This Malaria Operational Plan has been endorsed by the President's Malaria Initiative (PMI) Coordinator and reflects collaborative discussions with the national malaria control programs and partners in country. If any further changes are made to this plan, it will be reflected in a revised posting.

PRESIDENT'S MALARIA INITIATIVE

Malaria Operational Plan (MOP)

KENYA

FY 2009

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ABBREVIATIONS

ACT	Artemisinin-based combination therapy
ANC	Antenatal care
AL	Artemether-lumefantrine
APHIA	AIDS, Population, Health Integrated Assistance
BCC	Behavior change communications
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
GOK	Government of Kenya
HMIS	Health Management Information Service
IEC	Information, education and communication
IMaD	Improving Malaria Diagnostics
IPTp	Intermittent preventive treatment of pregnant women
IRS	Indoor residual spraying
ITN	Insecticide-treated bed net
KEMRI	Kenya Medical Research Institute
KEMSA	Kenya Medical Supply Agency
KeNAAM	Kenya NGO Alliance Against Malaria
LLIN	Long-lasting insecticide-treated bed net
M&E	Monitoring and Evaluation
MIAS	Malaria Information and Application System
MIP	Malaria in pregnancy
MIS	Malaria Indicator Survey
MOH	Ministry of Health
NGO	Non-governmental organization
PEPFAR	President's Emergency Plan for AIDS Relief
PMI	President's Malaria Initiative
PPB	Pharmacy Poisons Board
PSI	Population Services International
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 was selected as one of the eight new countries to receive funding during the third year of the President's Malaria Initiative (PMI). The objective of the PMI is to assist African countries, in collaboration with other partners, to rapidly scale-up coverage of vulnerable groups with four highly effective interventions: artemisinin-based combination therapy (ACT), intermittent preventive treatment for malaria in pregnancy (IPTp), insecticide-treated mosquito nets (ITNs), and indoor residual spraying (IRS) with residual insecticides.

Malaria is the leading cause of morbidity and mortality in Kenya. It accounts for about 30% of all outpatient consultations, 19% of all hospital admissions, and is reported to cause approximately 34,000 deaths annually among children under-five years of age. Among the four different malaria epidemiological zones found in Kenya, there are 30 malaria-endemic districts that experience stable, year-round malaria transmission with two peak transmission periods (June-August, and late November). An additional 16 districts in Kenya remain at-risk for periodic malaria epidemics. The total population at risk of malaria is approximately 23 million, or 70% of the population, including an estimated 3,500,000 children under-five and 1,100,000 pregnant women.

The preliminary results from the 2007 Malaria Indicator Survey (MIS) are demonstrating significant achievements. The proportion of households with at least one ITN increased from 6% in the 2003 DHS to 49% in the 2007 MIS. The proportion of children under-five sleeping under an ITN the previous night also increased from 5% in the 2003 Demographic Health Survey (DHS) to 40% in the 2007 MIS. By 2007, the proportion of pregnant women who received two or more doses of sulfadoxine pyrimethamine (SP) during their last pregnancy increased from 4% to 12.3% over the past five years. With the introduction of ACTs as the first-line treatment in September 2006, the 2007 MIS found that 4.3% of children under-five received ACT treatment within 24 hours of the onset of a fever experienced during the two weeks prior to the survey.

The Government of Kenya subscribes to the Roll Back Malaria Abuja targets and the Millennium Development Goals. Malaria is considered a priority for poverty reduction and the government's development agenda. Although the Ministry of Health (MOH) is committed to increasing access to health services and increasing the efficiency and quality of those services nationwide, a weak health infrastructure and shortage of health workers are formidable obstacles.

Kenya is the recipient of two malaria grants from the Global Fund to Fight AIDS, Tuberculosis and Malaria totaling $213 million. The Department for International Development (DfID) has been the major bilateral supporter of malaria programs in Kenya, providing approximately $20 million each year to support social marketing of ITNs and providing technical assistance to the Division of Malaria Control (DOMC) through the World Health Organization. The US Government has a long-standing presence in Kenya working in malaria research and control through USAID, Centers for Disease Control and Prevention (CDC), and the Walter Reed Army Institute of Research (Walter Reed). With support from these organizations, as well as UNICEF, and other national and international partners, a scaling up of malaria prevention and control interventions has already started.

This PMI Year 2 MOP for Kenya was developed in close consultation with the DOMC and with participation of nearly all national and international partners involved with malaria prevention and control in the country. The activities that the PMI is proposing to support fit in well with the Ministry's National Malaria Strategic Plan and build on investments made in Year 1 to improve and expand malaria-related services. To achieve the goals and targets of the DOMC and PMI in Kenya, the following major activities will be supported during Year 2 of the Initiative:

Insecticide-treated nets: Kenya has used several service delivery mechanisms over the last five years to distribute almost 11 million nets including: free/highly-subsidized ITNs provided through antenatal care (ANC) clinics, routine and campaign expanded program on immunization services, child health action days, community-based initiatives and retail outlets. The DOMC set a target of 80% coverage of vulnerable groups by 2007, defined as children under-five and pregnant women. To support this target, in Year 2 the PMI will procure an additional 670,000 LLINs and support free distribution through ANC clinics. While coverage has increased dramatically over the last several years, usage remains low; therefore, 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: Kenya began spraying in 16 seasonal transmission districts in 2007 with support from Global Fund Round 4 funding. In Year 1, PMI supported IRS activities in two of these 16 districts, as well as an additional bordering endemic district. This was launched in June 2008. In Year 2, PMI will continue spraying in these three districts, covering 200,000 households, and support the MOH spray operation through the procurement of personal protective equipment and provision of technical and operational support. PMI will also provide support for enhanced epidemic surveillance and entomological monitoring.

Intermittent preventive treatment of pregnant women: Despite high attendance of ANC clinics the 2007 MIS showed low coverage of IPTp—only 12% of pregnant women had received two or more doses of SP. In order to improve the uptake of IPTp, in Year 1, the PMI began supporting strengthening of focused antenatal care (FANC) in districts where training and community-based and national IEC/BCC efforts have been limited. In Year 2, PMI will support the training of an additional 4,600 health facility workers and contribute to the training of up to 6,000 community health workers in IEC/BCC and sensitization on reproductive health and MIP. PMI will also support the procurement and delivery of SP to health facilities.

Case management: There are currently no written national policy guidelines for malaria diagnosis, although the DOMC promotes the use of presumptive diagnosis in children under-five years of age and others when laboratory confirmation is not available. The MOH has expressed a desire to expand microscopic diagnosis. To support efforts to increase diagnostic capacity and quality, PMI in Year 1 is supporting the training of 80 laboratory technicians, as well as procuring 80 microscopes for the facilities where they work. In Year 2, PMI will continue this training and provide support to strengthen quality assurance/quality control systems for microscopy.

In Year 2, PMI will procure up to four million ACT treatments to help meet the ACT gap. 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 support training for formal private sector health workers; supervision of health workers; and follow up on the incorporation of focused antenatal care and malaria in pre-service training of health care providers.

Monitoring and evaluation: The PMI includes a strong monitoring and evaluation component to measure progress against the project goal and targets and to identify and correct problems in program implementation. The PMI monitoring and evaluation plan will be coordinated with the DOMC to ensure that critical gaps are being filled, and to standardize data collection and reporting. In Year 1, PMI is providing support to strengthening the health information system, including the printing and dissemination of registers, supporting sentinel sites, establishing methods in demographic surveillance system (DSS) sites to investigate causes of deaths for deaths at health facilities relative to routine surveillance, and supporting the malaria portion of the 2008 DHS including verbal autopsies. In Year 2, PMI will continue support to sentinel sites, demographic surveillance sites, and limited support to HMIS.

Building capacity: To achieve PMI targets for coverage of ACTs, ITNs, IPTp, and IRS, the PMI will provide support to improve monitoring and evaluation capacity, reporting systems, and implementation to the ACT roll out.

The proposed FY09 PMI budget for Kenya is $19.7 million. Of this amount, 29% will support procurement and distribution of ITNs, 34% improved case management including the purchase of ACTs, and 23% IRS. Approximately 5% will support malaria in pregnancy activities, and 2% will support monitoring and evaluation. Approximately 57% of the total budget will be spent on commodities.

THE 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% after three years of full implementation in each country. 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. The 2008 countries include: Benin, Ethiopia (one region), Ghana, Kenya, Liberia, Madagascar, Mali, and Zambia. Funding began with $30 million in Fiscal Year (FY) 06 for the initial three countries, increased to $135 million in FY07 and to $300 million in FY08 and FY09, and is expected to reach $500 million in FY10.

The PMI is committed to working closely with host governments and within existing national malaria control plans. Activities supported with PMI are coordinated with other national and international partners, including the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund), Roll Back Malaria (RBM), the World Bank Malaria Booster Program, World Health Organization (WHO), the United Nations Children's Fund (UNICEF), 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 FY09 planning visit, members of the PMI team met with the DOMC to identify priorities for funding for, guided in part by a stakeholders meeting with partners involved in malaria control. This document presents the detailed implementation plan for the second year of the PMI in Kenya. It briefly reviews the current status of malaria control and prevention policies and interventions, identifies challenges and unmet needs, and provides a description of planned Year Two 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 $19.7 million for FY09.

COUNTRY BACKGROUND

Kenya (see Figure 1, below) has a population of approximately 34 million with an annual growth rate of 2.3%, and is geographically divided into eight provinces and 72 districts. 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. The country has approximately 42 ethnic groups, and is a predominantly agricultural economy with a strong industrial base. Kenya 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; HIV/AIDS overall estimated adult prevalence was 6.1% in 2006 (UNAIDS); the national primary school enrollment level is nearly 80%; and gross national income per capita is less than $1,200 USD. In 2004, the total expenditure on health represented 4.1% of the gross domestic product, but the MOH plans to increase this to 8.4% of in 2007/08. The total fertility rate dramatically decreased between the 1970s and mid-1990s, but has recently been on the rise, currently at 5.0 children per woman. Furthermore, more than one in ten children dies before the age of five, with malaria being the number one killer of children.

