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

PRESIDENT'S MALARIA INITIATIVE

UGANDA

Malaria Operational Plan for FY 2009
FINAL

Submitted November 12, 2008

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ABBREVIATIONS

ACT	artemisinin-based combination therapy
AL	artemether-lumefantrine
ANC	antenatal care
BCC	behavior change communication
CDC	Centers for Disease Control and Prevention
CMD	community medicine distributors
DDT	dichloro-diphenyl-trichloroethane
DFID	United Kingdom Department of International Development
DHS	Demographic and Health Survey
DOT	directly observed treatment
DSS	demographic surveillance system
EPI	Expanded Program on Immunization
ESR	epidemic surveillance and response
FANC	Focused Antenatal Care
FY	fiscal year
Global Fund	Global Fund to Fight AIDS, Tuberculosis, and Malaria
GOU	Government of Uganda
HBMF	home-based management of fever
HC	health center
HIPS	Health in the Private Sector project
HMIS	health management information system
HPAC	Health Policy Advisory Committee
IDP	internally displaced person
IEC	information, education and communication
IPTp	intermittent preventive treatment in pregnancy
IRS	indoor residual spraying
ITN	insecticide-treated net
JICA	Japanese International Cooperation Agency
JUMP	Joint Uganda Malaria Program
LLIN	long-lasting insecticide-treated net
M&E	monitoring and evaluation
MEMS	Monitoring and Evaluation Management Systems
MIS	Malaria Indicator Survey
MOH	Ministry of Health
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
PMP	performance monitoring plan
PMTCT	prevention of mother to child transmission (of HIV)
RBM	Roll Back Malaria
RDT	rapid diagnostic test
RHU	Reproductive Health Unit
SP	sulfadoxine-pyrimethamine

UMSP	Uganda Malaria Surveillance Project
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USG	United States Government
WHO	World Health Organization

EXECUTIVE SUMMARY

In June 2005, Uganda was selected as one of the first three countries to benefit from the President's Malaria Initiative (PMI). The goal of this Initiative is to rapidly scale-up malaria prevention and treatment in 15 high burden sub-Saharan African countries and reduce malaria mortality by 50% by 2010.

Uganda's leading cause of morbidity and mortality is malaria, which is endemic in 95% of the country. Estimates show that malaria accounts for about 25-40% of outpatient visits to health facilities and the annual number of deaths attributable to malaria ranges from 70,000 to 100,000. Pregnant women and children under five years of age are the most affected by malaria and the disease is responsible for nearly half of inpatient pediatric deaths. With the support of PMI and other donors, Uganda is tackling this problem, and seeing early indications of success through its health management information system and other surveys.

Uganda has a comprehensive malaria control program, utilizing all proven strategies to prevent and treat malaria. The PMI strategy and indicators mirror closely those of the Government of Uganda (GOU), and the strong partnership of PMI with the Government is one of the hallmarks of this successful program. To prevent malaria, PMI Uganda has three components - long-lasting insecticide-treated nets (LLINs), indoor residual spraying (IRS), and intermittent preventive treatment of malaria in pregnant women (IPTp). To treat malaria, PMI supports improved case management through home-based management of fever (HBMF) and improved service delivery through improved supply chain management, training of health care providers, quality control of antimalarials, improved diagnosis, and supportive supervision. Other elements of the program include strengthening monitoring and evaluation and supporting epidemic surveillance and response to malaria.

The most current information about nationwide coverage of key malaria prevention and control measures comes from a nationwide Demographic and Health Survey conducted in mid-2006, which also serves as the PMI baseline. According to this survey, 19% of households nationwide owned one or more insecticide treated net (ITNs) and 10% of pregnant women and children under five had slept under an ITN the night before the survey. The proportion of children under five treated with an antimalarial drug within 24 hours of onset of fever was 29%. Only 1% of patients received an artemisinin-based combination therapy (ACT), but it should be noted that this survey was completed prior to the introduction of ACTs in Uganda. The proportion of pregnant women receiving the recommended two doses of sulfadoxine-pyrimethamine (SP) was 16%. A malaria indicator survey planned for 2009 will provide updated information on progress towards targets and serve as a mid-point survey for PMI.

The following table shows Year 3 targets and the early implementation activities supported by PMI:

Proposed Year 3 Targets (PMI and partners)	**Expected Results after 3 Years of Implementation** (March 2009)
Spray 795,000 houses in northern and southwestern Uganda, covering approximately 2 million persons	By September 2008, IRS was completed Kitgum, Gulu, Apac, and Oyam, covering approximately 416,000 houses and protecting a population of over 1.8 million (achieving coverage of greater than 90%). By March 2009, three additional districts (Pader, Kabale, and Kanungu) will be sprayed, covering approximately 260,000 more houses and protecting 1.1 million more residents.
Procure and distribute 750,000 LLINs through mass campaigns, antenatal clinics, and faith-based and community-based organizations	By March 2008, 879,998 PMI-funded LLINs either have been or will be distributed through various channels.
Increase the percentage of pregnant women receiving two doses of SP to 40%	Sufficient stocks of SP for MOH-procured IPTp exist in country. PMI supported development and distribution of 3,000 wall charts, gestational wheels, clean water and cups to health facilities to administer SP. PMI is also supporting a change in policy for IPTp for consistency with WHO guidelines.
Support transition to community-based distribution of ACTs to increase coverage of children under five with fever receiving antimalarial drugs within 24 hours to 40%	PMI supported the pilot use of AL in HBMF in three northern Uganda districts, and the subsequent roll-out of HBMF in nine conflict-affected districts of northern Uganda through provision of 11,831 HBMF kits and training of over 500 health workers in 25 districts to provide supervision to community medicine distributors.

In its fourth year, PMI/Uganda continues to grow and develop its program to achieve its targets. PMI will continue to support existing National Malaria Control Program (NMCP) strategies and plans and will coordinate with international and national partners to complement their funding and efforts. To achieve the goal and targets of PMI in Uganda, the following major activities were agreed upon after discussions with NMCP/MOH and all Roll Back Malaria partners:

Indoor Residual Spraying and Vector Control

PMI has supported a phased-in approach to IRS in Uganda since 2006, scaling up IRS from one district in 2006 to eight districts in 2008. To date, nearly 750,000 households have been sprayed and over 4 million people protected from malaria. Coverage of targeted districts has remained consistently high at over 90%.

In FY09, PMI will continue to support IRS in six highly endemic districts of Uganda (Kitgum, Pader, Apac, Oyam, Gulu, Amuru) and selective IRS in two epidemic-prone districts (Kabale and Kanungu). Approximately 785,000 households will be sprayed and over four million people will be protected. PMI will continue to monitor vector resistance and potential environmental impacts of IRS, as well as build capacity within the Ministry of Health to conduct and monitor IRS.

As a new strategy in its fourth year, PMI will dedicate funding to build the capacity of the public sector to oversee quality IRS programs in accordance with GOU policy and guidelines. It is hoped that this activity will make Uganda more eligible for an IRS grant through the Global Fund to Fight AIDS, Tuberculosis, and Malaria.

Insecticide-treated nets

Since 2006, PMI has procured and distributed 2.2 million LLINs to pregnant women and children under five years of age through mass campaigns, antenatal care (ANC) clinics and non-governmental and community-based organizations. PMI has simultaneously promoted consistent and correct use of LLINs; early evidence suggests that high usage of LLINs is being achieved.

Considering the projected needs calculated by the NMCP and contributions from other donors, in Year 4 PMI will procure one million LLINs for free distribution to target populations through mass campaigns, antenatal clinics, non-governmental and community-based organizations, and private sector facilities. To ensure sustained proper net usage, PMI will use mass media and community mobilization strategies to increase knowledge. Through these efforts, PMI expects to increase household ownership of ITNs to 60%.

Intermittent preventive treatment of pregnant women

Although the NMCP of Uganda instituted the two-dose IPTp policy over nine years ago, baseline PMI data in 2006 indicates that only 16.2% of pregnant women received the correct dose. Currently, only 42 % of pregnant women attend an antenatal clinic at least two times during their pregnancy. To increase coverage of pregnant women receiving two doses of IPTp, PMI developed and distributed 3,000 malaria in pregnancy wall charts and gestational wheels to 3,000 health centers as job-aids. Over the past two years, nearly 1,400 health workers were trained in IPT and supportive supervision was provided to ANC workers in 29 districts. PMI also provided cups and drinking water for IPT Directly Observed Therapy in northern Uganda districts.

PMI will work with Ministry of Health to improve their IPTp policy in FY09, and will provide supportive supervision to ANC workers. PMI will also provide safe water so that women can take their SP under direct observation at the ANC clinics. In addition, PMI will provide ANC registers to improve record keeping. PMI expects to increase the percentage of pregnant women receiving two doses of SP to 60% in Year 4.

Case management

To improve malaria case management, PMI has invested in training, supervision of health workers, logistic support for community medicine distributors and ACT quality testing and availability. Over 8,100 health workers received refresher training on malaria case management together with supportive supervision and 329 health workers were trained on management of severe malaria in eight districts. In addition, PMI distributed 5,343 ACT charts and provided 11,831 HBMF kits and 1,200 registers for community medicine distributors in northern Uganda. To improve malaria diagnostics, laboratory training was conducted for 272 health workers. Finally, PMI provided technical assistance to the NMCP and National Medical Stores on pharmaceutical management of ACTs and logistic support to the National Drug Authority for quality testing of ACTs.

Because Global Fund grants are covering all needs for both ACTs and severe malaria drugs, PMI will not procure pharmaceuticals in Year 4, but will instead support their distribution to health facilities from the district level where needed. PMI will also support the national pharmaceutical supply chain system to promote better management and fewer stock-outs of malaria-related commodities. PMI continues to support improved diagnostics by expanding integrated training of laboratory technicians and clinical officers in microscopy, and in Year 4, will also help the NMCP to roll out its policy and guidelines on rapid diagnostic tests to ensure greater use at Health Center levels II and III. Support will be continued to the National Drug Authority for pharmacovigilance

and post-market surveillance of ACTs. At the end of Year 4, PMI expects that 50% of children under five with fever will receive antimalarial drugs within 24 hours of developing fever.

Monitoring and Evaluation (M&E)

To measure progress against the project goal and targets and help identify and correct problems in program implementation, PMI/Uganda is working with other Roll Back Malaria partners to develop a strong M&E program for malaria in Uganda. Currently ten sentinel sites are active in collecting data on malaria-related indicators.

In FY09, additional support will be provided for a national Malaria Indicator Survey (combined with a national AIDS Indicator Survey), improved data collection and analysis of sentinel sites, and strengthening the NMCP M&E unit, which includes development and maintenance of a vector control intervention tracking database. PMI's M&E plan is coordinated with the NMCP, Global Fund, and other partners to share resources and standardize data collection and reporting.

Budget Summary

The FY09 PMI budget for Uganda is $21.6 million, distributed as follows: 43% for IRS and general vector control, 30% for the procurement and distribution of LLINs, 3% for IPTp, 8% for case management, 7% for M&E, and 1% for capacity building. Of the total budget, 42% will be allocated toward the purchase of commodities.

INTRODUCTION

President's Malaria Initiative

In June 2005, the United States Government (USG) announced a five-year, $1.2 billion initiative to rapidly scale-up malaria prevention and treatment interventions in high-burden countries in sub-Saharan Africa. The goal of this Initiative is to reduce malaria-related mortality by 50% by the end of the program's implementation. This will be achieved by reaching 85% coverage of the most vulnerable groups – children under five years of age, pregnant women, and people living with HIV/AIDS – with proven preventive and therapeutic interventions, including artemisinin-based combination therapies (ACTs), indoor residual spraying (IRS), intermittent preventive treatment for malaria in pregnancy (IPTp), and long-lasting insecticide-treated nets (LLINs).

The President's Malaria Initiative (PMI) began in three countries (Angola, Tanzania, and Uganda) in 2006. In 2007, four countries (Malawi, Mozambique, Senegal, and Rwanda) were added. In 2008, the addition of eight countries (Benin, Ethiopia (Oromia Region), Ghana, Kenya, Liberia, Madagascar, Mali, and Zambia) raised the total number of countries covered by PMI to 15. Funding began with $30 million in Fiscal Year (FY) 06 for the initial three countries, increased to $160 million in FY07 and $300 million in FY08 and FY09, and is expected to reach $500 million for all 15 countries by FY10.

In implementing this Initiative, the USG is committed to working closely with host governments and within existing national malaria control strategies and plans. Efforts are coordinated with other national and international partners, including the Global Fund against AIDS, Tuberculosis, and Malaria (Global Fund), Roll Back Malaria (RBM), the United Nations Children's Fund (UNICEF), and non-governmental (NGO) and private sector organizations to ensure that investments are complementary and RBM and Millennium Development Goals can be achieved.

