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**PRESIDENT'S MALARIA INITIATIVE**

**UGANDA**

**Malaria Operational Plan for FY 2012**

September 20, 2011

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## ABBREVIATIONS

ACT	Artemisinin-based combination therapy
AL	Artemether-lumefantrine
AMFm	Affordable Medicines Facility - malaria
ANC	Antenatal care
BCC	Behavior change communication
CDC	Centers for Disease Control and Prevention
CMD	Community medicine distributors
CSO	Civil society organizations
DHS	Demographic and Health Survey
DOT	Directly observed treatment
FY	Fiscal year
GHI	Global Health Initiative
Global Fund	Global Fund to Fight AIDS, Tuberculosis, and Malaria
GOU	Government of Uganda
HBMF	Home-based management of fever
HMIS	Health management information system
IEC	Information, education and communication
IPTp	Intermittent preventive treatment in pregnancy
IRS	Indoor residual spraying
ITN	Insecticide-treated net
LLIN	Long-lasting insecticide-treated net
M&E	Monitoring and evaluation
MOH	Ministry of Health
MPR	Malaria Program Review
NDA	National Drug Authority
NGO	Non-governmental organization
NMCP	National Malaria Control Program
NMS	National Medical Stores
PEPFAR	President's Emergency Plan for HIV/AIDS Relief
PMI	President's Malaria Initiative
PMTCT	Prevention of mother to child transmission (of HIV)
PNFP	Private not for profit health facilities
QA/QC	Quality assurance/Quality control
RBM	Roll Back Malaria
RDT	Rapid diagnostic test
SP	Sulfadoxine-pyrimethamine
UMIS	Uganda Malaria Indicator Survey
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USG	United States Government
VCD	Vector Control Division

## **EXECUTIVE SUMMARY**

Malaria prevention and control is a major foreign assistance objective of the U.S. Government (USG). In May 2009, President Barack Obama announced the Global Health Initiative (GHI), comprehensive effort to reduce the burden of disease and promote healthy communities and families around the world. Through the GHI, the United States will help partner countries improve health outcomes, with a particular focus on improving the health of women, newborns and children.

The President's Malaria Initiative (PMI) is a core component of the GHI, along with HIV/AIDS and tuberculosis. The PMI was launched in June 2005 as a 5-year, \$1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions and reduce malaria-related mortality by 50% in 15 high-burden countries in sub-Saharan Africa. With passage of the 2008 Lantos-Hyde Act, funding for PMI has now been extended through FY2014. Programming of PMI activities follows the core principles of GHI: encouraging country ownership and investing in country-led plans and health systems; increasing impact and efficiency through strategic coordination and programmatic integration; strengthening and leveraging key partnerships, multilateral organizations, and private contributions; implementing a woman- and girl-centered approach; improving monitoring and evaluation; and promoting research and innovation.

Uganda was selected as one of the first three countries to benefit from PMI. Malaria is Uganda's leading cause of morbidity and mortality and is endemic in 95% of the country. According to the Ministry of Health (MOH), malaria accounts for 25-40% of outpatient visits to health facilities and is responsible for nearly half of inpatient pediatric deaths.

The most recent malaria indicators comes from the 2009 Uganda Malaria Indicator Survey (UMIS) conducted before the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund) - supported mass LLIN distribution to pregnant women and children under-five years in 2010/11. The results the UMIS show that 47% of households nationwide owned one or more insecticide-treated nets (ITNs) and 44% of pregnant women and 33% of children under five had slept under an ITN the night before the survey. The proportion of children under five treated with an antimalarial drug on the same or the next day after onset of fever was 36%, although the proportion receiving an ACT was only 13.7%. The proportion of women receiving two doses of intermittent preventive treatment in pregnancy (IPTp) was 32%.

PMI and the Global Fund are the two main contributors to malaria control in Uganda, with a range of additional support from other donors. Uganda has two active grants from the Global Fund: Round 7 Phase 1, which has provided 7.2 million long-lasting ITNs (LLINs) and Round 7 Phase 2 which will provide an additional 10.4 million LLINs to achieve universal coverage. Round 10 Phase 1 and 2 will cover approximately 45 million doses of ACT, 6.7 million LLINs and 45 million rapid diagnostic tests (RDTs) through 2016.

PMI/Uganda's FY 2012 Malaria Operational Plan was developed in close collaboration with the National Malaria Control Program (NMCP) and other major partners during a team planning visit carried out in June 2011. The proposed activities fit in well with the draft Uganda 2010/11-2014/15 National Malaria Control Strategy and complement the contributions of other donors. The proposed FY 2012 PMI budget for Uganda is \$33.5 million. The FY 2012 planned activities are:

Indoor Residual Spraying (IRS) and Vector Control: PMI has supported IRS in Uganda since 2006, expanding from one district sprayed in 2006 to six districts in 2010. During the past year, more than 800,000 houses have been sprayed, protecting nearly 3 million people from malaria. Acceptance of IRS is consistently high with more than 85% coverage, although insecticide resistance to two (of four) insecticide classes has necessitated twice yearly spraying, nearly doubling the costs of IRS.

PMI FY 2012 funds will support IRS campaigns in the districts of Kitgum/Lamwo, Pader/Agago, Apac/Kole, Oyam, Gulu, and Amuru/Nwoya (districts were subdivided from six to ten districts in 2010, but geographic coverage of IRS has not changed), which have the highest malaria transmission rates in Uganda. PMI will closely monitor vector resistance, potential environmental impacts of IRS, and support capacity-building within the MOH to conduct and oversee IRS. With FY 2012 funds, approximately 850,000 houses will be sprayed and more than three million people will be protected.

Insecticide-treated nets: Since 2006, PMI has procured and distributed more than four million ITNs, mainly to pregnant women and children under five years of age through mass campaigns, antenatal care (ANC) clinics, non-governmental organizations, and civil society organizations. In FY 2010 and FY 2011, PMI focused on routine distribution through ANC clinics to ensure LLIN coverage in the most vulnerable populations, as the Global Fund mass campaign was ongoing. PMI procured 650,000 LLINs to be distributed through ANC in the north and central regions of the country. PMI has also supported behavior change and communication (BCC) efforts to increase demand for and promote correct use of LLINs.

PMI FY 2012 funds will procure and distribute 1 million free ITNs through antenatal care (ANC) clinics to sustain high net ownership following the mass campaign. To ensure proper net usage, PMI will use mass media and community mobilization strategies to increase knowledge and promote proper and consistent use of ITNs. This effort, combined with LLINs programmed from Global Fund Round 7 Phase 2, is expected to increase national household ownership of LLINs from 47% to 85%.

Intermittent preventive treatment of pregnant women: To increase the proportion of pregnant women receiving two doses of IPTp, PMI support has resulted in the development of a comprehensive malaria in pregnancy module incorporated into the FANC training, and training and on-the-job supervision of over 4,088 health workers on IPTp. PMI has provided pregnancy wall charts and gestational wheels as job-aids in all facilities providing antenatal care, and supported adoption of an MOH nationwide advocacy plan for IPTp. To supplement these efforts, PMI has purchased over 130,000 treatments for IPTp in the last three years in the private sector. In collaboration with PEPFAR, PMI has focused on integrating IPTp services with PMTCT and extended this support to private health facilities.

With FY 2012 funding, PMI will provide on-site training and supportive supervision related to malaria in pregnancy to ANC workers in the public and private sector. PMI will continue to provide safe water and drinking cups for direct observation of treatment. As a result of these efforts, the percentage of pregnant women receiving two doses of IPTp is expected to increase to 60% by 2012.

Case management: PMI has invested in training, supervision of health workers, and artemisinin-based combination therapy (ACT) and RDT procurement and quality testing to improve malaria case management. Over the last four years, PMI has supported training of over 37,000 health

workers on integrated malaria activities. During the past year, training on malaria case management including severe malaria and supportive supervision, was provided to health workers in 34 districts (including almost 3,000 workers from the private sector). More than 350 health workers in northern Uganda received training on logistics management.

In the last year, PMI has extended its support to the PNFP facilities. Over 1,000,000 ACT treatments were purchased and a controlled system of distribution of ACTs to PNFP facilities is currently underway through the Joint Medical Store (JMS). This was a critical intervention, given that the previous arrangement in which NMS provided 20% of the public supply of ACTs to PNFP facilities through JMS has ceased. NMCP plans to provide 22 million treatments of ACTs to the public sector through the Global Fund's Affordable Medicines Facility – malaria (AMFm) pilot this year and 45 million treatments of ACTs over a five-year period through its successful Global Fund Round 10 application. It is planned that integrated community case management (ICCM) which includes malaria will be rolled out to 31 districts using Round 10 resources.

PMI will also support the improvement of case management for uncomplicated and complicated malaria in the public and private sector. Together with other USAID health programs and the President's Emergency Plan for HIV/AIDS Relief (PEPFAR), PMI will strengthen the national pharmaceutical management system by improving performance and financial management, clarifying pharmaceutical policy, and establishing a transparent logistics management information system. Finally, PMI will continue to support training of health workers on RDTs and microscopy to improve parasitological-based diagnosis at all levels of the health system. In FY 2012, PMI will support the roll-out and use of RDTs in health facilities without laboratory services, microscopy training at health facilities with laboratory services, and both types of training to facilities with limited laboratory services. PMI will purchase 1,700,000 RDTs targeted at PNFP facilities.

**Epidemic Response and Surveillance:** As 19 districts in the southwest and eastern regions of Uganda are prone to malaria epidemics, PMI has supported the World Health Organization (WHO) in developing malaria-specific guidelines and algorithms to detect and respond to malaria epidemics. Health centers in seven districts have been trained to establish facility-specific malaria thresholds and analyze case data to allow for a rapid response to outbreaks. With FY 2012 funding, PMI will continue to support WHO efforts to strengthen the NMCP's and district health teams' ability to detect and respond to epidemics in these 19 districts.

**Monitoring and Evaluation (M&E):** PMI supports M&E to measure the progress of malaria control in Uganda and provide data for decision-makers to utilize this data. PMI-supported sentinel sites are active in collecting regular data on malaria morbidity and mortality (six inpatient and six outpatient sites), while supporting strengthening of the health management information system (HMIS) at national, district and health facility level. Since 2009, PMI has supported an M&E Advisor seconded to the NMCP, to provide on-the-job training for NMCP staff on malaria M&E and work with NMCP staff to collect and analyze malaria data and design and implement supportive supervision of M&E activities at the district level. With FY 2012 funding, PMI will continue to support sentinel site surveillance in order to provide that timely, accurate data on in- and outpatient malaria and continue support for the HMIS in collaboration with other U.S. government partners and other donors. In addition, PMI will continue its support to the NMCP M&E unit and provide technical and financial assistance for the second national Malaria Indicator Survey. Cross-sectional data will provide key information on asymptomatic and symptomatic parasitemia (and anemia),

while health facility data will provide data on symptomatic patients seeking care; the combination provides a comprehensive picture of the malaria burden in Uganda.

**Health Systems Strengthening and Integration:** Weaknesses in the health system directly impair the ability to deliver effective malaria control efforts. As a result and in response to the GHI, PMI supports capacity building for the NMCP, district and health facility staff; supply chain strengthening; human resource mobilization; and quality improvement approaches. As the effects of a weak health system are not unique to malaria, USAID/Uganda has leveraged PMI, PEPFAR, and other health funds to jointly address health systems and capacity issues for maximum impact. With FY 2012 funding, PMI will focus on strengthening of pharmaceutical management, human resources and capacity building, and quality improvement of service delivery. Additionally, PMI, together with USAID health programs and PEPFAR, will continue to strengthen the national pharmaceutical supply chain system through technical assistance to strengthen performance and financial management, clarify pharmaceutical policy, and establish a transparent logistics management information system.

## **INTRODUCTION**

### **Global Health Initiative**

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

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

### **President's Malaria Initiative**

The President's Malaria Initiative (PMI) is a core component of the GHI, along with HIV/AIDS and tuberculosis. The PMI was launched in June 2005 as a five-year, \$1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions and reduce malaria-related mortality by 50% in 15 high-burden countries in sub-Saharan Africa. Uganda became a PMI focus country in 2005.

With passage of the 2008 Lantos-Hyde Act, funding for PMI has now been extended through FY 2014 and, as part of the GHI; the goal of the PMI has been adjusted to reduce malaria-related mortality by 70% in the original 15 countries by the end of 2015. This will be achieved by reaching 85% coverage of the most vulnerable groups – children under five years of age and pregnant women – with proven preventive and therapeutic interventions, including artemisinin-based combination therapies (ACTs), long-lasting insecticide-treated nets (LLINs), intermittent preventive treatment in pregnancy (IPTp), and indoor residual spraying (IRS).

This FY 2012 Malaria Operational Plan (MOP) presents a detailed implementation plan for the seventh year of PMI in Uganda, based on the PMI Multi-Year Strategy and Plan and the National Malaria Control Program's (NMCP's) 5-Year Strategy. It was developed in consultation with the Uganda NMCP, with participation of national and international partners involved with malaria prevention and control in the country. The activities that PMI is proposing to support fit in well with the draft 2010-2015 National Malaria Control Strategy and Plan, and build on investments made by PMI and other partners to improve and expand malaria-related services. This document briefly reviews the current status of malaria control policies and interventions in Uganda, describes progress to date, identifies challenges and unmet needs if the targets of the NMCP and PMI are to

be achieved, and provides a description of planned FY 2012 activities. The total amount requested for the PMI in Uganda in FY 2012 is \$33.5 million.

### **The President's Malaria Initiative in the context of USAID Mission priorities**

USAID/Uganda's Country Development Cooperation Strategy (CDCS) implements President Obama's new U.S. Global Development Policy in the Ugandan context, making considered choices that focus and deepen programs and take closer account of the host country and donor context, while maintaining close coordination with USG. Within the U.S. Mission in Uganda, five presidential health initiatives are underway namely; PMI, the President's Emergency Plan for AIDS Relief (PEPFAR), GHI, the Global Climate Change Initiative, and Feed the Future. All presidential initiatives and traditional health and education programs under Development Objective 3 (DO3); improved health and nutrition status in focus areas and population groups, are united under the common goal of Uganda's transition to a modern and prosperous country. While each of the presidential initiatives, including PMI, have critical goals and objectives that the U.S. Mission in Uganda is committed to achieving, DO3 also prioritizes the cross-cutting goals of the Mission: strategic integration of health services, health systems strengthening, supporting decentralized social sector services, engagement of the private sector and civil society, and increased civic engagement and advocacy at the community level. This will help the government and private sector tackle the heavy disease burden, malnutrition, and unmet need for family planning by improving health service delivery systems. These USAID Mission priorities carried out by DO3 seek to ensure a contextually appropriate approach to health and development in Uganda. Collective and collaborative engagement of five presidential initiatives under the GHI framework will accelerate the achievement of specific PMI goals and objectives. A large part of the strategy will rely on strengthening the health systems that underlie service delivery.

