's Emergency Fund for AIDS Relief (PEPFAR), ITNs are included in the basic health care package provided to HIV positive persons. In 2008, the program supplied 150,000 ITNs to people who tested positive.

Proposed FY 2010 PMI Activities: *No cost to PMI*

The President's Emergency Plan for AIDS Relief focuses on the treatment of infected people, prevention of new infections, and support and care for people living with HIV/AIDS including orphans and vulnerable children. Given these goals, it is important that both PEPFAR and PMI programs complement each other since managing co-infections create outcomes that influence the success of each program. The PMI and PEPFAR teams will continue to ensure that ANC clinics provide the best platform for integrating HIV and malaria services by ensuring that HIV positive women of reproductive age who visit health facilities are provided with an ITN as they receive other services such as prevention of mother-to-child transmission and counseling to increase the effective impact of an ANC visit.

PARTNER COMMUNICATION AND COORDINATION

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.

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, FBOs, 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.

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, one FSN staff member has been hired to support 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 two 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: (\$937,700)

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, including a mission-wide program evaluation during 2010. (\$937,700)

ANNEXES

TABLE 1
Year 3 (FY10) Timeline of Activities

Activity	2010	2011											
	Oct-Dec	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Procure LLINs for routine distribution													
LLIN routine distribution													
ITN mass campaign support													
IRS implementation and management													
Epidemiologic surveillance in endemic IRS districts													
Entomological monitoring of IRS effectiveness in sprayed districts													
Environmental monitoring													
Epidemiologic surveillance in transitioning IRS epidemic districts													
Epidemic response and surveillance stockpile supplies													
Support for roll-out of new IPTp policy guidelines													
Support for community mobilization to increase IPTp acceptance													

Provide support to the DOMC for roll-out of the new RDT Guidelines in malaria- endemic districts.													
Strengthen capacity for malaria microscopy at the national, provincial and district level													
Improve microscopy diagnosis at lower level health facilities													
Procure and distribute 100 microscopes, reagents and consumables to support malaria diagnosis													
Purchase AL													
TA for supply chain management and in-country drug distribution													
Strengthen antimalarial drug quality monitoring and surveillance													
Strengthen malaria supervision													
Integrated community based IEC/BCC													
National IEC material production													

Peace Corps community based BCC activities														
Support to DOMC														
Strengthen DOMC global fund grant management														
Support for implementation of the National M&E plan														
Train two Field Epidemiology and Laboratory Training Program epidemiologists														
Provide targeted support to the DOMC's acquisition of routine data through the MIAS and data consolidation and analysis														
In vivo drug efficacy testing														
Conduct the 2010 MIS														
Investigation of causes of deaths from health facilities relative to DSS														

TABLE 2
FY 2010 Planned Obligations Kenya

Proposed Activity	Mechanism	Total Budget	Commodities	Geographic area	Description of Activity
Insecticide Treated Nets					
Procure LLINs for routine distribution	DELIVER	\$12,500,000	\$12,500,000	Nationwide	Buy 2.5 million nets for routine distribution to meet 18 months of demand. Nets are estimated at \$5 per net.
LLIN routine distribution	APHIA II - HCM (PSI)	\$2,500,000	\$0	Nationwide	Support the routine distribution of 2.5 million LLINs over the course of 18 months
ITN mass campaign support	APHIA II - HCM (PSI)	\$650,000	\$0	Nationwide	Provide DOMC assistance in implementing the 2010 sub-national mass campaign by supporting logistical costs and/or post-campaign evaluation
USAID TDY visit	USAID	\$0	\$0	Nationwide	1 TDY visit from USAID to provide assistance in implementing ITN program (Core Funded)
Subtotal		\$15,650,000	\$12,500,000		
Indoor Residual Spraying					
IRS implementation and management	TBD IRS Follow-On	\$6,800,000	\$2,744,000	4 Endemic Districts	Spray in three new endemic districts and continue IRS operations in Rachuonyo.
Epidemiologic surveillance in endemic IRS districts	TBD	\$150,000	\$0	4 Endemic Districts	Support enhanced epidemiological surveillance and monitoring in both highland and lowland districts to provide information that the DOMC can use to make decisions on the best strategy for IRS

