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PRESIDENT'S MALARIA INITIATIVE

Malaria Operational Plan (MOP)

RWANDA

FY 2010

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EXECUTIVE SUMMARY

The President's Malaria Initiative (PMI) began supporting activities in Rwanda in FY 2007 in close collaboration with the National Malaria Control Program (NMCP) as well as international and national partners. Malaria remains a major public health problem in Rwanda, although data from Health Management Information System (HMIS) suggest that the transmission of malaria in Rwanda has decreased significantly in the past few years. The reported number of episodes of uncomplicated malaria (confirmed and presumed) treated in public sector health facilities fell from 1.5 million in 2005 to 1.3 million in 2006 to 800,000 in 2008. In 2006, malaria was the leading cause of morbidity and mortality representing 37% of outpatient consultations and 41% of hospital deaths. In contrast, in 2008, malaria represented just 12% of outpatient consultations and only 16% of hospital deaths. Malaria is now considered the third leading cause of morbidity and mortality after pneumonia and diarrhea. According to the 2008 interim DHS, the child mortality rate is 103 deaths per 1,000 live births, a 32% reduction from the 2005 rate of 152/1,000.

Recent progress in malaria control in Rwanda has been attributed to several factors. Prompt treatment at health facilities has improved as participation in the national health insurance (*mutuelle*) scheme has risen to over 90%. Treatment of fever in children under five with artemisinin-based combination therapy (ACTs) at the community level has also increased to 21 of 30 districts nationwide. The impact of community treatment on the number of cases treated at health facilities is expected to continue to increase over the next several years. Ownership and usage of insecticide-treated bed nets (ITNs) has increased rapidly in both rural and urban areas of Rwanda due to increased availability of free nets to target groups through mass campaigns and routine delivery channels. Indoor residual spraying (IRS) which commenced in 2007 in three districts in Kigali has expanded to targeted areas in other districts and the country has begun to build capacity to carry out IRS operations. As a result of the decline in malaria incidence, the National Malaria Control Program (NMCP) has revised its national strategy (2008-2012) to target the entire population and not just the most vulnerable groups with malaria prevention and control measures.

The planning mission for the Year 4 Malaria Operational Plan (MOP) for Rwanda was conducted in May 2009. The planning team included representatives from the U.S. Agency for International Development (USAID), the Centers for Disease Control and Prevention (CDC), and the NMCP. Nearly all national and international partners involved with malaria prevention and control in Rwanda participated. Based on discussions and meetings with the NMCP and partners, the following major activities will be supported during Year 4:

Insecticide-treated nets (ITNs): The Malaria Strategic Plan promotes universal long-lasting ITNs (LLINs) coverage for all age groups with one for every two people or three nets per household. The main delivery channels are mass distribution during integrated vaccination campaigns and routine distribution through antenatal care (ANC) and Expanded Program for Immunization clinics in all health centers. The estimated annual LLIN need, based on the goal of universal coverage, includes approximately 840,000 nets for infants and pregnant women, to be targeted through routine services, and an additional six million nets needed for approximately two million households to achieve universal coverage. The PMI is procuring

581,100 nets with Year 2 funding (this total includes 56,700 PEPFAR-funded nets) to contribute to routine services, vulnerable populations, and mass distribution campaigns planned for 2010. The PMI will procure an additional 350,000 nets with Year 3 funding to contribute to these campaigns. The PMI is also strengthening LLIN distribution systems to district and community levels to prevent stock-outs, and is increasing information, education, communication / behavior change communication (IEC/BCC) activities to promote correct and consistent net use among vulnerable groups.

In Year 4, PMI will continue to support LLINs distributed through routine channels by procuring 300,000 LLINs for children under one and pregnant women. The PMI will continue to invest in improving net use with a national IEC/BCC task force to evaluate and revise integrated malaria messages for behavior change and community mobilization. With malaria transmission decreasing, promoting LLIN usage will be important to address decreasing risk perception among the general population. In addition, PMI will support the NMCP to assess the durability and longevity of LLINs to guide replacement strategies. These activities and contributions from other donors are expected to bring household ownership of one or more LLINs to more than 85% nationwide.

Indoor residual spraying (IRS): The PMI supports the NMCP's strategy to reduce malaria transmission through targeted IRS and entomological monitoring in targeted high-risk areas. Indoor residual spraying has featured highly in malaria control strategies in Rwanda since 2007. The most recent round of spraying covered 191,051 houses. In Year 3 (August 2009), PMI will support an expanded spray round to reach approximately 275,000 houses, using a long-lasting insecticide to maximize impact during the highest transmission period and through the second transmission peak early in 2010. In addition to procuring insecticide and spray equipment, recruiting and training community health workers (CHW) as spray operators, and associated IEC activities, PMI provided technical assistance to the NMCP to increase entomological capacity for resistance monitoring in the districts targeted for IRS by supporting the development of an entomology monitoring plan and an insectary.

For Year 4, PMI will continue to support targeted sectors protecting approximately 275,000 houses. To supplement on-going capacity building, continued financial and technical support for district-level vector control training is planned, primarily to develop IRS oversight capability. The PMI will also continue to support the insectary, insecticide resistance testing, and implementation of the entomological monitoring plan.

Malaria in Pregnancy (MIP): Because of increasing parasite resistance to sulfadoxine-pyrimethamine and decreasing malaria prevalence, the NMCP has discontinued intermittent preventive treatment of malaria in pregnancy (IPTp). The PMI continues to support other aspects of the prevention and treatment of MIP strategy. Marked improvements have been made in recent years to strengthen the integration of ANC services with other health programs. The Maternal Child Health (MCH) desk has taken the lead coordinating with other sections, including the NMCP, the Community Health Desk and EPI. The services provided by these units, in addition to fetal growth monitoring and birth preparation, make up the basic focused antenatal care (FANC) package, which is now available in 26 of 30 districts nationwide. A key shift in the MIP strategy is to use CHWs to identify pregnant women and

distribute a first dose of iron, folic acid, and mebendazole for anemia prevention. The CHWs also encourage pregnant women to use LLINs and attend early first ANC visits during their pregnancy. In Year 3, PMI helped improve the quality of FANC services through training and capacity-building efforts at national and district levels, delivered 250,000 LLINs for pregnant women attending ANC services, and provided a one-year supply of iron and folic acid.

In Year 4, PMI will continue to support the national strategy for the prevention and treatment of malaria in pregnancy with the increased involvement of CHWs in preventive services and strengthening surveillance and reporting systems of malaria cases during pregnancy. The PMI will collaborate with the MCH desk and the NMCP in the training, supervision, and implementation of the community outreach approach. The PMI will also focus on links between CHWs and health facilities to ensure availability and use of LLINs by pregnant women, early and regular ANC attendance, and prompt treatment for malaria. An assessment of the clinical burden of malaria in pregnant women in the context of declining malaria incidence will be carried out.

Case management: All health facilities officially transitioned to artemether-lumafantrine (AL) as the first-line treatment for uncomplicated malaria in October 2006. The Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund) now procures all AL nationwide and provides other antimalarials and diagnostic support for health facilities. The PMI concentrates on development of human resources and systems for home-based management of fever (HBMF); as well as on the private sector, strengthening laboratory diagnostic training, and supervision systems. Eighteen of the 19 districts in the country that are considered endemic for malaria have functioning HBMF programs. Two additional districts have introduced the use of rapid diagnostic tests (RDTs) in four health center catchment areas. The PMI also supports the repackaging of ACTs for HBMF and the private sector to ensure recognition and compliance among caretakers as well as to track facility versus community treatments. The PMI funds BCC/IEC to promote timely treatment seeking and proper use of AL, as well as household surveys of care-seeking behavior.

In Year 4, PMI will support efforts to ensure prompt and effective case management of malaria at health facilities, at the household level through HBMF, and in the private sector. At the health facility level, PMI will concentrate on strengthening capacity in laboratory diagnostics, supply chain management, and BCC. The PMI will also strengthen quality assurance/quality control systems at national and district levels for accurate malaria diagnostics, and will support the NMCP's supervisory role to monitor and reinforce the correct use of AL at health facilities and in communities.

Epidemic surveillance and response (ESR): Malaria surveillance will become increasingly important in Rwanda as the country moves toward malaria elimination, and the risk of both imported cases and outbreaks increases. Rwanda's ESR system features 20 sentinel sites, weekly reporting procedures, and response committees established at national, district and sector levels. While gradually improving in recent years, all of these systems need significant reinforcement. Progress in implementing ESR has continued slowly this year, but with an

increasing sense of urgency. A working group on ESR has begun regular meetings and is planning for the introduction of cell phone-based reporting from existing surveillance sites.

In Year 4, PMI plans significant support for ESR. The NMCP's ESR working group will develop a full plan during 2009, to be implemented in 2010. Elements will include a rapid data entry and response system, following the model used in Zanzibar; development of additional sentinel sites in newly epidemic-prone districts in eastern Rwanda; strengthening of response capabilities at national and district levels; and training with other capacity-building activities.

Monitoring and evaluation (M&E): There has been substantial progress in M&E over the last twelve months, with significant contributions from both PMI and PEPFAR. For the first time, HMIS data have become readily available, with sufficient completeness and timeliness to be used in routine analyses. Staff at the NMCP have analyzed these data and produced maps and charts showing the geographic distribution of malaria as well as time trends. The strengthening of the HMIS reflects the work of a national M&E task force as well as the efforts of a technical advisor to the ministry of health (MOH) partially supported by PMI. In addition, in Year 3, PMI is supporting implementation of the 2009 Malaria Indicator Survey (MIS) and district-level training for M&E.

In Year 4, PMI will continue to support NMCP M&E activities, including implementation of the national strategy, strengthening of district capacity, and evaluation of HBMF and private sector case management.

The proposed FY10 PMI budget for Rwanda is \$18 million. Of this amount, 21% will support procurement and distribution of LLINs, 23% implementation of community-based treatment of malaria and strengthened malaria laboratory diagnosis, 40% IRS, 4% malaria in pregnancy activities, 3% monitoring and evaluation, 3% epidemic surveillance and response, and 6% staffing and administration. Forty-one percent of the total budget will be spent on commodities.

ABBREVIATIONS and ACRONYMS

ACT	Artemisinin-based combination therapy
ANC	Antenatal clinic
AQ	Amodiaquine
AL	Artemether-lumafantrine
AM	Artemisinin
AMFm	Affordable Medicines Facility – malaria
ASM	Agents de Sante Maternelle (specialized maternal community health workers)
BCC	Behavior change communications
BTC	Belgian Technical Cooperation
CAMERWA	Centrale d'achat des Medicaments Essentiels, Consumables et Equipements Médicaux du Rwanda
CBO	Community-based organization
CCM	Community case management
CDC	Centers for Disease Control and Prevention
CHD	Community Health Desk
CHW	Community health worker
DHS	Demographic and Health Survey
EPI	Expanded Program for Immunization
ESR	Epidemic Surveillance and Response
FY	Fiscal year
FBO	Faith-based organization
Global Fund	Global Fund to Fight AIDS, TB, and Malaria
GOR	Government of Rwanda
HBMF	Home-based management of fever
HCC	Health Communication Center
HMIS	Health management information system
MOH	Ministry of Health
I-CCM	Integrated community case management
IDSR	Integrated Disease Surveillance and Response
IEC	Information, education and communication
IMCI	Integrated Management of Childhood Illnesses
IPTp	Intermittent preventive treatment of malaria in pregnancy
IRS	Indoor residual spraying
ITN	Insecticide-treated bed net
LLIN	Long-lasting insecticide-treated bed net
MCH	Maternal and child health
MEWS	Malaria Early Warning System
MIP	Malaria in pregnancy
MIS	Malaria Indicator Survey
MOP	Malaria Operational Plan
NGO	Non-governmental organization
NMCP	National Malaria Control Program
NRL	National Reference Laboratory

OVC	Orphans and vulnerable children
PEPFAR	President's Emergency Plan for AIDS Relief
PLWHA	People living with HIV/AIDS
PMI	President's Malaria Initiative
PMTCT	Prevention of mother-to-child transmission (of HIV)
PNILP	National Malaria Control Program formerly known as Programme national intégré de lutte contre le paludisme
PVO	Private voluntary organization
QA/QC	Quality assessment/quality control
RBM	Roll Back Malaria
RCC	Global Fund Rolling Continuation Channel
RDT	Rapid diagnostic test
REMA	Rwanda Environmental Management Authority
SIS-COM	Système d'information sanitaire communautaire
SP	Sulfadoxine-pyrimethamine
SPA	Service Provision Assessment
TRAC+	Treatment and Research AIDS Center
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USG	United States Government
WHO	World Health Organization

THE PRESIDENT'S MALARIA INITIATIVE

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

The President's Malaria Initiative (PMI) began in three countries in 2006: Angola, Tanzania, and Uganda. In fiscal year (FY) 07, four countries were added: Malawi, Mozambique, Senegal, and Rwanda. In FY 08, eight additional countries were added to reach a total of 15 countries covered under PMI. Funding began with \$30 million in FY 06 for the initial three countries, increased to \$135 million in FY 07, to \$300 million in FY 08 and FY 09, and is expected to rise to \$500 million in FY 10.

In implementing the USG component of this Initiative, the United States is committed to working closely with host governments and within existing national malaria control plans. Efforts will be coordinated with other national and international partners, including the Global Fund to Fight AIDS, Tuberculosis, and Malaria (the Global Fund), Roll Back Malaria (RBM), the World Bank Malaria Booster Program, the World Health Organization (WHO), the United Nations Children's Fund (UNICEF), and the non-governmental and private sectors, to ensure that investments are complementary and that RBM and Millennium Development goals are achieved. Country Assessment and Planning visits for PMI, as well as subsequent evaluations, will be highly consultative and held in collaboration with the national malaria control program and other partners.