The recent 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 of the malaria control activities. In addition, the upheaval during this period led to withholding of funds by some development partners further delaying the implementation of activities, such as procurements and distribution of essential commodities. Since the formation of a coalition Government, there has been a return to normalcy and the planning and implementation of activities are proceeding well.

Figure 1: Map of Kenya

HEALTH SYSTEMS INFRASTRUCTURE AND HEALTH SERVICE DELIVERY

The Government of Kenya (GOK) is committed to improving health service delivery as well as a commitment to malaria control. This is reflected in several key policy documents, including the National Health Sector Strategic Plan II, 2005-2010, the National Malaria Strategic Plan, and the Division of Malaria Control (DOMC) Annual Operational Plan II. 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, the Kenya Essential Package for Health represents the integration of all health programs into a single package that focuses its interventions 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 2001, the Government developed a 10-year National Malaria Strategy with the main objective to reduce the level of malaria illness and death in Kenya by 30% and to sustain that improved level of control until 2010. The National Malaria Strategy directly contributes to the Millennium Development Goals of reducing child mortality and maternal mortality.

The National Malaria Strategy articulates four strategic approaches that will:

- Guarantee all people access to quick and effective treatment;
- Provide malaria prevention measures and treatment to pregnant women;
- Ensure the use of ITNs in at-risk communities;
- Improve epidemic preparedness and response in epidemic-prone areas.

In addition, in January 2005, the DOMC developed a Malaria Communication Strategy to support the scale-up of effective interventions required to achieve the ambitious targets outlined in the National Malaria Strategy. The plan describes communication issues and broad information, education, and communication (IEC) approaches in support of the four strategic approaches of the National Malaria Strategy listed above. The DOMC organized an IEC technical working group comprised of representatives from various departments of the Ministries of Public Health and Sanitation, Ministry of Medical Services and other stakeholders.

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;
- Levels 4-6, the primary, secondary, and tertiary hospitals, which focus mainly on the curative and rehabilitative aspects of the service delivery package.

In 2003, there were approximately 4,557 health facilities in Kenya (526 hospitals, 649 health centres, and 3,382 health sub-centres and dispensaries). About 51% of these were GOK facilities, with 20% managed by non-governmental organizations (NGOs) or faith-based organizations (FBOs), and 29% managed by the private sector. In 2003, the MOH indicated that the proportion of public sector health facilities had risen to approximately 58%. The largest NGO/FBO private health care providers in Kenya are the African Medical and Research Foundation, the Christian Health Associations of Kenya, the Kenya Catholic Secretariat, the Family Planning Association of Kenya, the Kenya AIDS NGO Consortium, and the Kenyan Aga Khan Foundation.

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, which constitutes approximately 70% of all health personnel in Kenya. While the population-to-nurse and population-to-physician ratios are within WHO norms, these figures hide the large disparity in population-to-provider ratios among districts and 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 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 required), while others had more than 20.

The Health Sector Report 2007 notes that the MOH had 37,868 employees and aimed to increase that to 42,154. Furthermore, USAID and the Clinton Foundation have supported the recruitment of 1,154 contract health workers. In order to enhance the efficiency of health services the GOK intends to further decentralize its financial operations and disburse funds directly to health facilities. A Health Facility Fund will be established to implement this process and provide stringent criteria for the use of cost share funds at the facilities. These facilities include GOK facilities and about 600 dispensaries built utilizing the Constituency Development Fund, a financial mechanism controlled by Members of Parliament.

Management and Organization

In 2008, the Kenyan MOH structure was modified, as a consequence of governmental restructuring creating two Ministries: Ministry of Public Health and Sanitation and Ministry of Medical Services. The DOMC is under the Ministry of Public Health and Sanitation. Although each of these ministries will have different functions, it is expected that they will work closely together to avoid duplication of efforts. At the central level, both Ministries will 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). This will continue to promote efforts at decentralization by having DHMTs set local priorities and manage all health activities.

Community Health Providers

The National Health Sector Strategic Plan of Kenya outlines the implementation of community health services as the top priority of the MOH and its development partners. The plan establishes quotas for the 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 plan also promotes the right of Kenyans to demand appropriate services from all providers.

To facilitate this vision, CHWs communicate health messages and mobilize their communities, and promote utilization of health services. The MOH has advocated a system where one CHW serves 20 households or 100 people and is supervised by a CHEW who links the community to the health system. Each CHEW supervises 50 CHWs. This system has not yet been fully implemented across all health sectors.

The MOH places high priority on this community-based strategy, designed to "ensure that Kenyan communities have the capacity and motivation to take up their essential role in health care delivery"[1]. This strategy provides part of the framework for action within recommended PMI interventions, particularly with regard to training for malaria in pregnancy and treatment protocols, use of community-based NGOs for improving ITN use practices and IRS.

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 at health facilities each year, and 19% of all hospital admissions. Children under-five are particularly vulnerable. About 3.5 million children are at risk of infection and developing severe malaria, which not only affects child survival, but may also delay educational and social development. At least 14,000 children are hospitalized annually for malaria, and there are an estimated 34,000 deaths among children under-five each year. Pregnant women are also at high risk, and there are approximately 1.1 million pregnancies per year in malaria endemic areas. During pregnancy, malaria causes anemia, miscarriages and can result in low birth weight infants. Each year, an estimated 6,000 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: *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; *epidemic-prone areas* in highlands, which are highly populated; *epidemic-prone areas* in the arid/semi-arid lowlands which are sparsely populated; and *very low*

[1] "Taking the Kenya Essential Package for Health to the Community", Kenya Ministry of Health, June 2006.

risk or no transmission areas in the highlands above 2,000 meters. Transmission in the epidemic-prone/seasonal areas is highest from April through June.

CURRENT STATUS OF MALARIA CONTROL

Preliminary results from the 2007 MIS show considerable progress in malaria control in Kenya. The 2003 DHS reported that 22% of households in Kenya owned a bed net of any type, with only 6% owning an ITN. Only 5% of children under-five had slept under an ITN the previous night. The DOMC estimates that since 2002, approximately 10.8 million nets have been distributed through various mechanisms, although they estimate that 40% of these were conventional, untreated nets (the DOMC estimates that one-quarter of those conventional nets have subsequently been re-treated in the last 12 months).

Preliminary information from the 2007 Kenya MIS shows dramatic improvements in ownership and use of ITNs since 2003, but levels are still below national targets: 49% of households owned an ITN; 33% of pregnant women and 40% of children under-five had slept under an ITN the previous night.

Differences from the MIS national survey findings have been picked up in regional studies. Notably, data from a 2006 survey, conducted by the CDC in six provinces with the highest malaria burden in Kenya, suggests that regular ITN use may be linked to an individual's perceived exposure risk. The 2006 survey indicated that while 51% of households owned an ITN, similar to the proportion in the MIS, a higher proportion (52%) of children under-five had slept under an ITN the previous night than the proportion (40%) reported in the MIS.

Preventing malaria infection among pregnant women through IPTp remains a priority and a challenge in Kenya. The 2007 Kenya MIS reported that only 12% of women pregnant in the previous two years had taken two or more doses of SP during their pregnancy.

Case management indicators are of continuing concern. The 2003 Demographic and Health Survey (DHS) showed weak case management practices for malaria in children under-five years of age. 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. Although ACTs were introduced into Kenya in September 2006, the 2007 MIS has not shown much improvement in case management practices. The survey found that only 4.7% of children under-five received ACT treatment within 24 hours.

CURRENT STATUS OF MALARIA INDICATORS

Recent Estimates of Malaria Indicators:		
Intervention	**2003 Kenya DHS Pre-PMI Baseline Figures**	**2007 Kenya MIS (Preliminary data) Pre-PMI Baseline Figures**
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.	11.1%	15.5%
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.	--*	4.3%
Proportion of households with at least one ITN.	5.9%	48.9%
Proportion of children under five years old who slept under an ITN the previous night.	4.6%	39.7%
Proportion of pregnant women who slept under an ITN the previous night	4.4%	33.1%
Proportion of women who received two or more doses of sulfadoxine pyrimethamine (SP) during their last pregnancy in the last two years.	4%	12.3%
Indoor residual spraying (IRS) (Proportion of targeted houses adequately sprayed with a residual insecticide in the last 12 months)	--*	N/A**

* Data not available from 2003 DHS

** The DOMC has been targeting hot spots in the 16 highland districts. In 2007, approximately one million households were sprayed during this effort. The coverage of targeted households reached cannot be determined from the information we have.

NOTE: The 2007 Kenya MIS (June-July 2007) provides baseline data for the coverage indicators. The planned 2008 Kenya DHS will provide baseline data for all-cause under-five mortality.

MALARIA CONTROL FUNDING SOURCES

The DOMC Annual Operation Plan II has a total malaria budget for 2005-2007 of approximately $123 million (8,360,000,000 Ksh) for malaria control, treatment, and prevention. Over 78% of this funding comes from the Global Fund Rounds 2 and 4 grants, and 17% from the Department for International Development (DfID)/WHO. The remainder has come from UNICEF, USAID, the Government of Kenya (GOK), and other donors.

According to the Global Fund Grant Performance Report, although there were some initial delays, progress has been made. For Round 2, Phase 1 and Phase 2 have been approved, releasing the grant total of $27,700,377. Of this amount, 17% ($4,640,447) has been disbursed. The Round 4 grant totals $186,096,553. The phase 1 budget ($81,749,756) has been approved,

and 64% of it has already been disbursed ($52,188,969). The DOMC is currently finalizing reports necessary to begin the request for Phase 2 approval.