## **BACKGROUND**

### **Malaria Situation in Uganda**

Malaria continues to be a major public health problem and the most frequently reported disease at both public and private health facilities in Uganda. Clinically-diagnosed malaria is the leading cause of morbidity and mortality, accounting for 25-40% of outpatient visits at health facilities, 15-20% of all hospital admissions, and 9-14% of all hospital deaths. Nearly half of inpatient deaths among children under-five years of age are attributed to clinical malaria. A significant percentage of deaths occur at home and are not reported by the facility-based Health Management Information System (HMIS). The current estimated annual number of deaths from malaria ranges from 70,000 to 110,000.<sup>1</sup>

In most parts of Uganda, temperature and rainfall allow intense, perennial malaria transmission. Malaria is highly endemic in 95% of the country, covering approximately 90% of the population of 33 million. The remaining 5% of the country consists of unstable and epidemic-prone transmission areas in the highlands of the south- and mid-west, along the eastern border with Kenya, and the northeastern border with South Sudan. In some areas of northern Uganda, the entomological

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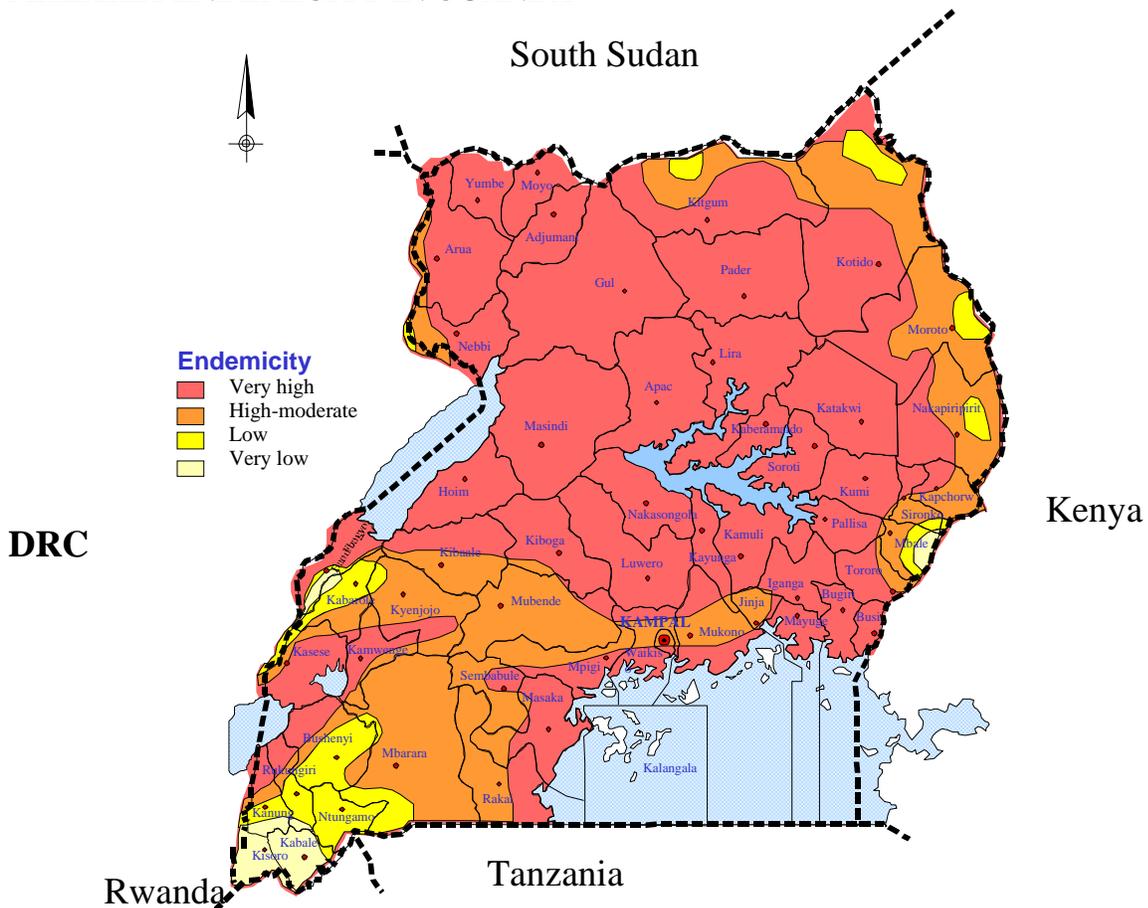
<sup>1</sup> Uganda Malaria Control Strategic Plan 2010/11-2014/15.

inoculation rates (infective biting rates by the mosquitoes that transmit malaria) are among the highest recorded in the world.

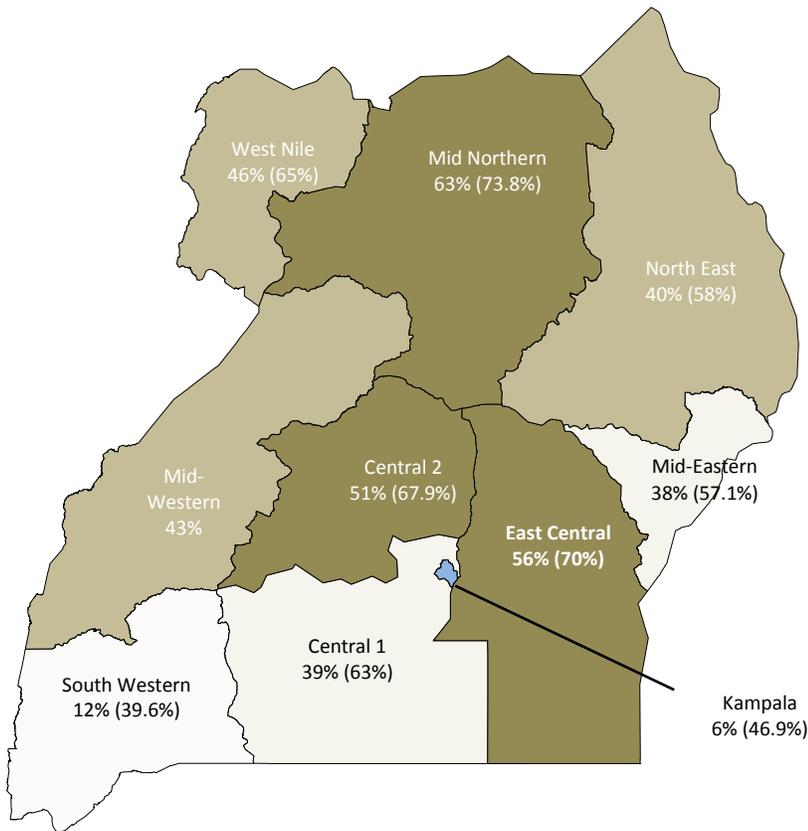
The most common malaria vectors are *Anopheles gambiae s.l.* and *Anopheles funestus*. *A. gambiae* is the dominant species in most places, while *A. funestus* is generally found at higher altitudes and during the short dry seasons (September through November), when permanent water bodies are the most common breeding sites. In some areas of northern Uganda, such as Apac and Oyam, *A. funestus* is the most common vector which feeds primarily in humans and also takes blood meals from other domestic animals. *Anopheles gambiae s.l.* and *A. funestus* feed and rest indoors, making ITNs and IRS viable vector control strategies.

The Uganda Malaria Indicator Survey, conducted in late 2009, showed that *Plasmodium falciparum* is responsible for 99% of malaria cases. *P. malariae*, accounts for 0.2% of cases as a mono-infection but is more commonly found as a mixed infection with *P. falciparum* (up to 2.7% of childhood infections in highly endemic areas). Both *P. vivax* and *P. ovale* are rare and do not exceed 1-1.6% of malaria cases in Uganda.

### MALARIA ENDEMICITY IN UGANDA



Malaria prevalence among children age 0-59 months measured using microscopy showed that 42 percent tested positive for malaria. Prevalence was higher in rural areas than in urban areas (47 versus 15 percent using microscopy) and ranged from 5 percent in Kampala to 63 percent in the mid-northern region. Survey data indicated that anemia is also a significant public health problem in Uganda. Six out of ten Ugandan children under five years of age are anemic (hemoglobin concentration below 11 g/dL). Twenty-one percent are mildly anemic, 30 percent are moderately anemic, and 10 percent are severely anemic. The map below shows the percentage of children 0-59 months of age testing positive for malaria with microscopy (with anemia rates in parentheses).



In early 2011, the Ministry of Health (MOH), through the NMCP and in collaboration with partners, conducted a comprehensive Malaria Program Review (MPR) of the progress and performance of the malaria program for the period 2000 to 2010. This review highlighted achievements and challenges and outlined key actions for improvement and strengthening to the current malaria control program in Uganda.

**Epidemiology:** The MPR emphasized the need to strengthen routine malaria surveillance systems (outpatient and inpatient) and to continue routine nationwide malaria prevalence and intervention coverage surveys, to update the national malaria risk map.

**Vector Control:** The review proposed rapid scale-up of both LLINs and IRS, either as single activities or combined, to achieve universal coverage. It also proposed strengthening the capacity of the Vector Control Division for malaria vector monitoring and surveillance by establishing and equipping a reference entomological laboratory and establishing representative sentinel sites to monitor vector bionomics and insecticide resistance.

**Intermittent preventive treatment for pregnancy:** The review suggested that the Reproductive Health Unit of the MOH take the leadership role in malaria in pregnancy with NMCP providing technical support to ensure the availability of malaria-in-pregnancy commodities. Revitalization of the RBM partnership for malaria in pregnancy was also suggested.

**Case management:** The review reiterated the need to support the rapid scale-up of case management at the community and private sector levels, including diagnostics and medicines. Under supply chain management, the review recognized the necessity of strengthening the quantification of malaria commodities using consumption data, and highlighted the need for Ministry of Health policies to guide National Medical Stores (NMS) procurement of malaria commodities. Improvement and maintenance of communication and collaboration between NMCP, Pharmacy Division, Procurement Unit, and NMS on procurement and supply management issues were also highlighted.

**Program management:** In this thematic area, the MPR highlighted the need for a national malaria policy update, strategic planning, and development of joint annual work plans. It suggested that NMCP conduct a joint annual review involving all malaria stakeholders including the districts. The review called on the Government of Uganda (GOU) and its partners to commit more resources to malaria activities; proposed elevating the NMCP to the level of a department in the MOH where it is able to participate in key policy, technical, and resource allocation decisions; and suggested revitalization of the zonal and district coordination mechanism to facilitate a more decentralized approach to malaria control.

### **Key Partners in Malaria Control**

The NMCP recently has benefited from increasing support from various partners. Currently, the NMCP has three approved grants from the Global Fund, new support from DfID and continued support from UNICEF, multiple NGOs, PMI and from development partners providing project and direct budget support through the Ministry of Finance and the Health Sector Wide Approach (SWAp). WHO is providing technical assistance mainly for monitoring and evaluation and has been an active participant in supporting Uganda's malaria control efforts. Clinton Health Access Initiative contributes to ongoing activities related to Affordable Medicine Facility - malaria (AMFm). The support DfID will provide is not yet fully defined. However, they have already supported the procurement of ACTs to cover a gap in the public sector before the supplies from AMFm arrive and are supporting a commodity surveillance program through UNICEF. UNICEF also continues to provide support for integrated community case management. While the NMCP and its partners follow the RBM Strategic Plan and the "three ones" principle: one coordinating mechanism, one plan, and one M&E system, this strategy is still poorly coordinated, leading to duplication of efforts and suboptimal resource utilization. Improving this coordination is critical in light of the increasing number of partners and resources for malaria control.

The Global Fund is currently providing support for ACTs and case management including limited diagnostics, through the AMFm pilot. This pilot provides subsidized ACTs to the public and private sector; rapid diagnostic tests (RDTs) and training on these commodities in 21 districts in the public sector (with a pilot for community level and private sector in 3 of the 21 districts); training on integrated management of malaria for health workers in 89 districts; support to revitalize home-based management of fever (HBMF); support for information education and communication/behavior change communication (IEC/BCC) on case management; and pharmacovigilance. The process for securing the Round 7 Phase 2 grant for a fill-in mass LLIN distribution campaign is underway. This grant will provide nearly 10.4 million LLINs to build on the first 7.2 million LLINs distributed in 2010/11 to provide universal coverage (defined as one net per two people). Lastly, Uganda was recently successful with its \$156 million Global Fund Round 10 application which will provide a five year supply of ACTs to the public and private not-for-profit sector including integrated community case management (a program which envelopes the HBMF); procurement of microscopes and scale up of RDTs; routine distribution of LLINs through ANC and Expanded Program on Immunization (EPI); IEC/BCC; support for strengthening Health Management Information System (HMIS), drug and insecticide resistance monitoring, health facility surveys, a Malaria Indicator Survey for 2015, and basic program support to the NMCP.

### **Uganda Malaria Control Strategic Plan 2010/11 – 2014/15**

The Uganda National Malaria Control Strategic Plan is based on the principles and aims of the global RBM partnership, the Abuja Declaration, and the Millennium Development Goals and serves as a framework for a broad partnership between the MOH, line ministries, civil society, non-governmental organizations, development partners and the private sector in order to achieve the set objectives and targets. The Plan complements the broader five-year Health Sector Strategic and Investment Plan (HSSIP) that features malaria as a high priority health and poverty issue. The NMCP's draft 2010/11 to 2014/15 Strategic Plan has also been written to align with the HSSIP III. The NMCP's goals are: to eliminate malaria as the major cause of illness and death in Uganda, ensure that families receive universal access to malaria prevention and treatment, and reduce all-cause mortality for children under-five years of age.

To accomplish these goals, the core malaria interventions include vector control (LLINs, IRS and larviciding), prevention of malaria in pregnancy, case management (including universal access to ACTs, HBMF, high quality parasitological diagnosis), forecasting epidemics, social mobilization and IEC campaigns, health systems strengthening, and monitoring and evaluation (M&E) strengthening. PMI support is designed to help the GOU accomplish these goals.