This document presents a detailed one-year implementation plan for the fourth year of the PMI in Rwanda. It reviews progress to date under PMI in Rwanda and the current status of malaria control and prevention policies and interventions, identifies challenges and unmet needs if the goals of PMI are to be achieved, and provides a description of planned Year 4 activities under PMI. The plan was developed in close consultation with the National Malaria Control Program (NMCP) and with participation of many national and international partners involved in malaria prevention and control in the country. The total amount of PMI funding requested for Rwanda in FY 10 is \$18 million.

MALARIA SITUATION IN RWANDA

Rwanda is a small, land-locked country in the Great Lakes region of eastern Africa, bordered by Uganda, Burundi, the Democratic Republic of the Congo, and Tanzania. It has a population of approximately 10 million, making it one of the most densely populated countries in Africa. Administratively the country is made up of 30 districts which are divided into sectors, "cellules" and then into 15,000 "umudugudus" (villages of 50-100 households).

from 1.5 million in 2005 to 1.3 million in 2006 to 900,000 in 2007 and 800,000 in 2008. In 2006, malaria was the leading cause of morbidity and mortality, representing 37% of outpatient consultations and 40.9% of hospital deaths - of which 42% were children under five. In 2008, malaria accounted for 12% of outpatient consultations and 16% of hospital deaths. Forty percent of malaria cases reported in 2008 were microscopically confirmed. Malaria is now considered the third leading cause of morbidity after pneumonia and diarrhea. It should be remembered, however, that trend lines are imprecise, due to irregular reporting, the absence of community data, and the fact that 60% of cases are presumed rather than confirmed.

Until recently, the NMCP relied heavily on routine facility reports and data from widely scattered surveillance sites for epidemic detection, but reporting was often incomplete or too delayed for prompt action; furthermore thresholds used for epidemic detection were based on higher transmission patterns. The Health Management Information System (HMIS) reporting was further delayed during 2008 due to implementation of a new HMIS system, although some district managers were able to identify changes in usual patterns before the normal quarterly reporting cycle. Reports from district managers prompted several investigations of suspected increases, usually revealing no increase in baseline from previous years; however, one epidemic was detected in Gisagara District.

Recent progress in malaria control has been attributed to several factors. Treatment at health facilities has occurred more promptly, as participation in the national health insurance (*mutuelle*) scheme has risen to over 90%. Treatment of fever in children under five at the community level has increased, because ACTs are now available locally in 21 of 30 districts; this will increasingly affect the number of cases treated at health facilities. Ownership and usage of insecticide-treated bed nets (ITNs) has increased rapidly in both rural and urban areas due to increased availability of free nets through mass and routine delivery channels. Indoor residual spraying commenced in 2007 in selected districts, and the NMCP will continue to use IRS to target high-risk malarial sectors, especially along international borders. As a result of this changing context, the NMCP has revised its national strategy (2008-2012) to target the entire population and not just the most vulnerable groups with malaria prevention and control measures.

Rwanda has received four Global Fund grants to date: Round 3 (completed), Round 5 (underway), Rolling Continuation Channel (RCC), and the recently signed Round 8. Approximately \$69 million has been disbursed as of mid-2009. Phase 1 of the Round 8 grant includes \$58 million to support the expansion of community case management and universal coverage of LLINs. Rwanda plans to submit a proposal for the Affordable Medicines Facility for Malaria which will provide further subsidized ACTs and allow the program to direct funds towards other case management and supply chain interventions.

The Belgian Technical Cooperation (BTC) will terminate its direct support of the NMCP in October 2009, after more than ten years; it will then commence direct support to the Ministry of Health (MOH), providing three million dollars in the coming year, some of which will go to the NMCP. The BTC has provided technical and financial assistance at the national and district levels and to sentinel sites, specifically fostering development of the Malaria Early

Warning System (MEWS), *in vivo* drug efficacy testing, as well as research. The BTC has also provided the services of an entomologist.

NATIONAL MALARIA CONTROL PLAN AND STRATEGY

Rwanda's malaria control and pre-elimination strategy has not changed significantly during the past year, although some refinements were made to conform to TRAC+ formatting guidelines. Objectives for 2012 under the new strategy generally parallel PMI's, though sometimes with more ambitious targets. They include:

- *At least 90% of all children under five years suffering from malaria will receive timely, correct, and affordable treatment within 24 hours after the appearance of symptoms.*
- *At least 90% of all cases of uncomplicated malaria in the health facilities will be treated in accordance with the national treatment policy.*
- *At least 80% of patients who receive antimalarials in facilities will be parasitologically confirmed before treatment; 80% confirmation in community settings.*
- *At least 85% of pregnant women and children under five years will sleep under an ITN.*
- *At least 90% of households will possess at least one ITN; 80% at least two.*
- *At least 90% of malaria epidemics that are detected will be controlled within two weeks following detection.*
- *At least 90% of houses in targeted areas will be sprayed according to the national vector control guidelines.*

Rwanda is currently in transition from malaria control to pre-elimination, requiring at least the same level of investment as before but greater surveillance capability as well as a more agile response to the changing malaria situation. The NMCP is fully committed to making these adjustments. The table below summarizes some of the transitions underway and their implications for Rwandan and PMI programming. (The PMI staff developed this table and used it to guide planning discussions with the NMCP for development of the MOP.)

Situation	Effects	Programmatic implications
Malaria prevalence falling to 1%	Lower risk perception, hence possibility of weakening political	Stronger BCC to reinforce preventive measures

	commitment and preventive measures	
	Reduced immunity, hence more severe cases, rapidly spreading outbreaks	Timely “micro-level” surveillance and response; also better management of severe malaria
	Mothers, health workers and other care givers less experienced in malaria management	Frequent refresher training; BCC messages
Increasing proportion of imported cases	Perhaps greater concentration of cases along trade corridors and in cities	Once overall transmission decreased, will need to identify and respond quickly to imported cases
Greater decentralization of malaria control and response	Stronger response systems	Need for capacity building at the district level, with extended support from national program
Interest in regional collaboration	Demand for documentation and sharing of lessons learned and best practices	Much stronger documentation of programs and results, explore forums for regional collaboration

Major programmatic changes are envisioned or already planned: universal rather than targeted bednet coverage; diagnostic confirmation of all fever cases; suspension of intermittent presumptive treatment for malaria in pregnancy (MIP) due to increased sulfadoxine-pyrimethamine (SP) resistance in a lower transmission setting; enhanced epidemic surveillance and response; shifts in vector control strategies; and increased cross-border collaboration. Underlying all interventions is a strong reliance on behavior change – especially for universal LLIN use and rapid response to fevers and outbreaks. The PMI has and will continue to support most of these adjustments.

CURRENT STATUS OF MALARIA INDICATORS

Rwanda has conducted two Demographic and Health Surveys (DHSs), including a full study in 2005 and an interim one in late 2007-early 2008. The NMCP also conducted a National Malaria Indicator Survey (MIS) in mid-2007. These surveys show marked improvements in key preventive indicators, as summarized below. For example, 18% of households owned a bednet in 2005, of which 15% were considered ITNs; 13% of children under five and 17% of pregnant women had slept under one the night before enumeration. The interim DHS approximately two and a half years later showed that 57% of households owned at least one

ITN, and that 58% of children and 62% of pregnant women had slept under one. The parasitemia level in children under five was 2.6% in 2008. Both sets of DHS results are shown below, along with never finalized results from the 2007 MIS. A follow up MIS is scheduled for August 2009, and the next DHS in 2010.

Estimates from 2005 DHS, 2007 MIS and 2008 interim-DHS

Indicator	DHS 2005	MIS 2007	Interim-DHS 2008
Proportion of children under five years old with fever in the last two weeks who received treatment with ACTs within 24 hours of onset of fever	Not yet implemented	*	pending
Proportion of households with at least one ITN	15%	54%	57%
Proportion of children under five years old who slept under an ITN the previous night	13%	60%	58%
Proportion of pregnant women who slept under an ITN the previous night	17%	60%	62%
Proportion of women who received two or more doses of IPTp during their last pregnancy in the last two years	0.3%	*	17%
Proportion of targeted houses adequately sprayed with a residual insecticide in the last 12 months (NMCP Reports)	N/A	94% Aug 08	97% Jan 09

Sources: Rwanda 2005 DHS; 2007 MIS; Interim-DHS 2008

* Final results not yet available

GOAL AND TARGETS OF THE PRESIDENT'S MALARIA INITIATIVE

The goal of this Initiative is to reduce malaria-related mortality by 50% in PMI countries. By the end of 2011, PMI aims to achieve the following in populations at risk for malaria:

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

EXPECTED RESULTS – YEAR FOUR

The PMI and the NMCP have agreed on the following outcomes for FY 2010:

Prevention

1. The PMI will procure and distribute 300,000 nets in FY 2010 to contribute to routine health facility services. The proportion of households that own at least one ITN is expected to increase to 80%.
2. The PMI will support spraying of 275,000 houses with a long-lasting insecticide protecting an estimated 1,250,000 residents.

Treatment

1. 60% of reported malaria cases will have parasitologic confirmation of malaria prior to treatment.
2. 100% of health facilities and community health workers will have continuous supply of ACTs available (for the previous six months).

INTERVENTIONS - INSECTICIDE-TREATED NETS

Background

The Malaria Strategic Plan promotes universal LLIN coverage for all age groups (one LLIN for two people or three nets per household), with a target of 90% coverage for the entire population. The main delivery channels are mass distribution during vaccination campaigns and routine distribution at antenatal care (ANC) and Expanded Program on Immunizations (EPI) clinics. Facilities provide free nets to all infants upon completion of vaccination and to pregnant women at their first ANC visit. Additional channels of net distribution on a more limited scale include support for the private sector, provision of nets for boarding schools and hospitals, and distribution to the poorest population and persons living with HIV. The NMCP supports LLIN distribution with multi-media, multi-level IEC/BCC encouraging correct and consistent use by families and caretakers; strengthening the supply chain and distribution channels to reach targeted groups; and a sound monitoring and evaluation (M&E) system to track net ownership and use, insecticide resistance, and net quality.

The MOH has distributed more than three million LLINs since 2006. Results from the 2008 interim DHS indicate high ownership and use with 59% of households owning a net (approximately 94% LLINs) and 60% of children under five and 65% of pregnant women sleeping under one (60% of pregnant women sleeping under LLINs). Since risk perception is decreasing along with malaria transmission, it will be important to promote constant usage among the general population.

To achieve universal coverage, the NMCP has been discussing multiple strategies including a staggered or phased approach to mass distribution with campaigns to be conducted in late December 2009/early January 2010 and again in March 2010. Over 5.1 million LLINs will be available through the Global Fund and PMI. Approximately two million of these nets will be distributed upon arrival in late December 2009 or early January 2010 to vulnerable target

populations including children under five and pregnant women. A second phase is planned for March 2010 with 3.1 million LLINs distributed in a door-to-door campaign supported by community health workers. The mass campaigns will contribute to achieving universal coverage and increasing ownership to three nets per household (or one LLIN for every two people).

The estimated annual LLIN need, based on the goal of universal coverage, includes approximately 840,000 nets for infants and pregnant women, to be delivered through routine services. An additional six million nets will be needed for approximately two million households to achieve universal coverage. The NMCP estimates 2.5 million nets are currently available and being used. The Global Fund Round 8 grant provides for 11.2 million LLINs over a five-year period intending to meet and maintain the universal coverage goal and covering all replacement needs through mass campaigns in 2010 and 2013. IEC/BCC activities related to bednets as described in the Round 8 proposal are budgeted for the two planned mass campaigns; however there is no support for routine IEC/BCC activities between 2009 and 2012.

LLINs available or planned for 2009 – 2010:

Demographics		
Total Population (approximate)	10,200,000	
Number of targeted households	2,040,000	Assumes 5 people per household
Total number of LLINs needed	6,120,000	NMCP target: 3 LLINs per household
Sources of LLINs	Quantity	Original Target
Global Fund Round 5 and 8	4.2 million	Phased campaign in late December 2009 or early January 2010 and second household campaign planned for March 2010 to achieve universal coverage
PMI FY 08	524,400	Originally planned for routine services-will be distributed upon arrival in late December or early January 2010
PEPFAR* FY 08	56,700	People living with HIV/AIDS (PLWHAs)
PMI FY 09	350,000	Contribution to March 2010 household campaign
Total LLINs available	5,131,100	
GAP (LLIN need minus LLINs available)	988,900	

* President's Emergency Plan for AIDS Relief

Of the six million LLINs needed to achieve universal coverage by 2010, approximately 5.1 million are available over the next year from Global Fund and PMI. A potential gap of nearly one million LLINs exists, to which PMI plans to contribute in FY 10.

Several logistical issues related to net distribution and replacement still need to be addressed in preparation for the two-phased campaign over the next year. The Government of Rwanda (GOR) bans use of plastic bags and as a result, the NMCP plans to re-package each LLIN with a paper bag at the point of final distribution. The program needs to track the number of nets distributed to households to ensure that additional nets distributed will fill (but not exceed) remaining gaps in household ownership of three nets. The lack of international guidelines for the collection and disposal of huge quantities of old/expired nets will be a major challenge for the upcoming campaign. In addition, the NMCP considers it a priority to determine the durability and longevity of LLINs in Rwanda, to guide planning on when to collect and how to properly dispose of old nets.

The NMCP determines the quantification and planning of LLINs and tracks district needs and quantities in collaboration with PMI and other partners. The Central Drug Purchasing Agency for Rwanda, (CAMERWA; French acronym), is the principal procurement agent for the Global Fund, GOR, and BTC nets and is responsible for warehousing and stocking at the central level. Population Services International (PSI) outsources vehicle transportation and distributes nets from central to district levels and directly on to health centers where needed. Problems remain with ensuring coordinated deliveries and maintaining routine stock inventories. While partners have managed large, one-time, net deliveries, there is limited experience implementing a routine distribution system and conducting regular inventory of stocks.