The Round 2 grant objectives include:

1. Increasing the percentage of pregnant women and children under five sleeping under ITNs through an ITN distribution system and community awareness campaign;
2. Increasing the percentage of pregnant women accessing IPTp with SP, including the purchase of SP;
3. Improving case management and effective treatment through training in Integrated Management of Childhood Illnesses and training shopkeepers in appropriate drug dispensing practices; and,
4. Improving community access to information about malaria through IEC and setting up ITN advocacy groups.

The Round 4 grant is a five-year agreement (2006-2011) whose objectives include:

1. Purchase and distribution of artemether-lumefantrine (AL) (pediatric and adult doses) 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 indoor residual spraying 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 to reach targets of 80% of children under five and 70% of pregnant women sleeping under an ITN;
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; strengthening drug supply and stock management at the health facility level.

There was a delay in disbursement of Global Fund Round 4, phase 2 funds in 2007-2008 due to challenges in reporting on two indicators: ACT consumption among adults and the community intervention on the number of persons reached by IEC. These indicators were reported and the funds have since been released. For the IRS activities in Global Fund Round 4, there was under-budgeting on some of the key areas such as payroll for spray operators. It is necessary for the DOMC to either reprogram some of the activities or contribute additional funding.

Kenya re-submitted the Global Fund Round 7 proposal with major revisions for consideration for Round 8. The proposal broadly covered increasing ITN coverage, rolling out AL to the community for home management of malaria and strengthening BCC and M&E. This proposal was not approved by the Global Fund Board. It is expected that Kenya will submit a proposal for Round 9, possibly re-submitting a revised version of its Round 8 grant.

CURRENT AND PREVIOUS USG MALARIA ACTIVITES IN KENYA

U.S. Government

USAID and CDC have a long history of working on malaria in Kenya, and have worked together on malaria and HIV/AIDS over the last 15 years. Kenya is a President's Emergency Plan for AIDS Relief (PEPFAR) focus country with implementation through USAID and CDC as well as through Walter Reed Army Institute of Research (Walter Reed).

CDC: CDC has worked in partnership with the Kenya Medical Research Institute (KEMRI) since 1979, supporting research related to malaria and other health issues. CDC has a research station in Kisumu in Nyanza Province, an area of very high malaria transmission, and has carried out several important research studies including one of the definitive ITN studies in the late 1990s, major studies on the efficacy of IPTp, and studies on malaria and HIV. In addition to the Kisumu research station and the work with KEMRI, CDC also has a large presence in Kenya under PEPFAR.

USAID: USAID manages a comprehensive development assistance program including work in governance, natural resource management, and support for small farmers, education, and health and population. In addition to HIV/AIDS work under PEPFAR, USAID also supports work in reproductive health/family planning and infectious diseases, including tuberculosis and malaria. In malaria, USAID has worked with CDC on several research activities, and supported work in malaria in pregnancy. USAID also provided assistance to the DOMC in the transition to ACTs, including support for procurement, quantification, and quality assurance in complement to the Global Fund's purchase of ACTs. USAID contributed to the DfID-supported program with Population Services International (PSI) to socially market ITNs and provide highly-subsidized ITNs through antenatal clinics. USAID has also provided support to Management Sciences for Health to work with Kenya Medical Supply Agency (KEMSA) and the DOMC to improve the management of drugs and to provide technical support to the Health Management Information System (HMIS).

Walter Reed Army Institute of Research: Walter Reed has had a presence in Kenya for nearly 28 years, working with USAID, CDC, KEMRI and the Kenyan Ministry of Defense. The primary areas of work have included malaria vaccine and drug development, work in HIV/AIDS as well as other areas, including leishmaniasis. Walter Reed has a study site in Kombewa in Nyanza Province as well as a research laboratory in Kondele. It runs a Center of Excellence for microscopy where they have trained research microscopists from throughout Africa. Walter Reed has helped develop the Nyanza Pediatric Hospital as a possible training site. Currently the Institute also plays a role in PEPFAR, where they have 7,000 patients under treatment and provide care and support services for an additional 8,000.

GOAL AND TARGETS OF THE PRESIDENT'S MALARIA INITIATIVE (*by 2010*)

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 2

By the end of Year 2, the PMI together with other partners will have achieved the following key results:

Prevention:

- Approximately 3,400,000 ITNs (of which PMI will provide 670,000 LLINs) will have been distributed to children under-five and pregnant women.
- At least 255,000 households in the three targeted districts supported by PMI for IRS will be sprayed (at least 1,275,000 residents protected); and
- Intermittent preventative treatment with SP in pregnant women will have been enhanced by procuring up to 1,000,000 SP treatments, training 4,600 health workers and 6,000 community health workers to promote increased uptake of IPTp.

Treatment:

- Procure and assist with the distribution of 4,000,000 treatments of Artemether-lumefantrine, AL.
- In collaboration with DfID, WHO, and the Global Fund resources, expand case management training to formal private sector health workers and increase supportive supervision; and

- Malaria microscopic diagnostic capacity in health facilities will have been enhanced through provision of training of trainers and on-the-job training for laboratory technicians.

INTERVENTIONS

Malaria in Pregnancy

Current Status/Challenges and Needs

The MOH has adopted a Focused Antenatal Care (FANC) approach to promote the health of pregnant women, which includes a recommendation that pregnant women make at least four visits to a skilled provider during their pregnancy, beginning in the first trimester. Prevention of malaria in pregnancy (MIP) has been incorporated as an integral component of the FANC approach. Each year approximately 1.5 million pregnancies occur in Kenya, with more than 1.1 million of those in women at risk of acquiring malaria infection. Kenya's 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 DOMC is responsible for technical oversight. 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, often after the 27th week. The 2003 DHS estimated that 88% of women attend one or more ANC visits, while 52% make four or more ANC visits; the median month of pregnancy that women attended their first visit was 5.9 months (23.6 weeks).

The MOH has set the following targets to be achieved by 2006. These targets have yet to be realized, but include:

- 60% of women will have received two doses of SP for IPTp in the second and third trimester;
- 80% of fever or anemia cases will be appropriately managed at ANCs;
- 60% of pregnant women will sleep under an ITN

National policy for the prevention of MIP from the MOH's National Malaria Strategy, 2001-2010, calls for the provision of:

- Free treatment doses of SP at each ANC visit after the first trimester, not less than four weeks apart, or other future prophylactic drug regimen that might evolve;
- Effective community-based communication to encourage prompt treatment of fever;
- Increased access to ITNs.

The national policy for IPTp is:

- Administer a dose of SP with each scheduled visit after quickening to ensure women receive at least two doses during their pregnancies.
- Women known to be HIV-infected or with unknown HIV status living in areas of high HIV prevalence (under10% among pregnant women) should receive at least three doses of SP.
- The SP should be given at an interval of at least four weeks.

- Pregnant women who are HIV positive and are on daily cotrimoxazole chemoprophylaxis should not be given SP because of an increased risk of side effects.

Despite the clarity of these guidelines, DOMC recognizes that confusion exists about this policy among partners, within different divisions of the MOH, and among health care workers at all levels of the health care system. In FY08, it was agreed that there is need for a stakeholder's meeting on MIP with participation from the DOMC, DRH, provincial health managers, FBOs, NGOs, and private sector partners to clarify the correct policy, the reason for the change from a policy based on giving a dose during each trimester to giving a dose at each visit, and best practices. This stakeholders' meeting will take place in the second half of 2008.

Current status of MIP interventions

Although the current registries used at ANC clinics record the provision of IPTp1 and IPTp2, no mechanism for tracking individual client re-visits exists. The new registers may also be unavailable in all health facilities. Data from the MIS indicate that approximately 12% of women received two doses of IPTp.

Several district-level surveys have demonstrated higher utilization rates of IPTp (than the 2003 Kenya DHS) where FANC/MIP training has been implemented. For instance, a JHPIEGO 2004 survey demonstrated that following trainings in 19 districts, 77% of pregnant women received at least one dose of IPTp in four of the sampled districts. A survey by the African Medical and Research Foundation (AMREF) showed coverage of IPTp 2 increased from 13% in March 2003 to 53% in February 2006 in another four districts. CHWs were anecdotally observed to have a positive impact on community awareness and utilization rates in the three districts where they were trained, but actual IPTp coverage still needs to be measured in these areas and compared with areas where CHWs have not been trained.

Funding for SP procurement has been undertaken through of the Global Fund Round 2, Phase 2 grant, which began on October 1, 2003. The total number of doses needed to cover the approximately 1.1 million at risk pregnancies per year is about 2.2 million doses (assuming 100% coverage with at least two doses of SP during pregnancy). With the change in national malaria treatment policy, KEMSA no longer regularly distributes SP to public health facilities since it is no longer considered part of the essential drug kit. KEMSA now encourages provinces and districts to collect the drug on demand at national stores. Unfortunately, many districts do not have the capacity to collect the SP, and therefore dispensing it through ANC clinics instead of pharmacies has further compounded drug management problems at the district level. As a result, stock-outs have been reported by DOMC staff and other partners. In response to this drug supply problem, the DOMC is exploring delivering SP to health facilities through the ITN distribution system while simultaneously working with KEMSA to strengthen the supply chain system and increase the uptake of IPTp at the ANC clinics.

The DOMC has prioritized training on FANC/MIP in 51 malaria-affected districts. Training on community reproductive health including MIP has been undertaken by the DRH with support from the DOMC as well as JHPIEGO, UNICEF, WHO, AMREF, the Population Council, and other organizations. Training materials have been developed and training of some health

workers undertaken in at least 42 endemic districts. Many of these, however, were training-of-trainers at the district level with very little training conducted at the dispensary or health center level. The DOMC would like to focus training for FANC/MIP and community reproductive health on four levels:

- Training of trainers from the District and Provincial Health Management Teams;
- Supervision training for members of the DHMT;
- Training of service providers;
- Training of CHWs to improve knowledge and create informed demand around uptake of IPTp, use of ITNs and early attendance at ANC.