Entomological monitoring of IRS effectiveness in sprayed districts	CDC IAA (with sub-grant to KEMRI)	\$150,000	\$0	4 Endemic Districts	Continue insecticide resistance monitoring in ten sites in western Kenya and expand to include areas in central and coastal Kenya
Environmental monitoring	EMCAB	\$30,000	\$0	IRS districts	Continue IRS environmental assessment activities
CDC TDY visits	CDC IAA (Atlanta)	\$24,200	\$0	4 Endemic Districts	2 visits from CDC to provide assistance in implementing IRS activities
Subtotal		\$7,154,200	\$2,744,000		
Epidemic Response and Surveillance					
Epidemiologic surveillance in transitioning IRS epidemic districts	WHO	\$200,000	\$0	Epidemic-prone districts	Support transition from IRS intervention in epidemic districts. Implement epidemic surveillance activities to detect malaria outbreaks.
Epidemic response and surveillance stockpile supplies	DELIVER	\$200,000	\$200,000	targeted district(s)	Support the procurement of supplies for epidemic response stockpiles in the targeted districts, including RDTs for diagnostics and ACTs for large-scale treatment.
Subtotal		\$400,000	\$200,000		
Intermittent Preventative Treatment of Pregnant Women					
Support for roll-out of new IPTp policy guidelines	JHPIEGO bi-lateral	\$375,000	\$0	priority endemic districts	Support the roll out of IPTp policy guidance to health workers in malaria endemic districts. This activity builds on the pilot facility level interventions aimed at strengthening IPTp delivery in targeted areas in Nyanza Province
Support for community mobilization to increase IPTp acceptance	JHPIEGO bi-lateral	\$500,000	\$0	priority endemic districts	Strengthen community interventions by supporting community behavior change communication and social mobilization to increase demand for and uptake of IPTp
Subtotal		\$875,000	\$0		

Case Management					
Diagnostics					
Provide support to the DOMC for roll-out of the new RDT Guidelines in malaria- endemic districts.	IMAD	\$400,000	\$0	targeted district(s)	Support the introduction of new DOMC RDT policy guidelines in malaria-endemic districts through staff training and supervision to handle, read and use diagnostic findings.
	DELIVER	\$300,000	\$300,000	targeted district(s)	Procurement of 500,000 RDTs
	MVDP (Walter Reed)	\$100,000	\$0	targeted district(s)	Establishment of a QA/QC system for checking the continued accuracy of RDT diagnostic services
Strengthen capacity for malaria microscopy at the national, provincial and district level	MVDP (Walter Reed)	\$300,000	\$0	Nationwide	Increase capacity of national, provincial and district level institutions at these levels to oversee and monitor implementation of the national strategies. Technicians from national, provincial and district level institutions will be trained to supervise diagnostic activities of lower level facilities in the country.
Improve microscopy diagnosis at lower level health facilities	IMAD	\$300,000	\$0	Nationwide	Provision of supportive supervision and on-the-job training by national/provincial/district level technicians and technologists trained under Years 1 and 2 of PMI. Supervisors will 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.
Procure and distribute 100 microscopes, reagents and consumables to support malaria diagnosis	DELIVER	\$300,000	\$300,000	Nationwide	Support increased diagnostic capacity of trained lab technicians with necessary equipment and reagents.

Treatment					
Purchase AL	DELIVER	\$7,540,000	\$7,540,000	Nationwide	Purchase up to 5.8 million treatments of AL. Budget covers cost of AL treatments, freight and insurance, customs clearance and storage and distribution costs at KEMSA. Quantities will meet the estimated stock needs for the next 18 months.
TA for supply chain management and in-country drug distribution	SPS	\$786,000	\$0	Nationwide	Pharmaceutical and supply chain strengthening: include support to distribution of AL and SP; end-use verification/monitoring of availability of key antimalarial commodities at the facility level; technical and financial support to the DOMC, DOP and district pharmacists to ensure effective planning and coordination of drug needs, procurement, distribution and supervision of stock monitoring, on-the-job training and antimalarial drug consumption data gathering as well as rational use
Strengthen antimalarial drug quality monitoring and surveillance	USP DQI	\$200,000	\$0	Nationwide	Provision of technical, strategic and operational support to the PPB and DOMC to support the detection and removal by the PPB of substandard and counterfeit antimalarials.
Strengthen malaria supervision	APHIA II	\$600,000	\$0	4 provinces - Nyanza, Coast, Rift, Western	Development and support to operationalization of an integrated malaria supervision plan at provincial and district level
USAID TDY visit	USAID	\$0	\$0	Nationwide	1 USAID TDY to provide assistance for CM/Drug Procurement (Core Funded)
Subtotal		\$10,826,000	\$8,140,000		