Progress during the last 12 months

Delays in 2008 procurement caused LLIN stock-outs at both ANC and vaccination clinics, leading to shifts in the target groups originally planned for both PMI and the Global Fund contributions. The PMI procured 550,000 LLINs in 2008 (FY 07 funding) which were distributed in June 2009. Of these, 250,000 were distributed to the poorest of poor households and another 250,000 to ANC clinics for pregnant women. Fifty-thousand LLINs have been centrally stored for response to epidemics. The PMI has started the procurement of another 524,400 LLINs which will be distributed by December 2009. The 350,000 LLINs planned in MOP 2009 will be used in early 2010 for targeted vulnerable populations and for the door-to-door campaign by CHWs. The PEPFAR also procured 56,700 LLINs for PLWHAs and will distribute them through existing channels, including PLWHA community organizations. Small quantities of nets were distributed through the private sector (approximately 5,000 per month); however, support to this channel will be phased out with the move toward universal coverage.

The NMCP established a national database with household information collected by CHWs to track ownership of ITNs and gaps in coverage. The database guided the LLIN distribution for the poorest of the poor populations this year. The PMI supported a tracking and behavior survey to examine determinants and barriers to LLIN ownership and use. Data were collected in May-June, 2008; and once results are finalized (anticipated in October 2009) they will be used to inform a national BCC/IEC strategy to promote LLIN use. BCC/IEC activities are on-going with mass media, district and community-level activities.

Proposed FY2010 Activities (\$3,849,000):

The PMI will continue to support the NMCP's efforts to achieve 90% LLIN coverage by increasing use among pregnant women and children under five years of age. The PMI will procure and support distribution of LLINs for routine services as well as contributing to replacement needs. The PMI will also continue to support strengthening of the supply chain management and distribution systems through various partners and explore opportunities for building longer-term capacity in this area. Support will include focused BCC/IEC efforts at national and community levels to promote usage and address a potential decrease in risk perception. Specific activities for Year 4 include:

- *Procure and distribute 300,000 LLINs:* Support the procurement and distribution of LLINs to contribute to routine distribution channels targeting pregnant women and children under one and contribute to universal coverage. The PMI will support the NMCP to review the quantities and intended target groups. The distribution strategy will support development of a routine distribution plan for nets and regular district-level inventory of stocks. Expenditures will also support procurement of paper bags for repackaging nets at the final distribution points. The PMI will also explore biodegradable packaging options with partners and net manufactures to replace plastic bags. (\$3,500,000)
- *BCC/IEC for LLINs:* Support BCC/IEC at national and community levels through some mass media campaigns and messages, but mainly focusing on CHW trainings, and community outreach and household awareness activities including post distribution campaign hang-up and keep-up activities. The PMI will support efforts to work with local NGOs and Rwandan partner organizations to carry out intensive interpersonal communication sessions, community mobilization and sensitization, and support for distribution of LLINs. Develop and implement activities to promote correct use of LLINs, integrated malaria messages and address any decreases in risk perception as malaria prevalence decreases. (\$250,000)
- *Capacity building for NMCP to monitor the durability and longevity of LLINs:* Provide technical assistance and support to the NMCP to develop monitoring approaches to assess the durability and longevity of LLINs to help inform programmatic options for replacement and maintenance of nets in houses. Specific activities will include, procurement of colorimetric technology for assessment of ITN insecticidal decay rates; transfer technology to NMCP and train M&E staff in its use; support the NMCP to establish surveillance of ITN insecticidal loss by monitoring selected group(s) of ITNs through the ongoing end-use verification activity and provide technical assistance to interpret and use results. Two CDC technical assistance visits will be supported in this activity. (\$99,000)

INTERVENTIONS - INDOOR RESIDUAL SPRAYING***Background***

Indoor residual spraying has featured in malaria control strategies in Rwanda since 2007. Beginning in 2008, declining malaria incidence in some sectors prompted adjustments, from

district-wide IRS coverage, to more targeted spraying to reflect localized risks (2008-2009). Round 1 reached 35 sectors in three districts (Kigali city, 152,072 houses), while Round 2 reached 36 targeted sectors in five districts (Kigali city plus Nyanza and Kirehe, 184,319 houses). The same 36 sectors were targeted in January 2009 but with increased coverage (191,051 houses). Targeting of specific sectors in each district was based on epidemiologic and entomologic data which identified high malaria transmission areas. In addition, districts along the Tanzanian, Burundian, Ugandan, and Democratic Republic of Congo borders report high caseloads and will remain vulnerable for many years because of continued high malaria prevalence in neighboring countries.

The next several years will see a continuation of the transition from IRS as an independent insecticide-based vector control strategy to IRS as a “knock-down” technique in tandem with universal LLIN coverage for “keep-down” (largely financed through Global Fund). According to the NMCP, IRS may also become a part of an epidemic prevention activity, used in conjunction with ITNs and IEC. The NMCP will augment PMI spray resources from other sources as early as August 2009 (targeted sectors in one or two districts) and seek additional IRS funding through other potential partners.

The NMCP has initiated cross-border collaboration, especially with the Kagera region in Tanzania. While maps show few crossing points, informal reports indicate that up to 20,000 persons cross the border daily in just one Rwandan district alone (Nyagatare in the northeast). Regional planning for cross-border IRS activity has been initiated.

In addition to accurate case reporting, effective IRS relies on ongoing vector resistance monitoring to make informed decisions about which type of insecticide to use and when to switch classes of insecticide to reduce the frequency of resistance genes in the target population. The PMI supports final development and operation of the Kigali insectary as well as routine monitoring at sentinel sites. Preliminary results of the NMCP’s insecticide resistance testing conducted in May 2009 show no decrease in mosquito sensitivity to insecticides.

Progress during the last 12 months

The PMI and the NMCP conducted two successful spray rounds during the past twelve months, reaching approximately 190,000 houses in 36 sectors and achieving greater than 90% coverage in both cases. (See Table below).

Round	Districts	Sectors	Structures		Coverage		Population		
			Found	Sprayed	Coverage	Rejection	Total	Under 5	Pregnant
Aug-08	5	36	201,545	189,756	94.2%	5.8%	885,957	146,214	15,748
Jan-09	5	36	196,126	191,051	97.4%	2.6%	866,002	143,852	14,785

Public acceptance of IRS appears to be increasing (due to involvement of CHWs and political leaders in IEC), with particularly low refusal rates in the early 2009 round (2.6%). Political support is also strong, generating demand for increased spraying in some districts. The PMI supported coordinated IEC/BCC efforts led by relevant stakeholders and partners. These

included a coordinating committee specifically focused on developing and implementing IRS messages and community sensitization.

The program is currently shifting from a short-acting wettable powder (WP) formulation to longer lasting capsule suspensions (CS). The early 2009 round used both Icon-WP® for about 20% of houses and Deltamethrin CS® for the remainder. In Year 3, PMI will support a single round of spraying for approximately 275,000 structures starting in August 2009, using a long-lasting residual formulation. Longer-lasting pyrethroid formulations are expected to remain effective for much longer, permitting annual rather than twice yearly spraying. Its sustained efficacy will be monitored in two districts to confirm durability and appropriateness

The disposal of insecticide sachets has remained unresolved since the Round 1 spray campaign although the GOR and PMI have agreed upon incineration of the sachets in country. The PMI has recently received assurances that remaining issues are about to be resolved and that used IRS sachets (currently in safe storage in Kigali) will be incinerated soon.

An insectary is now being established with PMI support at the Kigali Institute of Science and Technology (KIST), but is not yet fully operational. A recent Centers for Disease Control and Prevention (CDC) consultancy resolved remaining technical issues and has led to the start up of the insectary. The PMI is supporting an insectary staff member to manage the daily insectary operations.

Proposed FY2010 Activities (\$7,113,000):

In 2010, PMI will support the NMCP's transitional strategy for vector control management, including associated monitoring and capacity development. The plan itself will be developed during 2009 and will include new geographic targets; a shifting balance between IRS for vector "knock down" and bednets for "keep down;" a widened funding base for IRS and an increase in the capacity for epidemic response. Entomological and environmental monitoring will also figure highly in the strategy. In FY 2010, PMI expects to support the following specific activities:

- *Annual IRS implementation in targeted sectors for up to 275,000 houses:* These funds will support a single spray round starting in August 2010, plus procurement of commodities for another round approximately one year later. Ideally, the insecticide used will be a long-lasting pyrethroid formulation; however, insecticide rotation (i.e., to another insecticide class) will be considered if scientific evidence of pyrethroid resistance emerges prior to procurement. Sectors will be targeted in accordance with the NMCP's evolving vector control strategy, favoring districts bordering highly endemic countries, although the targeted number of houses will be the same as supported with FY09 funding. The PMI will encourage transfer of funding responsibilities to non-PMI funding after 3-4 rounds. Funds will also be used for capacity building, to gradually enable the NMCP to take on responsibility for both routine and epidemic-related spraying. (\$6,600,000)
- *IEC for IRS:* IEC will focus on the community level, with some use of more public media in sectors not previously participating in IRS. Community workers and local

leaders will inform individual households of spraying dates and preparation, and remind them of safety precautions as spraying occurs and how to maintain its effectiveness (e.g. no re-plastering of walls). A portion of communication funds will be reserved for any epidemic-related communication. (\$250,000)

- *Entomological monitoring:* These funds will continue to support central planning for entomologic monitoring and district implementation. In addition to routine entomologic monitoring already occurring at sentinel sites, other activities will include the establishment of a vector resistance monitoring system and ongoing support for the operations of the Kigali insectary including basic insectary and field collection supplies. Support for one insectary staff will continue with FY10 funding and then will be transferred to the NMCP the following year. In addition, this activity will include the procurement of specialized supplies needed for additional entomologic monitoring including insecticide resistance testing and LLIN longevity testing (latter activities described under LLIN section). One CDC technical assistance visit will be supported in this activity. (\$233,000)
- *Environmental compliance and monitoring:* External monitoring of the environmental compliance of the IRS operations including the management of side effects and disposal of sachets and other contaminated materials. (\$30,000)

INTERVENTIONS - MALARIA IN PREGNANCY

Background

Rwanda's MIP strategy was based on WHO's three-pronged approach which included two doses of IPTp with SP, the use of ITNs, and case management of malarial illnesses. The approach was implemented in its entirety until 2008 when the NMCP decided to discontinue IPTp. The decision to discontinue SP was primarily driven by evidence from two studies, one of which showed high therapeutic failure of SP in 6-59 month olds. A second study found no additional benefit of IPTp with SP when compared to placebo in pregnant women. The latter study recruited 2,250 women who also received an ITN on enrollment and was conducted at three sentinel sites looking at outcome measures including maternal hemoglobin, newborn weight, and placental parasitemia. The study showed no differences in outcomes in the SP versus placebo groups. This together with evidence of decreasing malaria transmission, led the NMCP to revise their IPTp strategy and discontinue IPTp.

As a result, the NMCP will now focus on other approaches for prevention and prompt treatment of malaria during pregnancy. Although 94% of pregnant women visit an ANC at least once, the median gestational age at first visit is six months, and only 43% of women make two or more ANC visits (Community needs assessment, School of Public Health, 2007). The aim therefore, is to provide targeted BCC/IEC, combined with innovative community- and facility-level performance-based financing and growing enrollment in community health insurance schemes, to promote earlier ANC consultation. In addition, the NMCP will increase efforts to ensure that LLINs are available for distribution at every facility during ANC visits.

Marked improvements have been made in recent years to strengthen the integration of ANC services. The MOH Maternal Child Health (MCH) Desk has taken the lead in coordinating with other sections, including the NMCP, TRAC+, the Community Health Desk (CHD), and EPI. The services provided by these units, in addition to fetal growth monitoring and birth preparation, make up the basic focused antenatal care (FANC) package. FANC services are now available in 26 of 30 districts nationwide. A key shift in the MIP strategy is to use specialized CHWs called Agents de Sante Maternelle (ASM) who focus specifically on the women in communities, including pregnant women and their newborns. As part of MIP interventions, they will identify pregnant women, distribute a first dose of iron, folic acid, and mebendazole for anemia prevention, and promote LLIN use as well as early and regular (up to four) ANC visits.

To date, there is limited information about the burden in Rwanda of asymptomatic and clinical malaria in pregnant women. The 2008 interim DHS showed a parasitemia of 0.9%, while the 2008 HMIS recorded approximately 27,000 malaria cases (of which 30% were confirmed) in pregnant women. Both figures reflect peripheral parasitemia or suspected malaria cases only; however, the NMCP recognizes the limitations of passive surveillance and routine clinical reporting for measuring the burden of malaria in pregnant woman and thus intends to institute a system for active surveillance of both asymptomatic and symptomatic malaria in pregnant women. Findings will guide future programmatic decisions around MIP following discontinuation of IPTp. Discussions are ongoing to properly define and develop this surveillance system.

Progress during the last 12 months

The PMI has helped improve the quality of FANC services at health facilities through training and capacity-building efforts at national and district levels. With FY08 funding, PMI procured a one-year supply of iron and folic acid. Global Fund LLINs are provided for free to pregnant women who attend antenatal care services; and in 2009, PMI delivered 250,000 LLINs to health facilities for this purpose, addressing year-long stock-outs of LLINs available for pregnant women. The PMI also assisted the MOH to develop and review training materials for strengthening integrated ANC services including FANC, prevention of mother-to-child transmission (PMTCT), nutrition education, promotion of breast-feeding and family planning.