### **CURRENT STATUS OF MALARIA INDICATORS**

The most recent update on malaria indicators comes from the 2009 Uganda Malaria Indicator Survey (UMIS). As of the drafting of this plan, a Demographic Health Survey (DHS) is ongoing with data collection underway in the field. Results are expected in late 2012. It is important to note that the 2009 UMIS was conducted before the Global Fund-supported mass LLIN distribution to pregnant women and children under-five years of age. The survey revealed that 47 percent of households in Uganda own at least one insecticide-treated net (ITN), and 46 percent own at least one long-lasting insecticidal net (LLIN). Compared with statistics for 2006 when 16 percent of

households owned at least one LLIN, ownership of mosquito nets has increased significantly. Only a third (33 percent) of children under age 5 in all households were reported to have slept under an LLIN the night before the survey (an increase from 10 percent in 2006), although the survey took place during one of the peak malaria transmission seasons. Forty-four percent of pregnant women reported that they slept under an LLIN the night before the survey (an increase from 10 percent in 2006), and only 32 percent of pregnant women said they received IPTp during the last pregnancy (compared with 16 percent in 2006). Survey results show that 45 percent of children under age five years age had a fever in the two weeks preceding the survey; among these children, 60 percent took some type of antimalarial drug: 23 percent took an artemisinin-based combination therapy (ACT), and 19 percent took quinine. Fourteen percent received the recommended treatment of ACT within 24 hours of the onset of fever according to national treatment policy.

### Baseline Malaria Indicators

Indicator	Baseline (2006 DHS) <sup>2</sup>	2009 UMIS
Percentage of households that own at least one ITN	16%	47%
Proportion of children under five years of age sleeping under an ITN the previous night	10 %	33%
Proportion of pregnant women sleeping under an ITN the previous night	10%	44%
Percentage of houses targeted for IRS that have been sprayed	N/A	99% <sup>3</sup>
Proportion of pregnant women who receive at least two doses of IPTp during antenatal care	16%	32%
Prevalence of parasitemia (by microscopy) in children 6-59 months	N/A	45%
Prevalence of anemia in children 6-59 months (Hg <10.9 g/dL) <sup>4</sup>	N/A	62%
Prevalence of severe anemia in children 6-59 months (Hg <8 g/dL)	N/A	10%

### GOALS AND TARGETS OF PRESIDENT’S MALARIA INITIATIVE

The PMI goal is to reduce the burden of malaria (illnesses and deaths) by 70% in the initial 15 PMI countries compared with pre-PMI levels by the end of 2015. Working with development partners, PMI will assist the GOU to achieve the following targets by 2015:

- 85% of households will own at least one ITN;

<sup>2</sup> Uganda Demographic Health Survey, 2006.

<sup>3</sup> This figure is from final IRS reports from PMI’s implementing partner in 2011 for the areas targeted for spraying. The UMIS found that 6% of households, nationwide, received IRS in the last 12 months.

<sup>4</sup> Roll Back Malaria, MEASURE Evaluation, USAID, UNICEF, World Health Organization, MACEPA, CDC. Guidelines for Core Population-Based Indicators. MEASURE Evaluation: Calverton, MD.

- 85% 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 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 six months;
- 85% of pregnant women will have received two or more doses of IPTp during their pregnancies; and
- 85% of children under-five with suspected malaria will have received treatment with an antimalarial drug in accordance with national malaria treatment policies within 24 hours of the onset of their symptoms.

## **PLANNED ACTIVITIES AND EXPECTED RESULTS – FY 2012 (YEAR SEVEN)**

### Prevention:

- At least 85% of houses in ten districts targeted in northern Uganda for IRS during FY 2012 will be sprayed and over 85% of people living in those areas (three million residents in 850,000 houses) will be protected.
- Approximately one million LLINs will be procured and distributed in highly endemic areas targeting pregnant women through ANC clinics. This effort, combined with 10.4 million LLINs programmed from Global Fund Round 7 Phase 2, is expected to increase national household ownership of LLINs from 47% to 85%.
- Continue support for a mass media and community-based IEC/ BCC campaign to promote correct and consistent bed net usage.

### Case Management:

- To supplement the inputs from Global Fund and GOU, PMI will procure 30% of the ACTs and RDTs required for malaria case management nationally; these commodities will continue to be provided to Private Not for Profit (PNFP) health facilities. These efforts are expected to increase the number of PNFP health facilities using ACTs and RDTs to 100% nationwide.

## **INTERVENTION - PREVENTION**

### **Indoor Residual Spraying**

#### Background

IRS remains an effective malaria prevention and control intervention when a high percentage of structures in operational areas are satisfactorily sprayed; the vector population is endophilic and is

susceptible to the insecticide in use. The NMCP recognizes IRS as one of the major malaria interventions in the country and prioritizes use of IRS in epidemic-prone areas, high transmission settings, and high-risk situations (e.g. internally displaced people's camps). Prior to PMI, the NMCP had not conducted any large-scale spray campaigns since the 1960's. In 2006, PMI supported a large-scale IRS program in the epidemic-prone southwestern highland district of Kabale and achieved impressive results both in terms of coverage and impact. In 2007, PMI targeted its support to high-risk sub-counties of Kabale and extended support to the neighboring district of Kanungu and four northern districts (Kitgum, Pader, Gulu, and Amuru), protecting large populations of internally displaced persons. After consultation with the NMCP, PMI then scaled-back support of IRS in Kabale and Kanungu and prioritized resources on the highest transmission areas of northern Uganda (Kitgum, Pader, Apac, and Oyam), areas with the highest concentration of camps and some of the highest rates of malaria transmission in the world. In 2005, a study estimated that on average, each person in this region received 1,600 malaria-infected bites every year,<sup>5</sup> and the population prevalence of malaria parasitemia among children under five in 2010 was 56%.<sup>6</sup>

PMI has since concentrated on the northern districts; to date, Kitgum and Pader have received seven rounds of IRS, Amuru and Gulu have received three rounds, and Oyam and Apac have received five rounds of IRS. IRS was initially conducted with pyrethroids in all districts except Apac and Oyam, which received DDT in 2008. Due to insecticide resistance to both insecticides, a change to carbamates was made in 2010. Targeted household coverage has been consistently high (above 95%).

IRS is conducted prior to the transmission peaks, where it is expected to have the greatest impact on malaria transmission; and insecticide selection is based on vector susceptibility studies. Routine entomological monitoring complements the spraying and has shown that the vector densities of sprayed households have significantly reduced<sup>7</sup>. Malaria data at PMI-supported sentinel sites and other government facilities are also showing downward trends of malaria cases. A recent anemia and parasitemia survey conducted in PMI-supported IRS districts (Apac and Pader) and one non-IRS district (Lira) for comparison showed significantly lower parasitemia levels of children in both IRS districts (37.2% and 16.9% in Apac and Pader respectively) compared to the non-sprayed district (50.1%). Anemia (hemoglobin < 11 g/dL) was less common in Apac (38.4%) and Pader (36.9%), compared to Lira district (53.0%).<sup>8</sup>

Since 2006, continual engagement of central and district level health workers, particularly the vector control officers and health assistants, has increased the GOU's capacity to oversee and coordinate IRS operations. As a result of this increased capacity, in 2008 with PMI-procured insecticide, the MOH carried out an additional round of IRS in selected sub-counties of Kabale and Kanungu and sprayed Kumi district using GOU funds. In addition, the NMCP continues to actively participate in planning, implementation and monitoring of IRS activities and pursue a scale up of the IRS program in Uganda, as evidenced by its intention to spray 24 highly endemic districts in the

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<sup>5</sup> Okello P. *et al* (2006), Variation in malaria transmission intensity in seven sites throughout Uganda. *Am. J. Trop. Med. Hyg.*, 75(2):219–225.

<sup>6</sup> Proietti C *et al* (2011), Continuing intense malaria transmission in northern Uganda. *American Journal of Tropical Medicine and Hygiene* ; 84(5): 830-7.

<sup>7</sup> Ranjith De Alwis, *et al*. 2011-PMI unpublished data

<sup>8</sup> Steinhart L, *et al*. Malaria Intervention Coverage and Associated Morbidity Indicator Survey in Children under five years in Uganda. (2011) – unpublished data.

current NMCP Strategic Plan, and the planned GOU contribution of approximately 3 billion Uganda shillings to IRS in 2012. Additional resources from the GOU as well as other partners will be needed to scale up IRS beyond the northern region.

Implementation of IRS in Uganda continues to face many challenges. Malaria transmission is intense and perennial in nearly every region of Uganda. Interrupting transmission when conditions are suitable for 10 months of the year requires multiple rounds of spraying per year or use of insecticides with a long residual action. In 2008, PMI piloted use of DDT in Apac and Oyam; however, its use was subsequently banned by a court injunction launched by organic farmers. Though the court injunction was lifted, insecticide resistance monitoring studies revealed high levels of vector resistance to DDT. PMI supported comprehensive vector resistance monitoring in six different eco-epidemiological zones from August to October 2009. In all sites, *Anopheles gambiae* was susceptible to the carbamate and organophosphate classes of insecticides tested but resistant to DDT. The resistance patterns of *A. gambiae* against the various pyrethroids fluctuated between full susceptibility (only for deltamethrin and cyfluthrin in Apac and Wakiso) to reduced susceptibility and resistance to the other pyrethroids tested. The development and spread of vector resistance to insecticides has increased the costs of IRS as carbamates are more expensive and have shorter residual action. Routine wall bio- assays measuring the quality and longevity of spraying in three sentinel sites have been conducted and results indicate high quality spraying and that carbamate insecticides are remaining effective for at least 4-5 months.

Currently, the NMCP does not have a clear strategy for implementing vector control interventions; but there is increased funding by GOU to scale up IRS and larviciding and proposals in development by other partners for future vector control interventions. A strategy is needed to provide a clear guideline on how the activities funded by GOU augment the PMI-supported IRS and routine distribution of LLINs through ANC facilities, as well as the mass distribution of LLINs with Global Fund resources. With exception of mass distribution of LLINs through the Global Fund Round 7, these three vector control interventions do not cover the whole country. In a few districts IRS, LLIN distribution and larviciding are being implemented, for the rest of the country LLIN distribution and in select areas, larviciding, are the only vector control strategies available. A clear evidence-based strategy will guide and rationalize the decision-making process and implementation of different vector control interventions.

To be able to develop a comprehensive vector control strategy, the NMCP needs to update the national malaria risk map using all available or generated data (epidemiological, entomological, demographic, socioeconomic and environmental including some remotely sensed data). The current map was developed in 2004 and it is out of date given changes due to the current malaria interventions, economic development and changes in the environment which are likely to have impacted the risk profile dramatically. The development of a comprehensive vector control strategy will also allow for a more detailed analysis at the micro level (sub-district or village level) in northern Uganda that will help the NMCP and districts to develop a transition plan on how best to deploy IRS and LLINs. The decision will also be guided by the results of PMI-supported LLIN/IRS operational research study in northern Tanzania once those results are available.

### Progress during the last 12 months

In June 2009, PMI renewed IRS in northern Uganda with a new bilateral cost plus award fee contract, and sprayed four cycles in Kitgum and Pader (fourth to seventh rounds), and Apac, Oyam, Amuru, and Gulu districts (second to fourth rounds). The spraying used a pyrethroid until May 2010 and then switched to carbamate insecticide from round five in Kitgum district. The project successfully conducted two rounds of spraying in six districts (now ten districts due to district subdivision) during the last 12 months, achieving a coverage rate of over 95% of the 850,000 targeted households and protecting approximately three million people in each spray round. Over the past year, approximately 8,000 personnel (team leaders, vector control officers/health assistants, spray operators, clinicians and environmental officers) have been trained in various aspects of IRS operation. Currently these individuals are actively engaged in conducting training, support supervision and monitoring activities including data collection for IRS activities. The MOH/Vector Control Division (VCD) conducts all entomological activities with the PMI IRS implementing partner only providing oversight for the program.

Large-scale comprehensive community sensitization and education drives are conducted before, during, and after each spray round. These include district leader sensitizations, sub-county leader awareness programs, parish level community meetings, radio announcements, radio spots and radio talk shows.

PMI invests in building Uganda's capacity to provide supervision and oversight of IRS activities, including technical quality, entomological and environmental monitoring, and accountability. Current IRS operations are managed by a PMI implementing partner with significant support from the NMCP, National Environmental Management Authority (NEMA), and district governments. Focused, integrated training on IRS planning, management and monitoring are also provided to district health officers, environmental officers, vector control officers, and NMCP staff. PMI is supporting the development of entomological monitoring capacity and insectary support to ensure strong entomological monitoring capacity within the MOH.

PMI will support the NMCP to implement biannual IRS in ten districts in northern Uganda, covering approximately 890,000 households and protecting more than three million residents in the same ten districts. A detailed spraying schedule with FY 11 funds from October 2011 through June 2012 is provided below:

District	Spray Cycle	Spray Date	Spray Cycle	Spray Date
Gulu	Round 4	October 2011	Round 5	April 2012
Amuru/Nwoya*	Round 4	October 2011	Round 5	April 2012
Kitgum/Lamwo*	Round 8	Oct-Nov 2011	Round 9	Apr-May 2012
Pader /Agago*	Round 8	Oct-Nov 2011	Round 9	Apr-May 2012
Apac/Kole*	Round 6	Nov-Dec 2011	Round 7	May-June 2012
Oyam*	Round 6	Nov-Dec 2011	Round 7	May-June 2012

\* Newly formed districts.

Proposed PMI activities with FY 2012 funding: (\$14,315,000)

- **Support for IRS in northern Uganda:** PMI will continue to support two cycles of IRS in the same geographical area that PMI sprayed before: Gulu, Amuru (Nwoya), Kitgum (Agago), Pader (Lamwo), Apac (Kole) and Oyam districts. The cost includes all components of IRS: insecticide procurement (carbamate or longer acting organophosphate), spray pumps and other required logistics; environmental assessments; monitoring; and IEC/BCC activities specific to IRS (\$13,500,000);
- **Entomologic surveillance and monitoring:** PMI will continue to build local entomologic capacity by assisting the NMCP/VCD at central and district levels to conduct comprehensive vector surveillance, including annual resistance surveys; monthly insecticide decay rates; vector taxonomy, density, and behavior; and vector infection rates every other year. Indicators will be measured in six locations targeted for IRS/ITN campaigns. The cost will be approximately \$50,000 per district (one site per district), which includes training, field costs, procurement of equipment, and sample analysis. PMI will also support maintenance of two field insectaries in collaboration with the VCD and Gulu University (\$350,000);
- **Develop local capacity to expand and sustain IRS:** PMI will continue to build the technical skills and capacity of the public sector as well as private sector, including companies and NGOs to oversee quality IRS programs, focusing on technical quality and accountability, in anticipation of future funding for IRS through GOU and other stakeholders. Technical support will be given to NMCP, VCD and districts to plan, implement, manage, and monitor the technical quality of those IRS programs (\$150,000);
- **Environmental monitoring oversight:** PMI will support joint independent environmental monitoring oversight with NEMA staff to monitor the safe use of insecticide and to guide the PMI program under 22 CFR 216 (\$40,000);
- **Support national level malaria risk mapping, development of an evidence-based rational vector control strategy and transition plan for IRS in northern Uganda:** PMI will support the NMCP to update the malaria risk map using epidemiological, entomological and other relevant data and use the same data platform to develop a rational vector control strategy for the country. PMI will also support the NMCP to perform similar in-depth micro level analysis to assess the vector control program in northern Uganda and develop a strategy on how best to deploy IRS and ITNs in a setting with a long malaria transmission season, multiple rounds of IRS and high coverage of ITNs (\$250,000); and
- **2 TDYs from CDC-Atlanta:** CDC entomological staff will provide technical support to planning and monitoring IRS activities. This includes technical support covers risk mapping, strategy development and micro-analysis for transition plan. (\$25,000).