To expand FANC/MIP training to all levels of the health system and community, the DOMC estimated a funding gap of approximately $2.4 million. This includes training, the provision of training materials and registries to record use of IPTp and net use by pregnant women. WHO, with support from DfID, will support FANC/MIP training of trainers at provincial level in 2008. To complement these efforts, PMI is supporting the training of 5,100 CHWs in 17 districts in Year 1. PMI will also support the training of trainers on FANC/MIP in 29 districts. In FY09, PMI will support the training of health workers in health facilities in the 29 districts and scale-up the training of CHWs by training an additional 6,000 CHWs in the 17 districts in Nyanza and Western Provinces. No funds from the Global Fund are earmarked for health worker training.

LLINs (Supanet® or PermaNet®, branded as SupaNet Extra) are currently being supplied to Maternal and Child Health and ANC clinics by PSI. With support from the Global Fund, PMI and other partners, the DOMC has scaled-up the provision of free LLINs to pregnant women at ANCs in all provinces. Approximately 6,400 service providers have been trained in the use of LLINs to prevent malaria. This program has also been supported by DfID from 2002-2007, but funding beyond 2008 is uncertain. It is estimated that at least one million nets are needed each year to keep up with the number of new pregnancies and replacement nets. Use of nets by pregnant women has been shown to be low. The Kenyan Red Cross Society and other partners are involved in community activities to increase use.

The first-line treatment for malaria in pregnancy is oral quinine in all three semesters. The MOH 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. A clear policy must be articulated by the MOH on the correct dosing of folic acid, as doses of 5mg can interfere with the efficacy of SP for IPTp.

Progress to Date

In Year 1, PMI supported the procurement of 840,000 doses of SP. In addition, PMI funding complemented DfID and WHO efforts by training 5,100 CHWs in 17 districts in Nyanza and Western Provinces. The CHW training included FANC/MIP, IEC/BCC sensitization and messaging for the recipient communities.

Proposed USG activities: ($980,000)

1. Procure up to one million SP treatments depending on Global Fund funding gaps (see Case Management section);
2. Support the distribution of SP drugs using innovative channels such as concurrent distribution with ITNs in antenatal clinics ($56,000);
3. PMI will build on the training of trainers in Year 1 through supporting the training of approximately 4,600 health care workers in FANC/MIP in the 29 districts where TOTs have been carried out ($624,000); and,
4. Strengthen community interventions by supporting the training of an additional 6,000 CHWs in IEC/BCC and sensitization on reproductive health and MIP in 17 districts and IEC activities ($300,000).

Insecticide Treated Nets

Current Status/Challenges and Needs

The Kenya National Malaria Strategy (2001-2010) includes the use of ITNs by at-risk communities to prevent malaria. The MOH, working with partners including NGOs, FBOs, other community-based organizations, the commercial sector and bilateral and multilateral organizations, promotes a comprehensive market approach to distribute ITNs to biologically and economically vulnerable populations. The MOH, with support from WHO and DfID, is currently revising its strategic framework for ITNs.

The DOMC has set a target of 60% coverage of vulnerable groups by 2006 and 80% coverage of these groups by 2007. Vulnerable groups are currently defined as children under-five years and pregnant women. People living with HIV/AIDS, the elderly, orphans and the poorest of the poor have been identified as additional target groups. Currently, multiple delivery mechanisms are used including free ITNs provided through ANC clinics, routine and campaign expanded program on immunization services, child health action days, community-based initiatives and retail outlets. Currently, PSI is distributing ITNs free through health clinics to children under one year of age and pregnant women. ITNs are available at a subsidized price of 50 Ksh ($0.75) per net through PSI retail outlets. The MOH also supports strategies to promote demand creation to ensure the development of a sustainable ITN market. The MOH encourages coordination of the distribution of free/highly subsidized ITNs to avoid undermining commercial sector efforts.

To achieve their targets among vulnerable populations, the DOMC estimates six million nets per year are needed for distribution through ANC clinics, replacement, and for distribution to the economically vulnerable and other vulnerable groups. Based on the numbers of ITNs distributed to date, vulnerable coverage targets are likely to have been met by the end of 2008. The need for replacement nets and coverage of newly pregnant women and children is estimated at 6 million nets per year. PMI is contributing towards filling the annual need for replacements and for new pregnancies/births. The ITN gap table, below, highlights the 2009 gap analysis for achieving universal coverage.

Universal Coverage 2009 ITN Gap Table	
A. Total ITN need 2008 based on universal coverage targets	20,400,000
B. Total ITNs in country as of 2008 (best data estimate)	16,563,602
C. Total ITNs gap to reach universal coverage *(a less b)*	3,836,398
D. Total ITNs needed to support new pregnancies and births	3,000,000
E. Total ITNs needed to replace nets distributed in 2005	3,411,207
F. Total requirement for ITNs to reach universal coverage in 2009 *(sum of c+d+e)*	**10,247,605**
G. Number of ITNs in 2009 from other partner funding	2,730,000
H. PMI contribution for ITNs in 2009	670,000
I. Remaining ITN gap to reach universal coverage for 2009 *(f less a+b)*	**6,847,605**
Assumptions a. Universal coverage target is three ITNs per household 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. 1,500,000 number of new pregnancies (8% of female population) all areas f. 5,760,000 children under-five all areas	

There has been considerable progress recently in increasing access to ITNs. The 2003 DHS reported 22% of households in Kenya owning any bed net, with only 6% owning an ITN; ownership is higher in urban areas. The DOMC estimates that since 2002, approximately 10.8 million nets have been distributed through various mechanisms, although they estimate that 40% of these were conventional, untreated nets (the DOMC estimates that one-quarter of these have subsequently been treated in the last 12 months). In the 2007 MIS, household ownership of ITNs was 49%, while proportions of children under five years and pregnant women who slept under a net the previous night were 40% and 33% respectively.

The primary partner in the distribution of ITNs is PSI, with funding from DfID, who has developed multiple distribution mechanisms. PSI began a pilot program in Coast Province in 2001 and expanded nationally the following year. In 2004, the subsidies were increased and long-lasting nets (PermaNet and Olyset) were sold through the clinics at KSH 50 ($0.75) for pregnant women and children under-five years of age. Conventionally treated nets bundled with an insecticide (KO-Tab) were sold at KSH 100 ($1.50) in rural shops and kiosks. By the end of 2006, PSI had distributed over nine million nets. In 2006, over 500,000 nets were provided by the commercial sector. Net sales at clinics in 2006 averaged almost 200,000 per month.

In early 2008, PSI began distributing LLINs free to pregnant women and children under one-year of age through the health clinics. Beginning in the third quarter 2008, the program will expand to the remaining provinces. LLINs are still available to children aged one to five years for KSH 50 ($0.75) while conventional nets may be purchased at rural shops for KSH 100 ($1.50).

Approximately 60% of nets owned in the country are LLINs, although the proportion is expected to rise rapidly. Retreatment kits are available at 20 KSH at clinics although utilization of these services is limited. With support from DfID and PMI, the DOMC and WHO organized a national net re-treatment campaign held in mid-2008. Additional nets will be obtained for replacement of those that are too worn to be retreated. The re-treatment campaign will be completed by the end of the third quarter of 2008. PSI is beginning to bundle the KO-Tab 123 re-treatment kit with locally-manufactured nets that are sold through the rural sales outlets. In 2007, DfID considered reprogramming money for malaria control into the sector wide approach used by the MOH. However, they continued to support the PSI net distribution program through 2008. It is again unclear if DfID will continue to provide direct support for the ITN distribution program in 2009. An ITN implementation framework was developed in 2007 by DOMC and partners. Based on this framework, it is likely that Kenya will move to a system of free distribution of ITNs, ultimately using KEMSA as the means of distribution. If that approach is adopted, a careful transition plan will have to be developed, with continued support to the PSI 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 beginning this year.

Progress to Date:

By the end of Year 1, an estimated 2,600,000 ITNs will be distributed for free through the ANC program. The Global Fund and DfID will each provide one million ITNs while PMI (FY08) will provide 600,000 ITNs. PEPFAR is planning to provide two ITNs to people testing positive for HIV/AIDS in a basic care package, for an estimated distribution of 150,000 ITNs in FY08.

In collaboration with the DOMC, WHO and DfID, PMI provided support to carry out a campaign in August 2008 for the re-treatment of conventional nets, including support for planning of the campaign, communication to the community regarding net re-treatment, and replacement ITNs for damaged or torn nets. Future support for re-treatment campaigns is not anticipated, as Kenya will now be distributing only LLINs from this point forward.

2009 Proposed USG Activities: ($5,750,000)

1. Help fill the ITN gap by purchasing 670,000 LLINs to distribute free of charge through the ANC clinic program and provide support for this program, particularly as Kenya transitions to a new ITN framework strategy ($4,750,000);
2. Provide programmatic and logistics support to the routine LLIN distribution system through the ANC clinics ($500,000); and,
3. Provide support to an integrated BCC/IEC campaign conducted by community-based organizations, FBOs or other NGOs in a stepped up targeted program at the community level to increase the appropriate use of ITNs by vulnerable groups. The integrated campaign will also include messages about IRS, prompt treatment and IPTp ($500,000).

Indoor residual spraying

Current Status/Challenges and Needs

Kenya national policy is to conduct indoor residual spraying in epidemic prone districts. Epidemic prone areas include the highlands of western Kenya as well as arid regions of northern Kenya. Epidemics in highland western Kenya have been more frequent and therefore, indoor residual spraying using lambdacyhalothrin has been targeted within the 16 highland districts in western Kenya. The total population in these areas is approximately 6.5 million people living in approximately 1.3 million household units. In 2006, approximately 200,000 structures were targeted for IRS. In 2007, the GOK targeted 1.1 million dwelling structures for IRS. According to the 2007 MIS, nearly one million households in the targeted districts were reached through the IRS campaign. The DOMC has targeted hot spots of malaria transmission such as wet valley bottoms where malaria transmission is most likely to occur. Kenya has just completed its IRS campaign for 2008 where the number of households sprayed is not yet known but is estimated to be fewer than 400,000 households in 14 districts. With FY09 funds, PMI will support the spraying of an additional 200,000 households in two highland districts and 100,000 households in one lowland endemic district in 2008.