The PMI then supported integrated FANC training in 24 of 30 districts, resulting in 40 national trainers, 25 supervisors, and approximately 599 providers trained both at the district hospital and health center level. The PMI has also supported the orientation of 4,982 CHWs and the sensitization of 3,456 local and religious leaders who now include prevention and control messages related to malaria in pregnancy in their sermons. Year 3 activities will support training in the remaining six districts and strengthening the role of ASMs in MIP strategies.

Proposed FY 2010 Activities (\$750,000):

In Year 4, PMI will continue to support the national strategy for the prevention and treatment of malaria in pregnancy. The PMI will collaborate with the MCH desk and the NMCP in the training, supervision and implementation of the community outreach approach and focus on

links between ASMs and health facilities to ensure that pregnant women receive and use LLINs correctly and consistently, attend ANC early and regularly, and receive prompt treatment for malaria. The PMI will also support efforts to assess the clinical burden of malaria in pregnant women following the discontinuation of IPTp, in the context of declining malaria incidence.

Specific PMI-supported activities will include:

- *Strengthening of malaria in pregnancy interventions within FANC services at district and national level:* The PMI will continue to support MCH and MIP interventions by providing technical assistance and coordination at the national level and resources for FANC refresher trainings at the district level. Emphasis on prompt identification of malaria in pregnant women through training FANC providers on malaria case management, ensuring referral systems are in place and integrating FANC supervision into other health center supervision activities. (\$200,000)
- *Strengthening and support of malaria in pregnancy interventions at community level:* The PMI in coordination with the MOH will continue to facilitate supervision of ASMs by health center supervisors, contribute to the training of the ASMs including the printing of training materials and routine data collection tools, evaluate performance of community outreach to pregnant women, and strengthen linkage between ASMs and health facilities to promote LLIN use and ANC attendance by pregnant women. (\$200,000)
- *Procurement of iron, folic acid and mebendazole:* The PMI will procure an 18-month supply of medications for the prevention of anemia. Iron, folic acid and mebendazole will be provided early to pregnant women by community health workers as part of the community level outreach to pregnant women prior to attendance at ANC clinics. The GF and UNICEF will provide medications for anemia prevention for health centers and mass campaigns.(\$100,000)
- *Surveillance of the burden of malaria in pregnancy:* In the context of the discontinuation of IPTp and focus on other approaches to the prevention of malaria in pregnancy, the NMCP intends to evaluate the burden of malaria among pregnant women. Depending on the specific strategy for surveillance that the NMCP establishes in 2009 (with PMI technical assistance), PMI will then support an initial assessment of the burden of malaria in pregnant women by providing technical assistance to protocol development, data collection and analysis, and resources for the implementation of the surveillance. Following the results of the assessment, PMI will provide technical assistance to the NMCP to establish strategies for continued MIP surveillance. (\$250,000)

INTERVENTIONS – CASE MANAGEMENT

MALARIA DIAGNOSIS

Background

In order to reach pre-elimination by 2012, as outlined in the Rwanda Malaria Strategic Plan, an important step will be to implement laboratory confirmation of all malaria cases before treatment in all age groups at both facility and community levels. (Current policy limits this requirement to facilities and to persons older than five.) The infrastructure for malaria diagnosis has improved in the past few years, such that 98% of health facilities currently have a functioning microscope and a laboratory technician. The number of technicians will further increase in 2009 as the MOH implements plans to support at least two technicians per facility. Reagent stock-outs have occurred in the past year and reflect the need to better coordinate the supply chain system for laboratory commodities. Rapid diagnostic tests (RDTs) have a limited role in facilities but may, according to new treatment guidelines, be used in emergency situations and when the laboratory technician is not available. Despite improvements in diagnostic capabilities at health facilities, only 40 percent of facility-based malaria cases were confirmed in 2008 (HMIS); and with decreasing transmission, the total reported caseload undoubtedly reflects significant overtreatment. A significant challenge in the upcoming year, in addition to strengthening quality laboratory services, will be changing provider behavior and understanding of the new guidelines.

At the community level, small-scale piloting of the use of RDTs by CHWs in two epidemic-prone districts commenced in March 2008. A full assessment of the pilot has not yet been conducted. The MOH envisions expanding RDT use at the community; however strategies and systems for this expansion are not yet in place. The National Reference Laboratory (NRL) does not have a quality assurance/quality control (QA/QC) system for RDT use and there has been limited training in the use of RDTs for health center providers who would also be responsible for supervising the CHWs. The NMCP also intends to reevaluate several brands of RDTs with the NRL before considering expansion of RDT use at the community level. Discussions about moving HBMF to health posts staffed by personnel with a higher level of training than CHWs may also impact the approach to RDT use in the community.

The NRL is primarily responsible for diagnostic quality control in the country. The NRL supervisory visits to clinical laboratories are integrated to review HIV, tuberculosis and malaria services. Supervisors use a standardized checklist to review supplies and monitor performance. There are two levels of quality control for blood smears: at the district hospital and at the NRL. Ideally, supervision should occur every three months but may not because of personnel shortages and lack of materials and logistic support. Qualified staff at NRL and district hospitals are insufficient to supervise the 406 health facilities in the country. Feedback is provided to the district through printed reports; however, in instances where the proportion of discordant results reaches a critical threshold, a supervisory visit is to be conducted and refresher training carried out. As the prevalence of malaria decreases, the number of positive slides will decrease; thus, standard operating procedures for collection of malaria slides have been revised to reflect changing transmission patterns.

Progress during the last 12 months

In the past year, PMI helped revise the national quality control protocol for malaria diagnostics and procured laboratory supplies including slides, slide boxes, and Hemocues®. The MOP 2008 funds will supply reagents for malaria microscopy to help prevent national stock-outs. The PMI has in addition supported one laboratory technician at the NRL to conduct supervisory visits to the districts. In 2007, PMI supported a pre-award audit of the NRL to build capacity to receive USG funds directly for MOP 2008. Unfortunately, there have been delays in the contracting process and the funds have not yet been granted. Once the contract is in place, PMI will work directly with the NRL to continue to improve implementation of the new QA/QC system and to provide supervision and training for new laboratory technicians.

MALARIA TREATMENT AT HEALTH FACILITIES

Background

As of October 2006, all health facilities officially transitioned from amodiaquine-SP (AQ-SP) to artemether-lumefantrine (AL) as the first-line treatment for uncomplicated malaria. Oral quinine is the second-line treatment for cases of uncomplicated malaria and when AL is contraindicated. For patients who cannot tolerate oral medications, the national guidelines recommend the use of injectable artemether or intravenous quinine until the patient can take oral medications. Health centers should refer cases of severe malaria for treatment at district hospitals or referral hospitals. Parenteral formulations of artemether and quinine are also recommended for pre-referral treatment of malaria cases during transfer from a peripheral health facility to the higher level of care. The new malaria treatment guidelines to be disseminated in 2009 will focus on diagnostics and referral procedures.

Progress during the last 12 months

After Year 1, PMI has not supported treatment at the health facility level because funding from Global Fund Round 5 provided adequate quantities of AL for facility-based health care covering all age groups until September 2009. The RCC grant then included funding for AL, quinine, and other supplies (e.g., IV infusion kits) for health facilities and provided sufficient AL for community-level treatment until 2013. The PMI has focused on malaria treatment in the community and the private sector. However, with the upcoming change in treatment guidelines and efforts to implement the new guidelines at the health facility and community levels, PMI will again support case management at health facilities.

MALARIA TREATMENT IN THE COMMUNITY

Background

Home-based management of fever (HBMF): The NMCP has identified 19 districts as malaria endemic areas for the expansion of HBMF, of which 18 have functioning HBMF programs. Two additional districts (21 in total) are considered epidemic-prone and have started HBMF using RDTs in four health centers. Many partners, including PMI, the Global Fund and BTC, support HBMF. Efforts include CHW training, provision of materials (CHW kits, registries, etc.) and job aids, supervision and monitoring. (BTC will terminate direct funding in October 2009 and switch to broad budget support.)

The PMI finances the re-packaging of AL treatments for community distribution. Blister packaging for children under five is branded with the name “PRIMO” and includes IEC materials in the local language, Kinyarwanda, to ensure proper dosing and administration. Trained CHWs sell AL treatments for a highly subsidized cost of FRW 100 (~\$0.18) each. The same packaging is used in the private sector.

The NMCP is currently piloting the use of RDTs by CHWs and plans to expand their use as the national strategy shifts from presumptive to laboratory confirmed treatment. A potential new addition to the HBMF strategy is the phased introduction of pre-referral treatment with rectal artesunate for cases of severe malaria seen by CHWs.

Expansion of HBMF to integrated community case management (I-CCM): A USAID-funded partner consortium working in four districts incorporated the treatment of diarrhea with oral rehydration therapy, treatment of acute respiratory infection with amoxicillin, and nutrition monitoring into the HBM program. Building on the successful experience and implementation of HBM, the MOH is rolling out the I-CCM package to expand and integrate I-CCM to all 30 districts in the country.

Progress during the last 12 months

The PMI partners have made significant progress in I-CCM during the last 12 months. Among the ten PMI supported HBMF districts, eight have completed the integration of HBMF into Integrated Management of Childhood Illnesses (IMCI), and a total of 212,572 children were treated for malaria from 2008 – 2009. The PMI partners supported refresher and supplementary trainings for HBMF and the malaria component of I-CCM for more than 11,000 CHWs. Updated case management tools (individual consultation forms, registers, algorithms, referral/counter-referral forms), and HBMF kits were provided to most CHWs; and 329 of these tools were also distributed to hospital supervisors and health/medical directors. Supportive supervision is ongoing in all HBMF districts.

At the central level, PMI supports the NMCP and CHD to coordinate implementing partners and ensure that all materials are reviewed and standardized according to national policy. Subsequent to the first HBMF evaluation in 2006, PMI supported a second evaluation which included eight districts: two from the original area, three new districts with ACTs, two districts with pilot RDT activities, and one district with the full community case management (CCM) package. The results of this evaluation, disseminated in September 2008, showed that HBMF can be successful strategy. CHW performance was good overall with 92% of CHWs giving a correct dose of ACTs to children meeting criteria for treatment for malaria but with weaknesses in identification of danger signs and in counseling. CHWs did not routinely check for danger signs of severe malaria (43%-74%); but referral practices were appropriate (86% of referrals from CHWs were subsequently treated for other conditions). Supervision was also found to be inadequate in quantity and quality with only 36% of planned CHW supervision visits conducted by health center staff. The 24 CHWs using RDTs demonstrated good knowledge and practice. The report suggested that a more in-depth evaluation is needed to examine the impact of integrated CCM on HBMF, and to analyze the cost-benefit of RDTs and test their operational validity. The PMI is providing additional support to integrate RDTs into the CCM algorithm, perform a retrospective analysis of RDT negative children, develop a

supervision model for CCM, and validate the RDT checklist that will be integrated into CCM. In May 2009, the CHD together with community-level partners conducted a one-week evaluation of CHW performance in treatment and drug management in four districts that had at least two months of implementation of I-CCM; data are currently being analyzed.

MALARIA TREATMENT IN THE PRIVATE SECTOR

Background

The NMCP's strategy to introduce AL into private sector pharmacies and over-the-counter outlets (*comptoirs*) includes officially registering these establishments, developing a system of accreditation to encourage recommended treatment practices, and developing a marketing and subsidized pricing scheme to promote appropriate treatment of malaria for children under five. In addition to increasing accessibility to AL, this strategy discourages the sale and use of non-recommended antimalarials that are either no longer efficacious (e.g. SP) or that could undermine the efficacy of the newly introduced treatment by promoting drug resistance (e.g., artemisinin monotherapy). The current private sector strategy provides highly subsidized AL to a population most at risk for severe malaria and subsequent death and has been successfully implemented nationwide. When the national policy shifts to treatment of laboratory confirmed cases only, ensuring that the guidelines are followed in the private sector will be a challenge.

More recent discussions have been held regarding the policy to provide subsidized malaria treatment for adults as well. Although adults are not at as great a risk of serious malaria and AL could be available at non-subsidized prices, the rationale for this is to prevent the misuse of the highly-subsidized pediatric treatments by adult family members. Prior to the expansion of subsidized ACTs for adults, the MOH is considering the role of RDTs in the private sector.

The NMCP would also like to reconsider the approach to HBMF in urban areas. Private clinics are readily available in towns and cities, and caregivers may prefer to attend these private clinics rather than seek care from a CHW. The NMCP plans to assess private clinic use for care of children under five and may consider shifting efforts in case management away from HBMF and to private clinics in selected areas.

Progress during the last 12 months

The PMI partners have continued to be the primary implementers of case management for children under five in the private sector. Beginning in early 2008, private providers have sold specially packaged AL (branded with the name "PRIMO") at a highly subsidized price of FRW 250 (~\$0.50). Partners distributed 128,530 PRIMO treatments to the private sector in 2008. Following initial training and distribution of PRIMO, PMI supported follow-up visits by trained personnel to assess pharmacist performance including reviewing the expiration dates of medications and stock-outs. Mystery clients were employed to evaluate services as part of the HBMF management evaluation described above. The evaluation included a sample of private sector outlets and found that the pharmacists weren't following the algorithm, particularly with respect to looking for and counseling about danger signs. As a result of these findings, technical assistance was provided to strengthen medical detailing procedures (stock management) and job aids. Adjustments were made to the training

approach for national refresher trainings, which included practice in probing for, and counseling about, the danger signs. In addition, BCC/IEC efforts continue to promote recognition of malaria symptoms, prompt treatment, and the importance of adhering to treatment regimens.

A follow-up mapping exercise and assessment of antimalarial availability in the private sector originally planned for 2008, will now be conducted in August 2009. The scope of the assessment has broadened to include all socially marketed products (funded by other programs). The malaria-specific results will be compared to the July 2007 baseline and will provide insight about distribution of ACTs and other antimalarials and about the quality of the training of private sector personnel.