## **Long Lasting Insecticidal Nets**

### **Background**

Uganda has a four-pronged strategy of distribution: (1) commercial sale of LLINs at full cost; (2) sale of subsidized LLINs through the private sector; (3) free distribution to vulnerable groups

through mass campaigns (targeting pregnant women and children under five years of age); and (4) free distribution through ANC/EPI clinics. HIV positive individuals usually receive nets through routine distribution through HIV treatment centers. The NMCP has made significant strides in improving the coverage of LLINs across the country. In January 2011, the NMCP completed the first round of nationwide mass distribution of LLINs supported by the Global Fund Round 7 grant. Approximately 7.2 million LLINs were distributed to pregnant women and children under five years of age across the country.

It is expected that by mid-2012, the second phase of the Global Fund Round 7 grant will commence; this will bring nearly 10.4 million LLINs into the country for a “fill-in” campaign to achieve universal coverage (defined as one net per two people). The campaign will include a “hang-up” program and IEC/BCC on correct usage and net care.

In January 2011, PMI supported a bed net coverage survey in the central region of Uganda to evaluate the impact of the Global Fund supported targeted mass campaign (PMI also provided technical assistance and funding for distribution and associated activities in this region). This region was selected as it was the first to receive campaign LLINs and would provide information on ownership and usage approximately six months after distribution. The preliminary results from this survey show an increase in LLIN ownership of at least one LLIN from 24% (UMIS 2009 Central 2 Region<sup>9</sup>) to 63% and households with more than one LLIN increased from 9% to 39%.<sup>10</sup>

Net usage lags behind ownership, but there have been significant improvements between 2006 and 2009 with a 10% to 33% increase in usage amongst children under five and a 10% to 44% increase amongst pregnant women.<sup>11</sup> The preliminary results from the 2011 central region survey show an increase in usage amongst children under five from 11% to 43% in all households (compared to the regional estimate from the 2009 UMIS). Usage amongst pregnant women was found to be 36% from the central region survey; however, the sample size from the UMIS was not sufficient to provide a comparative regional estimate.

The regional bed net coverage survey evaluated reasons for not using a net amongst households that received a net through the campaign; the reasons cited included that the net was not hung, it was too hot, the net was too old, there were no mosquitoes, or the net no longer kills the mosquitoes, or they do not like the smell. There is an on-going study by the Alliance for Malaria Prevention and USAID/Global Health evaluating the effectiveness of the “hang up” campaign which will provide additional information on whether this strategy needs to be modified to improve usage. This information will be very helpful as 42% of households reported that the net was not hung, even though there was a “hang-up” campaign immediately following the mass distribution. There is still a limited understanding about what influences net use within households: why a net is used or not, priorities amongst household members for nets if there are too few, and the care and repair of nets. These areas deserve further exploration in order to maximize net usage in a household and ensure a net remains viable for as long as possible.

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<sup>9</sup> Central 2 Region includes the districts of Kayunga, Kiboga, Luwero, Nakaseke, Mubende, Mityana, Mukono and Nakasongola.

<sup>10</sup> Steinhardt L, et al. Malaria Intervention Coverage and Associated Morbidity Indicator Survey in Children under five years in Uganda. (2011) – unpublished data.

<sup>11</sup> 2006 UDHS/2009 UMIS.

The successful Global Fund Round 10 grant provides the opportunity to sustain universal coverage through routine LLIN distribution through ANC and EPI clinics. This grant took into account PMI's continued contribution through ANC as well as contributions from other partners. The NMCP and partners have yet to develop a strategy for "keep up" after achieving universal coverage, but continue to plan for some degree of maintenance through established routine systems.

#### Progress during the last 12 months

PMI has supported all four of the above-mentioned strategies of LLIN distribution, and to date, PMI has procured and distributed approximately 2.7 million nets and close to 3 million nets have been sold with PMI marketing support. In FY 2010 and FY 2011, PMI focused on routine distribution through ANC clinics to ensure LLIN coverage in the most vulnerable populations, as the Global Fund mass campaign was ongoing. PMI procured 650,000 LLINs to be distributed through ANC in the north and central regions of the country.

A new training manual for malaria in pregnancy, which includes distribution of LLINs through ANC, was developed this year with PMI support, and this is being rolled out in districts where routine distribution through ANC already exists. This package includes training for ANC workers to provide education on the proper care and use of the net and the benefits of using a net. In addition, PMI supports comprehensive IEC/BCC campaigns for ITNs using the radio, health education at the clinic and interpersonal communication at community level. A pilot in primary schools in the central region is ongoing to see if education on malaria prevention at school level will translate into behavior change at the home.

#### Proposed PMI activities with FY 2012 funding: (\$7,125,000)

It is expected that by the end of 2012, a total of 17.7 million LLINs will have been distributed nationwide through the Global Fund Round 7 grant to provide one net for every two people. PMI will contribute to maintaining this coverage through routine ANC distribution and promoting net usage.

Planned activities with FY 2012 funds are as follows:

- **Procurement of LLINs:** PMI will procure approximately 1,000,000 LLINs for distribution through ANC clinics (\$5,500,000);
- **Distribution of free LLINs through ANC clinics:** PMI will target pregnant women for free distribution of 1,000,000 LLINs via ANC clinics in high disease burden areas in Uganda under integrated malaria in pregnancy program; evaluate the context of household net use including prioritization of nets within a household, the value and care of nets and barriers to consistent use; and development and promotion of practical behaviors that can be adopted by net users to extend the life of their nets (\$1,625,000); and
- **IEC/BCC:** See Cross-cutting IEC/BCC section for details on activities and funding.

#### Intermittent Preventive Treatment

## Background

The draft 2011 MOH National Malaria Control Policy continues to recognize malaria in pregnancy as a serious problem and defines the following policy objectives to guide implementation of malaria in pregnancy programs:

1. To ensure every pregnant woman sleeps under a LLIN throughout her pregnancy and thereafter.
2. To ensure pregnant women receive IPTp with an appropriate medicine and receive early diagnosis and prompt management of malaria episodes.

IPTp is integrated with and is operationalized through the RHU's focused antenatal care (FANC) policy which recommends that women with a normal pregnancy make four visits to an ANC clinic prior to delivery.

The recent MPR recognized the need for full integration of IPTp programs within the RHU leaving the NMCP with the responsibility of providing technical assistance to the RHU to ensure quality training of health workers on IPTp, provision of IPTp services at health facilities, supportive supervision, M&E, operational research, and IEC campaigns at the community level.

Antenatal attendance by pregnant women in Uganda is high. The 2006 DHS showed that approximately 96% of women attended an ANC at least once during their pregnancies and 90% attended at least twice; 79% of women visited an ANC for the first time during their second or third trimester (median months pregnant at first visit was 5.5 months). However, the 2009 UMIS found that only 45% of pregnant women took sulfadoxine-pyrimethamine (SP) during an ANC visit and only 32% received two or more doses of SP during their pregnancy, with regional variation ranging from 21% to 49%. This is despite improved availability SP at health facilities, provision of water and cups at the ANC clinics for directly observed treatment (DOT) of IPTp and training of health workers. Many reasons have been advanced to explain the low coverage rates of IPTp including: unwillingness of some pregnant women to take SP because they fear its effect on the fetus (a fear sometimes fostered by health workers);<sup>12</sup> pregnant women not given SP by the midwife, SP stock-outs, and irregular ANC attendance by pregnant women;<sup>13</sup> however, the reasons for low IPTp uptake need further exploration.

## Progress during the last 12 months

PMI has been addressing the challenges to IPTp coverage through sustained IEC/BCC campaigns on mass media and through health talks at health facilities. Also, PMI has provided cups and clean water to facilitate DOT with SP. However these efforts have not led to increase in IPTp rates. Using FY 2011 funds, an operational research study will be conducted to further understand the reasons

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<sup>12</sup> Barker J, Payes R, (2007). "Overview of Programmatic Interventions for Communication for Indoor Residual Spraying (IRS), Insecticide-treated Nets (ITNs), Case Management and malaria in Pregnancy." USAID.

<sup>13</sup> Ndyomugenyi R and Katamanywa J. 2010. Intermittent preventive treatment of malaria in pregnancy (IPTp): do frequent antenatal care visits ensure access and compliance to IPTp in Ugandan rural communities? *Trans R Soc Trop Med Hyg*.

that explain this low performance. PMI is also conducting an SP effectiveness study in Tororo district to establish the continued efficacy of SP for IPTp in Uganda.

In the last year, PMI's support for IPTp has resulted in the development of a comprehensive malaria in pregnancy module incorporated into the FANC training, training and on-the-job supervision of over 4,088 health workers on IPTp. PMI has provided pregnancy wall charts and gestational wheels as job-aids in all facilities providing antenatal care, and supported adoption of an MOH nationwide advocacy plan for IPTp. To supplement these efforts, PMI has purchased over 130,000 treatments for IPTp in the last three years in the private sector. In collaboration with PEPFAR, PMI has focused on integrating IPTp services with PMTCT and extended this support to private health facilities. PMI has extended resources to fund USAID/Uganda Mission district-based maternal and child health programs to integrate FANC and IPTp in their MCH programs.

Proposed PMI activities with FY 2012 funding: (\$400,000)

PMI will continue to support IPTp services in both the public and private sector. Information from the evaluation of factors contributing to low IPTp uptake will guide the specific activities.

Planned activities with FY 2012 funds are as follows:

- **Provide comprehensive IPTp services as part of integrated Malaria in Pregnancy at public ANC clinics:** Based on previous PMI support for IPTp services and results from the uptake evaluation, PMI will continue to support a package of services to maximize IPTp provision. This could include: support for procurement of SP, provision of clean water and cups to facilitate DOT of IPTp; provision of ANC registers for medical records; enhanced IEC/BCC to support district health education units to ensure that pregnant women understand that IPTp is safe and the importance of completing a full course of IPTp; and community-level advocacy to encourage pregnant women to attend ANC. PMI will also assist with integrated supervision for ANC health workers (with emphasis on IPTp, ITNs, and case management of pregnant women). PMI will support integration of service delivery with PMTCT in facilities where this service is provided and continue to strengthen integrated programs for maternal and child health (\$250,000);
- **Provide comprehensive IPTp services at ANC clinics in the private sector:**
  - a. PMI will continue to promote IPTp through training of health workers in small-to medium-sized private sector health clinics in order to enable them to promote a comprehensive package for IPTp, early detection of malaria during pregnancy, and offer DOT. These funds will also support IEC/BCC for ANC clients seeking care at private facilities and allow PMI to leverage on-going support from PEPFAR and MCH funds for private sector (\$100,000) and;
  - b. PMI will continue to support training and service delivery of comprehensive IPTp services and case management using matching funds with larger private companies<sup>14</sup> under their corporate social responsibility programs (\$50,000); and

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<sup>14</sup> Larger private companies such as HIMA and Tororo cement, Kakira and Kinyara Sugar works, James Finlay's Tea and Nile Breweries etc.

- **IEC/BCC:** See Cross-cutting IEC/BCC section for details on activities and funding.

## **INTERVENTION – CASE MANAGEMENT**

### **Malaria Diagnosis**

#### **Background:**

The draft of 2011 new National Malaria Control Policy makes an important departure from previous policy and recommends that parasite-based diagnosis with microscopy or RDTs should be part of malaria case management in all health facilities and at the community level. The policy states that:

1. Suspected malaria cases will be subjected to parasite-based diagnosis.
2. Microscopy remains the "reference or gold standard" for malaria diagnosis in case management and shall be the diagnostic method for all health centers level III (that have microscopes) and above.
3. RDTs will be used at health center III's without microscopes, health center II's and community level and to fill the gaps at higher level health facilities where microscopy is not possible.
4. The type of RDTs to be deployed in the country will be guided by evidence on sensitivity, specificity, ease of use and stability in the field, as determined by the performance evaluation and pre-qualification schemes of the WHO coupled with in-country testing.

This is consistent with WHO guidance on the need for parasitological confirmation of fevers in all groups before treatment with antimalarial drugs.<sup>15</sup> To achieve this policy directive, PMI is working closely with NMCP and other partners to ensure there is adequate equipment and supplies for microscopy at the higher level health facilities and RDTs at the lower levels. Also, elaborate plans have been developed to support country-wide training of personnel on both microscopy and RDTs. These efforts have seen at least one health worker trained in either microscopy or RDT in over 70% of the country.

In spite of these policies and efforts, most malaria diagnosis is still based on clinical symptoms, as many facilities lack laboratory diagnostic capacity, especially laboratory technicians. Even in facilities with malaria microscopy, many clinicians doubt the results and may disregard them when making a diagnosis. The 2009 UMIS found that only 17% of children with a fever had a blood sample tested for malaria before receiving treatment. Among older children and adults, and among all age groups in areas of low-to-moderate transmission, improper diagnosis based on symptoms alone often results in fevers being presumptively treated for malaria, resulting in the overuse of ACTs and inappropriate treatment of patients. As malaria prevention activities are scaled up, appropriate diagnosis and treatment will become even more critical because many fevers may not be due to malaria and health workers will need to look for and treat other causes of fevers. Future

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<sup>15</sup> WHO. 2010. Guidelines for the treatment of malaria -- 2nd edition. 1.Malaria – drug therapy. 2.Malaria – diagnosis. 3.Antimalarials – administration and dosage. 4. Drug therapy, Combination. 5.Guidelines. I.World Health Organization. ISBN 978 92 4 154792 5 (NLM classification: WC 770)

efforts will require sustained education of clinicians to base treatment on the test results and to educate communities to demand a malaria test before receiving antimalarial treatment.