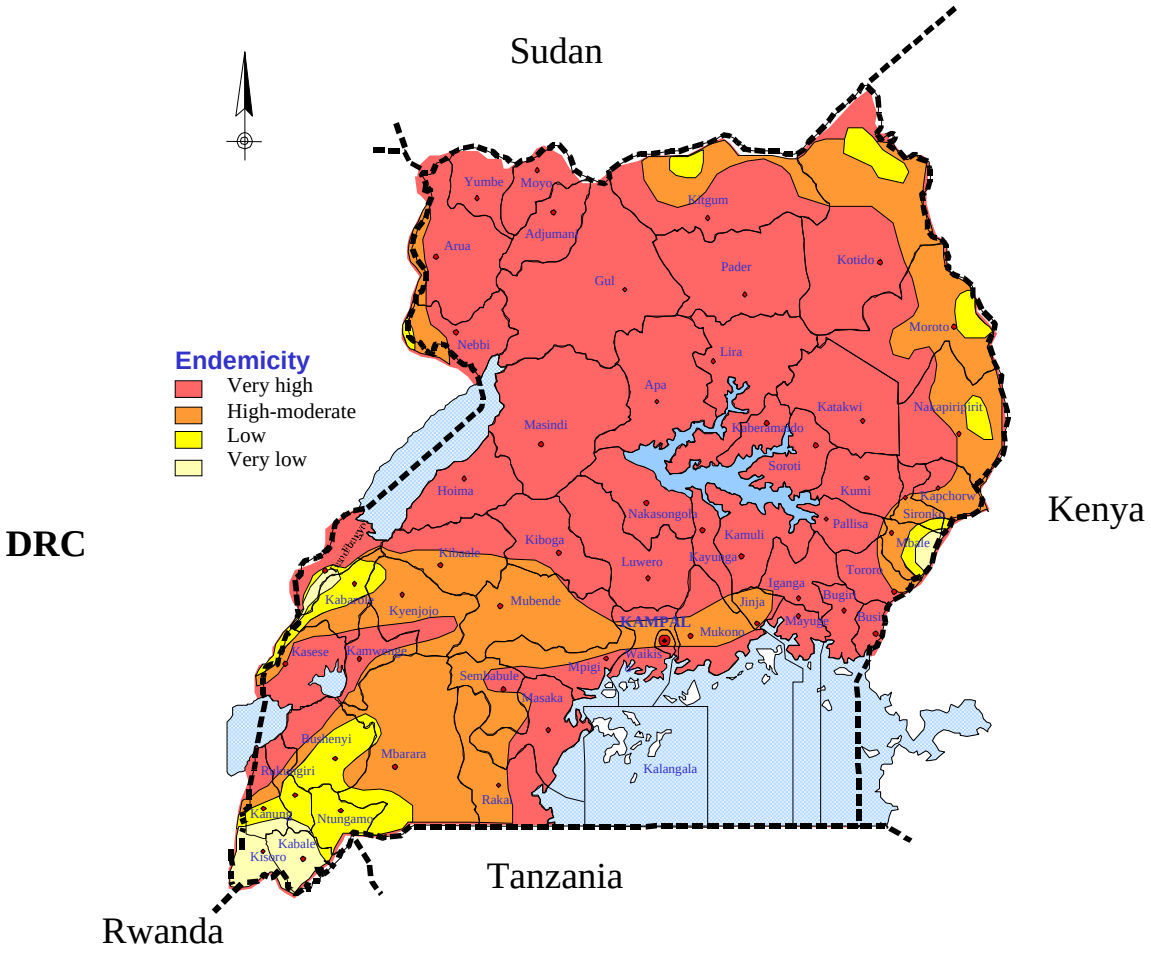
This document, developed in collaboration with the Government of Uganda (GOU) and other stakeholders, presents a detailed implementation plan for the fourth year of PMI in Uganda. It briefly reviews the status of malaria control policies and existing interventions supported by all partners in Uganda, identifies challenges and unmet needs to reach the targets of the PMI, and provides a detailed description of proposed Year 4 (FY09) PMI activities. The total amount of PMI funding requested for Uganda in FY09 is $21.6 million.

BACKGROUND

Malaria Situation in Uganda

Uganda's temperature and rainfall are sufficient to allow stable, year round (perennial) malaria transmission with relatively little seasonal variability. Malaria is highly endemic in 95% of the country, representing approximately 90% of the population of 29.4 million. In the remaining 5% of the country, namely in the highlands of the southwest, Midwest, and along the eastern border of Kenya and northeastern border of Sudan, malaria transmission is unstable and epidemic-prone. Malaria is the most reported disease both at public and private health facilities, causing high morbidity and mortality.

MALARIA ENDEMICITY IN UGANDA



Clinically-diagnosed malaria is the leading cause of morbidity and mortality in Uganda, accounting for 30-50% of outpatient visits at health facilities, 35% of hospital admissions, and 9-14% of hospital deaths. Nearly half of in-patient 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 (Uganda Malaria Control Strategic Plan 2005/6-2009/10). The NMCP estimates that the total number of fever cases for all ages was approximately 60 million in 2005. Of these cases, approximately 12 million were treated in the public and not-for-profit sector. Based on epidemiological estimates, children under five years suffer from three episodes of fever per year, and older children and adults suffer from two episodes per year. Clinically-diagnosed malaria cases reported through the HMIS declined from 12.8 million in 2004 to 8.4 million in 2006.

The most common malaria vectors in Uganda are *Anopheles gambiae s.l.* and *Anopheles funestus* with *A. gambiae* being the dominant species in most places. *A. funestus* appear with frequency in high altitude areas and during the short dry seasons 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. Within the *A. gambiae* complex, the predominantly anthropophilic *Anopheles gambiae s.s.* is by far most common. *Anopheles gambiae s.l.* and *A. funestus* are both highly endophagic and endophilic (feed and rest indoors), making ITNs and IRS preferable vector control strategies in Uganda.

Although all four species of the parasite exist in Uganda, *P. falciparum* is responsible for 90-98% of cases. *P. falciparum* has shown increasing resistance to both chloroquine and sulfadoxine-pyremethamine (SP) whether used separately as single therapy or together as a combination. The second most common species, *P. malariae*, accounts for 1-3% of cases as a mono-infection but is more commonly found as a mixed infection with *P. falciparum* (up to 16% of childhood infections in highly endemic areas). Both *P. vivax* and *P.ovale* are rare and do not exceed 1-1.5% of malaria cases.

Major Partners in Malaria Control

The Uganda National Malaria Control Strategic Plan follows the Roll Back Malaria Strategic Plan and the "Three Ones" principle: one national coordinating committee, one national malaria control plan, and one national monitoring and evaluation (M&E) plan. Although the Inter Country Coordinating Mechanism was originally the national forum for all stakeholders to coordinate malaria control plans and activities, the Health Policy Advisory Committee (HPAC) – chaired by the Principal Secretary of the MOH, and whose membership includes all MOH programs, health donor partners, and civil society – is now the main consultative policy-making body in health (including malaria). Decisions from this group are sent to the Senior Management Committee and the Top Management Team, chaired by the Minister of Health, for approval. Technical working groups report directly to HPAC. Malaria is part of the communicable diseases committee under the Basic Care Package Working Group. While this structure is in its infancy, with inconsistencies in meetings and reporting, coordination among malaria partners remains strong due in large part to the NMCP's active participation.

Since 2000, the Sector Wide Approach has served as the mechanism for development partners to coordinate their resources and includes both project and budget support. Development partners indicate their projected contributions for three to five years and these are reflected in the government Mid-term Expenditure Framework. Although most development partners channel at least part of their aid into budget support, the United States Agency for International Development (USAID) and the USG continue to provide project support rather than direct budget support. Partners providing budget support include the United Kingdom Department for International Development (DfID), the World Bank, the Danish, the Swedish, Irish Aid, the United Nations Children's Fund (UNICEF), WHO, Norway, the Italian Cooperation, the Japanese International Cooperation Agency (JICA), and the African Development Bank (ADB).

In addition to HPAC, the Senior Management Committee, and the Top Management Team, several other joint coordination, review, and monitoring mechanisms are in place, including various technical working groups and Health Donor Partners Group. There are joint district monitoring/supervisory visits (Area Team Visits), joint review missions to evaluate indicators, and bi-annual National Health Assemblies. The government and partners jointly agree on sector priorities, performance targets and the budget framework. Funds are disbursed by the Ministry of Finance, Planning and Economic Development to the MOH and districts for implementation of the agreed upon work plans.

The Global Fund is a signifigant source of funding for malaria programs in Uganda. Global Fund Rounds 2, 4 and 7 awarded grants totalling $212,100,635 over five years. The Round 2 Phase 1 grant for $23 million contributed to the scaling up of home-based management of fever (HBMF) to every district, organization of the first round of free ITN distribution and net re-treatment campaign, and start-up of an IRS program in three districts. As of February 2008, a total of

$21,054,781 had been dispersed under this grant. However, due to poor perfomance under Round 2 Phase 1, Phase 2 was not approved.

The $66 million Round 4 Phase 1 grant has allowed Uganda to introduce ACTs at the health facility level and will provide a sustained supply of ACTs until 2009. Implementation under this grant was temporarily suspended in September 2005, pending reorganization of the Project Management Unit. After concrete actions by the government to resolve this issue, the suspension was lifted. Drugs arrived in Uganda in the spring of 2006, including 15.5 million treatments of ACT for facility-based distribution. Most ($59,071,374) of the Round 4 Phase 1 grant has been disbursed, and Phase 2, intended for the roll-out of rapid diagnostic tests (RDTs) in 21 districts, has been approved.

A Round 7 proposal was submitted and approved in 2007 and signed in August 2008. The first disbursement is expected shortly. This grant will provide $125 million to procure and distribute LLINs, with the goal of achieving national coverage in five years.

Other sources of external funding for malaria programs in Uganda include UNICEF and WHO, which contribute about $500,000 annually. UNICEF contributed 237,000 LLINs in 2005/6, 300,000 LLINs in 2006/7 and 500,000 LLINs in 2007/8. DfID, through WHO, contributed $1 million worth of insecticide for IRS in Kitgum and Pader in May-July 2007. Dfid also contributed ACTs and supported malaria prevention activities, along with the Chinese Embassy.

UGANDA NATAIONAL MALARIA CONTROL PLAN AND STRATEGY

Uganda Malaria Control Strategic Plan 2005/06 – 2009/10

The Uganda National Malaria Control Strategic Plan, developed in 2005 in collaboration with RBM partners, defines Uganda's approach to malaria control. It is based on the principles and aims of the global RBM partnership, the Abuja Declaration, and the Millennium Development Goals. The plan serves as a framework for a broad partnership between the MOH, line ministries, civil society, NGOs, development partners and the private sector. The plan complements the broader five-year Health Sector Strategic Plan which features malaria as a high priority health and poverty issue. The NMCP's goal is that malaria will no longer be the major cause of illness and death in Uganda and that families will have universal access to malaria prevention as well as treatment.

The specific malaria control targets to be achieved by mid-2010 are:

- Increase the proportion of households having at least one insecticide-treated net (ITN) to 85% and households with at least two ITNs to 60%;
- Increase the proportion of children under five and pregnant women having slept under an ITN the previous night to 85%;
- Increase the number of districts covered by IRS (i.e. regular, high quality spraying of at least 85% of structures) to 15;
- Increase the proportion of children under five receiving correct treatment according to national treatment guidelines within 24 hours of onset of symptoms to 85%;
- Increase the proportion of pregnant women attending ANC services who have received the second dose of IPTp to 85%; and
- Reduce the case fatality rate among malaria in-patients under five years of age to 2%.

To accomplish these targets, the core interventions of the NMCP's Strategic Plan and their specific objectives include:

1. Prevention (Vector Control)
   - Rapidly go to national scale with ITNs in areas of moderate to very high malaria transmission using a mix of distribution mechanisms and to sustain a high coverage rate with continuous "replacement" distribution;
   - Increase the proportion of LLINs among all mosquito nets to a level that makes further re-treatment campaigns unnecessary;
   - Establish and sustain a system of annual (at a minimum), high quality IRS services that cover at least 85% of all targeted structures in areas of unstable transmission and pilot IRS in areas of stable transmission, scaling up where feasible; and
   - Complement ITN and IRS with selective environmental management (including larviciding) where a significant proportion of breeding sites can be identified and targeted and where measures can be sustained.

2. Case Management
   - Ensure universal access to ACTs including those accessing treatment through the commercial sector;
   - Enhance the prompt treatment of children under five within 24 hours of fever onset through the provision of home-based management of malaria fever using ACTs;
   - Reduce case fatality of severe malaria by establishing a system to provide highly effective pre-referral treatment (e.g. rectal artesunate) and improve the management capacity for severe malaria at health facilities and hospitals; and
   - Increase the proportion of malaria cases confirmed by high quality clinical and parasitological diagnosis, guided by feasibility and cost-effectiveness.

3. Malaria in Pregnancy
   - Increase coverage of IPTp and the proportion of pregnant women receiving at least two doses of IPTp, using directly observed treatment (DOT), in public and private sector health services as part of a comprehensive reproductive health package implemented during focused ANC services; and
   - Emphasize the prevention of malaria with ITNs among pregnant women by supporting suitable distribution mechanisms and promoting the regular and correct use of the nets.

4. Malaria Epidemics
   - Prevent epidemics of malaria in areas of very low and/or unstable malaria through regular application of IRS and strengthen the system of prediction, early detection and prompt response in epidemic prone areas.

5. Advocacy, Information, Education and Communication (IEC) & Social Mobilization
   - Raise the profile of and demand for malaria control interventions through targeted, well designed advocacy and communication campaigns and activities with special emphasis on the biologically and economically vulnerable; and
   - Support active community participation in malaria control activities.

6. Health Systems

- Strengthen the leadership role of the NMCP to promote partnership and coordination for malaria control at all levels of the health system;
- Contribute to the strengthening of a decentralized health system that can deliver quality services and effectively manage supplies through the NMCP and malaria zonal coordinators;
- Strengthen capacity of district malaria focal persons to promote and coordinate malaria control activities at the district, health sub-district, sub-county and community levels; and
- Strengthen capacity of regulatory bodies such as National Drug Authority (NDA) and the National Bureau of Standards to monitor the quality of malaria medicines, ITNs and insecticides used for malaria control.

7. Monitoring & Evaluation and Research

- Improve collection, quality, and utilization of routine data to monitor the implementation of malaria related interventions through the HMIS and other sources including MISs, Demographic Surveillance System (DSS), sentinel sites, and the private sector; and
- Strengthen links between the research community and RBM partners in order to ensure that ongoing research is oriented towards key operational questions and can provide the necessary evidence to continuously improve interventions for malaria control.

Uganda has several policy and strategy documents that support this strategic plan including: Malaria in Pregnancy Control (2000); Home-Based Management of Fever (2005); Policy and Strategy for Insecticide Treated Nets (2006); The Use of ACTs at the Community Level Implementation Guidelines for the HBMF Strategy second edition (2006); Management of Uncomplicated Malaria, a Practical Guide for Health Workers, 3rd Edition, (2005), and the Policy and Strategy for Indoor Residual Spraying (2006).