DRUG SUPPLY AND PHARMACEUTICAL MANAGEMENT

Background

The MOH currently procures antimalarials and supplies for health facilities through two main providers. The Centrale d'Achat des Medicaments Essentiels au Rwanda (CAMERWA), an autonomous non-profit organization considered to be the national medical store, currently procures about 60% of all facility drugs and supplies. CAMERWA is the only institution in Rwanda that can legally procure ACTs for the public sector. With support from PEPFAR and the Global Fund, CAMERWA is improving procurement, accounting, human resources, customer service, and storage practices to qualify as a USG direct funding recipient. The second, much less active supply provider is Bureau des Formations Medicales Agrees du Rwanda (Office for the Not-for-Profit Medical Facilities in Rwanda, or BUFMAR), another autonomous non-governmental and non-profit organization set up by faith-based organizations (FBOs) in Rwanda.

Currently, district pharmacies place orders at CAMERWA and are responsible for collecting their monthly orders from CAMERWA's warehouse. The Pharmacy Task Force and CAMERWA are working to create an active distribution plan; and eventually medicines for the primary health care system will be managed through a "pull" system with transportation provided by CAMERWA to district-level warehouses. The pull system should extend down to the peripheral levels where health facilities pick up their stocks from the warehouse and CHWs replenish their stocks from health facilities. The new system will be piloted in four districts in late 2009 prior to national implementation.

In the past, large quantities of ACTs were procured at one time, leading to losses of expired drugs as consumption levels decreased. Since 2008, smaller, more widely-spaced, procurements have resolved this problem. However, the supply chain of CAMERWA from central to community-levels has not been adequate to prevent frequent stock-outs of essential drugs at lower levels. The NMCP works with district pharmacists and health centers to forecast antimalarial needs. Prior to placing ACT orders at CAMERWA, districts must review the quantities requested with the NMCP and receive their official approval. However, stock outs at the community level and at health centers occurred in 2008 due to lack of coordination between health centers and district pharmacies, limited communication between community health workers and health centers, and inadequate support for transport (CCM assessment preliminary results, HBMF evaluation).

Long-lasting insecticide treated bed nets are distributed through a different system since CAMERWA cannot store large quantities centrally and must move supplies quickly to districts. Only a small reserve stock remains at CAMERWA for emergencies. Stock-outs may occur at health facilities because there is no routine distribution from the central level to the districts, and potential users may need to wait until subsequent shipments arrive in country. A system is not yet in place to track LLIN stocks at district levels and allow redistribution between facilities.

The MOH created the Pharmacy Task Force in 2005 to oversee retailers and serve as the national drug regulatory authority. Responsibilities include quality control, inspection, licensure, and ensuring a basic package of pharmaceutical products. While this Taskforce has the regulatory authority, capacity is nascent and will require support to carry out duties including quality control of incoming and circulating drugs. In 2007, the NMCP used Global Fund money to purchase a high performance liquid chromatograph for drug quality testing at port of entry. The machine is now located at the National University of Rwanda in Butare. A pharmacist/chemist who is also a staff member of the university has received training on operational procedures of the equipment; however, minimal testing has been done so far. To ensure good drug quality following storage in the field, the NMCP has expressed interest to potentially monitor drug quality at district and/or health center levels. An initial assessment of local need and capacity is necessary to determine the best possible system for drug quality control in Rwanda.

National pharmacovigilance systems are needed to monitor adverse reactions to ACTs and other health products. Reporting of adverse events to the proper authority (such as a pharmacovigilance unit) is important so that follow-up investigations can be conducted to determine causality and severity as well as provide recommendations for continued care and treatment. The MOH and various health programs, especially TRAC+ (which includes malaria and HIV programs), have recognized the need for a national pharmacovigilance system and are supporting the development of one integrated system. Both PMI and PEPFAR have contributed to this effort under the leadership of the Pharmacy Task Force. Because the needs of each program are different, the pharmacovigilance unit of the Pharmacy Task Force will continue to work closely with all health programs, especially the NMCP, to promote a smooth integration of ongoing pharmacovigilance activities into the national system.

Following a workshop in May of 2008, the Pharmacy Task Force organized a pharmacovigilance working group which includes participants from the various health programs (malaria, HIV/AIDS, EPI, tuberculosis,) and hospitals which developed and finalized the adverse events reporting form and drafted a concept paper for Rwanda's national pharmacovigilance system.

In vivo drug efficacy testing has been ongoing in three Rwandan sites under the East African Network for Monitoring Antimalarial Treatment, in collaboration with Prince Leopold Institute of Tropical Medicine and London School of Hygiene and Tropical Medicine. Drugs tested include AL, dihydroartemisinin-piperaquine (Artekin®) and chlorproguanil-dapsone (Lapdap) plus artesunate. Monitoring of AL efficacy will start in July 2009 in two sentinel

sites. All support for drug efficacy monitoring has been provided by the Global Fund and BTC, but support for monitoring of AL efficacy will end in October 2009 with the end of the BTC project. The NMCP plans to continue ACT efficacy monitoring in sentinel sites at least every 24 months.

Progress during the last 12 months

In the past 12 months, PMI supported several specific technical areas within the drug supply chain and for pharmaceutical management. Specific contributions are listed below:

Strengthening of antimalarial drug distribution: PMI support during the last 12 months was directed towards the supply chain system at the national level. Activities included capacity building within the NMCP and other stakeholders through training in supply chain management and an upcoming comprehensive assessment of the malaria commodities logistic system. Recommendations from the assessment will guide the work of a newly recruited, PMI-supported commodities manager at the NMCP. In Year 3, PMI will also build the NMCP's capacity to monitor LLIN distribution and use.

Rational drug use: The PMI has coordinated with PEPFAR to support activities involving rational drug use. Technical assistance has been provided to the Pharmacy Task Force to build MoH capacity in the area of rational drug use and pharmacovigilance, including support to the Pharmacy Task Force to establish pharmaceutical policies needed to promote both areas.

Regulation and drug quality control: The FY2009 was the first year PMI funded activities to support regulation and drug quality control in Rwanda. At the time this MOP was written, funding was not yet available to implement these activities, however it is anticipated that an assessment of the regulation and drug quality control needs of the NMCP will be undertaken by August 2009.

Pharmacovigilance: Significant progress has been made in the establishment of a national pharmacovigilance system, based on MOH leadership with Global Fund and joint PMI-PEPFAR support. "Guidelines for Medicine Safety Surveillance in Rwanda" have been developed and will be made official in June 2009. The adverse events reporting form was tested in eight health facilities at different levels (health center, district hospital, private clinic etc.). A training manual and terms of reference for the various organs of the system have been developed and a training of trainers will commence in June 2009. Following the initial training of trainers, a cascade training will commence at the district level in July 2009. In addition, the Pharmacy Task Force will work very closely with the MCH, EPI and NMCP to ensure the continued collection of adverse events to the measles vaccine during the upcoming measles/malaria integrated campaign. To continue building capacity at the central level, a staff member from the NMCP participated at a pharmacovigilance course in Uppsala, Sweden in May 2009. In addition, the NMCP, in collaboration with a physician from the University Hospital of Kigali, actively collects pharmacovigilance data on accidental ACT exposure in the first trimester of pregnancy. The NMCP also operates a hotline to record any adverse events associated with insecticide used during IRS rounds. The Pharmacy Task Force and the

NMCP are currently working on a protocol for adverse events reporting for “Primo,” the ACT distributed by CHWs at the community level and in registered pharmacies.

The NMCP has expressed interest to also conduct pharmacovigilance activities in the private sector but no specific activities have been undertaken. They are currently working with other partners including the Pharmacy Task Force to develop a strategy on how to best integrate pharmacovigilance activities in the private sector. NMCP and PMI partners provided some basic training in pharmacovigilance last year for registered private sector pharmacists, and there is interest to continue to build capacity in this area.

Pharmacovigilance activities are a joint effort in which PMI plays only a minor role. The NMCP with Global fund resources, PEPAR through the HIV/AIDS program, TB and the maternal and child health (including EPI) programs are contributing significantly to this national system collecting data on adverse drug reactions.

Case Management Proposed FY2010 Activities (\$4,276,000):

Diagnostics (\$512,000):

The PMI considers accurate diagnostic capacity a critical component of malaria case management and will continue to support the NMCP and the NRL in efforts to shift from presumptive treatment to the use of laboratory confirmation using microscopy or RDTs. In FY2010, the PMI will improve training and laboratory infrastructure and support the national quality assurance/quality control program. The PMI will continue to work with other partners, coordinating laboratory diagnostics activities with PEPFAR, the Global Fund, BTC, and other donor-funded activities, to improve the quality and availability of malaria diagnostics.

Specific activities include:

- *Laboratory diagnostic commodities:* Procure equipment and supplies for malaria laboratory diagnosis and the quality control system, including slides, Giemsa stain, replacement microscopes, or RDTs as needed for malaria diagnostics. Coordination of quantification and procurement procedures for all laboratory supplies is currently supported by PEPFAR, and PMI will coordinate with PEPFAR for specific malaria components (\$200,000);
- *Strengthen malaria laboratory diagnostics in health facilities:* Continue direct funding to the NRL to strengthen malaria diagnostics by supporting an integrated national quality control system for microscopy at health facilities and providing continued training for malaria diagnostics including RDTs. Specific contributions will reinforce training at health centers; increase availability of supervisory staff at the national, regional and district levels; and support supervisory visits to district hospitals and health centers. External technical assistance to the NRL to strengthen supervision and quality control systems will be coordinated through the PEPFAR’s technical expert seconded to the NRL. (\$150,000).

- *Implementation of rapid diagnostic tests at the community level:* Support the NRL's and NMCP's efforts to expand RDT use at the community by assessing field conditions of RDT kits, training and evaluating CHW performance with RDTs, and providing technical assistance to the NRL to incorporate the RDT strategy into the quality control system. One CDC technical assistance visit will be supported in this activity. (\$162,000).

Case Management in health facilities, community, and private sector (\$2,562,000):

The PMI will continue to support prompt and effective case management of malaria at the community level and in the private sector. The PMI, in collaboration with other partners, will work within the community health platform for prompt treatment of malaria, as well as for outreach to ensure that communities understand the importance of malaria prevention and control. Specific activities are described in the activities listed below. In addition, PMI will support case management in health facilities to ensure appropriate compliance with the new treatment guidelines.

Specific activities to be funded by PMI are:

- *Strengthen case management at health facilities:* The PMI will support the NMCP to evaluate and monitor the implementation of the new treatment guidelines at health facilities. Specifically, technical assistance will be provided to develop systems for monitoring whether providers adhere to diagnostic and treatment algorithms, for supporting refresher training for health providers as needed, and for providing resources for supervision visits. One CDC technical assistance visit will be supported in this activity. (\$412,000)
- *Support for community case management implementation:* As districts expand to I-CCM, PMI will continue to support the malaria/fever component of the package, including original and refresher training at district levels, supportive supervision, training in appropriate RDT use and referral, monitoring activities, and provision of CHW materials and supplies. The PMI will also assist in revision of CHW tools as discussions proceed regarding links with the community health information system, commodity management, and community performance-based financing (see commodity management and M&E sections for further description). The PMI will continue to support the CHD to coordinate all community health implementing partners to ensure that community health materials (e.g. training modules, job aids, motivation/incentive packages, per diem rates, supervision protocols, and key messages) are reviewed and standardized across partners. The PMI will support the fever management component in 14 MOH districts (only where PMI is already supporting HBMF efforts). The PMI will continue to support the MCH task force with the NMCP and other partners to develop a long-term, costed plan for community health roll out. The PMI will work closely with MCH partners to ensure that the full package in USG-supported districts is supported; however, PMI's support for malaria/fever management as part of the community health package will be limited to

no more than 50% of the entire cost of the Mission's new community health programs. (\$1,200,000)

- *Procurement of pre-referral treatment at the community level:* Procurement of artesunate for pre-referral treatment for severe malaria by CHWs. The strategy for this will be elaborated in 2009, but funds will be needed for artesunate suppositories because current Global Fund grants do not cover them. (\$150,000)
- *BCC for effective case management:* As diagnostic and treatment policies have changed, PMI will support the design of communication messages for health providers and CHWs that relate counseling and follow up to the most current treatment algorithms. (\$250,000) (See BCC section for more detail)
- *Capacity building for local NGOs:* Sub-grants to local NGOs for community malaria interventions will help build their capacity for HBMF and other malaria prevention and control activities. Funds will also support BCC/IEC messages to promote key behaviors related to malaria prevention and control at the community level. (\$200,000)
- *External evaluation of community case management:* The PMI will support the NMCP to conduct an external evaluation of I-CCM as the program rolls out in the 14 districts and also including districts that have implemented RDT use by CHWs. These external evaluations are invaluable to inform next steps to improve the performance of CHWs for the community treatment of malaria in children. The PMI will work with other donors to contribute additional resources so that all components of I-CCM will be evaluated. (\$100,000)
- *Support for supervision:* Provide operational costs for central staff oversight of field activities for case management. Integration of supervision visits can also include Epidemic Surveillance and Response (ESR), quality assurance, and M&E. Funds will also support NMCP participation in appropriate regional meetings. (\$100,000)
- *Strengthen private sector distribution of ACTs:* Continued support for the private sector approach to market ACTs for young children and adults, including use of mystery clients and monitoring of pharmacy registers to ensure appropriate malaria treatment. Work with the national association of private sector outlets to strengthen its capacity to support private pharmacies and outlets, and ensure timely distribution of ACTs to outlets nationwide, including ongoing support to minimize stock outs. Support possible expansion of the program to selected private clinics, depending on the outcomes of the private clinic assessment in urban areas. Coordinate with laboratory partners to develop diagnostic strategy in the private sector. (\$100,000)
- *Repackaging of ACTs:* Support to the community health program and private sector by printing and re-packaging of approximately 500,000 AL treatments for community-level distribution in a blister package for children and adult ACT treatments for use in the private sector in urban areas. (\$50,000)

Drug Supply and Pharmaceutical Management (\$1,202,000)

In Year 4, PMI will continue support for prompt and effective case management of malaria by strengthening the drug supply chain and promoting rational use of antimalarials. In collaboration with PEPFAR and other health programs, PMI will also support the MOH/Pharmacy Task Force to establish a pharmacovigilance and drug quality control system, including conducting drug efficacy studies for ACTs.