The Central Public Health Laboratory (CPHL) is mandated to coordinate, monitor, and supervise all health center (HC) III and IV laboratories, but is grossly understaffed and supervision is irregular. PMI and PEPFAR will continue their collaboration in laboratory strengthening by supporting CPHL and NMCP to conduct regular supervision of facilities for sustained quality diagnostic services.

A quality assurance (QA)/quality control (QC) system for diagnostics is being developed by the NMCP with support from the Foundation for Innovative New Diagnostics (FINN) and CDC. Currently, FINN, Malaria Consortium and PMI are supporting pilot QA/QC programs in a range of districts that will inform the development of the national QA/QC system.

#### Progress during the last 12 months

PMI's support to diagnostic capacity building started in FY 2007 through support to the Joint Uganda Malaria Training Program, integrated, comprehensive malaria training targeting all relevant personnel in a health facility. This program implemented nine training courses in 2007/2008 with 272 health care workers trained. In 2008, the Uganda NMCP laboratory technical working group (chaired by the CPHL and NMCP) with PMI support, revised this model to a three-day, on-site refresher training curriculum for microscopy and RDT course for implementation at the health facility level. For the past two years, PMI has supported this three-day on-site training on microscopy and RDTs for laboratory staff and clinicians. To date, 3,097 laboratory staff in over 40 districts has been trained under this model. A mapping exercise conducted in 2010 of all partners in Uganda who provide training on microscopy showed that 70% of the training needs in-country has been met; the NMCP has made plans to cover the remaining districts with PMI FY 2012 funds and support from other partners. Improving communication between different cadres of health professionals at facilities is now done through supportive supervision and in-service training using a performance improvement model which allows supervisors and supervisees to jointly identify problems and agree on specific quality improvement activities. In addition, PMI has supported training in the private sector: 296 health workers were trained and 6 facilities were identified to serve as district based learning centers. Reports from supported private facilities showed that of the 282,333 patients seen with fever at these private facilities, 260,225 (92%) received a laboratory test for malaria before getting an ACT. A communication campaign to increase awareness and demand for diagnosis before treatment was launched in the selected districts reaching over 300,000 thousand people.

According to technical working group guidance, all diagnostic training partners should follow two approaches to measure the impact of the training. First, they conduct pre- and post training evaluations as a part of the training course to measure the improvement of diagnostic skills and competency of laboratory personnel. Reports received by PMI demonstrated that trainees' knowledge and skills increased significantly after the training. In Rukungiri district, pre- and post-test results showed that the mean marks significantly increased from 83% to 94% ( $p < 0.005$ ). Secondly, trainers conduct joint follow-up support supervision visits 6 weeks after completion of the training. These visits are conducted together with NMCP and district laboratory focal persons to evaluate the performance of trained laboratory personnel and the impact of training on overall case management in health facilities. During these visits, the team assesses health workers' competence

in performing and interpreting test results, treatment for negative or positive patients, and records management. Supervision team members also identify and address challenges of laboratory logistics and supply management, provide on-the-job training for the aspects that were performed poorly, and collect data to assess the effects of the training on the overall management of fever cases.

In order for Uganda to roll out use of RDTs across the entire country in the public sector, more than 18 million RDTs annually would be required to cover all health facilities without microscopes. Through AMFm, approximately 17 million RDTs will be procured. The NMCP planned a step-wise rollout of RDTs, first targeting 21 districts with low to moderate endemicity and districts receiving IRS. In addition to a supply of RDTs expected through the Global Fund grant, PMI procured 1,400,000 RDTs for distribution through the public sector in accordance with the rollout scheme planned by NMCP and for PNFP facilities.

Proposed PMI activities with FY 2012 funding: (\$2,512,500)

FY 2012 PMI funds will be used to support training of health workers on RDTs and microscopy to improve parasitologic-based diagnosis at all levels of the health system and in both public and private facilities. The timing of future RDT trainings will depend on the availability of the tests themselves. PMI support will complement Global Fund and PEPFAR support for general laboratory and microscopy strengthening and PMI will work with PEPFAR to improve coordination in USG efforts to improve the laboratory system in Uganda. PMI will also support the development of a QA/QC policy for diagnostics that will be used by all NMCP partners.

- **RDT procurement:** With FY 12 funds, PMI will continue to purchase 1,700,000 RDTs targeted at PNFP facilities (\$1,300,000)
- **Support integrated malaria diagnostic trainings and roll-out of RDTs at health centers:** PMI will support the roll-out and use of RDTs at HCs II and III and microscopy training at HCs III and IV and referral hospitals. Trainings will be offered to staff at all public health facilities to provide district-wide coverage; microscopy training will be conducted in 19 districts across the country (\$950,000);
- **Support improved diagnostics in the private sector:**
  - a. While the district-based training will target both public and private sector, PMI will further focus its private sector support through training of laboratory staff in the private clinics (not associated with large companies) on RDTs and microscopy (\$200,000);
  - b. PMI will support training on the use of RDTs in the private sector through existing partnerships with companies providing health care for their employees and surrounding communities. Fifteen participating companies agreed to provide matching contributions under HIPS project targeted for this training (\$50,000);
- **IEC/BCC:** See Cross-cutting IEC/BCC section for details on activities and funding; and
- **TDY from CDC-Atlanta:** CDC staff will provide technical support to laboratory diagnostics (\$12,500).

## Treatment

### Background

Since 2004, artemether/lumefantrine (AL) has been the first-line treatment for uncomplicated malaria in Uganda. The second-line treatment is dihydroartemisinin piperazine (DP) and quinine. Artesunate suppositories are recommended for pre-referral treatment of severe malaria at the community level where parenteral therapy is not possible. Supervision conducted by the NMCP and district officials, supported by PMI, has shown that due to the frequent ACT stock-outs, many facilities administer monotherapy for treatment of malaria with artemether only, or with chloroquine and SP, either singly or in combination (neither of the latter two drugs are efficacious). In addition, improper administration of quinine for treatment of severe malaria occurs due to inadequate supplies of intravenous solutions which may lead to overdosing patients.

Stock-outs of ACTs remain the major challenge for proper case management of malaria at the facility and community level. The 2009 UMIS established that 36% of children with fever took any antimalarial drugs on the same or next day, however only 13.7% took an ACT within 24 hours of the fever. Although Uganda was one of the first countries in Africa to actively promote HBMF through volunteer Community Medicine Distributors, its implementation has been chronically impaired by repeated shortages of AL and the HBMF program was abandoned until recent support from the Global Fund. The 2009 UMIS indicated that only 18% of households reported knowledge of a community worker or Community Medicine Distributors within their community, and only 9% reported that person had malaria medicines available.

The Global Fund Round 4 Phase 2 grant was consolidated with AMFm and provided support for re-launching the HBMF program in selected districts. However, between the time of awarding Round 4 and its implementation, the national policy on community level care has changed from HBMF to integrated community case management (ICCM), which provides care for children under five for malaria, diarrhea, pneumonia, and care for neonates through voluntary village health teams (VHTs). However, there are different funding streams for HBMF and ICCM: the HBMF strategy is funded through Global Fund and ICCM through the Canadian International Development Agency and the Gates Foundation. The ICCM funding is for a two-year pilot in 20 districts and provides funding for training on case management and drug supplies to the VHTs only (i.e., there is no provision of drugs to health facilities who are the referral and supervisory points of contact for the VHTs). Hence, it appears that neither strategy is sustainable with current funding commitments and the way forward for community level health care remains unclear. Future USG support to either HBMF or ICCM should await findings of the current pilot ICCM program by UNICEF in 20 districts.

A 2006 USAID study in collaboration with the Public-Private Partnership for Health Desk of the MOH found that 46% of health facilities in Uganda are private.<sup>16</sup> Up to 82% of households first seek care from small drug shops, private clinics, and private-not-for-profit providers. The 2009 UMIS found that 55% of children with fever received care at private facilities. Most private providers in low-income countries do not receive guidance on diagnosis and treatment from the

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<sup>16</sup> Mandelli, Andrea, Lennie Bazira Kyomuhangi, and Susan Scribner. September 2005. *Survey of Private Health Facilities in Uganda*. Bethesda, MD: The Partners for Health Reformplus Project, Abt Associates Inc.

MOH, instead relying on information from pharmaceutical companies.<sup>17</sup> However, studies have shown that training medicine sellers on approved drugs increases the number of patients receiving an effective and correctly dosed drug.<sup>18</sup> In Luwero District, after participating in training, the proportion of sellers providing appropriate drugs increased from 2% to 73% and correct dosing increased from 0% to 50%.<sup>19</sup>

Medicines for Malaria Venture conducted a study in nine districts in Uganda in 2007 to better understand the market for antimalarials. They found that only 50% of private health facilities had any first-line antimalarials; AL was found to be up to sixty times as expensive as other non-artemisinin based medicines in the private sector, and only 50% of patients purchased a full course of any antimalarial treatment at one time.<sup>20</sup> Uganda has signed on to the AMFm grant that is expected to increase access to ACTs in both the public and private sectors; however, implementation of this grant has been slow. Though the first tranche of ACTs has recently been delivered, it remains to be seen whether this effort will lead to reduction in stock-out rates of ACTs in public facilities and a drop in the price of ACTs in the private sector, thus making ACTs more widely available throughout the country.

### Progress during the last 12 months

PMI supports integrated training and supportive supervision at the health facility level in more than 40 districts across the country. This includes management of severe and uncomplicated malaria, IEC/BCC, and malaria in pregnancy interventions. Over the last four years, PMI has supported training of over 37,000 health workers on integrated malaria activities. In addition, regular supervision has been provided to health workers in 34 districts supported by PMI to strengthen proper case management. Using FY 2010 funds, PMI supported private sector professional associations, such as the Uganda Private Medical Practitioners Association, Uganda Private Midwives Association and Drug Shop Owners Association, to network among their members and to develop a new training model (clinical audit model) for private sector. Selected district based master trainers, who were a product of the national training, in turn, used the clinical audit approach that allows on site mentoring and coaching of private sector providers. The master trainers also conducted regular support supervision to ensure proper diagnosis and case management of malaria among the private providers.

In the last year, PMI has extended its support to the PNFP facilities. Over 1,000,000 ACT treatments were purchased and a controlled system of distribution of ACTs to PNFP facilities is currently underway through the Joint Medical Store (JMS). This was a critical intervention, given that the previous arrangement in which NMS provided 20% of the public supply of ACTs to PNFP facilities through JMS has ceased. NMCP plans to provide 22 million treatments of ACTs to the public sector through AMFm this year and 45 million treatments of ACTs over a five-year period through its successful Global Fund Round 10 application. It is planned that ICCM will be rolled out to 31 districts using Round 10 resources.

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<sup>17</sup> Mills, A., Brugha, R., Hanson, K., McPake, B. What can be done about the private health sector in low-income countries? *Bulletin of the World Health Organization*, 2002, 80(4).

<sup>18</sup> Goodman, C., Brieger, W., Unwin, A., Mills, A., Meek, S., Greer, G. Medicine sellers and malaria treatment in sub-Saharan Africa. *Am J Trop Med Hyg*. 2007 Dec; 77(6 Suppl): 203-218.

<sup>19</sup> Tawfik Y, Nsungwa-Sabitii J, Greer G, Owor J, Kesande R, Prysor-Jones S. Negotiating improved case management of childhood illness with formal and informal private practitioners in Uganda. *Trop Med Int Health*. 2006;11:967-73.

<sup>20</sup> Medicines for Malaria Venture. August 2008. *Understanding the Antimalarials Market: Uganda 2007 – an overview of the supply side. A study by Medicines for Malaria Venture, in collaboration with Ministry of Health Uganda, HEPS and WHO.*

After the declassification of all ACTs to an over-the-counter drug in 2008, ACT supplies have become more widely available in the private sector. PMI supported training of private health practitioners in the new antimalarial drug policy. This training is often integrated with sessions on HIV/AIDS, family planning and child survival. To date, nearly 5,000 private health practitioners have received training in malaria treatment and prevention. In addition, PMI has supported small-to-medium sized private clinics under Uganda Health Marketing Group and has worked with large private corporations to leverage additional funds for malaria prevention through their Corporate Social Responsibility programs. These corporations provide free or subsidized health services to their employees and the surrounding communities. PMI works with these businesses on a cost-sharing basis for LLINs, IPTp, and laboratory diagnostics.

Proposed PMI activities with FY 2012 funding: (\$2,720,000)

PMI will support case management activities on uncomplicated and severe malaria including procuring commodities. Given the uncertainty about the future of ICCM beyond the planned pilot project, there is an urgent need to first establish consistent supplies of ACTs to health facilities, and given the finding that approximately 75% of Ugandans live within five kilometers of a health facility,<sup>21</sup> PMI will prioritize strengthening clinical services at health facility levels.

Planned activities with FY 2012 funds are as follows:

- **Procure antimalarial drugs:** PMI will support the procurement of drugs including ACTs, severe malaria drugs, and supplies for the treatment of malaria. The planned ACT and RDT procurement (mentioned in the Diagnostics section) is targeted for the PNFP sector through JMS, while the severe malaria drugs will be for both PNFP and public sector (\$1,120,000);
- **Support private sector providers and their networks and increase the role of district health officials in providing support and supervision:** District health teams in collaboration with private sector associations previously supported will provide routine support supervision to private health providers and support improvements in record keeping and HMIS reporting to national level. (\$250,000);
- **Strengthen case management in health facilities:** PMI will provide funds for strengthening case management for uncomplicated and severe malaria in public and private health facilities in most of parts of Uganda. This will include in-service training, supportive supervision and provision of job-aids to health care workers (\$1,100,000);
- **Support integration of malaria case management in maternal and child health programs:** PMI will support integration of malaria case management and IPTp into USAID supported maternal and child health programs in targeted districts. Currently MCH programs are working to improve clinical care related to the major causes of maternal and child mortality at health facility and community level. As malaria is a major cause of morbidity and mortality in these groups, the MCH programs have been focusing on improving malaria

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<sup>21</sup> Ministry of Health (MOH) [Uganda] and Macro International Inc. 2008. *Uganda Service Provision Assessment Survey 2007*. Kampala, Uganda: Ministry of Health and Macro International Inc.

case management and PMI support will further strengthen this component of the broader MCH platform. This integrated program will expand malaria control to an additional 15 districts, and will leverage nearly \$3 million of USG investment in the delivery of comprehensive MCH services and \$5 million of family planning services (\$250,000); and

- **Leverage support to large corporations:** PMI will continue its support to the 50 facilities operated by or through large companies providing malaria services with matching funds to serve employee families and neighboring communities. PMI funds will be leveraged on a 1:1 basis with private sector funds for malaria commodities, training and IEC/BCC activities (costs included under the ITNs, IPTp, and diagnosis).