Overview of the Health System

The formal health system in Uganda is stratified into the following categories: hospitals at the district, regional, and national levels, health centers (HCs) IV at the health sub-district level, HCs III at the sub-county level, and HCs II at the parish level. Although not a physical structure, HCs I are recognized as the community level where volunteers provide health services as part of a village health team. According to the 2002 health facility survey, non-governmental organizations (NGOs) operate 41% of hospitals, 5% of HCs IV, 18% of HCs III and 24% of HCs II.

Because of Uganda's decentralized system, districts are directly responsible for the delivery of health services and the implementation of health programs. In each district, the District Director of Health Services oversees all facilities in the district, including those operated by not-for-profit organizations (mainly faith-based organizations) and the private sector. The district develops its own health plans and budgets and receives financial support through a variety of mechanisms directly from the Ministry of Finance, Planning and Economic Development. The role of the MOH, therefore, is policy development, strategic planning and orientation, technical support, guidance and supervision, monitoring and evaluation (M&E), quality assurance and interventions in cases of epidemics.

Health care is also available through more informal channels that are outside the purview of the MOH. Private for-profit services for provision of medicines (pharmacies and drug shops) play a significant role in the delivery of health services. Traditional and complementary medicine practitioners are also an active segment of the health system and their importance varies regionally and with respect to the disease treated.

Lack or inadequacy of human resources at health facilities has been a critical factor in the poor quality of health service delivery. Recently, approximately 2,900 health workers were recruited into the system, increasing the proportion of approved posts filled with trained staff from 33% to 68%.[1] According to the Resource Inventory of 2004, a total of 27,500 health workers were employed, of which 9,100 of these were in the not-for-profit private sector. Despite this progress, the human resource situation is not yet satisfactory and more qualified staff are needed, particularly in the area of laboratory diagnosis.

CURRENT STATUS OF MALARIA INDICATORS

The 2006 Demographic and Health Survey (DHS) provides the most up-to-date information on the status of malaria control efforts and serves as the baseline for PMI. The survey was conducted in the dry season between April and August 2006 and included over 8,000 women and 2,000 men in 9,864 households. At the time the survey was conducted, ACT implementation had only just begun and IRS campaigns had not yet commenced. Consequently this survey does not capture results on initial progress in these interventions. An MIS is planned for 2009, which should provide a more accurate description of the status of malaria indicators in Uganda.

PMI Baseline Information	
Indicator	**2006 DHS[2]**
Percentage of households that own at least one ITN	15.9%
Proportion of children under five years of age sleeping under an ITN the previous night	9.7 %
Proportion of pregnant women sleeping under an ITN the previous night	10.0%
Percentage of houses targeted for indoor residual spraying (IRS) that have been sprayed	N/A
Proportion of pregnant women who receive at least two doses of IPTp during antenatal care	16.2%
Percentage of districts nationwide where malaria treatment with ACTs is implemented in health facilities	0%

GOALS AND TARGETS OF PRESIDENT'S MALARIA INITIATIVE

The goal of PMI is to reduce malaria-related mortality by 50% compared to pre-initiative levels by the end of the implementation of FY10 programs. Results are based on the projection that all development partners in Uganda (Global Fund, UNICEF, WHO, DFID, JICA etc.) are able to fully contribute to the plan. By the end of 2010, PMI will assist Uganda in achieving the following targets in populations at risk for malaria:

[1] HSSP II Volume I, MoH 2005
[2] Uganda Demographic Health Survey, 2006.

1. 85% of households will own at least one ITN;
2. 85% of households with a pregnant woman and/or children under five will own at least one ITN;
3. 85% of children under five will have slept under an ITN the previous night;
4. 85% of pregnant women will have slept under an ITN the previous night;
5. 85% of children under five with suspected malaria have received treatment with an antimalarial drug in accordance with national malaria treatment policies within 24 hours of the onset of their symptoms;
6. 85% of pregnant women will have received two or more doses of IPT during their pregnancies;
7. 85% of houses targeted for IRS will have been sprayed; and
8. 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.

EXPECTED RESULTS – YEAR FOUR

Prevention:

- Procure and distribute approximately one million LLINs to pregnant women and children under five years old, which is expected to increase national household ownership of ITNs from 15.9% to 60%.
- Continue support for a mass media and community-based IEC/behavior change communication (BCC) campaign to promote ITN usage, which, together with the procurement and distribution of LLINs, is expected to raise the percentage of children under five and pregnant women who have slept under a net the previous night from approximately 10% to 55%.
- Spray at least 85% of houses in geographic areas targeted for IRS (785,000 houses in eight districts).

Case Management:

- Continue to support the use of ACTs in health facilities with improved diagnostics, supportive supervision, and capacity development of the National Medical Stores (NMS) and National Drug Authority (NDA) for better forecasting, quantification, distribution, and quality assurance. All ACT needs are being met by other donors. These efforts are expected to increase the number of health facilities using ACTs to 100% nationwide.
- Assist with the implementation of Uganda's HBMF program using ACTs, which is expected to increase the number of children under five who receive treatment with ACTs within 24 hours of onset of fever from 1% to 50%.
- Strengthen focused antenatal care (FANC) to increase the proportion of women receiving two or more doses of IPTp from 16.2% to 50%, expand IPTp services by integrating them with prevention of mother to child transmission (of HIV) (PMTCT) services and private sector facilities, and revise the IPTp policy to reflect current WHO guidelines and ease implementation. The GOU is providing sufficient supplies of SP for IPTp.

Other:

- Conduct a nationwide IEC/BCC campaign, including mass media and community outreach efforts, to support year-round usage of LLINs/ITNs, acceptance of IRS, attendance at ANC clinics to receive at least two treatment doses of SP for IPTp, and increase prompt treatment-seeking behavior.

INTERVENTION - PREVENTION

Vector Control – General

The emergence and spread of vector resistance to insecticides is well recognized in Uganda. A July 2007 meeting of the Uganda National Academy of Sciences reviewed and assessed vector resistance to insecticides used for IRS in Uganda. The report concluded that: (1) there is documented resistance to both DDT and synthetic pyrethroids in country; (2) operational failures of IRS cannot be attributed to existing levels of resistance; and (3) monitoring of malaria vector resistance in areas targeted for IRS is necessary. In response to the report, the NMCP, with PMI support, drafted the "National Policy Guidelines for Malaria Entomology Surveillance". The draft guidelines identify five WHO-recommended indicators – vector taxonomy and density, vector behavior, vector infection rates, vector susceptibility to insecticides and the decay rate of insecticidal effect following IRS/ITN – for inclusion in routine surveillance. It is anticipated that this document will be used to inform national-level decision-makers (NMCP and the Vector Control Division (VCD)), district-level vector control personnel, and planning groups interested in supporting IRS, such as the Global Fund. Unfortunately, routine entomologic surveillance, including insecticide susceptibility, has not been conducted in an organized manner due to lack of support. The NMCP has expressed its intent to strengthen routine entomologic surveillance to guide vector control program planning and implementation.

Progress to Date:

During Years 1 and 2, PMI supported a training course and planning meeting between PMI, Uganda Virus Research Institute, NMCP, VCD, and the IRS contractor to coordinate, discuss, and review technologies for monitoring transmission rates. In addition, PMI established insecticide resistance monitoring for IRS activity in Kabale district with a training course on the use of the bottle bioassay for mosquito insecticide resistance testing. Drawing on recommendations from the "National Policy Guidelines for Malaria Entomology Surveillance", resistance monitoring was conducted in Apac district in 2007 – 2008 in conjunction with IRS activities. The results indicate low levels of DDT and pyrethroid resistance and further support the need for expanding surveillance of vector resistance to other districts.

Planned FY09 PMI Activities: ($524,200)

With assistance from PMI, the NMCP intends to scale up entomological surveillance per recommendations from the "National Policy Guidelines for Malaria Entomology Surveillance". Because IRS and LLINs are priority malaria control interventions for the MOH, the NMCP intends to monitor the five recommended indicators mentioned above to both detect early signs of vector resistance and measure the impact of vector control strategies. Results from such entomological surveillance will allow decision-makers to assess the feasibility of once yearly spraying in areas of high seasonal transmission. The NMCP is also considering insecticide rotation to slow the development of resistance.

Planned activities during FY09 are as follows:

- **Entomologic surveillance***:* PMI will continue building local entomological capacity by assisting the NMCP/VCD at the central level. The VCD will be supported to assess resistance and other indicators of IRS impact. Indicators will be measured in five locations targeted for IRS campaigns and LLIN distribution. The cost of $75,000 per district includes

training, field cost, procurement of equipment and sample analysis. PMI will also support a central-level insectory and finalization of "National Policy Guidelines for Malaria Entomology Surveillance," costing an additional $75,000. *($450,000*)

- **Insecticide resistance monitoring**: Given that integrated vector management relies in part on chemical control (IRS and LLINs) and is being scaled up rapidly, it is critical to monitor vector resistance to insecticides. PMI proposes to conduct entomological evaluations to determine levels of vector resistance in Uganda to insecticides currently being deployed (pyrethroids and organochlorines) and to those that could be used (carbamates and organophosphates). Resistance studies will be undertaken in selected sentinel sites and results will help guide the NMCP in establishing models for insecticide rotation and determining baseline levels of resistance in areas of intense vector control efforts. *($50,000*)

- **2 TDYs from CDC-Atlanta**: CDC Staff to provide technical support to entomologic training and monitoring activities. *($24,200)*

Indoor Residual Spraying

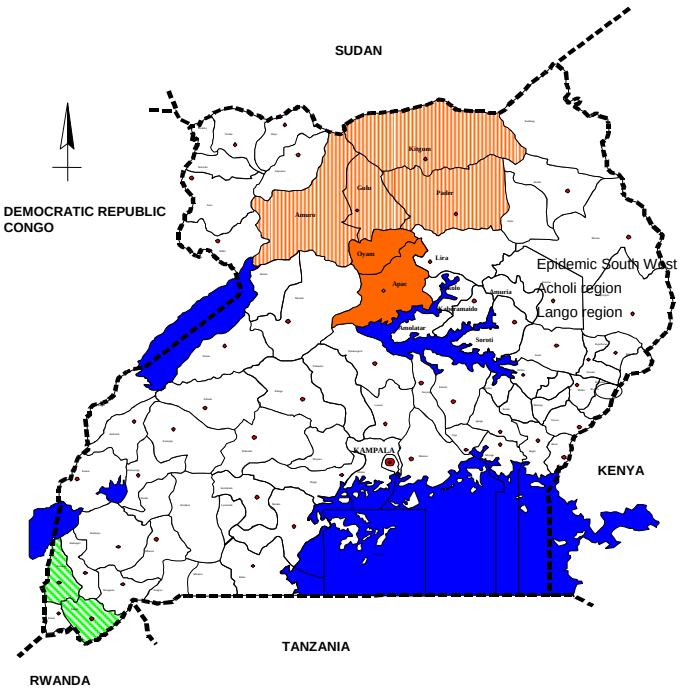
Current Status, Challenges and Needs

The Uganda National Malaria Control Strategic Plan 2005/6-2009/10 emphasizes IRS as one of the major malaria prevention and control interventions in the country. The NMCP's policy and strategy for IRS recognizes that IRS needs to be implemented in epidemic-prone areas, high transmission settings, and high-risk situations, such as internally displaced persons (IDP) camps and refugee settings.

The first ever large-scale pilot IRS campaign was introduced in the epidemic-prone highland district of Kabale in 2006 with PMI support. Given the high coverage rate and remarkable public acceptance, PMI supported the NMCP's plans to expand and conduct larger-scale, well-targeted, and evidence-based IRS campaigns, with the goal of rolling out IRS activities in several regions of the country. Therefore, in its second year, PMI supported selective spraying in the southwestern districts of Kabale and Kanungu, targeting only high risk sub-counties, as well as blanket spraying in the northern districts of Kitgum, Pader, Amuru, and Gulu.

During the 2007/8 spray campaign, the NMCP again expressed its desire to expand implementation of IRS, as well as use longer-acting residual insecticides for IRS operations following approval from the National Environment Management Authority (NEMA) to use DDT for IRS. Therefore, the PMI FY08 IRS plan proposed the use of longer-lasting insecticides to eliminate the need for semiannual campaigns. A pilot spray campaign with DDT was conducted in Apac and Oyam districts during March-April 2008. However, a court injunction by organic farmers blocked health authorities from using DDT in northern Uganda midway through the 2008 spray season. Despite apparent minimal public resistance to DDT and high interest of MOH to continue to use DDT, there remain vocal opponents of the use of DDT. As a result of the court injunction, PMI is limited to using insecticides with only 3-6 months efficacy. Therefore, due to higher than anticipated operational costs, PMI adjusted the targeted districts for FY08 from an originally planned 15 districts to eight districts. To date, the court injunction has not been lifted and a hearing is pending.

Map showing current IRS districts



Progress to Date:

With FY06 funds, PMI sprayed nearly 103,000 households in Kabale District. The following year, PMI sprayed nearly 446,000 households in Kabale and Kanungu as well as IDP camps in four districts in Northern Uganda. Since the reintroduction of IRS in Kabale and Kanungu, there has been a demonstrable decline in malaria-related hospital admissions and outpatient attendance. Since the first round of spraying in Kanungu in 2007, data collected from the Kihihi Health Center showed an 83% reduction in laboratory-confirmed cases of malaria between August and October 2007 when compared with the same time period the previous year. With only one year of data post-IRS, further data collection and analysis is needed to confirm whether this decline is attributable to IRS.

As required by USG regulations, an IRS Supplemental Environmental Assessment for DDT use in IRS in Uganda was completed in early 2008, outlining the various conditions necessary to avoid potential negative impacts of IRS with DDT, and initially restricting DDT use to Apac and Oyam Districts. Strict mitigation measures and conditions were established, including maintenance of strict chain-of-custody of DDT by PMI's implementing partner. From March to April 2008, IRS campaigns with DDT in Uganda were carried out in the highly endemic districts of Oyam and Apac. The campaign covered 197,901 houses, benefiting 674,462 persons (93% of the targeted population), of which 23% were children under five years and 4% were pregnant women. Preliminary data from Apac and Oyam demonstrate significant declines in malaria post-IRS, particularly when compared to unsprayed neighboring districts.

With FY08 funds, PMI also conducted a second round of spraying in Kitgum and Pader with a combined target of approximately 225,000 houses.