- *Strengthening commodity supply chain management for drugs and other commodities at the central level:* Continue support to the NMCP for reinforcing supply chain systems, using previously developed tools and software; collaboration with CAMERWA to improve forecasting and quantification of malaria commodities at the national level; and support for integration of PMI commodities into existing reporting formats and systems. Support participation in GOR technical working groups (including a Coordinated Procurement and Distribution System) focusing on nationwide quantification; forecasting and procurement of all laboratory supplies, drugs and commodities; seconding one logistics staff member to the NMCP to coordinate all malaria commodities for the program, including technical support for this person to continue the NMCP's LLIN monitoring system established with PMI support in Year 3. (\$290,000)
- *Strengthening commodity supply chain management for malaria commodities at the district and community level:* The goal of this new supply chain activity is to improve pharmaceutical management within the decentralized system. The scope will include but is not limited to intensive field work in the ten PMI supported HBMF districts. PMI will support training and supervision to district and health facility pharmacists in charge of malaria commodities, and will develop monitoring tools and systems for health centers and community health workers to better forecast needs and avoid interruptions in stock. Support coordination of health centers (who serve as link for CHWs) and district pharmacies. The end use verification tools will be incorporated into this activity. (\$500,000)
- *Continue supporting the national pharmacovigilance system and active pharmacovigilance of ACTs at the community level:* The PMI, in collaboration with PEPFAR and GF, will support training at all levels, as well as the development and distribution of job aids. In addition, PMI will support the pharmacovigilance unit of the Pharmacy Task Force to work closely with the NMCP to ensure that their pharmacovigilance surveillance activities continue and are integrated into the national system. The PMI will support the NMCP and the Pharmacy Task Force to develop a strategy to collect information on adverse events reporting of ACTs distributed by CHWs. Furthermore, PMI will support the NMCP and the Pharmacy Task Force to explore integrating pharmacovigilance activities in the private sector. One CDC technical assistance visit will be supported in this activity, in combination with support for the drug quality activity. (\$212,000)
- *Drug quality:* Continue supporting the NMCP and Pharmacy Task Force to establish a quality control system to identify sub-standard antimalarial drugs both at the national

and district levels. The PMI will support training on quality control at the central and district level. In addition, PMI will procure necessary reagents for the testing of antimalarials. (\$100,000).

- *Monitoring of Drug Efficacy:* The PMI will provide logistic and technical support for ACT drug efficacy monitoring which the NMCP started in early 2009, with possible expansion from two to three sentinel sites following accepted WHO drug efficacy protocols. (\$100,000)

INTERVENTIONS - BEHAVIOR CHANGE COMMUNICATION (BCC)

As mentioned in the strategy section, Rwanda is moving towards a “pre-elimination” phase, when less than 5% of all suspected malaria cases have laboratory confirmation, for malaria prevention and control. Prompted by the changing context of malaria control in Rwanda, the NMCP in collaboration with partners is revising the national malaria communication strategy. Preliminary results from a recent behavioral survey conducted by Population Service International indicate that the perception of risk of acquiring malaria is decreasing. Treatment algorithms will be revised and diagnostics will eventually replace presumptive treatment of malaria among children under five at both the facility and community level. The incidence of severe malaria cases may increase as immunity in all age groups decreases, and there will be pressing need to convince caretakers to go the district hospital when necessary. There is increasing emphasis on epidemic detection and response, and the need for appropriate community responses to outbreaks. IPTp is no longer used for prevention of malaria in pregnancy, and the community health policy is shifting key commodities, such as iron folate and mebendazole, through community maternal health workers (ASMs) which may have the unintended effect of deterring early ANC visits.

This situation warrants a strong emphasis on behavioral change and solidifying social norms. Community, caretakers, health providers, and leaders at all levels within the GOR will need to be sensitized on the importance of maintaining key malaria prevention and control behaviors and practices, especially regarding the significant changes in malaria prevention and control policies and shifts in epidemiological trends.

Progress during the last 12 months

The PMI is supporting the central BCC task force, which the MOH is responsible for organizing and managing. All PMI supported BCC implementing partners have identified their target audiences and are working to harmonize messages across partners, but there is still a need to develop a formal process to ensure consistency in messages to key audiences. The PMI partners have delivered appropriate malaria prevention and control messages to over 75% of their target audiences in their respective districts. Training modules, job aids, and assessment tools for BCC have been developed and are being used widely in health provider and CHW trainings. Each partner has a list of monitoring and evaluation indicators to chart progress of BCC activities; and each is undertaking baseline, mid-term, and final evaluations to chart progress BCC, along with periodic performance assessments. Partners are working closely with the NMCP as certain policies change, e.g. IPTp, and have already begun

adjusting and pre-testing their messages to enhance LLIN use and promote early diagnosis and treatment for malaria in pregnant women.

Proposed FY 2010 Activities (Costs referenced in other sections):

The PMI will work at the central level and continue to strengthen the national integrated BCC task force, which includes the NMCP, Health Communication Center (HCC), CHD, MCH, and other desks as appropriate, to support ITNs, HBMF, case management, epidemic detection and response, and MIP. The PMI will support the development and implementation of a formal process for coordinating of BCC/IEC at all levels to ensure consistency in technical messages, while ensuring that channels are adapted as appropriate for the target audiences. In addition, PMI will work with partners to ensure that effective BCC methods are being utilized and that routine monitoring and program revisions are conducted as necessary to maximize desired behavioral outcomes.

Among the interventions, some key components include (each technical area is referenced in appropriate section with related costs):

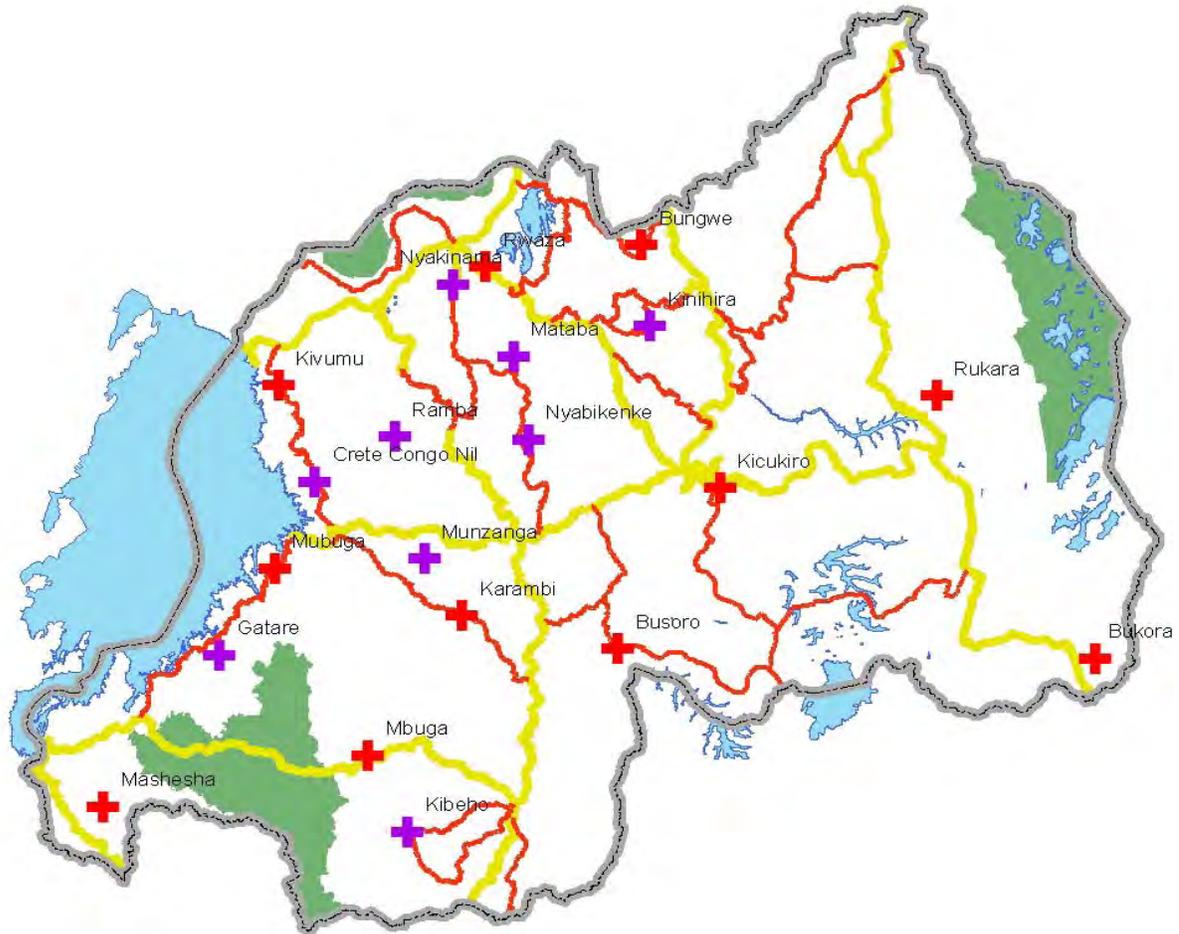
- **IRS:** CHWs conduct household visits to explain the importance of IRS, resulting in lower refusal rates and better compliance with instructions on how to prepare for IRS.
- **LLINs:** CHWs provide messages to reinforce correct and consistent LLIN use, including net repair and proper care, as they collect door to door data on net use. The PMI will provide technical assistance for 2009 and 2012 LLIN campaigns as needed.
- **MIP:** Ensure ASMs provide outreach to encourage early and frequent ANC visits, and that pregnant women sleep under an LLIN.
- **Case Management:** CHWs sensitize communities and caretakers on changes that affect their care seeking and prevention of malaria, such as prompt follow up with a referral for a child with severe malaria or a non-malaria related fever. This also will focus on appropriate counseling among health providers.
- **ESR:** In addition to including routine messages about the importance of an effective and rapid response during outbreaks, CHWs provide immediate outreach to communities when outbreaks occur to ensure that LLINs are used and cases of fever are appropriately and promptly treated.
- **Collaboration with MCH:** The PMI will work with MCH partners to support revision and integration of appropriate messages as part of the integrated BCC Task Force and to continue to engage local groups, including faith based organizations, to ensure that there are no missed opportunities to provide integrated messages where appropriate.

INTERVENTIONS –EPIDEMIC SURVEILLANCE AND RESPONSE

Background

As Rwanda moves toward malaria elimination – while surrounded by countries of much higher endemicity – ESR will become increasingly essential and eventually the program's most important strategy. The population will become increasingly vulnerable to malaria because of reduced immunity; and the country's capacity to minimize outbreaks will depend on the speed of their detection and the effectiveness of the response. Rwanda's malaria-free future depends on ESR, and the goal of achieving pre-elimination by 2012 cannot be realized if systems are not in place at least a year or two earlier.

Rwanda's ESR system features 20 sentinel sites (see map below), weekly TRAC+ reporting procedures, and response committees established at national and district levels. While gradually strengthening in recent years, all these systems are sub-optimal and need significant reinforcement. Ideally, each sentinel site should diagnose and report fever cases, measure climatological factors, and monitor vector resistance, density and infection rates. Only eleven sites do so regularly, however, and even these may perform less well after October 2009 when BTC stops paying salaries. (Existing sites, moreover, are concentrated in western and central Rwanda, with only two located in eastern districts newly at risk of epidemics.) TRAC+'s system is based on 41 hospitals, with reports submitted each Monday morning and summarized in a weekly bulletin; reporting rates vary between 70 and 80%. (The NMCP also receives weekly reports by cell phone text messages, but these must be manually transferred to databases.) Unfortunately, weekly reports exclude community data and include a high proportion (>50%) of clinically diagnosed cases, making them less than fully useful for epidemic detection.



Processes for reviewing data are somewhat *ad hoc* and depend on individuals who may not be available at all times. Epidemic thresholds are in transition, moreover, due to the steady decline in malaria incidence in recent years; they must be assessed manually until such time as adequate historical data (ideally five years) become available. Quantitative reviews are centralized, with limited role for districts. (The latter, though, may be informally aware of major changes in caseloads and may alert headquarters staff by telephone.)

When outbreaks are suspected or identified, as in Gisagara last year, the NMCP quickly mobilizes its own staff as well as partners to investigate and stop transmission. Measures include free treatment of diagnostically confirmed malaria cases, emergency distribution of LLINs (when available), BCC and IRS. These measures may be delayed, however, by the somewhat tardy recognition of outbreaks and by dependence on partners and others who may not themselves be fully prepared.

Progress during last 12 months

Progress in implementing ESR has continued slowly this year, but with an increasing sense of urgency and determination to move forward despite unavoidable delays related to TRAC+ and MOH reorganization. The GOR leaders recognize that the objectives of the Malaria

Strategic Plan cannot be achieved without effective ESR; and that systems for reporting, analysis and response must be fully in place by the time MOP 2010 takes effect. One senior staff has been sent to Tulane University for advanced training. A working group on ESR has begun regular meetings. An outbreak along the Burundi border late in 2008 was dealt with promptly and efficiently (once it had been identified); other reported outbreaks were investigated and determined to not have passed epidemic thresholds. These hopeful signs encourage expectations that effective procedures will be underway by the time MOP 2010 begins operations.