## **Pharmaceutical Management**

### **Background**

The pharmaceutical management system in Uganda is generally weak and coordination of efforts to support strengthening of this system is poor. National Medical Stores is responsible for the procurement and distribution of all essential medicines and health supplies for the public sector, while Joint Medical Stores caters for the private-not-for-profit facilities. In the past five years, primarily due to bottlenecks in disbursements of Global Fund grants, there have been several major national stock-outs of the first-line drug, AL, for the treatment of uncomplicated malaria. Supplies of National Drug Authority (NDA) approved, WHO pre-qualified ACTs procured from Quality Chemicals (a Ugandan pharmaceutical company) with GOU funds have been available since last year, but stocks are limited. Supplies of ACTs for the public sector in the last year have come from a combination of GOU-purchased AL from Quality Chemicals (approximately eight million treatments) and from remaining funds of Global Fund Round 4 Phase 2 (16.3 million treatments). In addition, DfID provided approximately 9.2 million treatments to cover a gap between these stocks and the arrival of the AMFm ACT supply for the public sector. As of July 2011, over 11 million treatments had arrived in country. It is not clear, however, if these supplies will cover both public and PNFP facilities because of a recent policy shift by the GOU to prioritize MOH public health facilities over PNFP facilities when supplies are limited. Even when stocks of ACTs are available, districts and health facilities cannot rely on their orders being filled, and health workers are often unaware of the quantities they will receive until the ACTs are delivered.

In early 2010, the NMS and MOH changed the national policy to partially reintroduce the "push" system where lower-level health facilities (HCs II and III) will receive a standard kit of set quantities of essential drugs, including ACTs, SP and other health supplies. Hospitals and HCs IV will continue to be able to order based upon their determined needs. A study conducted by a USAID implementing partner in December 2010, six months after the introduction of the kit, showed a 69% decrease in number of days stocked out of five tracer medicines (including ACTs). However, with the considerable variation in malaria cases across facilities, some facilities were over-stocked and some under-stocked with ACTs for all pack sizes and at both levels of care. The study also revealed that the quantity of AL received in each kit was not constant in each delivery cycle, either because of careless packing or rationing.

The quality of antimalarial drugs is of growing concern. In Uganda, the NDA monitors drug and public health commodity quality through registration of pre-marketed medicines, inspection of factories that manufacture antimalarial drugs, licensing of drug outlets, and post-marketing surveillance. Support for capacity building for drug monitoring has been provided by multiple partners, including PMI, USAID and the Global Fund. In 2010, NDA reported that 22%<sup>22</sup> of all ACTs and SP failed standard quality testing. This is a significant increase from the 3% they reported the year prior.<sup>23</sup> Investigations to explain this marked increase are ongoing.

### Progress during the last 12 months

In Years 2 through 5, PMI provided technical assistance to help the NMS, the NMCP, and district health programs to improve their quantification of AL, RDTs, SP for IPTp and severe malaria drugs. To date, over 350 health workers in northern Uganda have been trained on logistics, drug quantification, ordering, and storage. Even with support from PMI, USAID/Uganda, and other donors who have provided technical assistance in logistics management over the last ten years, significant challenges remain in the drug supply system. In 2010, PMI supported JMS to store and distribute 1,290,000 ACT treatments and 382,500 RDTs to 445 PNFP facilities and develop a reporting form to create a database for reporting malaria cases data, treatment information, and consumption and stock levels of malaria commodities in those facilities.

As these challenges affect multiple programs supported by USG health funds, USAID/Uganda has consolidated its technical assistance under a single mechanism to address the problems of pharmaceutical management through a system-wide approach. This support aims to improve the availability and accessibility of essential medicines and health supplies by tackling each link in the supply chain at all levels of the system including financial management, procurement, storage and distribution, and information management. The program aims to strengthen both NMS and JMS systems and work in 45 districts to increase district level capacity in quantification, ordering, and stock management.

In addition, PMI has provided the NDA with equipment (e.g., a high performance liquid chromatography machine, gas chromatography, and mini-labs), technical assistance, training, and other support to improve the pre-market inspection of antimalarials and to help establish post-marketing surveillance sites. This support historically had been through malaria-specific partners, but is now done through a USAID/Uganda partner that focuses on strengthening the overall system for all commodities, with a special focus on drugs and supplies for HIV, family planning, and malaria.

### Proposed PMI activities with FY 2012 funding: (\$800,000)

- **Strengthen pharmaceutical supply chain management and monitor drug quality of antimalarials:** PMI will provide technical assistance to help the NMCP/MOH quantify the national requirements for ACTs, RDTs and other antimalarial drugs and establish a central Quantification and Procurement Planning Unit. The PNFP facility ACT and RDT consumption data will be collected, analyzed and for the first time, be available for the national quantification, increasing its accuracy. Support will be given to JMS in distribution,

<sup>22</sup> NDA Quality Control Laboratory Report to Annual Health Sector Performance Report 2009/10.

<sup>23</sup> NDA Quality Control Laboratory Report to Annual Health Sector Performance Report 2008/09.

management, reporting, and monitoring of ACTs and RDTs donated to PNFP facilities by PMI. PMI will support improved pharmaceutical management systems in district health offices and health facilities, in 15 districts in the northern region. The PMI investment in supply chain management leverages more than \$5 million from other health funding streams (including PEPFAR) to provide a robust response to the challenges in pharmaceutical management. To ensure all antimalarials entering the Uganda market are of appropriate quality, PMI will continue to support strengthening the NDA in monitoring drug quality (\$800,000).

## **Drug Resistance Monitoring**

### Background

Resistance monitoring of first-line antimalarials has routinely been done in Uganda since 2001, and since 2006 through PMI support. This work has been instrumental in changing policy from ineffective regimens to ACTs. The most recent evaluation of current artemisinin-based combination therapies available in Uganda (excluding artemisinin-naphthoquine) in 2009 showed all formulations were still highly effective.<sup>24</sup>

### Progress during the last 12 months

PMI has supported biannual monitoring of drug resistance of first-line antimalarials since 2006. The last study was done in 2009 comparing AL, amodiaquine plus artesunate and dihydroartemisinin-piperazine. FY 2010 funding is already available for an evaluation in 2011.

### Proposed PMI Activities with FY 2012 funding:

- No activities are planned with FY 2012 funding.

## **INTERVENTION - CROSS-CUTTING IEC/BCC**

### Background

PMI supports IEC/BCC as a cross-cutting activity focusing on all interventions: case management including diagnostics, LLINs, and IPTp. PMI supports both integrated and targeted IEC/BCC campaigns to increase awareness, demand and usage for prompt malaria diagnosis and treatment, usage of LLINs and IPTp usage among pregnant women.

### Progress in the last 12 months

Since 2006, PMI has supported the development and use of various communication channels at national level to increase awareness of the need for proper diagnosis before initiating treatment for

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<sup>24</sup> Adoke Y, Mpimbaza A, Bukirwa H, Staedke S, D'Allesandro U, Talisuna A, Rosenthal P, Wabwire-Mangen F, Dorsey G, Kanya M. "Comparing Different Artemisinin-based Combination Therapies in Uganda: Implication for Policy," (presentation at 5<sup>th</sup> MIM Conference, Kenya).

malaria, use of ACTs, use of LLINs and directly observed therapy with SP for IPTp. PMI has also supported IEC/BCC at district and community level to encourage awareness and uptake of malaria prevention and control measures. The 2009 UMIS found that knowledge of the cause of malaria and ways to prevent malaria was high (over 85%). However, usage of nets as well as health seeking behavior for children under 5 years of age with fever was suboptimal with net use of only 33% among children under 5 years and only 17% of children who had a fever two weeks prior to the survey had been tested for malaria before treatment.

Proposed PMI activities with FY 2012 funding: (\$650,000)

PMI will continue to provide support for all types of IEC/BCC at national, district and community level.

Planned activities with FY 2012 funding are as follows:

- **Increase awareness, demand, uptake and usage of malaria prevention and control interventions:** PMI will support targeted and evidence-based IEC/BCC at national, district and community level to encourage consistent and proper use of bed nets, usage of IPTp by pregnant women, prompt care seeking for suspected malaria and parasitological-based diagnosis and appropriate treatment for those with confirmed malaria. IEC/BCC will be done through nation-wide radio spots and health communication at the facility level and within the community. (\$650,000).

## **INTERVENTION – EPIDEMIC PREPAREDNESS AND RESPONSE**

### Background

Approximately 19 districts in the southwest and eastern regions of Uganda are considered epidemic-prone. In the last year, retrospective weekly malaria data for the last five consecutive years was analyzed to produce surveillance normal channel graphs using percentiles against which to detect increased malaria at a given period of time. In the last year, three districts had epidemics; one epidemic was detected through data from the PMI-supported sentinel site, the second was detected through the epidemic preparedness and response system and the third was through anecdotal reports of increasing cases in that district. The NMCP includes early detection and rapid containment of malaria epidemics as one of its key strategic objectives and has adapted WHO epidemic preparedness and response guidelines to the Ugandan context. The Epidemic Surveillance Department of the MOH provides weekly updates on district-reported cases of epidemic-prone diseases, including malaria; however, even if an epidemic is detected, districts are often ill-equipped to implement epidemic control recommendations due to lack of funds for fuel, personnel, diagnostic capacity, and stocks of commodities.

Elements of the NMCP's epidemic preparedness that require strengthening include: ensuring that the surveillance system is based on timely recording and reporting, and data are analyzed and interpreted promptly; improving malaria diagnosis in targeted hospitals and Health Center IVs in epidemic-prone districts; ensuring adequate supplies at all treatment facilities so prompt care can be

provided during an outbreak; and ensuring preventive measures can be put in place once an outbreak is identified.

### Progress in the last 12 months

PMI has supported WHO to develop an epidemic preparedness and response strategy for malaria targeting 19 districts. This has been achieved through the use of normal channel graphs, training health workers on these tools, epidemic preparedness and response (EPR) concepts and methods, and developing EPR guidelines, and conducting support supervision. In 2010, malaria epidemics were detected and responded to in Kabale and Bukwo districts. However, due to the introduction of diagnostics in some EPR focus districts, normal channel graphs have become increasingly less sensitive since only confirmed cases are plotted.

In the last year, 96 health facilities in Mbale and Kasese were supported to strengthen malaria surveillance through use of malaria normal channel graphs. 110 health workers in these two districts were trained on EPR. In addition, the district-based task forces in the two districts were trained on how to appropriately respond to upsurges/epidemics. EPR guidelines and job aides were also developed and distributed to all 19 EPR districts.

### Proposed PMI activities with FY 2012 funding:

In the coming year, PMI will continue support to EPR through the Integrated Disease Surveillance and Response (IDSR) system of the Uganda MOH. The IDSR system provides weekly updates on district-reported cases of epidemic-prone diseases, including malaria. Support to IDSR is provided by multiple partners including USAID/Uganda, CDC (including PEPFAR support) and WHO.

### Planned activities with FY 2012 funds are as follows:

- **Epidemic preparedness and response:** PMI will support Integrated Disease Surveillance and Response (IDSR) and the training of staff of health facilities located in epidemic-prone regions. PMI will also support the National Task Force and district task forces to meet regularly, evaluate data in a timely manner and respond to suspected/confirmed outbreaks. This may include commodities, transportation, diagnostic support through RDTs or microscopy, supplies and equipment for malaria epidemic containment and IEC materials required for rapid community response. (\$50,000).

## **MONITORING AND EVALUATION**

### Background

Significant strides have been made in monitoring, evaluation, and surveillance in malaria over the past several years in Uganda. A national M&E plan was developed, the M&E unit at NMCP now has four full-time staff and three technical assistants, the first ever Malaria Indicator Survey was conducted in 2009, and HMIS and IDSR tools have been updated and include more malaria indicators. In addition, support has been provided at health facility, district, and national levels to improve data collection, reporting, and usage. Despite this progress, there is still work to be done in order to make the HMIS system fully functional and malaria program M&E useful for decision

making and tracking progress. PMI and other partners plan to continue to build on the achievements made in this area.

PMI Uganda relies on multiple sources of data to measure the impact of malaria control efforts. PMI uses a combination of facility-based information to provide information on symptomatic patients presenting to facilities for care and cross-sectional data which provides information on both symptomatic and asymptomatic individuals and coverage of malaria interventions. This combination provides a comprehensive picture of the malaria burden in the country and the achievements and gaps in coverage to guide PMI and NMCP decision making. Several of the M&E activities for malaria are supported by multiple partners (USG and others). The following sources of data are used to measure progress in malaria control:

- The 2006 Uganda DHS: Provided baseline information for PMI activities.
- The 2009 Uganda Malaria Indicator Survey: Provided national and regional-level coverage and impact data on the four major malaria interventions, as well as biomarkers for anemia and parasite prevalence in children under-five years of age.
- Sentinel Surveillance Sites: Six outpatient and six inpatient surveillance sites in different transmission settings across Uganda provide data on malaria indicators at health facility level.
- The 2010 Anemia and Parasitemia Survey: Provided information on anemia and parasitemia in children under-five years of age and district-level coverage data in two districts with IRS and one district without IRS, with similar distribution of LLINs and support for case management in Northern Uganda.
- The 2011 LLIN Coverage Survey: Provided information on net coverage and other malaria intervention coverage at district level in the central region of Uganda after the targeted mass LLIN distribution campaign in early 2010.
- The 2011 Uganda DHS: Will provide data comparable to the 2006 UDHS data, as well as anemia levels in children under five (fieldwork is on going).
- The 2011 Uganda RBM MERG Impact Evaluation: Will provide an analysis of malaria activities for the past ten years and their impact on key malaria indicators and overall child mortality.

### Progress in the last 12 months

#### *Sentinel site surveillance activities*

While the HMIS is a priority for strengthening, this gap will take time to improve upon, sentinel sites serve as an important data source in the interim. Uganda sentinel surveillance sites are providing important information on the impact of malaria interventions in their catchment areas. There are currently six inpatient and six outpatient sentinel sites located in different malaria transmission zones. PMI-supported sentinel sites provide malaria data available in Uganda and the NMCP utilizes these data for program monitoring, decision making and advocacy. There are several advantages for using sentinel sites for malaria data collection and reporting:

- Current weakness of Uganda HMIS, including lack of critical data elements to be able to properly monitor the malaria control program;

- Lower cost than frequent national (and sub-national) population-based surveys in addition to inappropriateness of using population-based survey data for collecting routine program monitoring data;
- Improvement in the quality of data from sentinel sites, and timely availability of data that are useful for PMI management, decision making and advocacy;
- Sentinel sites as an integral component of Uganda NMCP's M&E strategy, highlighted during the recent MPR; and
- Other USG programs are interested in utilizing sentinel sites as a platform for surveillance of other important diseases.