Summary IRS data from 2006 up to July 2008

District	Period of operation	Total Houses sprayed (% coverage)	Total population protected (% protected)	Number protected	
				Children <5	Pregnant women
2006					
Kabale	Jun-Aug	103,329 (96%)	488,502 (96%)	82,275	NA
2007					
Kabale	Jan-Feb	76,084 (98%)	364,784	60,698	6,022
Kanungu	Feb-Mar	45,321 (100%)	191,399	36,222	5,580
Kitgum	May-Jun	84,007 (95%)	371,846	86,811	14,709
Pader	Jun-July	138,458 (97%)	538,752	138,605	30,339
Amuru	Nov	102,247 (99%)	399,175	108,079	21,147
Total		**446,117 (98%)**	**1,865,956 (98%)**	**430,415**	**77,797**
2008					
Gulu	Feb	135,831 (94.3%)	525,505	243,986	117,443
Oyam	Mar-Apr	94,876 (93.1%)	315,765	70,549	12,274
Apac	Mar-Apr	103,025 (92%)	322,697	78,761	16,298
Kitgum	June-July	82,720 (88.9%)	381,111	87,720	13,361
Pader	June-July	Results forthcoming			
Total		**416,452 (93%)**	**1,545,078 (96%)**	**481,016**	**159,376**

Over the past year, approximately 10,000 personnel (spray operators, clinicians and environmental officers) have been trained in IRS operation. It is anticipated that these individuals will be able to implement future rounds of spraying in Uganda, further reducing the costs.

The NMCP recognizes that IEC and social mobilization for IRS are fundamental to the success of its IRS program. Based on prior experience, the NMCP believes that IEC/BCC through radio and community meetings is critical for the success of IRS and that involvement of local leaders (formal and informal) is important. Massive community sensitization and education drives were conducted before, during and after house spraying in each district. These included district leader sensitizations, sub-county leader awareness programs, parish level community meetings and cinema programs, and radio announcement, spots and talk shows. In addition, fact sheets were developed and distributed to spray personnel and community leaders. PMI is currently supporting development of a tool kit and guidance document, including a video, for community education and sensitization.

Planned FY09 PMI Activities: ($8,760,000)

Consistent with the NMCP's IRS strategy, PMI will support spraying in high transmission areas and selective spraying in sub-counties of Kabale and Kanungu that are prone to epidemics and have been previously sprayed. PMI will continue to support the MOH in implementing IRS in six to eight districts (depending on insecticide choice and cost). Support will include the procurement of insecticide, spray pumps, spare parts, and personal protective equipment, and to renting of vehicles and storage facilities. The NMCP has also requested assistance for IRS planning, personnel management, environmental and human health safety and logistics

management, including forecasting and procurement of insecticide, on-the-job training of spray personnel, and mapping and stratification of areas for IRS.

To develop Uganda's capacity to expand and sustain IRS operations, PMI will invest in capacity development of the public sector to provide appropriate supervision and oversight of IRS activities, including technical quality, environmental monitoring, and accountability. The current IRS operation is run by a USAID implementing partner, with some technical support from the NMCP, NEMA and district governments. Due to the cost of this program, it is unlikely to ever reach coverage levels anticipated by the NMCP. However, before other donor contributions (such as Global Fund money) can be effectively utilized to expand IRS, the government (NMCP, NEMA, district government) must have the capacity to oversee these operations. The initial phase of this activity will target district environmental officers, district health officers, district commissioners, NEMA officials, and NMCP staff with focused, integrated training on IRS oversight issues.

Planned activities during FY09 are as follows:

- **Support for IRS in the northern districts of Pader, Kitgum, Gulu, and Amuru***:* PMI will support spraying in IDP camps, urban areas and newly settled villages in Pader, Kitgum, Gulu and Amuru districts in June/July 2009 and, pending duration of insecticide efficacy, November 2009-February 2010. ($3,320,000 FY08 money; $5,900,000 FY09 money)

- **Support for IRS in the northern districts of Apac and Oyam***:* PMI will assist NMCP/MOH to conduct the second year of spraying in Apac and Oyam Districts in June/July 2009, and, pending duration of insecticide efficacy, November 2009-February 2010, covering 200,000 households. ($2,400,000 FY08 money; $2,100,000 FY09 money)

- **Support one round of targeted IRS in epidemic-prone southwestern districts***:* PMI will conduct one round of spraying in nine sub-counties affected by malaria in Kabale (approximately 35,000 households) and six sub-counties in Kanungu (approximately 60,000 households). ($460,000)

- **Develop local capacity to expand and sustain IRS**: In anticipation of future funding availability through the Global Fund or other donors, PMI will build the capacity of the public sector to oversee quality IRS programs, focusing on oversight of technical quality, environmental monitoring, and accountability. ($300,000 FY09)

Note: The above IRS programs include budget for all necessary components, including environmental assessments, monitoring, and IEC/BCC activities specific to IRS.

Insecticide-Treated Nets

Current Status, Challenges and Needs

Long-lasting insecticide-treated bednets remain one of NMCP's key prevention interventions in malaria vector control. Since 2006, over three million LLINs have been distributed by all partners nationwide. With continued support from PMI and the Global Fund Round 7 grant, the NMCP aims to increase the number of households owning one or more ITN to at least 85% and the number of households owning two or more ITNs to at least 60% by 2010. The NMCP also intends

to increase the percentage of pregnant women and children under five who will have slept under an ITN the previous night to more than 85% by 2010.

Based on the 2006 DHS, the percentage of children under five and pregnant women who sleep under ITNs was low at only 9.7% and 10.1%, respectively. National household coverage (households owning one or more ITNs) was 15.9%. Ownership varied by geographic region. In the North, where there have been major efforts to distribute ITNs, household ownership was highest at 28%, while the Central regions were lowest at 8%. Given the large influx of LLINs from both PMI and other sources, a model produced by the Malaria Consortium has estimated that the proportion of households owning one or more ITN at the end of 2007 is approximately 40%. The MIS scheduled for 2009 will provide more up-to-date ITN ownership and use data.

There is also evidence that usage is increasing. In October to December 2007, a net retention and use evaluation was conducted at four health facilities in Gulu District where LLINs were being distributed through ANCs. The evaluation found that use of LLINs received at ANCs by pregnant women was reported to be 89%; use of any ITN by pregnant women was 96%; and use of LLINs by anyone in the household was 99%. These *use* rates are comparable to a previous evaluation on LLIN distributions carried out in Kitgum District, which found that 94% of pregnant women reported that they had slept under an ITN the previous night and 89% slept under LLINs received at ANCs. Both evaluations show that it is possible to achieve high usage of LLINs through ANC distribution.

Uganda has a five-pronged strategy for ITN distribution:

- Free distribution to vulnerable groups through mass campaigns
- Free distribution through ANC/Expanded Program of Immunization (EPI) clinics
- Community distribution using community based organizations (NGO Net Facility)
- Subsidized LLIN through the private sector
- Sale of LLINs at full cost through the commercial sector

Overview of Uganda distribution program			
Approach	**Target population**	**Target areas**	**Funding partner**
Mass Distribution	Rolling campaign in designated sub-counties	Sub-counties as directed by NMCP	PMI and Global Fund
Malaria in Pregnancy/ANC distribution	Pregnant women and children less than five years	ANC clinics in the 24 Northern districts	PMI
Community distribution through NGOs/CSOs (LLIN net facility)	Pregnant women and children less than five years	Sub-counties as determined by NMCP	PMI
Subsidized nets through private sector	Those who can afford	Urban areas	PMI
Commercial	Those who can afford nets	Urban centers	Commercial partners with PMI support

Progress to Date:

PMI has supported all five LLIN distribution channels in Uganda.

Mass community-level net distribution and sensitization campaigns
Mass campaigns are the predominant distribution strategy for LLINs in Uganda. The first large-scale LLIN distribution campaign was held in 2007, and 1.8 million LLINs were distributed to pregnant women and children under five years of age in 26 districts using Global Fund Round 2 funds. PMI supported distribution of nearly 1.1 million additional LLINs through this mechanism. In total over 2.9 million LLINs have been distributed through mass campaigns since 2007.

Using the model established in the 2007 Global Fund distribution, PMI has continued to support rolling mass campaigns to distribute LLINs at the sub-county or district level. The first of these was a joint PMI/Malaria No More campaign that immediately followed the Global Fund campaign, which distributed 592,000 LLINs (including 369,000 Malaria No More LLINs) to children under five and pregnant women. The NMCP provided direction on the sub-counties to be targeted based on knowledge of previous net distributions and epidemiology with a special emphasis on those areas with low ITN ownership and high malaria endemicity. PMI is currently distributing another 560,000 LLINs to households with children under five and pregnant women, focusing on districts in the twelve Eastern regions at the NMCP's request. It is expected that all households with vulnerable populations in the target districts/sub-counties will own at least one LLIN following these campaign efforts.

The LLIN campaign approach has been refined over the last year to increase efficiency and ensure that all vulnerable groups are covered. The ten-day campaign process is as follows: district sensitization of key district officials; community sensitization through radio, leaflets and a community meeting; training of volunteer Community Medicine Distributores (CMDs); registration of beneficiaries (i.e. pregnant women and children under five); distribution of LLINs to registered beneficiaries at village level; collection of reports completed by district officials; and follow-up by CMDs a week later to ensure that the nets were correctly hung and properly used by beneficiaries.

Because of the success of these campaigns and the need to cover more beneficiaries, the NMCP included this LLIN distribution model in their approved Global Fund Round 7 proposal. With these funds, the NMCP plans to distribute 17.5 million LLINs to all pregnant women and children under five over a three-year period. In the first year of the grant (2009), funds should be available to procure and distribute 4.2 million LLINs to pregnant women and children.[3]

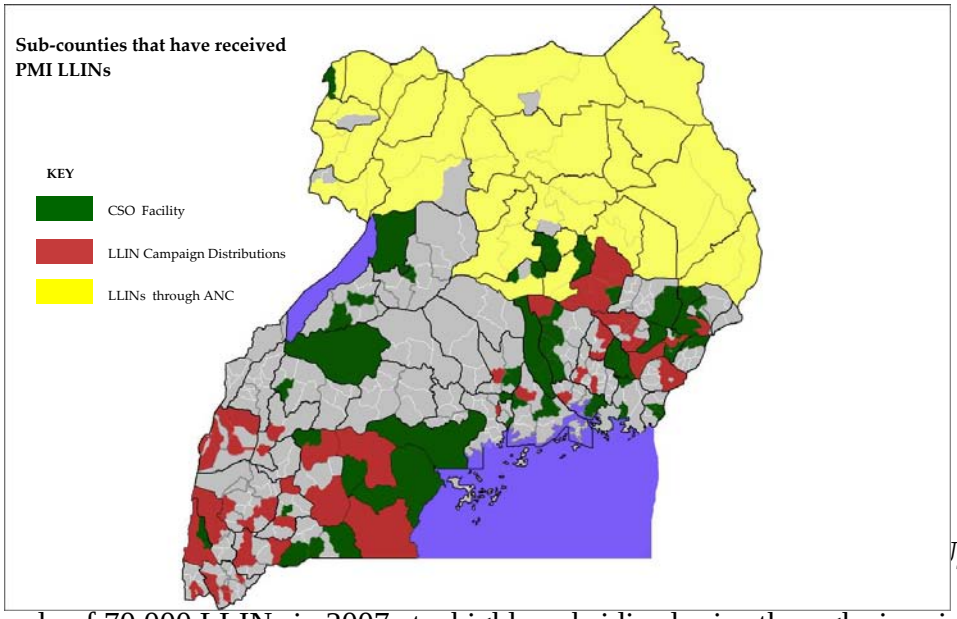
Distribution of free LLINs through ANC/EPI clinics
The NMCP's other major LLIN distribution channel is through ANC and EPI clinics during routine visits. With PMI support, LLINs have been provided to pregnant women through ANC clinics in 24 districts in Northern Uganda and, since 2005, over 715,000 LLINS have been distributed through this approach. With FY08 funds, another 350,000 LLINs will be distributed in this manner by the end of the year. ANC workers have also been trained to both explain the need for an LLIN and to demonstrate its proper use. There is interest by the NMCP to expand this strategy to more districts as a means to maintain high ITN ownership. In the northern districts, the ANC/EPI distribution model has successfully helped both increase LLIN ownership and ANC attendance.

NGO net facility

[3] Assumes that the Global Fund Round 7 grant is signed in 2008.

Building on the mass campaign approach, PMI supported the development of an LLIN NGO net facility to provide free LLINs to CBOs for distribution to pregnant women and children under five in selected districts. CBOs working at the community level often have funding for malaria prevention advocacy but not for LLIN procurement. By providing LLINs for use in their projects, PMI is able to capitalize on their close interaction with communities and engage them in malaria prevention and control. In 2007, 20 NGOs were selected to provide 104,000 LLINs to target populations. Using FY08 funds, a second call for applications identified eight more NGOs to distribute another 120,000 LLINs in the same manner. Under NMCP direction, the LLIN facility aims to complement geographically the areas covered through mass community-level campaigns.

Figure 1
Sub-County Map of PMI LLIN distribution by ANC and other distribution mechanisms (Including Malaria No More)**, Dec. 2005- Dec. 2007**



Uganda

Subsidized LLINs
PMI supported the sale of 70,000 LLINs in 2007 at a highly-subsidized price through six private sector distributors. These LLINs were mainly targeted to urban areas where residents could afford them and were sold for approximately $3.00 each. In 2008, 49,998 subsidized LLINs were procured for this avenue and have been targeted for peri-urban areas. As of June 2008, approximately 28,000 have been sold. However, given the focus on free LLIN through mass campaigns to vulnerable populations, the provision of subsidized LLINs is no longer considered a viable way to achieve rapid scale-up and will not receive support from PMI in FY09.

Private sector LLIN market
While mass campaigns rapidly scale-up net ownership and effectively target vulnerable populations, a vibrant private sector market for ITNs is needed to ensure sustainability. Demand for ITNs exists in urban commercial sectors. For example, the commercial for-profit sector sells approximately 700,000 ITNs, the majority of which are LLINs, per year in urban centers such as Kampala.