Proposed FY2010 Activities (\$500,000):

We anticipate substantial progress in planning for effective ESR during the remainder of calendar 2009 and the first part of 2010, with the MOP 2010 period devoted to full implementation. As noted above, an ESR working group is currently updating a plan first proposed in 2005.

- *Support for implementation of the new ESR plan (\$500,000):* According to national priorities, this plan may include:
 - A rapid cell phone-based reporting and analysis system, based on the Malaria Epidemic Early Detection System developed in Zanzibar, to be operational in selected areas by mid-2010
 - Expansion of full sentinel sites in newly epidemic-prone districts in eastern Rwanda
 - Development of systemized procedures for weekly review of malaria data, within the NMCP national office as well as selected districts
 - Strengthening of response capabilities at national and district levels (selected districts), to include outbreak investigation, emergency case management, LLIN distribution and BCC to reinforce use, IRS.
 - Training and other capacity-building activities.

As noted, MOP 2009 funds will be used to further develop the national strategy, while FY 2010 funding will provide for full implementation.

MONITORING AND EVALUATION

Background

Monitoring and evaluation continue to be weak points in the national program, although significant progress has been made during the past year. In addition to routine monitoring of reported malaria cases through the HMIS, monitoring is needed for such routine processes as commodity procurement and distribution, fever case management at both facility and community levels, rollout of community case management, insecticide resistance, and entomology (the latter three discussed separately). Somewhat longer term evaluation and perhaps even operations research are needed for the rapidly evolving community case management program, for the rollout of RDTs, for the impact of new MIP strategies, and of

course for the effectiveness of the overall Malaria Strategic Plan. In general, such data have become increasingly vital as Rwanda approaches pre-elimination and enters into a regional leadership role in malaria reduction. The relative weakness of M&E capabilities has led to increased attention from the MOH, the Global Fund, and other donors.

Progress during last 12 months

This attention has led to substantial progress over the last twelve months, with significant contributions from PMI. A major accomplishment this year was the revision of the NMCP's M&E strategy, including both indicators and routine data review processes. The PMI staff participated actively in a series of workshops and meetings that eventually led to this revision. The NMCP is now in the process of hiring an M&E specialist, with a second likely to be added later. For the first time, HMIS data have become readily available with sufficient completeness and timeliness to be used in routine analyses. Several individuals at the NMCP have analyzed these data and produced maps and charts showing the geographic distribution of malaria as well as time trends. (These reports, however, still rely heavily on clinically-diagnosed cases and they lack figures from home-based management. Comparisons with previous years are weakened by the unreliability of 2007 and earlier HMIS data.) The strengthening of HMIS reflects the work of a national M&E task force as well as the efforts of a technical advisor to the MOH partially supported by PMI. Before the end of FY 2009, PMI will set up an office server at the NMCP for HMIS data to allow for improved access to timely data and reinforcing district capacity by conducting a practical training to improve capacity of district managers to review logistics data (especially on ACT and LLIN availability and use) as well as service data (and within the latter, data on diagnostic confirmation).

Other PMI-supported activities this year included the following:

- 2008 DHS verbal autopsy reporting: This report should be available shortly but the small number of deaths reported may weaken conclusions.
- Assessment of home-based management: This report, while generally positive, identified potential problems with supervision and roll out of RDTs; findings have influenced follow up discussions.
- Community-based information system: Support was provided to strengthen the Système d'Information Sanitaire Communautaire (SIS-COM), generating HBMF data for six districts. However, these data have not yet been integrated into the HMIS and finalizing the community reporting system and analyzing the data with HMIS data is an important priority in the upcoming months.
- M&E training for both national and district teams: A course has been planned for August 2009.
- 2009 MIS: Technical assistance is currently underway to support the planning for the upcoming MIS. Support includes preparation of PDAs for MIS implementation and assistance with advanced analysis of MIS data and production of the final MIS report.

Proposed FY 2010 Activities (\$512,000):

The PMI proposes to increase allocations this year, in line with the increasing importance of monitoring and evaluation.

- *Continue strengthening district M&E capacity:* Training and routine technical assistance to enable district teams to improve HMIS data collection, analysis and use of data in routine decision making. Support for an M&E position within the NMCP. One CDC technical assistance visit will be supported in this activity (\$162,000)
- *DHS 2010:* Contribute to other USG and GOR funding to support the malaria module in the upcoming DHS. (\$250,000)
- *M&E reporting systems in USAID/Rwanda:* The PMI contribution to mission contract for standardizing partner reporting systems and ensure USAID reporting requirements. Contractor will train implementing partners and collate quarterly data for mission reports. (\$100,000)

HIV/AIDS and MALARIA***Background***

HIV prevalence in Rwanda is estimated to be 3.1% and there are just under 180,000 adults and children infected with HIV in Rwanda (2009 Epidemiological Update). This, coupled with the presence of major programs such as the PEPFAR and the World Bank's Multi-Country HIV/AIDS program, makes integration of malaria control activities with those for HIV a high priority. Rwanda is one of fifteen focus countries for PEPFAR and received a total of \$123 million in both FY2008 and FY2009, in central and country funds.

HIV-infected people have a greater risk of severe disease due to malaria; and clinical malaria in HIV-infected persons is associated with a transient increase in their viral load and further suppression of the immune system. Accordingly, HIV/AIDS and malaria programs have taken steps to integrate activities where possible in order to address the compounding effects of both infections and to promote synergy across programs. Opportunities for integration for HIV and malaria are primarily within preventive services, for example delivery of LLINs to persons living with HIV/AIDS through home care packages or mechanisms for orphans and vulnerable children (OVC); also support of ANC services to ensure prompt and effective case management of malaria in pregnancy including the treatment and prevention of anemia. Beyond these specific interventions, cross-cutting areas such as training/supervision, laboratory services, drug quality control, pharmacovigilance, and monitoring and evaluation systems offer the most promising opportunities for integration and synergy.

Progress during the last 12 months

PEPFAR will procure 56,700 LLINs for PLWHAs, and PMI and the NMCP will support their distribution in coordination with PEPFAR NGO clinical partners. The PMI and PEPFAR are collaborating to assess LLIN access for PLWHAs in PEPFAR-supported care and treatment sites, prior to LLIN distribution. Integrated malaria and HIV laboratory training and supervision have begun with the NRL, the NMCP, BTC, PEPFAR and PMI. In addition, pharmacovigilance activities led by the Pharmacy Task Force continue, as described in the

pharmacovigilance section; these involve various health programs, including malaria, HIV, tuberculosis, and EPI.

Proposed FY 2010 Activities (funding provided through PEPFAR and other sources):

Links with PEPFAR are particularly important for the following activities, as described in other sections of this document:

- *LLINs for PLWHAs and orphans and vulnerable children:* To ensure LLINs are distributed to these groups, PMI and the NMCP will continue to coordinate with PEPFAR to include funding for LLINs in the PEPFAR Country Operational Plan FY 2010 and to support tracking and monitoring of their use.
- *Financial and technical support of FANC services through MCH unit:* The PMI and PEPFAR will continue to work closely with the MCH desk and the respective MOH programs to support integrated FANC services
- *Laboratory services integration:* Continuation of joint planning with tuberculosis and HIV programs to integrate training and supervision of laboratory workers to improve the quality of malaria diagnostics and strengthen district level ability to conduct quality control. In addition, PMI and PEPFAR will support the NRL to coordinate quantification, forecasting and procurement of lab commodities.
- *System strengthening and cross-cutting areas:* Other opportunities to coordinate efforts in support of systems include those for monitoring and evaluation purposes and commodity management and distribution. Continued technical support to CAMERWA and the Pharmacy Task Force for pharmaceutical distribution will be coordinated with PEPFAR, to be included in both MOP and COP for FY 2010.
- *Pharmacovigilance:* Pharmacovigilance activities for AL and antiretroviral therapies will be coordinated between PMI and PEPFAR with CDC technical assistance. (See the case management section for additional detail.)

CAPACITY BUILDING WITHIN NATIONAL MALARIA CONTROL PROGRAM

Background

Rwanda's NMCP consists of 19 professional staff, including those on international training, and led by a public health physician, Dr. Corine Karema. In addition to national staff, the Unit has two in-house international advisors: a Dutch epidemiologist (available through 2010) and a Belgian public health physician (leaving in late 2009). The PMI team also provides direct technical assistance, especially on M&E, surveillance, and case management. During 2009, PMI will assume support for two fully seconded positions (housed at the NMCP): logistics and M&E.

Most staff have been financed through BTC, but this direct support will end in October 2009 and be assumed directly by the Government of Rwanda. BTC has also financed staff at sentinel sites, but this will stop soon as well. NMCP staff are hard working and competent

but frequently overwhelmed by donor requirements and the need to participate in regional trainings and meetings.

The NMCP forms one part of a larger MOH group known as the Treatment and Research AIDS Center (TRAC+), whose mandate covers all infectious diseases. Organizational relationships within the Ministry of Health are being restructured at the moment, with a possibility that common functions such as M&E and epidemic surveillance may be moved from individual technical units. Delays have occurred pending the outcome of higher-level discussions.

The NMCP is housed in its own building apart from other MOH units (as are other technical units). Vehicles have been provided by BTC but will be reclaimed later in 2009 when direct BTC support ends. The Unit has adequate internet access but no internal network nor direct access to the HMIS database or TRAC+ systems.

Progress during the last 12 months

The PMI supported training and capacity building of the NMCP in the following areas.

- *Entomology:* The PMI supported the training of 17 field technicians on mosquito density, behavior, species identification and sampling methods. The next training is planned for July 2009 on the dissection of mosquito salivary glands and ovaries to equip technicians with the capacity to monitor entomological inoculation rate. In addition, two NMCP staff received training in ELISA techniques for malaria sporozoite detection in mosquitoes, and two sentinel site staff received advanced training in vector control.
- *Community case management:* The PMI supported the attendance of three MOH participants at the African CCM conference held in Madagascar in late 2008. The conference highlighted Rwanda's progress in CCM, prompting the group to nominate Rwanda for the 2009 CCM meeting.
- *ESR:* In July 2009, PMI will support training for sentinel site personnel in the use of cell phone-based data transmission. Twenty-nine personnel from sentinel sites network will be trained in correct collection and transmission of critical epidemiologic data for epidemic early detection.
- *Supply Chain Management:* The PMI partially supported a supply chain management and commodity security course targeting 24 MOH staff including NMCP staff, responsible for supply chain activities.
- *Monitoring and Evaluation:* The PMI supported a training course entitled "Program Support of Malaria Control & Prevention at District-level". Fifteen personnel from decentralized levels participated in a 25-day training consisting of three modules: (1) Principles of integrated malaria control and prevention: Vector control & entomology; (2) Principles of integrated malaria control and prevention: Clinic and community; and (3) Applied monitoring and evaluation for malaria control.
- *Information management:* In preparation for the 2009 MIS, PMI supported advanced PDA programming training for 12 MOH and Kigali Institute of Science and Technology personnel who will be involved in the MIS and future household surveys.

Proposed FY 2010 activities (See case management section):

The termination of direct Belgian assistance to the NMCP reduces funding for certain routine activities, including supervision of decentralized malaria activities and participation in international training. Support for supervision of field activities will be provided to the NMCP as described under the case management section. Ongoing in-country or regional trainings will be supported under specific intervention areas.

- *Support for supervision:* Provide operational costs for central staff oversight of field activities, including ESR, quality assurance, community case management, and M&E. Funds will also support NMCP participation in appropriate regional meetings. (Costs reflected in the case management section)

COMMUNICATION AND COORDINATION

PMI-Rwanda Steering Committee: The PMI Steering Committee, a multi-sectoral group for coordinating and reviewing PMI activities, was established at the request of the Government of Rwanda. Although the Committee has not been able to convene on a regular basis since its inception and first meeting in 2006, efforts are underway to revitalize this oversight group. The lapse in regular meetings can be partly attributed to the diverse commitments of its high-level participants, including the MOH Permanent Secretary as chair and the USAID Mission Director as co-chair.

PMI Partners Meeting: The PMI and the NMCP have organized individual and all-partner review meetings as part of the review process for PMI-funded activities to inform progress, identify challenges, and provide solutions and approaches for effective implementation. Meetings have been held approximately every six months but the intention for the upcoming year is to hold them quarterly.

IRS Steering and Technical Committee: The NMCP has continued to support and facilitate the IRS Steering Committee and has formed a subcommittee known as the IEC technical committee, which includes HCC, the NMCP, Research Triangle International (RTI) and PMI. This committee is charged with providing input to the development of the IEC strategic plan, the design of the communication materials and coordinating the IEC campaign.

Country Coordinating Mechanism (CCM) for the Global Fund: The Country Coordinating Mechanism for the Global Fund continues to meet every month. The PMI has participated in proposal development and review, most recently for the Round 8 malaria proposal and in discussions about Affordable Medicines Facility for Malaria (AMFM).

Roll Back Malaria (RBM) activities: The NMCP continues to hold regular meetings with the RBM group, and partners involved in malaria control activities. Members are particularly active during preparations for Africa Malaria Day.

MCH and the partners in MIP: The Maternal Child Health unit continues to provide support to the NMCP, and all the partners involved in malaria in pregnancy. These partners have

proposed quarterly thematic group meetings and stressed the importance of increased involvement of the NMCP and MCH in these meetings.

The Community Health Desk (CHD): The CHD has elaborated an integrated community health policy and has continuously taken the lead in bringing together all the stakeholders in community health including HBMF, community IMCI, community performance-based financing, other child survival, family planning, and HIV palliative care partners.