In 2007, the Global Fund and USAID (with FY07 malaria funds) supported the MOH IRS campaign. Funding gaps for the 2008 spray season occurred again, and it is expected that further assistance will be needed for the 2009 spray season. The GOK has requested supplemental donor support for insecticides, personal protective equipment, supervision, training, and salaries for sprayers. The DOMC re-calculated their estimated needs for IRS assuming a cost of US$13 per household. With a target of 700,000 households for 2009, the estimated cost of the DOMC IRS program is $9.1 million. Kenya has only $2.1 million allocated for IRS through the Global Fund. Given the large funding gap for Kenya's IRS program, PMI is unable to fully support the Kenya IRS program to meet targets set in the Global Fund proposal. To assist the Kenya national program in meeting these targets, PMI will provide support to reprogram Global Fund money to either obtain additional money from other areas to close the gap, or to refocus the IRS program to specific, high risk areas within the highlands. PMI will work closely with the DOMC and WHO to refine their IRS strategy and ensure that Global Fund targets are met.

With rapidly increasing coverage of ITNs throughout Kenya, there have been anecdotal reports of greatly reduced malaria incidence throughout the country, including the highlands. Three questions that need to be addressed regarding IRS in Kenya are:

1. Is IRS a cost-effective strategy in epidemic-prone areas as the overall case burden is going down?
2. What is the long-term strategy for IRS in epidemic and endemic areas of Kenya in the context of increasing LLIN coverage?
3. Should IRS be implemented in neighboring endemic areas?

Answers to these questions will require enhanced surveillance and monitoring in sprayed areas to assist the DOMC in making decisions about where to allocate resources for IRS. The DOMC is planning to conduct parasitological and entomological evaluations of the IRS program. This evaluation should be strengthened and expanded. Thorough parasitological evaluation is needed

as a follow-up to the IRS campaign. With the high ITN coverage and reports of reduced malaria burden at health clinics, it may be possible to provide more targeted coverage of IRS in these highland districts and, as ITN coverage increases further, it may be possible to phase out IRS in these areas entirely. The DOMC has expressed interest in refocusing their IRS program to target endemic areas, particularly those that border the highland districts that are currently covered by the Kenya IRS program.

Progress to Date

In June 2008, PMI launched IRS in two highland and one neighboring endemic district targeting 85% coverage in all three districts. PMI also provided technical assistance to the DOMC to refine their IRS strategy for epidemic prone areas in the highlands of western Kenya and assist with planning and training for the 2008 IRS campaign. Technical assistance was provided with PMI funding to assist with the logistics and training in 2008.

In addition, PMI will provide support for enhanced surveillance and monitoring in both highland and lowland districts to document the effectiveness and cost-effectiveness of IRS in these areas. A project to evaluate the effective half-lives of non-pyrethroid insecticides on traditional house wall surfaces is planned and will commence when FY08 funding is released. If the effective lifetime of these non-pyrethroids is similar to that of the insecticides currently used for IRS, they should be considered for incorporation into the IRS program as part of an insecticide resistance management strategy. Insecticide resistance monitoring has already been conducted at 10 sites in four lowland districts in western Kenya: one district where IRS is planned, one district where ITN coverage has already reached PMI targets and two other districts. Resistance monitoring will continue after the lowland district has been sprayed.

2009 USG Proposed Activities: ($4,575,000)

For FY09, PMI will continue spraying three districts in Kenya. PMI will also continue to provide technical assistance to the MOH IRS program. Activities will take place to:

1. Provide technical assistance to the DOMC to refine their IRS strategy for epidemic-prone areas in the highlands of western Kenya and work with the DOMC and the MOH to reprogram Global Fund support for IRS in the highlands, ($24,200);
2. Assist with planning and training for the 2010 IRS campaign ($190,800);
3. Provide support to conduct IRS in two highland and in one neighboring endemic district targeting 85% coverage in all three districts ($3,500,000);
4. Support enhanced epidemiological surveillance and monitoring in both highland and lowland districts to provide information that the DOMC can use to make decisions on whether to continue spraying, particularly in highland transmission areas. Surveillance will also be done in a small number of facilities in the lowland areas that are currently sprayed under PMI to provide additional comparative data to inform the decision making process. ($175,000);
5. Continue insecticide resistance monitoring in 10 sites in western Kenya and expand to include areas in central and coastal Kenya ($150,000);

6. Procure personal protective equipment to support the Global Fund-funded spraying managed by the DOMC ($500,000); and,
7. Conduct an Environmental Monitoring Assessment ($35,000).

Case Management

Current Status/Challenges and Needs

Kenya changed its first-line malaria treatment policy to artemether lumefantrine (AL) in April 2005 and launched this new policy in September 2006. Second-line treatment for uncomplicated malaria is oral quinine and parenteral quinine is recommended for severe malaria. The policy recommends injectable artemether, injectable artesunate or artesunate suppositories for pre-referral care. To date, these other pre-referral drugs have not been available. There are no changes anticipated to the treatment policy at this time. However, PMI will continue to monitor the stock of drugs for severe malaria and is prepared to work with the DOMC to procure additional stocks if deemed necessary.

These revised treatment guidelines were introduced to public and NGO sector health workers in 2006 through a three-day cascade training approach. However, training has not proven to be sufficient for the effective implementation of the new treatment guidelines. Recent studies have documented weak case management practices in the Kenyan public sector, even among those health workers who have received additional instruction. This is most likely due to inadequate supervision of providers through the DHMTs in conjunction with lack of IEC/BCC activities.

The DOMC received funding from the Global Fund Round 4 grant for the procurement of AL and severe malaria drugs. In 2007, the AL procurement and roll-out ran smoothly, but there was consensus that the initial AL needs had been underestimated due to the construction of several new health facilities and increased demand. At the time, supply gaps were not expected until late 2008. However, due to problems with the Global Fund's AL procurement and reporting policies coupled with the 2007-2008 post-election violence in Kenya, AL stocked-out much sooner than expected, beginning in November 2007 and lasting through 2008.

The delay was caused by the Global Fund requirement that the DOMC issue an open tender for their AL procurement, which extended the procurement timeline considerably. Additionally, the DOMC could not meet its Global Fund Round 4 reporting obligations for two indicators: 1) the number of adults receiving AL treatment guidelines; and 2) the number of people reached with IEC messages. These two factors substantially delayed the release of funds and the order of the antimalarial drugs. An open tender was finally conducted and a manufacturer of generic AL was awarded the tender. The reporting issues on ACT consumption have been addressed in the short run.

At present, Global Fund reporting and procurement issues have been resolved but drugs will most likely not arrive in country until October 2008. PMI has ordered an emergency shipment of 400,000 treatments of AL to alleviate the problem and is working closely with the DOMC to plan future shipments. Further, a quantification exercise is planned for June 2008 which will

update the quantification estimates from last year taking into account actual consumption data. However, even with these steps it is likely that there will be a shortfall through 2009. The DOMC is also estimating that there will be a gap for severe malaria drugs in 2009, but the priority is to stabilize the AL supply in the medium term.

The procurement of AL is still being managed by KEMSA, through the Global Fund Procurement Consortium. KEMSA manages the procurement, distribution, logistics and storage for antimalarial medicines for the public sector. Inventory management and reporting of consumption data has been one of the greatest challenges in managing the supply of AL, and PMI continues to support strengthening the supply chain system. Investments focus on strengthening inventory management and reporting of consumption data, quantification, supervision, and KEMSA's procurement capacity.

The DOMC has identified the need to support redistribution of AL stock among health facilities at the district and province level. KEMSA does not have the capacity to move stocks from districts which may have excess AL to districts that have stocked-out. Since KEMSA is operating on a "push" system and consumption data is still not reliable, the ability to redistribute stocks will provide the DOMC with the ability to rapidly respond to stock-outs in-country and make best use of the AL already present in Kenya.

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. Currently, there is funding from DFID to support pharmacovigilance and drug efficacy sentinel sites for AL in Kenya.

AL is still scheduled as 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 being operated in Kenya. The results of these pilots are expected to inform a policy change for ACTs through the private sector in late 2008.

However, a range of antimalarial medicines of varying quality are still available in the private sector. Due to a few highly publicized incidents involving counterfeit ACTs and the discovery of the substandard antmalarial drugs in Kenya, the DOMC is increasing its focus on working with PPB to strengthen its surveillance of antimalarial drug quality and enforcement capacity

Progress To Date

To alleviate the 2008 stock-out situation, PMI has procured 397,440 treatments of AL that arrived at the end of June 2008. Procurement of up to an additional 3,500,000 treatments will continue through 2008. Support was provided to pro-actively collect district level consumption data to meet the Global Fund reporting indicator. In addition, 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. Finally, a nationwide quantification exercise is taking place to plan for PMI and Global Fund procurements of ACTs.

Training on the new malaria treatment guidelines has covered over half the health workers in the country. All public sector health workers are expected to be trained by the end of calendar year 2008 through support from PMI and DFID. PMI has directly supported this effort by funding the training of 3,200 health workers in 2008. Additionally, PMI is supporting the development of the new treatment guidelines into pre-service curriculum at all the major universities and health worker training facilities.