PMI has supported the LLIN private sector by directly supporting local retail and wholesale ITN distributors, and simultaneously developing local capacity to manufacture LLINs. In its first three years, PMI supported Netmark*plus* to increase the supply of ITNs available in the private sector by providing direct support to local ITN distributors in management and branding. As a result, the number of private ITN wholesale distributors in Uganda rose from one to eight over the last five years. In FY09, PMI will no longer financially support Netmark*plus*'s work in this area, as the market has sufficiently matured and stabilized.

Summary of PMI LLINs distributed to date

Calendar Year	ANC	Mass Campaign	Net Facility	Subsidized LLINs	Total LLINs per Year

2005	288,000	--	--	--	288,000
2006	88,444	--	--	--	88,444
2007	187,584	601,900	104,416	70,000	963,900
2008 (projected)	150,000	560,000	120,000	49,998	879,998
Total by channel	**714,028**	**1,161,900**	**224,416**	**119,998**	**2,220,342**

Note: Of this total, 2,100,344 LLINS were provided free of charge to beneficiaries

Net re-treatment

Although PMI supported the re-treatment of over 600,000 nets in FY06/07 campaigns, the majority of nets now being distributed or sold in Uganda are treated with long-lasting insecticides, and those distributed prior to FY06 are being replaced. Thus, PMI will not support net re-treatment campaigns in FY09.

Projected ITN Needs and NMCP priority areas

As part of the Global Fund Round 7 application, the NMCP calculated its LLIN gap to achieve 100% coverage of pregnant women and children under five. Assuming that the first procurement of Round 7 Global Fund ITNs are procured and distributed by the end of 2009, the NMCP estimates that the LLIN gap in 2009/10 will be approximately 1,440,000 LLINs. However, this estimate assumes a three-year lifespan of LLINs and no incidents of leakage, both of which could underestimate the gap.

Projected Need of LLINs (in 000s)				
Year	**2007/8**	**2008/9**	**2009/10**	**2010/11**
LLINs supplied from other donors (assumes no PMI contribution in FY09-FY10)	3,600	5,850	3,400	6,100
Cumulative number of effective ITNs (those less than 3 years old)[4]	4,700	5,200	4,800	3,000
Number of pregnant women	1,500	1,550	1,600	1.660
Number of children under five	5,770	5,900	6,200	6,400
Estimated LLINs needed for 85% coverage	5,816	5,960	6,240	6,448
Gap	**1,116**	**760**	**1,440**	**3,448**

IEC for ITNs

Low net utilization rates show that there is a great need for comprehensive and sustained national IEC/BCC campaigns on the correct and consistent use of ITNs. From FY06 to FY08, PMI supported efforts to conduct comprehensive IEC/BCC campaigns for ITNs. PMI has supported the development of IEC materials tailored to CMDs on the correct and consistent use of LLINs, developed a series of radio spots discussing ITNs, and distributed 300,000 copies of the "Everyday Health Matters" newsletter on malaria. One PMI implementing partner has focused on a marketing strategy for private sector LLINs which included the popular "Squito" cartoon strip, road shows, mobile promotion units and brand specific campaigns to promote use of ITNs. While these efforts have been positive, there is a need to harmonize messages across partners and with the MOH.

[4] This figure is based on the number of nets distributed by all sources since 2005 and assumes no leakage. It is widely believed that this is an overestimate of ITNs in the country. If the MIS confirms this high coverage rate, the number of LLINs procured will be reduced.

Also, in addition to raising awareness about ITNs, which is high in Uganda, mass campaigns need to address behavior change so that ITNs are used correctly and consistently.

Planned FY09 PMI Activities: ($6,420,000)

Based on the projected needs calculated by the NMCP, and considering potential contributions from the Global Fund, the following activities are planned for 2009:

- **Procurement of LLINs:** PMI will procure one million LLINs for free distribution to target populations through ANCs, net facilities, mass campaigns and private sector corporations that add additional subsidies for free distribution to end users. *($5,500,000)*

- **Distribution of free LLINs through ANC clinics:** PMI will continue to target pregnant women for free distribution of LLINs: 155,000 LLINs will be distributed through clinics in northern regions, 80,000 in West Nile regions, and 650,000 in the rest of Uganda. The total cost includes IEC/BCC, distribution and M&E related to LLIN distribution. *($825,000)*

- **Distribution through mass campaigns and the net facility:** PMI will provide 95,000 free LLINs to pregnant women and children under five through the LLIN net facility and mass campaigns in districts with low LLIN coverage. *($95,000)*

Intermittent Preventive Treatment

Current Status, Challenges and Needs

The MOH advises pregnant women who are having a normal pregnancy to make four visits to the ANC clinic for FANC prior to delivery. The 2004 NMCP report on malaria in pregnancy activities showed that approximately 95% of pregnant women in Uganda attended an ANC clinic at least once during pregnancy. Of these women, 80% returned for a second visit. Very few women attended the recommended four times and 60% of women delivered at home. The original policy for IPTp for pregnant women was adopted in 1998 to cover all of Uganda's districts. This policy is included in the Reproductive Health Unit (RHU)'s FANC policy and the NMCP strategy. Both the NMCP and the RHU are responsible for the training, supportive supervision, M&E, operational research, and provision of IPTp services at health facilities and IEC campaigns at the community level.

Although the policy has been in place for over nine years, the 2006 DHS data indicate that only 36.6% of pregnant women receive one dose of SP and only 16.2% receive two doses. Intermittent preventive treatment coverage varies in different parts of the country. For example, coverage of the first dose of IPTp ranges from 10% to 50%. Given that 85% of women make at least two ANC visits and that the median first ANC visit to the clinic is at 5.5 months, IPTp rates should be much higher. Factors explaining the low utilization of IPTp services include: 1) drug supply problems with frequent stock outs of SP, 2) lack of sufficient personnel to both see patients and maintain accurate records, 3) poor morale among the overwhelmed ANC staff, 4) pregnant women initially seeking antenatal care too late in their pregnancy to take a second dose of SP, 5) lack of clean drinking water and cups for directly observed treatment of IPT, and 6) the perception by some women that taking medicines during pregnancy harms babies.

Progress to Date:

In the past two years of implementation, PMI support to IPTp has resulted in development and provision of FANC training manuals, training and on-the-job supervision of 1,693 health workers on IPTp, provision of 3,000 malaria in pregnancy wall charts and gestational wheels as job-aids and adoption of an MOH IEC nationwide advocacy plan for IPTp. Support has also focused on integrating IPTp services with PMTCT.

Using FY08 funds, PMI is supporting a change in policy for IPTp from two-dose IPTp to provision of SP at every scheduled ANC visit after quickening (if at least one month apart) to reflect current WHO guidelines. The revised policy will be easier to implement and ensures that there are no missed opportunities for pregnant women to be provided with SP for IPTp and reduces confusion among health workers as to when to administer IPTp. Experience from Malawi showed that a change in policy to monthly doses increased complete IPTp coverage to 79%. There is no evidence that more than three SP treatments in the second and third trimesters are harmful to the mother or fetus. The revised IPTp policy includes the following:

1. Provide every woman with a dose of SP at every ANC visit after quickening.
2. Women who do not know their HIV status should receive at least three doses of SP IPTp.
3. Women who are HIV-infected should receive daily trimethoprim-sulfamethoxazole, and should not receive SP for IPTp.
4. There is no harm in giving more than two doses of SP IPTp, for those women who come in for monthly ANC visits.
5. Women can receive SP through the last week of pregnancy without risk to the mother or baby.
6. IPTp should not be given if SP was given in the prior four weeks.

In addition to policy development, PMI FY08 funding is supporting the purchase of cups and water containers for provision of safe water at ANCs to facilitate direct observation of pregnant women swallowing SP tablets.

Planned FY09 PMI Activities: ($575,000)

Planned activities during FY09 are as follows:

- **Supporting IPTp policy implementation:** PMI will support implementation of the new policy for IPTp to ensure that the policy and accompanying guidelines are produced and disseminated to all facilities. *($25,000)*

- **Provision of comprehensive IPTp services at ANC clinics:** Building on the trainings conducted in the first three years of the PMI program, further support includes a package of services: provision of clean water and cups to facilitate direct observation of SP dosing, provision of ANC registers, enhanced IEC/BCC to support district health education units in collaboration with the NMCP, and community-level advocacy to encourage pregnant women to attend ANCs and complete their IPTp doses. PMI will also assist integrated supervision for ANC care front line health workers (with emphasis on IPTp, ITNs and appropriate case management of pregnant mothers). Emphasis will be placed on supporting integration of service delivery with PMTCT in facilities where this service is provided. *($550,000)*

INTERVENTION - TREATMENT

Malaria Diagnosis

Current Status, Challenges and Needs:

Most malaria diagnosis in health facilities in Uganda is based on clinical symptoms rather than microscopy. Many facilities lack diagnostic capacity, and even in facilities with available malaria microscopy, many clinicians lack confidence in the results and may disregard them when making a diagnosis. Among older children and adults in high transmission areas, and among all age groups in areas of low-to-moderate transmission, improper diagnosis based on symptoms alone often results in children with fever being presumptively treated for malaria, when the likelihood of the fever episode being due to malaria may be extremely low. Without proper malaria laboratory diagnostic capacity, a case of fever may or may not be treated appropriately. Moreover, presumptive treatment for malaria can lead to ACT stock outs.

Findings from the 2007 Uganda Service Provision Assessment indicate that laboratory diagnostic capacity for malaria (by microscopy or RDTs, though RDTs are only 2% of diagnostic capacity) exists in only 26% of all health facilities. Approximately 8 in 10 hospitals and HCs IV have laboratory malaria diagnostic capacity, compared with 36% of HCs III and only 11% of HCs II. Laboratory malaria diagnostic capacity is higher in private facilities (50%) than in public facilities (18%). The Central Public Health Laboratory is mandated to coordinate, monitor, and supervise all HC III and IV level laboratories, but is grossly understaffed. Although PEPFAR funded the purchase of a large number of microscopes for the national public health laboratory system in 2006, it only met 35% of the national requirements and thus a large gap still remains.

In August 2007, the NMCP adopted new recommendations for use of RDTs in the diagnosis of malaria. A new policy document entitled “Policy Guidelines on the use of Rapid Diagnostic Tests in Malaria Management” has been developed as well as the trainer’s guide, “Rapid Diagnostic Tests in Malaria Management”. The NMCP policy initially recommended the use of RDTs in all HCs II and III where a microscope or microscopist is not available. In February 2008, a meeting of policy stakeholders further developed policy recommendations as follow:

- Hospitals, HCs IV, and HCs III that have at least a microscope and a microscopist should use microscopy for malaria diagnosis.
- Health centers II and III that do not have microscopes or microscopists should use RDTs.
- HRP2 type RDTs should be used in Uganda when RDTs are used for malaria diagnosis.
- Presumptive treatment of malaria for children under five with a fever remains the standard.

Progress to Date:

Since FY07, PMI has been supporting the Joint Uganda Malaria Training Program (JUMP), an integrated comprehensive malaria training targeting laboratory personnel, clinicians, nurses and data managers working in the same health facilities, implemented jointly by the Uganda Malaria Surveillance Project (UMSP) and Infectious Diseases Institute (IDI). The goal of the training is to increase laboratory skills for microscopy, improve expertise in clinical management of fever including both uncomplicated and severe malaria, and ensure good communication between team members. Through this innovative team approach, laboratory personnel, clinicians, and data managers are trained together. This joint training methodology has been found to improve malaria

diagnosis, strengthen case management of malaria, and further develop the malaria surveillance record-keeping and reporting to the HMIS. The NMCP and Central Public Health Laboratory act as advisors to the JUMP steering committee.

Although JUMP has not yet been scaled up to the national level, it contributes greatly to filling the large gap in malaria microscopy training needs in areas where PMI operates. Starting with health care workers in the ten existing sentinel surveillance sites for malaria, JUMP implemented nine training courses in 2007/2008 and trained a total of 272 health care workers (170 clinical staff, 39 lab staff, 52 staff, and 11 trainers). A number of peer trainers have also been trained to implement a district-based cascade training targeting staff from regional hospitals, district hospitals, HCs IV and selected HCs III that have a functional laboratory and are within the ten districts with a sentinel site. To date, two such cascade training sessions lasting five to six days have been held in Jinja District benefiting 50 trainers. To ensure that the enhanced capacity is maintained and to measure its impact on health care delivery and provide ongoing supportive supervision, a multi-skilled mobile team regularly visits targeted facilities. In addition to training the personnel, UMSP provides continuing quality assurance and control to the laboratories. Although engaging local institutions as implementing partners and as advisors to the development of training has increased implementation costs, it has also increased its chances of sustainability and nationwide expansion. A recent UCSF evaluation of the integrated malaria training program at eight sentinel sites found that integrated team-based training was associated with significant improvements in malaria case management, most notably an increase in the proportion of those with suspected malaria being referred for microscopy and a decrease in the proportion of those with negative blood smears prescribed antimalarial therapy.

The NMCP has received funding to purchase and provide training on the use of RDTs under the Global Fund Round 4 Phase 1 and 2 grants. The NMCP's strategy is to first introduce RDTs into HCs III in low transmission, epidemic-prone areas and later scale up to HCs III in 21 districts (adding highly endemic districts). To support the NMCP's plans, UMSP is currently leading a non-PMI funded pilot evaluation of HRP2-based RDTs at six HCs II and III. The objective of the project is to evaluate the clinical effectiveness and safety of a basic training program incorporating RDTs as compared to presumptive treatment for the management of patients who present with suspected malaria at peripheral health centers. Results of this evaluation as well as the on-going evaluation of JUMP will help determine the most appropriate and feasible plan for national scale-up of improved diagnostics.

While JUMP continues to provide a high standard of diagnostic capability, PMI with FY08 funds will simultaneously support a complementary, scalable model to improving diagnosis at HCs III using RDTs in support of the NMCP policy. Learning from JUMP, this model will develop a "culture of diagnosis" among clinicians and patients, increasing the demand for and confidence in diagnosis of malaria prior to treatment.