IEC/BCC					
Integrated community based IEC/BCC	C-CHANGE	\$1,700,000	\$0	targeted endemic districts	Expand community-based IEC/BCC efforts by evaluating and adapting the existing the grant program and appropriately scaling it up to include additional targeted districts
National IEC material production	APHIA II - HCM (PSI)	\$345,000	\$0	Nationwide	Support national level IEC material production and dissemination to facilitate communication of new and/or revised DOMC policies and key messages for national-level dissemination, for provincial-level health care workers, local DHMTs, level 2 and 3 facilities, and/or targeted communities. Support the DOMC to conduct donor coordination, undertake advocacy-related activities to ensure that malaria control is sustained as a national priority, and support national malaria-related activities.
Peace Corps community based BCC activities	SPA	\$25,000	\$0	priority endemic districts	Support six peace corps volunteers assigned to malaria endemic regions to undertake key BCC activities to create awareness and demand for ITN use, prompt treatment of fever and acceptance of IPTp.
USAID TDY visit	USAID	\$0	\$0	Nationwide	1 USAID TDY visit to provide assistance for IEC/BCC Program (Core Funded)
Subtotal		\$2,070,000	\$0		
DOMC					
Support to DOMC	APHIA II-HCM (PSI)	\$200,000	\$0		Support to improve the DOMC's technical capacity, fulfill its supervisory role, and enhance the role of the technical working groups.
Strengthen DOMC global fund grant management	TBD LMS Follow-On	\$100,000			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	APHIA II Evaluation	\$200,000	\$0	Nationwide	Provision of technical assistance and capacity building of existing DOMC M&E staff to establish workable processes to monitor and disseminate programmatic performance
Train two Field Epidemiology and Laboratory Training Program epidemiologists	CDC IAA (Atlanta)	\$100,000	\$0	Nationwide	Train two FELTP trainees for a two-year secondment, upon graduation, to the DOMC M&E and MIP teams to increase the long-term capacity within the DOMC to carry out appropriate program planning, implementation and monitoring and evaluation. The budget for each trainee includes tuition, stipend, laptop, materials, training, travel, and conferences for the two year program.
Provide targeted support to the DOMC's acquisition of routine data through the MIAS and data consolidation and analysis	SPS	\$150,000	\$0	nationwide	Strengthen the quality and timeliness of data by the various data sources (HMIS, LMIS, PV system, IDSR etc). Collect national and sub-national level data to consolidate and provide evidence of where Kenya is and the progress made to date.
<i>In vivo</i> drug efficacy testing	MVDP (Walter Reed)	\$50,000	\$0	targeted district(s)	Continue <i>In vivo</i> drug efficacy monitoring at eight established DOMC sites to test the sensitivity of AL and examine efficacy of ACTs
Conduct the 2010 MIS	MEASURE DHS III	\$1,200,000	\$0	nationwide	Fully fund a 2010 Malaria Indicator Survey to measure coverage of malaria interventions and malaria case management on the national level
Complementary data on malaria-related morbidity and mortality in DSS	CDC IAA (with sub-grant to KEMRI)	\$75,000	\$0	district-level, population of 135,000	Support reporting of complementary data on malaria-related morbidity and mortality in DSS
CDC TDY support	CDC IAA (Atlanta)	\$12,100	\$0	Nationwide	Support one CDC TDY to provide technical assistance for HMIS support and M&E capacity building
Subtotal		\$1,787,100	\$0		

Staffing and Administration					
In country Administration and Staff	USAID/CDC	\$937,700	\$0	Nationwide	USAID and CDC Staffing and Mission wide support efforts
Subtotal		\$937,700	\$0		
GRAND TOTAL		\$40,000,000	\$23,384,000		