Proposed USG Activities: ($6,056,000)

In Year 2, PMI will continue to build on its Year 1 efforts to strengthen case management by: procuring ACTs to alleviate the shortage; training health workers; and strengthening pharmaceutical management and supply chain systems. Specifically, the PMI will support the following activities:

1. Procure up to four million AL treatments, and additional SP and severe malaria drugs as needed to fill in supply gaps in the public and Mission/NGO sector ($4,500,000);
2. Pharmaceutical and supply chain strengthening activities will also include end-use verification/monitoring of availability of key antimalarial commodities at the facility level. Specifically, this will entail regular supervisory/monitoring visits to a random sampling of health facilities and regional warehouses to detect and trigger further action on the following critical areas: ACT (or other drug) stockouts; expiration dates of ACTs at health facilities; leakage; anomalies in ACT use; and verifying quantification/ consumption assumptions. (Cost of activities covered under Activity #1, above);
3. Support health worker training and supervision for the remaining public sector and private formal sector health workers, with an increased focus on strengthening supervision and adherence to new treatment guidelines in addition to training through the development of supervisory checklists, job aides, field visits, monitoring of key performance indicators, and long-term strategies for refresher training ($606,000);
4. Continue support and follow up to incorporate pre-service curriculum into all the major universities and health worker training institutions, and ensure that the new curriculum is incorporated into universities and training institutions ($100,000);
5. Continue support for drug management, supply chain logistics, inventory management and in-country redistribution of AL stocks. In addition, PMI will support in-country redistribution of AL stocks as needed to ensure that all health facilities in Kenya are stocked. ($750,000 of which approximately $350,000 is allocated to supporting the in-country redistribution activity. This activity will be reprogrammed to either procure additional AL or continue supply chain strengthening in event the funds are not used in their entirety.); and,
6. 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 ($100,000).

Malaria Diagnosis

Current Status/Challenges and Needs

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 classified and treated as 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 classified and treated as having malaria. The use of parasitological diagnosis is recommended where 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 rapid diagnostic tests (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 cause of fever should be presumptively treated as malaria

Presently, there is no national policy outlining the goals, standards, and strategies for diagnosis of malaria in Kenya. The DOMC has indicated that strengthening of malaria diagnosis through improved microscopy would be desirable, and there is also some interest in exploring how RDTs could be used at health facilities to improve treatment decisions. It is unknown what percentage of malaria cases in Kenya are parasitologically confirmed.

Although the DOMC reports that all provincial and district hospitals have microscopes and laboratory technicians capable of performing malaria diagnosis, old, malfunctioning, or missing microscopes need to be replaced at many of these facilities. Moreover, since the same microscopes are used for bacteriology, tuberculosis smears, and stool parasite examinations, additional microscopes could enhance capacity for efficient malaria diagnosis. Global Fund monies have not been earmarked for purchase of microscopes. PEPFAR and other partners previously purchased some microscopes, primarily to support tuberculosis diagnosis. Previously conducted health facility surveys indicated that most health facilities below the district level did not have the capability of performing malaria microscopy.

There are an insufficient number of trained microscopists to adequately staff larger health centers and dispensaries. Equally pressing is the need to re-train many of the existing laboratory technicians at district and provincial level to improve the quality of malaria diagnosis. Supervision of microscopists is also lacking. The National Public Health Laboratory oversees laboratory work at the provincial level, which in turn is supposed to oversee the district level, but it is currently in a capacity building phase with limited supervisory capacity. Interviews with

DOMC staff, and visits to health facilities during the MOP indicated that there is essentially little to no supervision of microscopy going on at any level.

At the present time, RDTs are not widely used in Kenya. DOMC has gained limited experience with RDTs (ICT Parasight F®) at the Health Dispensary level in highland areas as part a plan to detect and manage malaria epidemics in a timely fashion. A recent study by KEMRI/CDC and KEMRI/Wellcome Trust has shown high (~90%) sensitivity and specificity of RDTs when used by trained health workers at peripheral facilities, but poor acceptance of RDT results by these same health workers to guide treatment decisions. DOMC expressed substantial interest in obtaining additional information on how best to use RDTs and improve their acceptance before rolling them out nationwide. As a national policy for the use of RDTs has yet to be developed, purchase of RDTs by the Global Fund Round 4 has been delayed.

Progress to date

In November 2007, general guidelines for the use of malaria microscopy diagnostic procedures were completed and distributed to health facilities with the assistance of DfID-supported technical assistance from WHO.

In Year 1, PMI in conjunction with Walter Reed partnered with the DOMC to train 80 laboratory technicians on malaria microscopic diagnosis and purchased 80 binocular microscopes for the facilities where they work. In addition, PMI is collaborating with the DOMC to undertake a needs assessment of laboratory capacity to begin the development of a laboratory quality assurance system. This system will strengthen existing capacity and provide limited implementation support for training and supervision. The quality assurance system will focus on training/refresher training for supervisors, checklists and job aides; supervisory visits and on-site remedial action.

Planned Year 2 USG Activities: ($620,000)

PMI support to diagnosis will continue to focus on improving the quality of microscopic diagnosis in Year 2. Policy options on RDTs are still under consideration but no firm decisions have been made.

1. In collaboration with the DOMC, develop a quality assurance system for laboratory diagnosis and operationalize that system by supporting supervisory visits, developing and using check lists, providing on-site remedial action, conducting internal and external quality assurance of malaria smear preparation and reading, and ensuring quality control of reagents and equipment ($300,000); and
2. Provide on-the-job training and training-of-trainer skills for laboratory technicians on malaria microscopic diagnosis. PMI will support the provincial training of clinic and hospital-based malaria microscopists devoted to clinical care, to strengthen their malaria diagnostic skills. The proposed training will enhance clinical diagnosis and improve malaria slide reading skills to ensure a baseline standard of performance in malaria microscopy for clinical care. Cascade training will be supported to increase the quality of

diagnostic capacity within the country at a rapid pace. Assistance will include equipment and training supplies needed to complete the activity. ($320,000)

SURVEILLANCE, MONITORING & EVALUATION

Current Status/Challenges and Needs

HMIS

The Kenyan HMIS is not functioning at an optimal level; there is a paucity of district reports at the national level and data is not available to support planning for specific health programs. Most health facilities report monthly to the districts, although this information is not transmitted to provincial and national levels, resulting in only about 1% of district health information reported at the national level. Little is known about how this data is used at the various levels of the health system. Problems identified have included: too many indicators; lack of standardized registers and tools; multiple vertical surveillance systems; computer-based systems used for data entry causing work overload for the lower-level health workers; and no clear cut reporting channels. These problems are exacerbated by requests for additional indicators from health programs that are expanding the scope of their work. The Government's health sector reforms emphasize the importance of HMIS' role in monitoring health progress and are resulting in significant operational and management changes.

One of MOH data monitoring reforms was to reduce the number of health program indicators from 46 to 27, as recommended by the successful "Kwale" model. An Aga Khan Foundation pilot, this model successfully demonstrated that limited information (in this case, 27 indicators) can be used to successfully plan effective health programs. These indicators are collected in databases at the district level and are used for district level decision making. The Kwale model is currently being rolled out in districts within North East, Nyanza, and Coast provinces. With an estimated cost of $78 million from DANIDA this model is expected to be implemented to all Kenyan districts in the next five years. A similar program design is currently being developed for the provincial and national levels and will be launched in 2009.

In support of these changes, the MOH relegated responsibility for data collection and coordination solely to the HMIS unit. Individual departments in the MOH agreed to develop harmonized registers and reporting formats. All programs identified the key indicators that could be monitored under HMIS, which if deemed appropriate after discussion, were included in the registers and tools. For malaria control, five indicators were identified for inclusion:

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

Monitoring and Evaluation Unit and the Malaria Information and Application System

Due to the more stringent requirements of the DOMC to monitor progress and report to various partners such as the Global Fund, a Monitoring and Evaluation (M&E) Unit was established. Technical assistance for M&E is currently being supported through USAID funding. An assessment of the status of data sources for malaria information and data availability to the DOMC was conducted in early 2006. The assessment highlighted the need for:

1) agreement on a minimum set of indicators for overall malaria monitoring;
2) strengthening the data sources for routine monitoring of performance-based financing results, survey data, training data, etc. for the various malaria interventions;
3) establishment of a networked Malaria Information and Application System (MIAS) database on the DOMC server;
4) capacity building of DOMC staff in the use of the MIAS system; and
5) support to departments and districts aimed at strengthening data flow.

The DOMC M&E working group is supporting activities and reforms based, in part, on the 2006 data assessment in conjunction with the M&E unit. Data sources used to monitor malaria program progress that are currently targeted for strengthening by this working group include:

- HMIS for routine malaria monitoring – support harmonization of HMIS registers, support strengthening HMIS data flow process;
- Other divisions including DRH, Division of Child Health, etc.- support capacity building for the collection and sharing with the DOMC of relevant data; and
- Planning and coordination of surveys within all intervention areas – establishment of a survey database with tools, data and reports of completed surveys and timelines for planned surveys.

Population-based Surveys

The last DHS in Kenya was in 2003, and another is scheduled to begin in late 2008 and will be completed in early 2009. The 2003 survey demonstrated low coverage of treatment and prevention measures, and led to efforts to increase financing of these interventions, including increasing ownership and use of ITNs through a number of different service delivery mechanisms. Following the DHS in 2008, the next population-based survey in Kenya with a mortality component will be the DHS in 2013. A Malaria Indicator Survey (MIS) was conducted in June and July 2007, funded primarily by DfID and WHO. Discussions are ongoing as to how the 2011 MIS can be modified to provide interim mortality data.

Demographic Surveillance System

A Demographic Surveillance System (DSS) 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 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

Sentinel Sites
PMI is supporting sentinel sites to monitor malaria morbidity and mortality as prevention and treatment measures are scaled-up. PMI will work with established DOMC/Wellcome Trust/KEMRI sentinel sites, where month-by-month pediatric (0-15 years) admissions by malaria versus non-malaria diagnosis in seven hospitals have been tracked since 1999. Quarterly data is gathered from in-patient registers and death certificates, as well as information on climate, ITN sales and figures, and drug supply. Additional parameters on out-patient and in-patient malaria-related morbidity and mortality are tracked to gather data relevant to PMI.

In vivo drug efficacy monitoring is an important monitoring component of case management activities in Kenya. *In vivo* testing of various antimalarial drugs, including AL, is performed at eight sites throughout Kenya and coordinated by the DOMC.