Planned FY09 PMI Activities: ($412,500)

In FY09, PMI will continue to support the JUMP model of training for HCs IV and district referral hospitals. The Global Fund Round 4 will support the training of health workers in the use of RDTs at HCs II and III with no microscopy capability in collaboration with STOP Malaria, a new PMI-funded bilateral agreement. All support will be aligned with the MOH guidelines on use of RDTs.

Planned activities during FY09 are as follows:

- **Strengthen malaria diagnostic capacity at HC IV level and above**: PMI will support the expansion of integrated training of clinicians and laboratory technicians on malaria diagnosis and treatment for district referral hospitals and HCs IV. The JUMP program will expand to additional districts and establish further laboratory networks. As the trainings expand, the model will be decentralized with less focus on Kampala-based training and more emphasis on leveraging the training hubs and utilizing cascade training to maximize impact. Crucial elements of the training will be packaged so that additional partners who want to build on lessons learned can assist with further scale up. Mobile teams will monitor and provide supportive supervision of trained personnel. *($312,500)*

- **Support integrated malaria diagnostic trainings and roll-out of RDTs at HCs II and III**: PMI will help support the roll-out and use of RDTs at HCs II and III by helping develop a scalable model to improve diagnostics. This model will increase the reliable use of RDTs to diagnose malaria and help ensure that care is decided based on the results of the RDT. *($100,000)*

Pharmaceutical Management

Current Status, Challenges and Needs

National Medical Stores manages the procurement and distribution of essential medicines and health supplies for the public sector while Joint Management Stores manages similar activities for the not-for-profit private sector. During the last two years, the supply system for ACTs has been changed from a push to a pull system. Instead of receiving standard drug kit quantities according to the number of patients reported in the previous three months, districts and health sub-districts now order from the essential drugs and commodities list based on actual demand. The change from a push to a pull system has been difficult and has resulted in stockouts in many health centers. Delivery to districts is made at two-monthly intervals and the costs are charged against a credit line (Essential Drug Account). Funds available for essential medicines, vaccines and supplies have increased from $0.80 to $1.50 per person per year, but still fall short of the $3.50 needed to successfully implement the Minimum Health Care Package. In 2000, previously existing cost-sharing at government health facilities was abolished and all treatment and medicines are now free of charge.

Progress to Date:

In Years 2 and 3, PMI continued to provide technical assistance to help the National Medical Stores, National Malaria Control Program and the district health programs to update their quantification of artemether-lumefantrine (AL) for uncomplicated malaria and severe malaria drugs using population age structure, population growth rate, and estimated number of clinical malaria cases per age group. Future quantifications will need to be based on consumption data as soon as this information becomes available.

Planned FY09 PMI Activities: ($400,000)

Despite an adequate supply of ACTs, there remain reports of shortages, stockouts, and even some overstocks of the drugs in public and private facilities. The 2007 Service Provision Assessment revealed that about 80% of health facilities experienced stockouts at some time during the six

months preceding the survey. This is due to a variety of factors including delays in customs clearance and quality testing, problems in the existing pull distribution system, lack of a computerized logistic management information system, and lack of storage at the district level requiring drugs to be pre-packaged at the national medical stores for all health facilities in the country. In addition, further support for supervision of health providers in the use of ACTs is needed, as well as provision of treatment guidelines and job aids to reduce unnecessary consumption of antimalarial medication.

Planned activities during FY09 are as follow:

- **Strengthen pharmaceutical supply chain management**: The PMI will provide continuing technical assistance to help NMS and NMCP/MOH update the quantification of ACTs and other key antimalarials based on consumption data. Also, PMI will provide support to the NMCP to establish and implement its computerized malaria commodities information acquisition system that will be used to provide accurate, reliable, and timely information on use and availability of malaria medicines at the district, regional, and national level. In addition, PMI will provide further support for delivery of drugs from district stores to health facilities, and rational drug use in health facilities. *($400,000)*

Case Management

Current Status, Challenges and Needs

The Uganda MOH has made major strides in ensuring that everyone needing treatment for malaria receives ACTs, including those accessing treatment through the commercial sector. In 2004, the MOH endorsed ACT as the first-line treatment for uncomplicated malaria. The first-line treatment is AL, brand name Coartem®, and artesunate-amodiaquine is as an alternative to the first-line treatment. Since then, the MOH has carried out education programs for communities on the new policy guideline and trained over 30,000 health workers. The Global Fund Round 4 proposal approved for $66 million is estimated to cover the ACT needs for the public sector, private non-profit facilities, and HMBF program for the period 2005 to 2010.

To ensure the prompt treatment of children under five with suspected malaria, the MOH is implementing the HBMF strategy through CMDs. The MOH policy on HBMF requires each village to select two people trusted by the community to be trained as CMDs. The CMDs are trained how to identify children with fever and, based on the age of the child, provide an appropriate dose of antimalarial drugs. In April 2007, the NMCP changed its treatment policy for HBMF from pre-packaged chloroquine plus SP (HOMAPAK) to AL due to increasing drug resistance of *P.falciparum* to CQ and SP. The CMDs are supervised by health workers from the nearest health facility and are required to make monthly reports on the number of children with fever treated and/or referred.

Progress to Date:

With commodity and other support from PMI, WHO initially piloted the use of AL in HBMF in three districts in northern Uganda. The results from the WHO pilot districts and a PMI-supported evaluation of community ACT provision in Kiboga district indicate that there are some problems with the change in treatment to AL. In particular, there is a need to provide incentives to CMDs, to

provide training on the different packaging for different age groups (there are three formulations for the under-five age group), and the need for continuous supportive supervision.

The NMCP plans to roll-out the new HBMF program nationwide. Last year, PMI supported the roll-out of HBMF activities in nine conflict-affected districts in northern Uganda. Over 512 health workers from HCs II up to district hospital were oriented on HBMF with AL to strengthen their ability to provide supervision to CMDs. The Global Fund Round 4 grant supports the re-training of all CMDs, the collection of drug consumption data to accurately quantify commodity needs, and the provision of incentives for CMDs, including medicine boxes and bicycles. However, appropriate supervision of CMDs at the community level remains a challenge. In 2007-2008, the NMCP trained about 40,000 CMDs in the proper use of ACTs at the village level with funds from the Global Fund grant. Over 60,000 remain to be trained.

The NMCP is also working to improve the treatment of severe malaria and recently developed treatment guidelines for severe malaria. According to the guidelines, all cases of severe malaria should be treated with intravenous quinine. Facilities unable to offer in-patient care should provide pre-referral treatment - either intravenous quinine or artemether injectable. In FY07, PMI supported development of a training manual for health workers on severe malaria management and trained 329 health workers. In the following year, PMI helped the NMCP to quantify the needs for severe and pre-referral malaria drugs. With the signing of the Round 4 grant, the Global Fund will continue to support the purchase of drugs for severe malaria and the training of health workers. There is still a need for funding for supportive supervision of health workers, development and delivery of job aides to health facilities and support for delivery of drugs to facilities from district level to ensure that there are no drug stock-outs. PMI will fill this gap using FY09 resources.

The private sector also remains a major source of antimalarial drugs. There are over 300 licensed pharmacies and about 4,000 unlicensed drug shops throughout Uganda that provide a range of antimalarial remedies, including AL at very high prices (between $5 and $10 per treatment). Over 60% of patients with fever first seek care through the private sector. In 2008, the NMCP introduced AL into both the formal and informal drug markets. PMI using FY08 funding supported the re-classification of AL from a prescription only to an over-the-counter medicine. To help with the new program, Medicines for Malaria Venture is conducting a study of private sector treatment-seeking behavior. In addition, PMI trained 2,870 private sector providers on the new NMCP malaria policy and developed and distributed job aides on ACT treatment. The NMCP is striving to make ACTs affordable through the private sector, while combating counterfeit drugs and monotherapies.

Planned FY09 PMI Activities: ($562,100)

Planned activities during FY09 are as follows:

- **Enhance supervision of HBMF by health assistants at sub-county level**: PMI will help the NMCP strengthen supervision of CMDs by sub-county-based health assistants. Health assistants will arrange quarterly meetings with CMDs to discuss progress and update skills, share job aids, and collect quarterly data on the numbers of cases treated and referred. *($450,000)*

- **Provision of treatment guidelines and job aides for management of both uncomplicated and severe malaria in all health facilities**: PMI will support the

provision of treatment guidelines and job aides to be distributed to health facilities to strengthen delivery of care by health workers. *($100,000)*

- **TDY from CDC-Atlanta**: CDC Staff to provide technical support for strengthening of case management. *($12,100)*

Pharmacovigilance, Drug Resistance Monitoring and Drug Quality

Current Status, Challenges and Needs

The NDA is charged with both the development and maintenance of a pharmacovigilance system as well as ensuring drug quality. The pharmacovigilance system in Uganda is in its initial stages of development. Based on the WHO model, the NDA has designed a generic form to collect passive reporting data on all medicines; however, this system only reports limited numbers of adverse drug reactions. In order to roll-out an improved system, the NDA will require additional training, supervision, and community sensitization. Also, adverse event reports will need to be collected, analyzed, and acted upon.

The NDA aims to address drug quality of antimalarials through registration of pre-marketed medicines, inspection of factories which manufacture antimalarial drugs, licensing of drug outlets, and post-marketing surveillance. Circulation of fraudulent drugs, especially antimalaria drugs, is a well known problem in East Africa. A recent study showed that over 30% of antimalarial drugs sold in Kampala pharmacies were fraudulent.

Antimalarial drug resistance also remains a major concern. Ongoing surveillance of drug efficacy in Uganda is critical to ensure early identification of the emergence of resistance to AL and effective treatment policy. A recent study by UMSP in Tororo and Apac followed 414 individuals over a 28-day period and found that treatment with AL was associated with an almost 53% risk of recurrent parasitemia within four weeks following therapy. Further, this study showed 11.5% of recurrent parasitaemia due to recrudescence. These results highlight the extremely high incidence of malaria among children living in high transmission areas and the failure of even effective antimalarials to prevent re-infections. More recently, with funding from the Belgian Embassy, UMSP has completed two drug efficacy surveillance studies comparing AL with a promising new ACT, dihydroartemisinin-piperaquine, which has recently been approved for use in Uganda. Results indicate that recrudescence rate for dihydroartemisinin-piperaquine is 4.5%, superior to AL in preventing recurrent parasitemia. The results of these studies have been shared with the Ugandan NMCP and may have implications for future antimalarial drug policy.

Progress to Date:

Beginning in August 2007, PMI supported a pilot pharmacovigilance system with input from the NDA and other stakeholders at the UMSP sentinel site in Jinja. The site collected data from the community, and public and private sectors using enhanced passive reporting of adverse events associated with antimalarial drugs. A total of 61 health care workers and key community members were trained on the importance of pharmacovigilance, recognition of adverse events, and methods of reporting. Since October 2007, a total of 543 events have been reported, of which 423 (78%) were classified as adverse events associated with antimalarial drugs, particularly *chloroquine* and SP. The most common side effects reported were itching / pruritus, weakness, dizziness, vomiting, skin rash and blurred vision.

To address the issue of drug quality, PMI provided the NDA with equipment (e.g., a high performance liquid chromatography machine, mini-labs, etc.), technical assistance, training, and other support to improve the pre-market inspection of antimalarials and to help establish sentinel post-marketing surveillance sites. In 2007, PMI supported the provision of five mini-labs and the training of 25 technicians to operate these mini-labs. In 2008, another four mini-labs were provided to cover all NDA regional centers to act as sentinel post-marketing surveillance sites. Additional support is needed to finance operation of these sites, expand the pre-marketing quality assurance program, and further build the capacity of the NDA. During the three month period from April to June 2008, only nine of the 202 samples of antimalarials tested failed, yielding a success rate of 95.5%. When failures are identified, NDA follows the procurement path to identify pharmacies involved in the sale of fraudulent drugs, seizes the procurement, and may order closure of businesses.

Planned FY09 PMI Activities: ($290,000)

Planned activities during FY09 are as follows:

- **Strengthen pharmacovigilance and quality testing of antimalarials***:* PMI will continue to support NDA in building a robust pharmacovigilance and quality control system for anti malarial drugs. Support will be provided for training, sensitization, supportive supervision, adverse effects data collection, and analysis. PMI will also help NDA improve its pre-marketing quality control of antimalarials entering the country, expand its sentinel sites for post-marketing drug surveillance and fraudulent drug program to better understand the breadth of fraudulent drug issues in Uganda, and further build its capacity to fulfill its regulatory functions. *($190,000)*

- **Monitor drug resistance (efficacy) of anti malarial drugs***:* PMI will continue routine bi-annual drug efficacy testing of first-line, second-line, and potential alternative antimalarials in two sites across the country to inform policy decisions. *($100,000)*

INTERVENTION - EPIDEMIC PREPAREDNESS AND RESPONSE

Current Status, Challenges and Needs

Epidemic malaria transmission in Uganda occurs in approximately ten districts in southwestern and eastern regions. For this reason, the NMCP includes early detection and rapid containment of malaria epidemics as one of its objectives, and has adapted guidelines from WHO. Thresholds for what is considered to be an epidemic are established for each district based on the past three to five years of case data. If the number of malaria cases exceeds expected seasonal transmission thresholds, epidemic investigations and response are initiated immediately. However, existing systems for epidemic detection and response are weak and disorganized. In addition, districts do not always abide by epidemic control recommendations. Implementation is inconsistent, in part due to reliance on the HMIS system which is burdened with delays, and by the non-electronic means of communications used by the majority of districts. Other factors contributing to the weak system include: 1) slow reporting to the district and national level, 2) delayed or incomplete analysis of reports, and 3) lack of funding for fuel, available personnel, diagnostic capacity, and surge capacity in commodities to respond (e.g. additional drugs, ITNs, IRS).

The core elements to revitalising malaria epidemic preparedness and response include:

1. Ensuring a surveillance system that is based on timely recording and reporting, and prompt data analysis and interpretation;
2. Improving malaria diagnosis in targeted sites in epidemic prone districts; and
3. Working with hospitals and HCs IV as points for data collection since they are equipped with diagnostic facilities and equipment.