The NMCP would like to expand the number of surveillance sites and is advocating for additional financial support from the MOH and other partners. In FY 2012, the partner implementing sentinel site surveillance will pilot modifications to site support approach to assess whether cost can be reduced without compromising data quality and utility.

#### *2011 Demographic Health Survey*

PMI and the USG mission in Uganda provided technical and financial support for the 2011 DHS, in collaboration with other donor support, which will provide information on coverage of key malaria interventions and health-seeking behaviors to inform future programming. Results are expected by the close of 2012.

#### *2010 Anemia and Parasitemia Survey*

An anemia and parasitemia survey was conducted in two districts receiving IRS and one district without IRS in the northern part of Uganda in December 2010. These districts also receive support from PMI and other partners on case management, malaria in pregnancy and LLIN distribution. This survey provides district level data on coverage of key malaria interventions and prevalence of anemia and parasitemia in children under-five years of age. Preliminary results show a significant difference in both anemia and parasitemia in districts that received IRS compared to the district that did not. Interestingly, bed net usage was higher in districts receiving IRS as well. Final results are expected in late 2011.

#### *2011 LLIN Coverage Survey*

The LLIN coverage survey was conducted in January 2011 in 7 districts in the central region of the country that were the first to receive LLINs from the targeted mass campaigns supported by the Global Fund and PMI. This survey provides district-level data on key malaria indicators with a focus on LLIN ownership and usage. Preliminary results show that net ownership increased from 24% (regional estimate from 2009 UMIS) to 63% and usage amongst children under five years of age increase from 11% (regional estimate from 2009 UMIS) to 43%. Final results are expected in late 2011.

#### *Routine information system strengthening*

The HMIS was revised in 2010 to include updated indicators on morbidity and mortality of key diseases including malaria. The HMIS is the main source of data for the NMCP to track health facility level malaria data; unfortunately, only a few malaria indicators were added to the monthly HMIS report during this last revision. However, the weekly epidemic surveillance tool includes many more indicators on malaria, including diagnostic and treatment practices and ACT stock status. This tool is the basis of the IDSR, a weekly summary of potential epidemic diseases. PMI and other USG partners, including significant PEPFAR support, have supported strengthening of the HMIS system at both national and district level. This has led to increased reporting, but there are still significant gaps in data quality, timeliness, completeness, and usage at all levels. PMI has also supported strengthening at all levels, including training on the HMIS tools at health facility and district level; provision of information technology support at district and national levels to improve reporting; training on and revision of the NMCP database to track HMIS and malaria interventions; and secondment of an M&E specialist to the NMCP (support for this position ends at the closure of FY 2011). To date, 3,491 health workers have been trained on the new tools and 1,179 manuals and tools have been printed and disseminated for use. Sixty five percent of the PMI-supported districts report on a timely basis and 89% provide complete data.

#### *Implementing partner monitoring and evaluation*

PMI contributes to the support of a USAID/Uganda Mission-wide data collection mechanism for all implementing partners. This project assists partners to develop performance management plans, collect data and conducts data quality assessments. The data collected helps the USG assess collective efforts in the health sector, of which PMI is a key player.

#### Proposed PMI activities with FY 2012 funding: (\$2,375,000)

PMI will continue to build on the support it has previously given through NMCP to strengthen the HMIS. Until the HMIS is fully functional, PMI will continue to support sentinel site surveillance in order to provide that timely, accurate data on in- and outpatient malaria. In addition, PMI will continue its support to the NMCP M&E unit and provide technical and financial assistance for the second national Malaria Indicator Survey. Cross-sectional data will provide key information on asymptomatic and symptomatic parasitemia (and anemia), while health facility data will provide data on symptomatic patients seeking care; the combination provides a comprehensive picture of the malaria burden in Uganda. PMI continues to collaborate with other donors and partners (including DfID) to pool support for key M&E activities.

- **Support sentinel sites:** PMI will continue support for the six existing in-patient and six outpatient sentinel sites (\$400,000);
- **Support for strengthening routine systems in Central/Western/Northern Uganda:** In the Central/Western regions, PMI will continue the work started in FY 2009, to support data collection and analysis at district level. Specific activities will include printing of HMIS tools for both health facility and district reporting and in-service support on data analysis at both health facility and district level to demonstrate and reinforce the utility of data collection. In the Northern Region, the work already done to strengthen HMIS in the Central Region and planned for this year will be condensed into

one year in order to obtain high quality data from health facilities in the north, where significant investment from PMI and USAID/Uganda is placed. Training, provision of tools (printed and information technology) and supervision will be provided.(\$550,000);

- **PMI-specific M& E:** PMI will continue to support the USAID/Uganda Mission project to serve as the central data collection point for all PMI implementing partners and conduct data quality assessments for selected indicators (\$100,000);
- **2013 Malaria Indicator Survey:** PMI will support the next MIS to provide regional and national-level data on anemia, parasitemia and coverage of key malaria interventions. Districts will provide another community level, cross-sectional data point that will provide further information on how best to move forward with IRS and try to understand why parasitemia remains high despite high levels of intervention coverage. (\$1,200,000);
- **Strengthening the M&E unit at NMCP:** PMI will continue support to further strengthen the NMCP to collect, analyze and report on the progress of malaria prevention and control interventions and the impact on malaria morbidity and mortality. This includes support for management of the central level databases (including possible support to the MOH Resource Centre, in charge of the HMIS) and capacity building for data analysis and reporting. This will include provision of limited equipment, training on data analysis and technical assistance (\$100,000); and
- **2 TDYs from CDC-Atlanta:** CDC staff will provide technical support for M&E activities, including the HMIS, MIS, sentinel sites, and operations research projects (\$25,000).

## **HEALTH SYSTEMS STRENGTHENING (HSS) AND CAPACITY BUILDING**

### Background

The weak health system in Uganda is a significant impediment to successful malaria control. The PMI-supported MPR found that weak systems were a major obstacle to malaria services planning, implementation, and monitoring at all levels of the health system. Inadequate financing, organization, and coordination; lack of human resources (including the capacity of existing personnel), infrastructure, and commodities; and poor leadership and governance remain major challenges.

With only 56% of established posts filled in health facilities, and an inequitable distribution of the health workforce, Uganda struggles to provide high quality services in all parts of the country, especially the hard to reach and rural areas. Unsatisfactory performance, absenteeism and low productivity of health workers coupled with frequent stock outs of essential medicines has resulted in under-utilization and poor quality of health services. While USAID programs support technical assistance to improve human resources for health in the country, due to multiple factors, including lack of political will and flat line wage bill ceilings, the systemic challenges in recruitment, retention, and effective and efficient human resource management continue at the service delivery

levels. While all facilities offer malaria treatment services, availability of functional laboratory diagnostic capacity is limited to 50% of health facilities.

The private sector continues to play an important role in the delivery of health services in Uganda, with more than half of the population seeking care from private sector as their first point. More importantly, the PNFP sector provides services in many rural and hard to reach areas.

NMCP has limited capacity in coordinating among the different partners (donors, implementing partners, zonal and district malaria focal persons and health facilities) as well as among the different interventions led by the NMCP malaria focal persons. Engagement of the NMCP with the various planning and decision making processes within the MOH is limited, which results in missing opportunities for priority setting. As a result, progress in malaria control in Uganda is limited, with overlapping coverage in some areas and no or poor coverage in others, inadequate data sharing for partners to monitor progress, and poor utilization of existing resources.

#### Progress in the last 12 months

Recognizing these gaps, PMI, USAID/Uganda, PEPFAR, and the GOU have increased the emphasis on health system strengthening. PMI plans to continue to provide direct support to health system strengthening via its own programs and integrated support with other USAID/Uganda and external partners.

In collaboration with PEPFAR and other USAID health programs, PMI supports improving workforce policy and planning through strengthening human resource information systems; supporting development and implementation of evidence-based human resources strategies; strengthening human resource units within MOH, local government and NMCP; advocating for policies that increase workforce retention and productivity; and developing in-service and pre-service training plans aligned to the actual needs.

Technical competence in the health sector and in NMCP remains weak in Uganda. In the last two years, PMI has supported capacity strengthening at the NMCP to enhance its leadership role and management functions. For example, PMI seconded an M&E specialist to the NMCP who has strengthened the link between the NMCP and the MOH Resource Center (HMIS), which has improved data access and use by the program. Support has been given to the NMCP to refine their organogram and create detailed job descriptions for all staff members.

In addition, CDC has a fellowship program with Makerere University focused on building a cadre of public health specialists with strong research, services management, and epidemiology and disease outbreak investigation skills. PMI will invest in supporting two fellows in the CDC's Field Epidemiology and Laboratory Training Program (FELTP); these fellows will propose their malaria-specific activities and PMI and NMCP will see how best to support them at either national or district level. Priority will be given to qualified NMCP or district malaria focal persons.

In addition to strengthening the public health system, PMI support to the private sector has led to increased private sector involvement in malaria control through the creation of a pool of six private marketers of LLINs, a robust social marketing platform for malaria products including nets and ACTs, and the engagement of at least 15 major corporations to invest their own funds to provide

malaria services to both their workers and surrounding communities. PMI has also supported efforts to strengthen the role of civil society in malaria control through its support to the Malaria Communities programs and the Malaria and Childhood Illness NGO Secretariat (MACIS), which is a coalition of civil society organizations, engaged in malaria and/or integrated management of childhood illnesses interventions in Uganda.

Capacity-building of the NMCP is continuously supported in by the two PMI Senior Technical Advisors and two Malaria Program Management Specialists on all aspects of malaria control activities and programming. These advisors have played key roles in the country's malaria technical working groups. Since 2008, PMI has also equipped the NMCP with computers and accessories, scanners and photocopiers. PMI also supports four quarterly RBM/NMCP partner review meetings each year and two technical working group meetings on malaria laboratory diagnostics and ITNs. PMI through USAID's human resources for health program has initiated the implementation of comprehensive support to strengthen the functions of NMCP.

Proposed PMI activities with FY 2012 funding: (\$575,000)

- **Capacity building support to NMCP:** PMI will continue to support the NMCP to strengthen coordination with malaria stakeholders through RBM coordination meetings, supportive supervision for district level program implementation, and public symposia to share program updates, challenges and best practices. PMI will also continue targeted support to NMCP to improve its ability to carry-out its managerial and operational responsibilities (\$50,000);
- **Field Epidemiology and Laboratory Training Program (FELTP):** PMI will support strengthening of national capacity for program planning, management and monitoring through practical field placements of recent graduates in well-performing malaria programs where they can be mentored by experienced program managers (both GOU and NGOs). Through these placements, the graduates will receive on-the-job training. This new initiative will fund two students to follow the malaria track in CDC's two-year Field Epidemiology and Laboratory Training Program (FELTP) in partnership with Makerere University School of Public Health (\$100,000);
- **Human resources for health:** PMI will support the USAID/Uganda sector-wide initiative to address human resource shortages and develop the capacity of the health workforce at national and district level. This support will help prioritize the recruitment, retention, and performance of health workers who will address the highest burden health issues in Uganda, including malaria. USAID/Uganda's human resource technical assistance program will also work with other USAID-supported partners to ensure proper human resource planning at the district level. PMI's investment leverages over \$2 million of PEPFAR and other USG health investments for this area of HSS (\$300,000);
- **Peace Corps / PMI collaboration** PMI will support Peace Corps Volunteers and their counterparts working at the community level through trainings and placement with PMI implementing partners to strengthen their skills in malaria control and prevention (\$25,000) and;

- **Support to pre-service training:** PMI will support updating the curriculum for malaria case management in key institutions that train clinical staff. This will include each cadre of health worker potentially addressing malaria (doctors, clinical officers, different levels of nurses, midwives). Once the curriculum is developed, it will be rolled out to the schools across Uganda (\$100,000).

## **INTEGRATION WITH OTHER GLOBAL HEALTH INITIATIVE PROGRAMS**

As part of the GHI, the USG has developed an expanded PMI strategy prioritizing integration of malaria prevention and treatment activities with maternal and child health, HIV/AIDS, neglected tropical diseases, and tuberculosis programs; strengthening host country health systems to ensure sustainability; and ensuring a women-centered approach for malaria prevention and treatment activities at both the community and health facility levels.

In Uganda, PMI will contribute to the goals of the GHI by:

- Supporting health systems strengthening efforts, including:
  - a. Strengthening supply chain management for health commodities at the central, regional, and district level (costs included under the Pharmaceutical Management section);
  - b. Addressing human resources for health and developing the capacity of the health workforce at national and district level (costs included under the Health Systems Strengthening and Capacity Building section);
  - c. Strengthening the quality and timely use of HMIS data (costs included under the M&E section);
- Supporting integration of malaria control in MCH and PMTCT programs to promote a harmonized approach for district-based health delivery (costs included under the Case Management section);
- Improving the quality and use of ANC through integrated support for FANC (costs included under the IPTp section);
- Working with PEPFAR to improve laboratory diagnostic capacity through the development of QA/QC systems along with training and supervision (costs included under the Diagnostics section);
- Continued support with HIV/AIDS, and tuberculosis programs for public-private partnerships (cost sharing with private companies) and capacity building (costs included under the IPTp and Case Management section);
- Continued support for integrated supportive supervision of health workers at central and district level (costs included under the Case Management section); and
- Continued support for integrated vector control (i.e. plague, yellow fever, etc.).

## **STAFFING AND ADMINISTRATION**

PMI staff in Uganda is comprised of two Malaria Technical Advisors (one CDC and one USAID), who provide oversight to all PMI-related activities in Uganda, and two USAID Project Management Specialists who support the management and administration of PMI activities. The PMI team is situated within the USAID/Uganda Health Team, with the Health Team Leader involved in strategic

planning, budgeting, cross-cutting issues, and linkages with broader Development Objective 3 (DO3) and Mission efforts. The Health Team is a part of DO3, which coordinates health, HIV, and education efforts to improve the health and education status of Ugandans.

All PMI staff members are part of a single interagency team led by the USAID/Uganda Mission Director. The PMI team shares responsibility for development and implementation of PMI strategies and work plans, coordination with national authorities, management of collaborating agencies and supervision of day-to-day activities. Candidates for these positions (initial hires or replacements) are evaluated and interviewed jointly by USAID and CDC. Both agencies are involved in hiring decisions, with the final decision made by the individual agency.