Progress to Date:
The printing and distribution of new harmonized HMIS registers will be completed by the end of 2008. A new malaria website, www.nmcp.or.ke hosted on the DOMC server was developed for information sharing. Phase I of the Malaria Information and Application System (MIAS) database, the core system for headquarters, is being developed in early 2008. Phase II, the electronic tool for reporting from districts will be completed later in 2008.

A national workshop using the MESST in collaboration with the Global Fund took place in May, 2008. The DOMC is scheduled to review the National Malaria Strategy in the last quarter of 2008, at which time the M&E targets will be set. The revised M&E plan is expected to be ready by the end of 2008. Continued strengthening of central-level as well as district-level M&E activities can be achieved through implementing the recommendations that came out of the MESST workshop, and through continued support for sentinel surveillance sites which will provide data on malaria indicators and function as early warning sites for malaria epidemics. The M&E Unit provided input for malaria indicators for the 2008 Kenya DHS to be completed in fall 2008.

Analysis of the 2007 MIS is completed and a final report is expected in mid- 2008. PMI will support completion of verbal autopsies on community deaths in the Kisumu DSS during 2008 in order to obtain an ongoing measure of malaria-related mortality and program impact. PMI will work in four established sentinel sites to gather data relevant to PMI during 2008.

Proposed USG Activities: ($325,000)

1. Facilitate reporting and supervision for HMIS – The HMIS will be a continual source for collecting data for key malaria indicators. As this revamped system is rolled-out in 2008, it is important that appropriate supervision be supported to ensure proper data collection and reporting. PMI will support these supervisory visits to ensure quality data collection and reporting. ($50,000)
2. The Kenya DSS regularly conducts verbal autopsies on all deaths reported through routine community surveillance. Malaria-related mortality among children under-five, measured through verbal autopsies, has decreased dramatically in the DSS at the same time that malaria control interventions have been implemented in the community. Monitoring mortality data through verbal autopsies is of great interest to PMI as a way to gather complementary data that helps gauge the impact of program activities on an ongoing basis. Verbal autopsies are a resource intensive activity and currently under-funded in the DSS. PMI proposes to support a verbal autopsy component of the DSS to maintain this complementary, though vital, ongoing measure of program impact. This resource-intense activity is currently under-funded. During Year 2, PMI will support completion of verbal autopsies data on community deaths and compared with those routinely reported to the DSS. ($75,000)
3. Support established DOMC/Wellcome Trust/KEMRI sentinel sites to collect both in-patient and out-patient malaria morbidity and mortality data, which will provide interim measures of the progress of program implementation between population surveys. This support is contingent upon confirmation that PMI will have access to the data from the sentinel sites supported with PMI funding. Data sharing agreement should be finalized by the end of 2008. ($200,000)
4. *In vivo* drug efficacy monitoring at eight established sites. ($50,000)

HIV/AIDS and MALARIA

Kenya is a PEPFAR focus country, and has a severe generalized HIV/AIDS epidemic with estimated adult HIV prevalence of 6.1% (UNAIDS, 2006) which translates into 1.2 million HIV-positive Kenyans over age 15 and approximately 150,000 infected children under 15. An estimated 140,000 Kenyans died of AIDS in 2005. Deaths to date have left 1.1 million children orphaned by AIDS. The Kenyan epidemic varies significantly from region to region, with Nyanza Province affected by prevalence rates approximating those in some Southern African nations. Women are nearly twice as likely as men to be infected.

The USG is the predominant supporter of HIV/AIDS interventions in Kenya, with FY09 funding of over $528 million. DfID is the next largest bilateral donor, and other HIV/AIDS donors include the Japan International Cooperation Agency, Germany's GTZ, and the World Bank. In addition, the Global Fund has approved HIV grants totaling nearly $130 million.

In Kenya, PEPFAR supports a comprehensive package of services including basic prevention and treatment programs. PEPFAR has made investments in laboratory capacity building, including training of laboratory technicians and purchase of expanded stocks of test kits. In addition, PEPFAR is implementing the Uganda basic care package in Nyanza province, which

includes ITNs. In the future, the basic care package will be rolled-out in other high prevalence provinces.

There are several opportunities for synergy between the PEPFAR and PMI programs in Kenya. Nyanza Province has the highest rates of HIV prevalence, and is also one of the provinces with the highest rates of malaria transmission. Specific areas of potential collaboration include:

Proposed USG Activities: (No additional funding-covered under other sections)

1. In FY08, the PMI supported free distribution of ITNs in Nyanza Province. PEPFAR will be distributing ITNs to people living with HIV/AIDS as part of its basic care package in Nyanza Province. Increasing access to and use of ITNs in Nyanza and other malaria endemic provinces is also a priority for the PMI program. PEPFAR and PMI can share information on ITN distribution, and data from the PMI-planned operations research study on barriers to use of ITNs will also be shared with PEPFAR. Another ITN-related activity for the PMI in Year 2 was to work with community-based organizations and NGOs to improve the appropriate use of ITNs by vulnerable groups. It is likely that there will be opportunities to interact with community-based organizations working under the PEPFAR program.

2. Laboratory strengthening: PMI will build on the laboratory training system and approach used by PEPFAR through Walter Reed Army Institute of Research. PMI will also collaborate closely with PEPFAR to ensure PMI's laboratory investments are complementary to those of PEPFAR, as much as possible.

3. Malaria in pregnancy: PMI's support for further scale-up of the malaria in pregnancy training at the facility and community levels will be undertaken by the USAID-managed AIDS, Population, Health Integrated Assistance (APHIA) program network. HIV/AIDS activities – including work with ANCs for prevention of mother to child transmission – make up a significant portion of the APHIA program. With APHIA providing support to district-level facilities and to the DHMTs on both HIV/AIDS and malaria interventions, there are tremendous opportunities for synergy and coordination.

CAPACITY BUILDING WITHIN THE DIVISION OF MALARIA CONTROL

The DOMC was established in 2000 and falls under the recently-created Ministry of Public Health and Sanitation. There are currently about 46 officers working in various technical groups with the Division. A Malaria Business Plan has been prepared by DOMC for support by the GOK and development partners. It was developed based on the National Malaria Strategy as well as National Health Sector Strategic Plan II, and includes seven priority sections: program administration and coordination; clinical management to provide prompt effective treatment; management of malaria and anemia in pregnancy; vector control; epidemic preparedness and response; information, education and communication; and monitoring, evaluation and research. The DOMC has assigned lead officers for each priority section.

In addition to DOMC, other key departments within the MOH for malaria include the Division of Child Health and the Immunization program, DRH, and the Division of Environmental Health. The DOMC is also responsible for coordinating with KEMSA and Mission for Essential Drug Supply on malaria drug procurement and distribution, and with the Pharmacy Division, and the Pharmacy and Poisons Board, the MOH's Drug Regulatory Authority. DOMC staff also coordinates closely with the staff within the MOH responsible for the overall HMIS. Due to the more stringent requirements of the DOMC to monitor progress and report to partners such as the Global Fund, an M&E unit was established within the Division.

DOMC staff members have been stretched considerably by the substantial workload involved in reporting on the Global Fund grants, and by the additional workload related to collecting AL consumption data, as well as overseeing the effective implementation of the AL rollout nationwide. The DOMC is also responsible for managing the very ambitious IRS program in 16 epidemic-prone districts, covering a significant share of the population.

Proposed USG Activities: ($200,000)

Under the PMI, the USG will provide additional support to the MOH and specifically to the DOMC. This support is critical to the effective implementation of PMI activities, and the long-term institutional capacity building of the DOMC and the MOH. One of the primary roles for the PMI in-country staff will be to work closely with their counterparts in the DOMC. The two in-country PMI Malaria Advisors will be expected to spend a significant portion of each day with the DOMC, and will be expected to have a desk or a place to work within the DOMC in order to effectively integrate this team with the DOMC staff. The support will include:

1. Continuation of administration, technical assistance and information system/database support for the DOMC. In addition to the technical support that will be offered to the DOMC by PMI staff, the development and strengthening of the capacity for the management of malaria activities by the DOMC is essential. PMI will support the strengthening of the information/data base system to ensure availability of up-to-date information that is essential for program administration and implementation. ($100,000)

2. Technical support for the overall effective implementation of Kenya's IRS program, in addition to the focused implementation of IRS in the four districts described in the IRS section. (Covered in IRS section); and

3. Support for administration, oversight and supervision particularly of the planned malaria interventions to ensure that the DOMC provides prompt reports. Since the DOMC offers national oversight for malaria control activities, it is essential that DOMC provide supervisory support to the provincial and district health staff for the implementation of planned activities. ($100,000)

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.

There is a malaria subgroup under the Interagency Coordination Committee for the Global Fund. This malaria committee is convened by the head of the DOMC on behalf of the Director of Medical Services. It includes the MOH, NGOs, FBOs, the private sector and development partners. They meet quarterly with additional interim meetings as needed.

There are also several working groups led by the DOMC around particular issues. These include the Drug Policy Technical Working Group, which was reconvened to help affect Kenya's drug policy change. There is also a formal IEC working group which comprises representatives from various departments of the MOH and stakeholders to assist in the implementation of the IEC strategy and plan. Stakeholders and partners also convene around ITNs and other vector control issues.

In addition, the major bilateral donors working in Kenya have come together to develop a Joint Program of Work for their health programs. Early in 2007, six donors (Danish DANIDA; UK DfID; German Development Cooperation; Swedish SIDA; the US Government; and the World Bank) participated in the development of a framework for coordination and action within the health sector. Under this framework, each partner is to select relevant priority areas and provide funding in a coherent and coordinated way, respecting the leadership and stewardship of the MOH.

NGO COLLABORATION

Current Status/Challenges and Needs

In addition to the contributions of USG agencies, and multilateral and bilateral organizations, several international NGOs are active in malaria control in Kenya. The Kenya NGO Alliance Against Malaria (KeNAAM) was established in 2001 and includes both national and international NGOs working on malaria in Kenya. The purpose of KeNAAM is to enhance collaboration through networking and to improve collaboration among the NGOs and with public sector and donor partners. KeNAAM has over 42 members. In addition, USAID/Kenya is currently supporting the APHIA II projects across the eight provinces to provide integrated HIV/AIDS services with limited reproductive health, family planning and child survival components. The projects are implemented through various consortia comprised of partnerships between international and local NGO and community-based organizations.