Progress to date:

Funds in the pipeline from FY07 and FY08 are available for epidemic surveillance and response (ESR) skills training, reviewing/developing ESR guidelines, providing necessary tools (e.g. record books, patient registers, tally sheets) and supportive supervision. An Officer will be recruited by WHO and based at the NMCP to provide full time support in epidemic surveillance to implementing districts and sentinel sites.

In addition to ensuring that key issues in ESR are addressed, the following strategies are being considered:

- Reconstitute and encourage regular meetings of the National Task Force, previously established by WHO, to investigate and respond to epidemic surveillance results;
- Revise and update current ESR guidelines and algorithms;
- Revitalize ESR task force teams at the district level by sensitizing the district leadership, and update the skills of the teams to respond to malaria epidemics;
- Train Records Assistants in data management and utilization of data for decision-making to establish malaria thresholds at health centers; and
- Provide support for epidemic response, including commodities, transportation, diagnostic support through RDTs or microscopy, supplies and equipment for malaria epidemic containment and IEC materials required for rapid community responses.

Planned FY09 PMI Activities: ($0)

No funding will be allocated in the FY09 malaria operational plan for this activity. There are sufficient resources from FY07 and FY08 for the above activities. Additional funding to support on-going ESR activities will be considered for FY10.

PUBLIC-PRIVATE PARTNERSHIPS

Current Status, Challenges and Needs

Public-private partnerships are a highly attractive means of leveraging additional support and expertise for priority health programs. PMI recognizes the important role played by the private sector in serving a significant population outside of government supported facilities. In Uganda, the USAID-supported Health in the Private Sector (HIPS) project has enabled PMI to leverage additional funds for malaria control. Companies that join the HIPS partnership contribute funds from their own resources either as matching funds to the contribution by PMI, or in some cases towards malaria control in communities around their locality. The HIPS project has allowed PMI to enhance PEPFAR/PMI integration as well as to support the delivery of services, particularly LLINs and IPTp, to pregnant women.

Progress to Date:

With FY08 funds, HIPS is promoting the use of LLINs and IPTp for over 12,000 pregnant women through ten major companies, including large sugar and tea producers and cement and manufacturing firms.

Planned FY09 PMI Activities: ($150,000)

PMI will continue to utilize public-private partnerships in FY09. PMI will increase both the number of companies participating in the HIPS project, and the number of beneficiaries reached by to 250,000 people in 15 districts (including 20,000 pregnant women and 160,000 children under five). PMI funds will be leveraged with private sector funds to expand the impact of malaria control activities and encourage the entry of companies into the mix of key malaria stakeholders.

Planned activities during FY09 are as follows:

- **Support LLINs distribution in private sector corporations***:* PMI will provide 100,000 LLINs to private sector corporations to distribute free to pregnant women and children under five in areas of operation. These corporations will provide matching funds to add an additional 100,000 LLINS for free distribution to end users. ($100,000)

- **Supporting private sector companies' health facilities to provide comprehensive IPTp services at ANC clinics:** PMI will support the delivery of comprehensive and integrated IPTp services with PMTCT at facilities operated by numerous private sector companies. ($50,000)

MONITORING AND EVALUATION

Current Status, Challenges and Needs

Monitoring and evaluation capacity remains a significant gap in the NMCP. In 2007/8, the NMCP, along with the M&E Technical Working Group, developed a National Malaria M&E Plan, which should be finalized by September 2008. The malaria indicators in this plan are closely aligned with those of the Monitoring and Evaluation Reference Group of RBM. However, NMCP has inadequate capacity and limited tools and equipment for M & E. The NMCP has only one part-time M&E staff member and no statistician. This critical human resource shortage has resulted in the inability of the NMCP to implement many of its M&E priorities.

In the NMCP M&E plan, the MIS (scheduled for mid-2009), the DHS, and the HMIS will be used to monitor coverage of the four key interventions: ACTs, ITNs, IPTp, and IRS (e.g., percentage of pregnant women sleeping under an ITN the previous night). Additional malaria morbidity and mortality information will be gathered using mechanisms such as the verbal autopsy survey, the verbal autopsy validation study, DSS sites and sentinel site surveillance.

PMI Uganda uses the following three major tools to measure the impact of its program performance:

- The 2006 Uganda DHS: This survey provided baseline information for PMI activities in Uganda.
- The 2007 Uganda Service Provision Assessment Health Facility Survey: Results are being used to monitor the availability and quality of health services.
- Malaria Indicator Survey: This joint survey between the AIDS indicator survey and MIS is planned to begin in May 2009, after the rainy season. The MIS will show population-level coverage and impact data on the four major malaria interventions as well as biomarkers for anemia, parasite prevalence and parasite differentiation (through thick/thin blood slides).

Progress to Date:

Verbal autopsy survey and validation study
PMI supported the Uganda Bureau of Statistics to conduct verbal autopsies of deaths in children under five that occurred in the three years prior to the 2006 DHS using the new WHO verbal autopsy tool. It will allow an estimate of malaria-attributable mortality among children under five years old. The final report of the verbal autopsy study will be available by the end of 2008.

PMI has been supporting a study to examine the validity of verbal autopsy procedures in three different epidemiological settings in Uganda as the sensitivity of verbal autopsy for establishing malaria-associated mortality may vary with transmission intensity. In addition, there is a plan to develop and evaluate expert-derived algorithms for reviewing verbal autopsy data, building on prior algorithms, and utilizing the expertise of the physicians involved in the review of the verbal autopsy questionnaires. The verbal autopsy validation study results are expected in 2009.

Sentinel site surveillance activities
Sentinel sites were first established by UMSP and the MOH in 2001 to determine the efficacy and safety of antimalarial drugs in epidemiologically different sites. With support from PMI and the MOH, there are now ten sentinel sites in nine districts (Kabale, Kanungu, Iganga, Tororo, Mubende, Apac (2), Oyam, Masindi, and Jinja). The focus of work on sentinel sites in 2007-2008 has been to increase the quality of data management and analysis, ensure high quality laboratory diagnosis and improve health worker performance. These sites have the capacity to monitor and

collect reliable data on malaria morbidity and mortality indicators from outpatient departments and inpatient wards.

Uganda Service Provision Assessment, 2007
This nationwide facility-based survey was designed to collect information on facility infrastructure, resources and management systems, and availability of services for child health, family planning, maternal health (ANC, delivery care), and selected infectious diseases (malaria, HIV/AIDS, tuberculosis and sexually transmitted diseases). Data collection began in September 2007 at 491 public, private and not-for-profit health facilities throughout the country. The sample of facilities was designed to allow for national and regional conclusions on key indicators. The final report was released in September 2008.

Establishment of a national electronic database tracking system to monitor ITN distribution
In 2007, PMI collaborated with the President's Emergency Plan for HIV/AIDS Relief (PEPFAR) to launch a project with the NMCP to develop and implement an electronic database for tracking ITNs that enter Uganda. This collaborative project has developed a composite database tool with various sources of relevant information. The database harmonizes the reporting requirements of the NMCP, Ministry of Health, and also the Health Sector Strategic Plan 2005-2010. The central database itself was designed to be flexible enough to address prospective future needs and is prepared to link with multiple relational databases for HIV/AIDS and other diseases, as well as interventions. Hopefully, the database and its corresponding digital map will streamline all relevant malaria-related activities within the country to conform to standard indicators, monitor ITN partner activities, and coordinate future ITN distributions to fill coverage gaps in specific sub-counties.

The MOH uses the HMIS to monitor Heath Sector Strategic Plan performance and to provide routine morbidity and mortality data from health facilities across the country. The NMCP also uses HMIS for its program monitoring. Information currently used from HMIS for informational markers include:

- the number of outpatient clinical malaria cases per district (with reports from over 90% of health facilities)
- proportions of malaria-positive blood tests
- malaria-attributable mortality

The HMIS system does not capture any vector control programmatic indicators such as ITNs distributed and households sprayed. This information is crucial for program planning and management. Therefore, PMI is supporting establishment of a vector control tracking database to help guide the national malaria control program.

Monitoring and Evaluation Management Services (UMEMS)
The new UMEMS project serves as the central data collection point for compilation of project information and dissemination for all PMI implementing partners. They assist project partners in developing their performance management plans, and ensure that these are harmonized with the Uganda PMI PMP. This project helps with quarterly and annual reporting as per PMI requirements.

<u>Planned FY09 PMI Activities: ($1,424,200)</u>

Planned activities during FY09 are as follows:

- **Malaria Indicator Survey**: As part of the impact evaluation of PMI, an MIS will be done in May 2009 at the mid-point of PMI implementation in combination with the AIDS Indicator Survey. In FY09, $1 million from FY08 was allocated for the MIS, and FY09 funding makes up the balance for completion of the survey. *($800,000)*

- **Strengthen and expand sentinel sites:** The existing ten sites will continue to be strengthened to provide quality data on malaria-attributable morbidity and mortality. Electronic data management systems will be established in at least one site per district that will target both the HCs IV and hospitals in the district. Health staff will be trained in these systems and in quality data collection. Each site will receive supportive supervision three times a year, assistance with internal quality control systems for health facility laboratories, and external quality assurance for laboratory diagnosis of malaria by periodic sampling of malaria slides from health facility laboratories for accuracy by an expert microscopist at the UMSP Kampala core facility. *($300,000)*

- **Program monitoring and tracking system development**: Support for developing databases for NMCP for tracking programmatic progress in key malaria intervention areas (e.g., data on ITN distribution, IRS spray campaigns). *($100,000)*

- **PMI data collection and reporting**: The UMEMS project serves as the central data collection point for all PMI implementing partners. It provides data quality assessment, analyzes PMI progress towards goals and allows for rapid reporting of results. This partner also conducts PMI partner progress meetings. *($200,000)*

- **2 TDYs from CDC-Atlanta**: CDC Staff to provide technical support to M&E strengthening activities. *($24,200)*

CAPACITY BUILDING WITHIN THE NMCP

Current Status, Challenges, and Needs

The NMCP is responsible for developing policy, establishing norms, and planning, organizing, and overseeing all malaria control and prevention activities in the country. It also coordinates all malaria-related activities with key staff from the Community Health Department, Pharmacy Department, Epidemiology Surveillance Division, and with NGOs, donors, and other partners. The NMCP links with the Child Health and Reproductive Health Sections to integrate malaria prevention and treatment into the integrated management of childhood illnesses and ANC and works with the Health Education Section to develop and implement communications and behavior change activities for malaria.

Strong and effective leadership by the NMCP is critical to the success of malaria control and prevention efforts funded by the Global Fund, other international donors and partners, and PMI. The NMCP staff currently consists of a programme manager, one senior entomologist, one senior health educator, one environmental health coordinator, and four senior medical officers/ epidemiologists assigned to provide oversight and supervision to different technical areas of malaria: IPTp, HBMF, case management, M&E and research activities. However, as previously mentioned, the M&E unit of the NMCP lacks critical human resource capacity and equipment

(computers and accessories, scanners, and photocopiers) to adequately operate and fulfill its functions. Currently, there is no mechanism in place at the NMCP to evaluate large-scale malaria interventions. At the regional level, there are zonal malaria focal persons, and at the district level, there are district malaria focal persons appointed to oversee all malaria related activities within their respective district health management teams.

Progress to Date:

Two PMI Advisors (CDC and USAID) have been critical in supporting NMCP activities in Uganda. Both Advisors have played key roles in the country's malaria technical working groups, the mechanism by which the NMCP coordinates with PMI and other partners. For example, in collaboration with all malaria partners, a draft M&E plan for the NMCP has been developed and will be finalized soon.

Planned FY09 PMI Activities: ($130,000)

To reach the NMCP targets for coverage with ACTs, ITNs, IPTp, and IRS, PMI and other partners will need to work together to strengthen the capacity of the NMCP and other collaborating departments and sections at the central, regional, and district levels to plan, conduct, supervise, monitor and evaluate malaria prevention and control activities. This will require the improvement of working and communication facilities, logistical support, and strengthening human capacity at the NMCP through training, supervision, and mentoring.

Planned activities during FY09 are as follows:

- **Capacity building support to the NMCP**: In Year 4, PMI will continue to support the secondment of an M&E staff person to the NMCP and also continue to support the operations of the NMCP by providing various resources such as equipment and supplies. This secondment will be time-limited, and the NMCP will agree to turn this into a permanent position within two years. *($100,000)*

- **Coordination with other donors**: PMI will support NMCP activities geared at strengthening its coordination role with the various NGOs and donors involved in malaria control in the country. This will include facilitating coordination meetings and public symposia where different malaria updates and lessons learned can be shared with all partners. *($30,000)*

HIV/AIDS AND MALARIA INTEGRATION

Current Status, Challenges and Needs

PMI- and PEPFAR-supported activities lend themselves to opportunities for collaboration. Both Initiatives target vulnerable populations – pregnant women and children under five – and people living with HIV/AIDS are especially vulnerable to malaria.

Progress to Date:
PMI and PEPFAR are currently collaborating on the combined MIS/AIS scheduled for May 2009. In addition and as previously mentioned, PMI-supported activities that have integrated with

HIV/AIDS programs in Uganda include HIPS (public-private partnerships) and pharmaceutical management.

Planned FY09 PMI Activities: ($115,000)

In FY09, PMI will expand collaboration with PEPFAR. Planned activities during FY09 include:

- **Leadership development at the district level for integrated supportive supervision**: PMI will support the development of leadership capacity for performance monitoring and integrated supervision of malaria in selected pilot districts where PMI supported activities are intense. The objective of this activity is to build leadership capacity at the district level in order to enhance effective supervision of malaria activities. *($65,000)*

- **Building local capacity for malaria program management through an on-the-job internship program**: PMI will support the Mission-led initiative to build national capacity for program management through the placement of recent graduates in well-performing programs where they can be mentored by experienced and senior program managers and receive on-the-job training. These interns will be supported to work at host institutions for a period one to two years. *($50,000)*

STAFFING AND ADMINISTRATION

Two senior malaria technical advisors provide oversight to all PMI-related activities in Uganda, one from CDC and one from USAID. In addition, two project management specialists were hired by USAID to support the management and administration of PMI activities. All PMI staff members are part of a single interagency team led by the SO8 Health Team Leader and overseen by the USAID Mission Director. The PMI team is responsible for the development and implementation of PMI strategies and work plans, the coordination of malaria activities with national authorities, the management of collaborating agencies' PMI-funded activities, and the supervision of all day-to-day PMI-related activities. Candidates for new positions will be evaluated and/or interviewed jointly by USAID and CDC, and both agencies will be involved in hiring decisions, with the final decision made by the hiring agency.