The PMI team oversees all technical and administrative aspects of PMI, including project design, managing malaria prevention and treatment activities, M&E of outcomes and impact, and reporting of results. All technical activities are undertaken in close coordination with the MOH/NMCP and other national and international partners, including the WHO, UNICEF, the Global Fund, DfID, private stakeholders, and district officials. PMI also collaborates closely with other Mission colleagues on cross-cutting issues and ensures that PMI activities are well-coordinated with U.S. Mission goals for sustainable development in Uganda; and to ensure a cohesive approach to the GHI principles. Staff members from CDC and USAID headquarters provide additional technical support to the Uganda-based PMI team and, when needed, provide on-site technical assistance.

Proposed PMI activities with FY 2012 funding: (\$1,977,500)

- **Management of PMI:** Support two PMI Malaria Technical Advisors (one USAID and one CDC) based at the USAID Mission in Kampala, including all work-related expenses (e.g., travel, supplies), and two Project Management Specialists. Forward funding was provided for CDC administrative costs in the amount of \$182,553 in FY 2011 (those funds have been subtracted from the FY 2012 costs here) (\$1,977,500).

## ANNEX

**MOP FY 2012 TABLE 1**

<b>Partner Organization</b>	<b>Geographic Area</b>	<b>Activity</b>	<b>Total Budget</b>
TBD IRS	Acholi and Lango regions	Two rounds of spraying in ten districts i.e. Kitgum, Lamwo, Pader, Agago, Apac, Kole, Oyam, Gulu, Amuru and Nwoya	\$14,250,000
Girls' Education Monitoring System (GEMS)	Acholi and Lango regions	Environmental Monitoring Oversight	\$40,000
DELIVER	National	LLIN, ACT, SP and RDT procurement	\$7,920,000
Centers for Disease Control and Prevention (CDC)	National	TDYs + staffing and administration - excluding forward funding from FY 2011	\$480,500
STOP Malaria Project (SMP)	South, Eastern and Western regions	LLIN distribution, IPTp strengthening in the public sector, strengthen diagnostic capacity, supportive supervision for case management and IEC/BCC, support to routine data systems, program monitoring and tracking system development	\$3,993,750
TBD	Acholi and Lango regions	LLIN distribution, IPTp strengthening in the public sector, and supportive supervision for case management	\$503,750
STRIDES for Family Health (STRIDES)	Eastern, Central and Western regions	LLIN distribution and IPTp strengthening in the public sector	\$227,500
Uganda Health Marketing Group Ltd (UHMG)	Acholi and Teso regions	IPTp and diagnostic capacity strengthening in the private sector; build capacity of private sector health care provision in Apac, Katakwi, Kumi, Soroti, Serere and Ngora districts	\$650,000
Health Initiatives for the Private Sector (HIPS)	National	Strengthen IPTp and malaria diagnostic capacity in the private sector	\$100,000
Securing Ugandan' Right to Essential Medicine (SURE)	National	Pharmaceutical supply chain strengthening at central, regional and district levels	\$800,000
Uganda Malaria Surveillance Project (UMSP)	National	Sentinel sites and diagnostic training	\$950,000

TBD	National	PMI data collection, dissemination, reporting, DQAs and partner meetings.	\$100,000
World Health Organization (WHO)	National	Epidemic preparedness and response	\$50,000
TBD-HMIS	Acholi and Lango regions	Support for routine systems in all public health facilities in Lira, Pader and Apac	\$250,000
TBD-MIS	National	Support Malaria Indicator Survey 2013	\$1,200,000
CAPACITY Project	National	Integrated supportive supervision through leadership training at district levels	\$300,000
Peace Corps	National	Malaria awareness training for PCVs and community counterparts	\$25,000
USAID	National	Staffing and administration	\$1,659,500
<b>Total</b>			<b>\$33,500,000</b>

**MOP FY2012 ACTIVITY TABLE**

<b>Proposed Activity</b>	<b>Mechanism</b>	<b>Total Budget</b>	<b>Commodities</b>	<b>Description of Activity</b>	<b>Geographic area</b>
<b>PREVENTION</b>					
<b>IRS</b>					
Support for IRS in northern Uganda districts	TBD IRS	\$13,500,000	\$8,500,000	Two rounds of spraying in ten districts of the Acholi and Lango regions	10 districts in the Acholi and Lango regions
Entomological surveillance and monitoring	TBD IRS	\$350,000	\$75,000	Maintain six entomological sentinel sites for entomological surveillance and monitoring; resistance monitoring every year, and vector bionomics every year	National
Develop local capacity to expand and sustain IRS	TBD IRS	\$150,000		Capacity development of GOU - NMCP, NEMA, and district governments to plan, manage and oversee technical quality, environmental monitoring and accountability of IRS programs in Uganda	National
Support national level malaria risk mapping, development of evidence-based rational vector control strategy and transition plan for IRS in northern Uganda	TBD IRS	\$250,000		Support the NMCP to update the malaria risk map using epidemiological, entomological and other relevant data and develop a rational vector control strategy for the country. PMI will support the NMCP to perform similar in-depth micro level analysis to assess the vector control program in northern Uganda and develop a strategy on how best to deploy IRS and ITNs.	National and 10 districts in the Acholi and Lango regions
Environmental Monitoring Oversight	GEMS (Global Environmental Monitoring Support)	\$40,000		Joint independent environmental monitoring with NEMA to oversee the safe use of insecticides	10 districts in the Acholi and Lango regions
2 TDYs	CDC	\$25,000		Technical assistance visit for planning and monitoring entomological, vector control activities, and supervision of IRS activities	National
<b>Subtotal</b>		<b>\$14,315,000</b>	<b>8,575,000</b>		
<b>LLINs</b>					

Procurement of LLINs	DELIVER (Procurement)	\$5,500,000	\$5,500,000	Procure 1,000,000 nets	National
Distribution of free LLINs through ANC clinics in central/eastern/western regions	STOP Malaria Project (SMP)	\$1,212,500		Distribute free LLINs to pregnant women in SMP districts (estimated pregnant women: 685,358); evaluation of the culture of net use; and develop and pilot net care and repair BCC methods.	34 districts: central/eastern/western regions
Distribution of free LLINs through ANC clinics in northern region	Northern Uganda Malaria, AIDS and Tuberculosis (NUMAT) follow-on	\$217,500		Distribute free LLINs to pregnant women in northern Uganda districts (estimated pregnant women: 136,032)	15 mid-northern districts in the Acholi and Lango regions
Distribution of free LLINs through ANC clinics in nine non-SMP districts	STRIDES for Family Health (STRIDES)	\$195,000		Distribute free LLINs to pregnant women in nine STRIDES districts (estimated pregnant women: 124,017)	9 non-SMP districts in central/eastern/western regions
<b>Subtotal</b>		<b>\$7,125,000</b>	<b>\$5,500,000</b>		
<b>IPTp</b>					
Malaria in pregnancy services in central/eastern/western regions	SMP	181,250		Includes provision of safe water and cups to aid with DOT, training, IEC/BCC and support supervision	34 districts: central/eastern/western regions
Malaria in pregnancy services in northern region	TBD	36,250		Includes provision of safe water and cups to aid with DOT, training, IEC/BCC and support supervision	15 mid-northern districts in the Acholi and Lango regions
Malaria in pregnancy services in 8-non-SMP districts in central/eastern/western regions	STRIDES	32,500		Includes provision of safe water and cups to aid with DOT, training, IEC/BCC and support supervision	8 non-SMP districts in central/eastern/western regions
Provide comprehensive malaria in pregnancy services at ANC clinics in the private sector	Uganda Health Marketing Group (UHMG)	\$100,000		Promote IPTp through training of health workers in small to medium private sector health clinics in order to enable them to promote a comprehensive package for IPTp, early detection of malaria during pregnancy, and offer directly observed treatment	National

Provide comprehensive malaria in pregnancy services at ANC clinics in the private sector	Health Initiative in Private Sector (HIPS)	\$50,000		Support training and service delivery of comprehensive IPTp services and case management using matching funds with larger private companies using their corporate social responsibility programs	National
<b>Subtotal</b>		<b>400,000</b>	<b>\$0</b>		
<b>Subtotal: Prevention</b>		<b>\$21,840,000</b>	<b>\$14,075,000</b>		
<b>TREATMENT</b>					
<b>Diagnosis</b>					
Procure malaria diagnostic commodities	DELIVER	\$1,300,000	1,300,000	Support procurement of diagnostics and supplies	National
Support integrated malaria diagnostic trainings, roll out of RDTs and QA/QC at health centers	Uganda Malaria Surveillance Project (UMSP)	\$550,000		Support roll out and use of RDTs at HCs II and IIIs, and microscopy training at HCs III and IV and referral hospitals to provide district-wide coverage	West Nile , South West regions
Support integrated malaria diagnostic trainings, roll out of RDTs and QA/QC at health centers	SMP	\$400,000		Support roll out and use of RDTs at HCs II and IIIs, and microscopy training at HCs III and IV and referral hospitals to provide district-wide coverage	Northern/Karamoja, central and southern regions
Support improved diagnostics in the private sector	UHMG	\$200,000		Support training of laboratory staff in private clinics (not associated with large companies) on RDTs and microscopy	National
Support improved diagnostics in the private sector	HIPS	\$50,000		Support training on the use of RDTs in the private sector through existing partnerships with 15 companies providing health care for their employees and surrounding communities	Partner companies nationwide
1 TDY	CDC	\$12,500		Technical assistance to strengthen diagnostics	National

<b>Subtotal</b>		<b>\$2,512,500</b>	<b>\$1,300,000</b>		
<b>Case Management</b>					
Procure malaria commodities	DELIVER	\$1,120,000	1,120,000	Support procurement of drugs including ACTs, SP, severe malaria drugs and supplies for the treatment of malaria	National
Support private sector providers and their networks, and increase the role of district health officials in providing support and supervision	UHMG	\$250,000		Support professional associations such as Uganda Private Medical Practitioners Association, Uganda Private Midwives Association, and Drug Shop Owners' Association to network among their members and to provide them with training, supervision and regulation. District level task forces will be organized to support regulation, supportive supervision, and data collection	National
Strengthen case management in health facilities	SMP	\$1,100,000		Strengthen case management for uncomplicated and severe malaria in public and private health facilities including in-service training, supportive supervision and job aids in 34 districts. This activity will be integrated with other disease support supervision (HIV, TB, MCH, FP, etc.)	National
Support integration of malaria case management in maternal and child health services	TBD	\$250,000		Support integration of malaria case management and IPTp into USAID supported maternal and child health programs in 15 districts	Northern Uganda
Leverage support to large corporations	HIPS	\$0		Continue support to 100 facilities operated by large companies with matching funds to serve employee families and neighboring communities (costs included under ITNs, IPTp, and diagnosis)	National

<b>Subtotal</b>		<b>\$2720,000</b>	<b>\$1,120,000</b>		
<b>Pharmaceutical management</b>					
Pharmaceutical supply chain management	SURE	\$800,000		TA to MOH, National Medical Stores, and Joint Medical Stores for improved quantification and forecasting, procurement, warehousing, distribution, LMIS and reporting plus expansion to district level. Provide support to NDA for quality assurance and post-marketing surveillance.	National
<b>Subtotal</b>		<b>\$800,000</b>			
<b>Drug resistance monitoring</b>					
Biannual drug resistance monitoring	UMSP	\$0		Support biannual monitoring of drug resistance of first-line anti-malarials to monitor continued effectiveness.	
<b>Subtotal: Treatment</b>		<b>\$6,032,500</b>	<b>\$2,420,000</b>		
<b>Cross-cutting activities</b>					
IEC/BCC	SMP	\$550,000		Includes all types of IEC/BCC at district level	National
IEC/BCC	UHMG	\$100,000		Support national BCC campaign to re-enforce the role of small and medium private health providers, and work through mass media to create demand for malaria prevention and treatment services	National
<b>Subtotal</b>		<b>\$650,000</b>			
<b>Epidemic Preparedness and Response</b>					
Epidemic preparedness and response	WHO	\$50,000		Support IDSR activities including training staff in epidemic-prone regions; support national task force and district task forces to meet regularly, evaluate data in a timely manner, and respond to suspected/confirmed outbreaks	National
<b>Subtotal</b>		<b>50,000</b>			
<b>Monitoring and Evaluation</b>					

Strengthen sentinel sites	UMSP	\$400,000		Collect and monitor in- and outpatient data on malaria-related cases and fatalities in established surveillance sites.	National
Support to routine data systems at district level in Central/Western Uganda	SMP	\$300,000		Support M&E of malaria activities in the district - specifically data analysis at facility and district level	Central/Western regions
Support for routine systems at district level in Northern Uganda	TBD	\$250,000		Intense strengthening of routine data systems at health facility level	Acholi and Lango regions
Continued support to monitoring and evaluation management systems	TBD	\$100,000		PMI data collection, dissemination, reporting, DQAs and partner meetings, etc.	National
Malaria Indicator Survey 2013	TBD	\$1,200,000		Including IRS districts	National
Strengthen NMCP M&E unit	SMP	\$100,000		Supportive supervision, sustain databases for NMCP to track programmatic progress in key malaria intervention areas including a focus on IEC/BCC M&E	National
2 TDYs	CDC	\$25,000		Technical assistance visits for sentinel site surveillance, HMIS and MIS	National
<b>Subtotal</b>		<b>\$2,375,000</b>			
<b>Health systems strengthening and capacity building</b>					
Capacity building support to NMCP	SMP	\$50,000		Equipment, coordination of partner meetings	National
Field Epidemiology and Laboratory Training Program (FELTP)	CDC	\$100,000		Building on PEPFAR support in FY11, support one FELTP student to support program planning, management and monitoring in the M&E unit of the NMCP	National
Support sector-wide capacity building initiative to address human resource shortages, and develop the capacity of the health workforce at national and district level	CAPACITY PROJECT	\$300,000		Support the sector-wide capacity building initiative to prioritize recruitment, retention, and performance of health workers who will address the highest burden health issues in Uganda, including malaria	National

Peace Corps malaria program	Peace Corps	\$25,000		Support malaria awareness training for Peace Corps Volunteers (PCVs) and their counterparts	National
Support to pre-service training	SMP	\$100,000		Update curriculum for malaria case management in key institutions	National
<b>Subtotal</b>		<b>\$575,000</b>			
<b>Staffing and Administration</b>					
CDC Management	CDC	\$318,000		Management, CDC RA's salary. Forward funding of \$182,553 from FY 2011 was provided to cover a portion of FY 2012 costs (have been excluded here)	National
USAID Management	USAID	\$1,659,500		Includes management, CDC Resident Advisor's ICASS costs	National
<b>Subtotal</b>		<b>\$1,977,500</b>	<b>\$0</b>		
<b>GRAND TOTAL</b>		<b>\$33,500,000</b>	<b>\$16,495,000</b>		