TABLE 3
Estimated Budget Breakdown by Intervention

Intervention	Commodities		Non-Commodities		Total	
	(\$)	(%)	(\$)	(%)	(\$)	(%)
Insecticide-treated Nets	\$12,500,000	31.3%	\$3,150,000		\$15,650,000	39.1%
Indoor Residual Spraying	\$2,744,000	6.9%	\$4,410,200	11.0%	\$7,154,200	17.9%
Epidemic Response & Surveillance	\$200,000	0.5%	\$200,000	0.5%	\$400,000	1.0%
Case Management	\$8,140,000	20.4%	\$2,686,000		\$10,826,000	27.1%
Intermittent Preventive Treatment	\$0	0.0%	\$875,000	2.2%	\$875,000	2.2%
Monitoring and Evaluation	\$0	0.0%	\$1,787,100	4.5%	\$1,787,100	4.5%
IEC/BCC	\$0	0.0%	\$2,070,000	5.2%	\$2,070,000	5.2%
NMCP Support	\$0	0.0%	\$300,000	0.8%	\$300,000	0.8%
Administration	\$0	0.0%	\$937,700	2.3%	\$937,700	2.3%
Total	\$23,584,000	59.0%	\$16,416,000	41.0%	\$40,000,000	100.0%

TABLE 4
Year 3 (FY2010) Budget Breakdown, by Partner

Partner Organization	Geographic Area	Activity	Budget
APHIA II	Nationwide	Strengthen malaria supervision	\$600,000
<i>sub-total</i>			<i>\$600,000</i>
APHIA II: HCM	Nationwide	LLIN routine distribution	\$2,500,000
		ITN mass campaign support	\$650,000
		National IEC material production	\$345,000
		Support to DOMC	\$200,000
<i>sub-total</i>			<i>\$3,695,000</i>
APHIA II: Evaluation	Nationwide	Support for implementation of the National M&E plan	<i>\$200,000</i>
C-CHANGE	Nationwide	Integrated community based IEC/BCC	<i>\$1,700,000</i>
CDC IAA (Atlanta and KEMRI offices)	Nationwide	Entomological monitoring of IRS effectiveness in sprayed districts	\$150,000
		CDC TDY visits	\$36,300
		Train two Field Epidemiology and Laboratory Training Program epidemiologists	\$100,000
		Investigation of causes of deaths from health facilities relative to DSS	\$75,000
		In country Administration and Staff	\$180,000
<i>sub-total</i>			<i>\$541,300</i>
DELIVER TO3	Nationwide	Procure LLINs for routine distribution	\$12,500,000
		Purchase AL	\$7,540,000
		Procure and distribute 100 microscopes, reagents and consumables to support malaria diagnosis	\$300,000
	Targeted Districts	Epidemic response and surveillance stockpile supplies	\$200,000
		Provide support to the DOMC for roll-out of the new RDT Guidelines in malaria- endemic districts.	\$300,000
<i>sub-total</i>			<i>\$20,840,000</i>
EMCAB	Nationwide	Environmental monitoring	<i>\$30,000</i>
IMaD	Targeted Districts	Provide support to the DOMC for roll-out of the new RDT Guidelines in malaria- endemic districts.	\$400,000
	Nationwide	Improve microscopy diagnosis at lower level health facilities	\$300,000
<i>sub-total</i>			<i>\$700,000</i>

JHPIEGO	Nationwide	Support for roll-out of new IPTp policy guidelines	\$375,000
		Support for community mobilization to increase IPTp acceptance	\$500,000
<i>sub-total</i>			\$875,000
MEASURE DHS Phase III	Nationwide	Conduct the 2010 MIS	\$1,200,000
MPV (Walter Reed)	Nationwide	Strengthen capacity for malaria microscopy at the national, provincial and district level	\$300,000
		Provide support to the DOMC for roll-out of the new RDT Guidelines in malaria- endemic districts.	\$100,000
	Targeted Districts	In vivo drug efficacy testing	\$50,000
<i>sub-total</i>			\$450,000
SPA	Targeted Districts	Peace Corps community based BCC activities	\$25,000
SPS	Nationwide	TA for supply chain management and in-country drug distribution	\$786,000
		Provide targeted support to the DOMC's acquisition of routine data through the MIAS and data consolidation and analysis	\$150,000
<i>sub-total</i>			\$936,000
TBD	Targeted Districts	IRS implementation and management	\$6,800,000
		Epidemiologic surveillance in endemic IRS districts	\$150,000
	Nationwide	Strengthen DOMC global fund grant management	\$100,000
USAID/CDC	Nationwide	In country Administration and Staff	\$757,700
USP DQI	Nationwide	Strengthen antimalarial drug quality monitoring and surveillance	\$200,000
WHO	Nationwide	Epidemiologic surveillance in transitioning IRS epidemic districts	\$200,000
TOTAL			\$40,000,000