The two senior technical advisors, together with the project management specialists, will work together to oversee all technical and administrative aspects of the PMI in Uganda, including finalizing details of the project design, managing and overseeing malaria prevention and treatment activities, monitoring and evaluation of outcomes and impact, and reporting of results. All staff members report to the SO8 Health Team Leader. The CDC staff person is supervised by CDC, both technically and administratively. 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, the World Bank and private stakeholders.

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

Planned FY09 PMI Activities: ($1,837,400)

- **Management of PMI***:* Support two PMI (one USAID and one CDC) based at the USAID Mission in Kampala, including all work-related expenses (e.g., travel, supplies, etc.), and two project management specialists. *($1,837,400)*

ANNEXES

Table 1
President's Malaria Initiative – Uganda
Year 4 (FY09) Timeline of Major Activities

ACTIVITY	2008	2009											
	OCT-DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Purchase Commodities (drugs, LLINs, insecticides, spraying and lab supplies)													
IRS campaigns in Northern Uganda													
Entomologic capacity-building and study of insecticide resistance													
LLIN distribution through ANC, campaigns, and net facility													
Support IPTp policy implementation and provision of integrated IPT services													
Training and supervision in laboratory diagnosis and support of roll-out of RDTs													
Strengthen pharmaceutical supply chain management													
Provision of treatment guidelines													
Strengthen pharmacovigilance and quality testing of antimalarials													
Support epidemic preparedness and response													
Malaria Indicator Survey													
Strengthen and expand sentinel sites, develop monitoring and tracking system, and support MEMS													

Table 2
President's Malaria Initiative – Uganda- Planned Obligations for FY09

MOP FY09 TABLE 2					
Proposed Activity	**Mechanism**	**Total Budget**	**Commodities**	**Description of Activity**	**Geographic area**
PREVENTION					
IRS					
Support for IRS in Acholi region	IRS TBD	$5,900,000	$2,500,000	Two rounds of spraying in Acholi region with longer acting insecticides in June/July 2009 and Nov 09-Feb 10	Kitgum, Gulu, Pader, Amuru
Support for IRS in Lango region	IRS TBD	$2,100,000	$875,000	Two rounds of spraying in Lango region with longer acting insecticides in June/July 2009 and Nov 09-Feb 10	Apac and Oyam
Support for targeted IRS in southwestern Districts of Kabale and Kanungu	IRS TBD	$460,000		Selective spraying in high malaria transmission sub-counties in Kabale and Kanungu during high transmission season	Nine sub counties in Kabale and six sub counties in Kanungu
Develop local capacity to oversee quality IRS	IRS TBD	$300,000		Capacity development of GOU (NMCP, NEMA and district government) to oversee technical quality, environmental monitoring and accountability of IRS programs in Uganda	National
Subtotal		***$8,760,000***	***$3,375,000***		
Vector Control – General					
Entomologic Surveillance	IRS TBD	$450,000	$50,000	Conduct entomologic surveillance in 5 locations, training, procurement of equipment/supplies, sample analysis and insectory support to VCD	IRS districts
OR on Insecticide Resistance	TBD	$50,000		Entomological evaluation of vector resistance to various insecticides	National
2 TDYs	CDC	$24,200		Technical assistance visit for planning and monitoring entomological and vector control activities	National
Subtotal		***$524,200***	***$50,000***		

MOP FY09 TABLE 2					
Proposed Activity	**Mechanism**	**Total Budget**	**Commodities**	**Description of Activity**	**Geographic area**
LLINs					
Procurement of LLINs	STOP Malaria	$5,500,000	$5,500,000	75,000 for Northern Uganda, 80,000 for W. Nile and Karamoja, 650,000 for STOP Malaria target districts, 95,000 for LLIN facility and 100,000 subsidized for HIPS, (total 1 million)	
Distribution of free LLINs through ANC clinics	NUMAT	$75,000		Costs include IEC/BCC, distribution and M&E	Acholi and Lango regions
	STOP Malaria	$100,000		Costs include IEC/BCC, distribution and M&E, and collaboration with MCP partner in W. Nile	West Nile and Karamoja
	STOP Malaria	$650,000		Costs include IEC/BCC, distribution and M&E	Rest of Uganda (RoU)*
Distribution of LLINs through the LLIN net facility and mass campaigns	STOP Malaria	$95,000		Distribution of approximately 95,000 LLINs through mass campaigns and NGO/CBOs to pregnant women, children under five, and other targeted vulnerable groups (costs are comprehensive)	National
Subsidized nets to private sector corporations that add additional subsidies for free distribution to end users	HIPS	$100,000		100,000 LLINs through corporate health facilities working in partnership with HIPS, targeting pregnant women, children under five and other targeted vulnerable groups	National
Subtotal		***$6,520,000***	***$5,500,000***		
IPTp					
IPT policy implementation	STOP Malaria	$25,000		Continued support to MOH to develop guidelines/curriculum and implement the policy	National
Comprehensive IPTp services at ANC facilities	STOP Malaria	$350,000	$75,000	Includes provision of safe water and cups to aid with DOT, training, IEC/BCC and support supervision	Selected areas in Rest of Uganda (RoU)

MOP FY09 TABLE 2					
Proposed Activity	**Mechanism**	**Total Budget**	**Commodities**	**Description of Activity**	**Geographic area**
	NUMAT	$200,000	$25,000	Includes provision of safe water and cups to aid with DOT, training, IEC/BCC and support supervision	Selected districts in Northern Uganda
Support of private sector company health facilities for comprehensive IPT services	HIPS	$50,000	$5,000	Subsidized IPT drugs and comprehensive IPTp services through HIPS partner companies	Partner companies nationwide
Subtotal		***$625,000***	***$105,000***		
Subtotal: Prevention		***$16,429,200***	***$9,030,000***		
TREATMENT					
Diagnosis					
Strengthen malaria diagnostic capacity	CDC – UCSF/UMSP	$300,000	$100,000	Continued support to provide comprehensive diagnostic training to selected health center IVs, district and referral hospitals; procure selected laboratory supplies	National
	STOP Malaria	$100,000		Integrated diagnostics training using RDTs at health centers II and III	STOP Malaria districts
1 TDY	CDC	$12,100	0	TA to strengthening laboratory diagnostics	National
Subtotal		***$412,100***	***$100,000***		
Pharmaceutical management					
Pharmaceutical supply chain management	New Logistics Award	$400,000		TA to MOH, National Medical Stores, and Joint Medical Stores for improved quantification and forecasting, procurement, warehousing, distribution, LMIS and reporting	National
Subtotal		***$400,000***	***$0***		
Case Management					

MOP FY09 TABLE 2					
Proposed Activity	**Mechanism**	**Total Budget**	**Commodities**	**Description of Activity**	**Geographic area**
Supportive supervision for CMDs providing home-based management of fever	NUMAT	$150,000		Provide support for scale-up of HBMF with ACTs: supervision, on the job training, and motivation of CMDs	Northern Uganda
	STOP Malaria	$300,000			Rest of Uganda (RoU)
Supportive supervision and job-aids for use of severe malaria drugs	STOP Malaria	$100,000		Provide supportive supervision and job-aids to health care workers on the proper use of severe malaria drugs	National
1 TDY	CDC	$12,100		TA to strengthening malaria case management	National
Subtotal		***$562,100***	***$0***		
Pharmacovigilance					
Quality assurance of antimalarials	USP	$40,000		Short-term TA from USP to NDA and limited supply of reagents	National
Quality assurance of antimalarials and pharmacovigilance	NDA	$150,000		Pharmacovigilance, quality control and post marketing surveillance of antimalarials (NDA to take on these costs in later years)	National
Anti malarial drug efficacy studies	CDC – UCSF/UMSP	$100,000		Conduct drug efficacy testing for antimalarials (CQ, SP, AL, DP) in 2 sites	National
Subtotal		***$290,000***	***$0***		
Subtotal: Treatment		***$1,664,200***	***$100,000***		
EPIDEMIC SURVEILLANCE AND RESPONSE					
Support for epidemic surveillance and response	WHO	$0		Strengthen system to detect epidemics and respond in 4 districts (FY07 and FY08 pipeline)	Epidemic-prone districts
Subtotal		***$0***	***$0***		

MOP FY09 TABLE 2					
Proposed Activity	**Mechanism**	**Total Budget**	**Commodities**	**Description of Activity**	**Geographic area**
MONITORING AND EVALUATION					
Malaria Indicator Survey (MIS)	Measure/ DHS	$800,000		Complete Malaria Indicator Survey in conjunction with AIDS Indicator Survey	National
Strengthen and expand sentinel sites	CDC – UCSF/UMSP	$300,000		Collect and monitor hospital and outpatient data on malaria-related cases and fatalities up to 14 sites. ($1,200/mo/site)	10 existing sites in Uganda plus addition of four new sites in areas currently not covered
Program Monitoring and tracking system development	STOP Malaria	$100,000		Sustain databases for NMCP to track programmatic progress in key malaria intervention areas (e.g. ITN tracking database)	National
Continued support to UMEMS	UMEMS	$200,000		PMI data collection, dissemination, reporting, DQAs and partner meetings, etc.	National
2 TDYs	CDC	$24,200		Technical Assistance to sentinel site surveillance and MIS	National
Subtotal		***$1,424,200***	***$0***		
CAPACITY BUILDING					
Capacity building support to NMCP	STOP Malaria	$100,000		Seconded staff, equipment & supportive supervision	National
Linking NMCP with donors	STOP Malaria	$30,000		Linking NMCP with donors, conduct symposia, etc.	National
Integrated supportive supervision through leadership training at district levels	TBD	$65,000		Target 10 districts chosen based on leadership capacity, performance, and scale of PMI involvement; also support for central MOH leadership training	National (10 model districts)

MOP FY09 TABLE 2					
Proposed Activity	**Mechanism**	**Total Budget**	**Commodities**	**Description of Activity**	**Geographic area**
Build local capacity through internship program	TBD	$50,000		Support interns to work with malaria-related partners	National
Subtotal		***$245,000***	**$0**		
STAFFING AND ADMINISTRATION					
CDC Management	CDC	$636,400			
USAID Management	USAID	$1,201,000			
Subtotal		***$1,837,400***	***$0***		
GRAND TOTAL		**$21,600,000**	**$9,130,000**		
*Rest of Uganda refers to regions outside of W. Nile, Acholi, Lango, and Karamoja, but does not imply all districts outside of these regions.					

Table 3
President's Malaria Initiative – Uganda
Year 4 (FY09) Budget Breakdown by Intervention

Area	Commodities $ (%)	Other $ (%)	Total $
Indoor Residual Spraying	39%	41%	$8,760,000
Vector Control - General	11%	89%	$524,200
Long-Lasting Insecticide-treated nets	84%	16%	$6,520,000
Intermittent Preventive Treatment	17%	83%	$625,000
Treatment (including diagnosis, case management, pharmaceutical management and pharmacovigilance)	6%	94%	$1,664,200
Monitoring and Evaluation	0%	100%	$1,424,200
Capacity Building	0%	100%	$245,000
Administration	0%	100%	$1,837,400
Total	**42%**	**58%**	**$21,600,000**

Table 4
President's Malaria Initiative – Uganda
Year 4 (FY09) Budget Breakdown by Partner ($)

Partner Organization	Geographic Area	Activity	Budget*
IRS TBD	Kitgum, Pader, Amuru, Gulu, Apac and Oyam, Kabale and Kanungu	Procurement of IRS insecticide & equipment, training, IEC/BCC and environmental monitoring; support to NMCP IRS activities; strengthen entomologic capabilities of NMCP/VCD. Develop public sector capacity to oversee IRS	$9,210,000
STOP Malaria	Rest of Uganda (not covered by NUMAT)	Procurement & distribution of LLINs through ANC clinics, LLIN net facility and mass campaigns; IPT policy implementation; comprehensive IPTp services at ANC facilities; support supervision and job-aids on the use of severe malaria drugs; support to HMIS; program monitoring and tracking system development	$7,450,000
NUMAT	Acholi and Lango regions	Distribution of LLINs through ANC clinics; comprehensive IPTp services at ANC facilities; supportive supervision to CMDs providing home-based management of fever	$425,000
HIPS	National	Subsidized nets to private sector corporations that add additional subsidies for free distribution to end users and comprehensive IPT services with PMTCT at private sector health facilities	$150,000
CDC – UCSF/UMSP	National	Strengthen and expand sentinel sites and malaria diagnostic capacities and conduct anti malarial drug efficacy studies	$700,000
TBD - New Logistics Award	National	Pharmaceutical supply chain management: TA to MOH, National Medical Stores, and Joint Medical Stores for improved quantification and forecasting, procurement, warehousing, distribution, LMIS and reporting.	$400,000
USP	National	Short-term TA from USP to NDA and limited supply of reagents	$40,000
NDA	National	Pharmacovigilance, quality control and post marketing surveillance of anti malarials. NDA to take on these costs in later years.	$150,000
Measure/DHS	National	Early funding to complete MIS	$800,000
UMEMS	National	PMI data collection, dissemination, reporting, DQAs and partner meetings.	$200,000
TBD Capacity Development	National	Management capacity development in 10 districts chosen based on leadership capacity, performance, and scale of PMI involvement; support for central MOH leadership training; support interns to work with malaria-related partners	$115,000
OR TBD	National	Entomological evaluation of vector resistance to various insecticides	$50,000
CDC TDYs	National	TDY	$75,000
CDC	National	Staffing and administration	$634,000
USAID	National	Staffing and administration	$1,201,000
			$21,600,000