Proposed USG Activities (cost of activities covered under other sections)

Under the FY08 PMI plan, a number of community-based, health-facility based, and central level activities are planned with NGOs, including: training and capacity building of the DOMC,

training of health care providers; activities to raise awareness and knowledge in the community about malaria prevention and treatment. Specific activities will include:

1. Community-based and facility-based training and IEC/BCC activities for MIP through the network of NGOs in the APHIA partners (see MIP);

2. Follow up on incorporation of pre-service curriculum development for MIP and case management through JHPIEGO (see MIP and Case Management); and

3. IEC/BCC activities for integrated malaria messages at the community level in the newly competed request for applicans for NGOs, FBOs, and community-based organizations (see Vector Control, ITNs).

STAFFING AND ADMINISTRATION

Two health professionals will oversee the PMI in Kenya, one representing CDC and one representing USAID. Currently, the USAID staff member has been hired. In addition, one FSN will be 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: ($1,144,000)

In-country PMI staff salaries, benefits, travel and other PMI administrative costs: Two PMI staff members to oversee activities supported by PMI in Kenya were recruited and hired by CDC and USAID. The recruitment for the USAID position was initiated in 2007 with FY07 malaria funds. The CDC position recruitment and hiring is currently underway. One FSN will be recruited early in FY09. ($1,144,000)

ANNEX 1

Table 1

President's Malaria Initiative – Kenya
Year 2 (FY09) Timeline of Activities

Activity	2009	2010											
	OCT-DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Hire PMI staff in country													
Purchase commodities													
Training for community workers in MIP													
MIP Facility training													
BCC integrated activities													
IRS- planning and environmental activity													
IRS Environmental; Assessment													
Purchase IRS equip/insect.													
IRS implementation													
IRS													

Surveillance-Cross-Sectional Survey													
IRS Surveillance-Routine Monitoring													
Evaluation of duration of non-pyrethroid insecticides													
ACT training													
Pre-service curriculum development													
Laboratory technician training													
Mini-lab drug quality testing and training													
Technical assistance for ACT quantification													
HMIS support													
Insecticide resistance monitoring													

Table 2
President's Malaria Initiative – *Kenya*
Planned Obligations for FY09 (USD)

Proposed Activity	**Mechanism**	**Budget (*commodities)***	**Geographic Area**	**Description of Activity**	**Page Number**
PREVENTIVE ACTIVITIES					
IPTp Community Training and IEC	APHIA II	$300,000	17 districts	Scaling up by training an additional 6,000 CHWs in BCC and IEC activities	21
HCW training at facilities	APHIA II ACCESS	$524,000 $100,000	29 districts	Training of 4,600 health workers in FANC/MIP	21
SP Distribution thru ITN Systems	HCM (PSI)	$56,000	Nationwide	Distribution of SP thru PSI's LLIN distribution system	21
Purchase of LLINs	DELIVER TO3	$4,750,000 *($ 4,750,000)*	Nationwide	Purchase of 670,000 LLINs to fill in annual gap, and program support	23
Support to free LLIN distribution	HCM (PSI)	$500,000	Nationwide	Program support for logistics, promotion, and management of routine LLIN distribution	23
Integrated IEC/BCC	C-CHANGE	$500,000	Nationwide	Integrated malaria BCC and IEC community messaging	23
IRS implementation and management	IRS IQC TO2	$3,500,000 ($*1,300,000*)	3 districts	Support IRS for 300,000 households in 2 endemic districts and 1 epidemic district	25
IRS TA to DOMC	IRS IQC TO2 CDC IAA (Atlanta)	$190,800 $24,200	IRS Districts	TA for GOK IRS 2010 spray campaign including supervision and training Provide TA to refine DOMC IRS strategy and GF grant	25
MOH IRS support: Personal Protective Equipment	IRS IQC TO2	$500,000 *($500,000)*	IRS Districts	Support Kenya MOH IRS operations by purchasing PPE for sprayers	26

Surveillance in IRS districts	CDC IAA (with sub-grant to KEMRI) and CDC/IAA Atlanta	$150,800 $24,200	3 districts	Enhanced epidemiological surveillance and monitoring to document IRS effectiveness in both endemic and epidemic areas	25
Entomological monitoring of IRS effectiveness in sprayed districts	CDC IAA (with sub-grant to KEMRI)	$150,000	10 sites in western Kenya	Conduct insecticide resistance monitoring	25
Environmental monitoring	TBD	$35,000	TBD	Support for IRS environmental assessment	26
SUBTOTAL: Preventive		**$11,305,000** ***($ 6,550,000)***			
CASE MANAGEMENT ACTIVITIES					
Purchase AL, SP and severe malaria drugs	DELIVER TO3	$4,500,000 (*$4,500,000*)	Nationwide	Purchase of up to 4 million treatments of AL and additional SP, severe malaria drugs to help fill annual gap	28
Case management training	SPS	$606,000	Nationwide	Training for treatment policy role-out	28
Pre-service curriculum development	ACCESS	$100,000	Nationwide	Pre-service curriculum development for ACT and MIP policy and practices	28
TA for supply chain management and in-country redistribution	SPS	$750,000	Nationwide	TA for Supply Chain (350,000) and In-country Redistribution of AL (400,000)	28
Drug quality strengthening via Minilabs, training, database	USP DQI	$100,000	Nationwide	5 Minilabs procured with at 20 technicians trained; database for tracking drug quality developed	28
TOT in malaria laboratory diagnosis and cascade supervision	MVP IAA (Walter Reed) and TBD	$320,000	Nationwide	Training of trainers and cascade training for lab technicians in malaria diagnosis, supervision and material support.	30

QA/QC Diagnostics	IMaD	$300,000	Nationwide	Strengthening QA/QC system for microscopic diagnosis	30
SUBTOTAL: Case Mgmt.		**$6,676,000** ***($ 4,500,000)***			
MONITORING AND EVALUATION					
Sentinel site support	APHIA II: Evaluation CDC IAA (Atlanta)	$175,800 $24,200	2-4 districts	Support of existing sentinel sites 2 TDYs for TA support	34
In vivo drug efficacy testing linked to sentinel sites	TBD	$50,000	District level	ACT drug efficacy monitoring *in vivo*	34
HMIS support	SPS	$50,000	Nationwide	Support of reporting and supervision at health facilities	34
Investigation of health facility mortality causes relative to DSS	CDC IAA (with sub-grant to KEMRI)	$75,000	District-level, population of 135,000	Measure of impact indicators and validation of other data sources	34
SUBTOTAL: M&E		**$375,000**			
IN-COUNTRY MANAGEMENT AND ADMINISTRATION					
In-country staff; Admin. expenses	USAID/ CDC IAA	$1,144,000	Nairobi	Support in-country staff; admin	38
SUBTOTAL: Mgmt. and Admin.					
OTHER					
Support/TA assistance to DOMC	SPS	$200,000	Nationwide	Support for supervision, reporting systems, TA and supervision for M&E and AL rollout	36
SUBTOTAL: Other		**$200,000**			
GRAND TOTAL		**$19,700,000** *($ 11,050,000)*			

Table 3

President's Malaria Initiative – Name of Country
Year 2 (FY09) Budget Breakdown by Intervention (USD)

Area	Commodities (%)	Other (%)	Total
PREVENTION			
Intermittent Preventive Treatment	--	$980,000 (100%)	$980,000
Insecticide-treated Nets	$4,750,000 (83%)	$1,000,000 (17%)	$5,750,000
Indoor Residual Spraying	$1,800,000 (39%)	$2,775,000 (61%)	$4,575,000
TREATMENT			
Case Management	$4,500,000 (70%)	$2,176,000 (30%)	$6,676,000
Monitoring & Evaluation	--	$375,000 (100%)	$375,000
NMCP Support	--	$200,000 (100%)	$200,000
Administration/Staffing	--	$1,144,000 (100%)	$1,344,000
Total	**$11,050,000 (57%)**	**$8,650,000 (43%)**	**$19,700,000**

Table 4

Year 2 (FY09) Budget Breakdown by Partner (USD)

(Once the FY09 Implementation Plan is approved and contracts/grants cooperative agreements awarded, all other partners will be listed here)

Partner Organization	Geographic Area	Activity	Budget
ACCESS	Nationwide	Pre-service curriculum development	$200,000
APHIA II	46 districts	MIP training, IEC	$824,000
APHIA II: Evaluation	Nationwide	Sentinel site establishment	$175,800
C-CHANGE	TBD	Community BCC/IEC	$500,000
CDC IAA (Atlanta and KEMRI offices)	IRS Districts	Malaria morbidity surveillance in IRS districts; Insecticide resistance monitoring, DSS	$448,400
DELIVER TO3	Nationwide	LLIN, ACT, SP, Procurement	$9,250,000
HCM	Nationwide	LLIN and SP distribution	$556,000
IMaD	Nationwide	QA/QC Microscopy	$300,000
IRS IQC TO 2	3 districts	IRS implementation, surveillance, management, and TA	$4,190,800
MPV (Walter Reed) and TBD	Nationwide	TOT in malaria laboratory diagnosis and cascade supervision	$320,000
SPS	Nationwide	ACT policy role-out, training, supply chain management TA, DOMC support	$1,606,000
USAID/CDC	Nairobi	Staffing for 3 positions	$1,144,000
USP DQI	Nationwide	Minilab procurement/training	$100,000
TBD: Diagnostics	TBD	*In vivo* drug efficacy testing linked to sentinel sites	$50,000
TBD: Environmental Monitoring	TBD	Conduct IRS Environmental Assessment	$35,000
Total			**$19,700,000**