PEACE CORPS

The Peace Corps currently has 30 volunteers working within sector and community health services in 17 districts around Rwanda. While only recently arrived, many have already developed ties with community and facility health workers. Experience in other countries indicates that they can facilitate implementation of new approaches, by smoothing the gap between professional and non-professional workers, by working out implementation details, and by providing feedback on what works and what doesn't. They can work with the community to understand why bednets are not being used; they can ensure effective communication of behavioral messages; and they can assist with both upward and downward referrals. As local residents speaking local languages, Peace Corps Volunteers may develop unique perspectives and feedback channels for health programs too often seen only from the top down.

Frequent communication and technical updates are essential. Volunteers need to know about program initiatives and their potential roles; senior Peace Corps and PMI staff need to know where volunteers are working and what their relationships are with health systems and community leaders. Coordination meetings are essential; additional money does not appear to be needed. The PMI plans to hold monthly information exchanges as well as participate in the volunteer's in-service training.

NEGLECTED TROPICAL DISEASES

A neglected tropical disease program was launched in Rwanda in August of 2007 as a three year, \$3 million project with funding from Geneva Global (<http://www.genevaglobal.com>) and support from the Global Network for Neglected Tropical Disease Control. Implemented through Columbia University's Access program, it works in all 30 districts but is now in its final year. The project works in five strategic areas, namely:

1. Determination of the local burden of NTDs and building the national capacity for their control
2. Promotion of proper case management.
3. Preventive measures and BCC
4. Epidemiological surveillance and operational research
5. Institutional support, coordination and sustainability.

The project targets school-aged children between the ages of 5 and 15 years (younger children receive UNICEF support), with mass treatment for soil-transmitted helminthes; it treats

schistosomiasis in endemic areas with praziquantil and albendazole. The project has also trained laboratory technicians for soil-transmitted helminthes and schistosomiasis, and has procured and distributed microscopes and hemocues to some health facilities for improved diagnosis of NTDs.

The program works within the existing MOH and Ministry of Education structures. It specifically worked with the MCH desk, the NMCP and the EPI program during the Mother-Child week to carry out mass drug administration for both soil-transmitted helminthes and schistosomiasis, covering 88% of the targeted population. The program works also with the CHD by training the same cadre of CHWs in the identification, prevention and control of neglected tropical diseases. In the education sector, two teachers per primary school have been trained in neglected tropical diseases prevention and control through advocacy for water supply and sanitation. Sensitization campaigns have also been conducted, both in communities and through private and national radio stations. In terms of institutional support, the project works with the Epidemic and Infectious Disease unit of TRAC+ to strengthen human capacity. The Director of NMCP is the president of the neglected tropical disease Steering Committee, and in the future the neglected tropical disease program will be included in the Malaria and Parasitic Diseases Unit within the new MOH structure.

Areas that can be explored for possible collaboration between PMI and NTDs may include the following:

1. CHWs activities in community case management and BCC/IEC.
2. Surveillance systems support that will be integrated to address all diseases of epidemic potential.

PRIVATE SECTOR PARTNERSHIPS

Novartis has been involved with the NMCP and other partners in the provision of subsidized AL with country specific packaging for use in HBMF and the private sector. Novartis has a new formulation of AL for children and has worked with the NMCP and PMI to ensure that it will come in packaging acceptable for case management in the community and private sector.

STAFFING AND ADMINISTRATION

Two health professionals have been hired to oversee PMI in Rwanda, one representing CDC and the other representing USAID. In addition, one Rwandan has been hired as a Foreign Service National to support the PMI team. All PMI staff members are part of a single inter-agency team led by the USAID HPN officer who has been delegated that authority by the USAID Mission Director. The PMI team shares responsibility for development and implementation of PMI strategies and work plans, coordination with national authorities, management of collaborating agencies, and supervision of day-to-day activities.

The three PMI professional staff work together and oversee all technical and administrative aspects of PMI in Rwanda, including finalizing details of the project design, implementing malaria prevention and treatment activities, monitoring and evaluation of outcomes and

impact, and reporting of results. All three report to the USAID Mission Director and to the Health officer. 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, World Bank and the private sector.

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

Table 2

**President's Malaria Initiative - Rwanda
Planned Obligations for FY10 (\$000)**

Proposed Activity	Mechanism	Budget (<i>commodities</i>)	Geographic Area	Description of Activity
PREVENTIVE ACTIVITIES				
LLINs				
Procure and distribute 300,000 LLINs	DELIVER (3,000) PSI (500)	3,500 (3,500)	National	Procure 300,000 LLINs and distribute free or at highly-subsidized prices through routine channels to pregnant women and children under five, support stockpiling of nets for response to malaria outbreaks, and contribute to universal coverage and IRS exist strategies.
IEC/BCC for LLIN use ¹	PSI	250	National	Support a central level BCC/IEC task force to develop a strategy for implementing integrated malaria messages and coordinating with community partners to conduct community mobilizations and BCC activities.
Capacity building for NMCP to monitor the durability and longevity of LLINs	TBD (75) CDC (24)	99	National	Technical assistance to the NMCP to assess durability and longevity of LLINs. Will inform LLIN replacement strategy including establishing a plan for monitoring of LLIN effectiveness. Two CDC TDYs will be included to support this activity.
IRS				
Annual IRS implementation	IRS IQC Global	6,600	Targeted sectors	Procurement of insecticides and other IRS

¹ Community IEC/BCC activities are integrated across prevention activities. These activities will include household-level efforts to promote demand for, and correct use of, ITNs and ANC services as well as ACTs. The activities are broken down in this table and throughout this document for the purposes of presenting financial investments by intervention area.

Proposed Activity	Mechanism	Budget (commodities)	Geographic Area	Description of Activity
in targeted sectors	Task Order	(3,300)		supplies/equipment; training and other operational costs including district level capacity building for IRS activities for up to 275,000 houses. Includes commodities for following spray round in 2011
IEC and community mobilization for IRS	PSI	250	Targeted sectors	Implementation of IRS IEC strategy for IRS round in Aug 2010. BCC/IEC task force will serve as steering committee and ensure that IRS IEC will also be part of integrated IEC/BCC activities
Entomological M&E	IVM (200) CDC (33)	233 (70)	IRS districts	Continued support for central planning for entomological monitoring and district implementation. Includes establishment of a vector resistance monitoring program, support for the insectary including capacity building of insectary staff and procurement of specialized supplies needed for entomologic monitoring including insecticide resistance testing and LLIN longevity testing . One CDC TDY is included to support entomological monitoring and continue building capacity at the central level.
Environmental compliance	EMCAB	30	IRS districts	External monitoring of the environmental compliance of the IRS operations, including management of side effects and disposal of sachets and other contaminated materials.
Malaria in Pregnancy				
Strengthening of MIP interventions within FANC at district and national level	TBD	200	National	Support to MCH and NMCP to implement the new MIP policy, provide resources and coordination for FANC training and support the national and district levels to conduct supervision.
Strengthen community level MIP interventions	USAID Bilateral Award- ISD	200	National	Support implementation of MIP strategy at community level by supporting CHW training, printing training materials and routine data collection tools, evaluate performance of community outreach to pregnant women and strengthen the linkage between the CHWs and health facilities

Proposed Activity	Mechanism	Budget (<i>commodities</i>)	Geographic Area	Description of Activity
Procurement of iron, folic acid and mebendazole	DELIVER	100 (100)	National	Procurement of an eighteen month supply of medications for the prevention of anemia for use by community health workers as part of the community level outreach to pregnant women prior to attendance at ANC clinics
Malaria in pregnancy surveillance	TBD	250	National	Provide support to malaria in pregnancy surveillance through a baseline assessment conducted at sentinel sites by providing technical assistance to protocol development, data collection and analysis
SUBTOTAL: Preventive		11,712		
CASE MANAGEMENT				
Diagnosis				
Laboratory diagnostic commodities	DELIVER	200 (200)	National	Procure lab equipment and supplies for malaria diagnostics, including slides, Giemsa stain, replacement microscopes, or RDTs as needed for malaria diagnostics at the NRL or district health facilities.
Strengthen malaria laboratory diagnostics	NRL	150	National	Strengthen reference capacity of NRL and management of national lab system by providing training, support for supervision, transportation and supporting malaria diagnostic capacity.
Implementation of RDTs at the community	TBD (150) CDC (12)	162	National	Support national strategy to expand RDT use at the community by assessing field conditions of RDT kits, training evaluating CHW performance with RDTs and providing technical assistance to the NRL to incorporate the RDT strategy into quality control system. One CDC TDY is included to support the roll out of RDTs at the community level and to help establish a QA/QC system
Community and Private Sector Treatment				

Proposed Activity	Mechanism	Budget (commodities)	Geographic Area	Description of Activity
Strengthen case management at health facilities	USAID Bilateral Award-TBD (400) CDC (12)	412	National	Evaluate and monitor the implementation of new treatment guidelines at the health facilities. Provide technical assistance to develop systems for monitoring adherence to diagnostic and treatment algorithms, support refresher trainings for health providers and provide resources for supervision visits. One CDC TDY is included in this activity.
Community case management implementation	USAID Bilateral Award-ISD	1,200	National and District	Support continued implementation of community case management of fever within community health package in selected districts.
Procurement rectal artesunate for pre-referral treatment at the community:	DELIVER	150 (150)	National	Procurement of intrarectal artesunate for pre-referral treatment for severe malaria by CHWs.
BCC for effective case management:	PSI	250		Support the design of communication messages for health providers and CHWs for counseling and follow up to the most current treatment algorithms
Capacity building for local NGOs	PSI	200	National	Sub grants to local NGOs for community malaria interventions to build the capacity of local NGOs for HBMF implementation and other malaria prevention and control activities
Support for NMCP supervision	USAID Bilateral Award-TBD	100	National	Support operational costs for central staff oversight of field activities, including community case management, ESR, quality assurance, and M&E
External evaluation of CCM	MCHIP	100	National	Support the NMCP to conduct an external evaluation of I-CCM as the program reaches full implementation
Private sector provision of ACTs	PSI	100	Over 200 private sector pharmacies and outlets nationwide	Strengthen private sector capacity to appropriately market ACT for young children and adults; support the timely distribution of ACTs to private sector outlets nationwide.

Proposed Activity	Mechanism	Budget (commodities)	Geographic Area	Description of Activity
Repackaging of ACTs	PSI	50 (50)	10 districts	Printing and re-packaging ACTs for HBMF and private sector
Drug Supply and Pharmaceutical Management				
Strengthen national commodity supply chain management for malaria commodities	DELIVER	290	National and district levels	Continue support to the NMCP for reinforcing supply chain systems, using previously developed tools and software; collaboration with CAMERWA to improve forecasting and quantification of malaria commodities at the national level; Support for one commodities manager staff at the NMCP
Strengthen commodity supply chain management for malaria commodities at the district and community level	SPS	500	District and community	Improve pharmaceutical management within the decentralized supply chain system. Provide training and supervision to district and health facility pharmacists in charge of malaria commodities. Develop monitoring tools and systems for the health centers and community health workers. Support coordination of health centers (who serve as link for CHWs) and district pharmacies.
Pharmacovigilance	SPS (200) CDC (12)	212	National	Support for national pharmacovigilance system. One CDC TDY is included to support the NMCP and Pharmacy Task Force to roll out and expand the pharmacovigilance system. The TDY will also support drug quality activities listed below.
Drug quality	USP	100	National	Assist in the development of a national quality control strategy, conduct trainings on quality control at the central and district level, procure necessary reagents for the testing of antimalarials
Monitoring of Drug Efficacy	HS2020 with sub to Tulane	100	Sentinel sites	Provide support to ongoing ACT drug efficacy monitoring occurring in Rwanda
SUBTOTAL: Case Management		4,276		
EPIDEMIC SURVEILLANCE & RESPONSE ACTIVITIES				

Proposed Activity	Mechanism	Budget (commodities)	Geographic Area	Description of Activity
Support implementation of national ESR plan	HS 2020 with sub to Tulane	500	National and districts	Support expansion of surveillance sites, strengthen detection and response capacity of districts to epidemics through technical assistance for monitoring systems and training of district staff
SUBTOTAL: ESR		500		
MONITORING & EVALUATION ACTIVITIES				
Continue strengthening district M&E capacity	USAID Bilateral Award-HSS (150) CDC (12)	162	National	Training and routine technical assistance to enable district teams to improve HMIS data collection and use of data in routine decision making. One CDC TDY is included in this activity.
Support for the 2010 DHS M&E and reporting unit in Mission	Measure MEMS	250 100	National n/a	Support the malaria module of the 2010 DHS Contribution to USAID Mission M&E requirements and responsibilities as they relate to PMI
SUBTOTAL: M&E		512		
STAFFING & ADMINISTRATION				
USAID and CDC staff and associated administrative expenses	USAID/CDC	700	n/a	Support for USAID & CDC Malaria Advisors, plus associated administrative costs.
FSN staff and other in-country administrative expenses	USAID	300	n/a	Malaria Program Specialist for PMI, partial support for other administrative/support staff within USAID Mission
SUBTOTAL: Mgmt. and Admin.		1,000		
GRAND TOTAL		18,000 (7,370)	<i>Commodities represent 41 % of total budget</i>	

Table 3

President's Malaria Initiative – Rwanda
Year 4 (FY10) Budget Breakdown by Intervention (\$000)

Area	Commodities \$ (%)	Other \$ (%)	Total \$
Insecticide-treated nets	3,500 (91%)	325 (9%)	3,849
Indoor residual spraying	3,370 (47%)	3,743 (53%)	7,113
Case management	400 (9%)	3,876 (91%)	4,276
Malaria in pregnancy	100 (13%)	650 (87%)	750
Epidemic preparedness & response	0	500 (100%)	500
Monitoring and evaluation	0	512(100%)	512
Administration	0	1,000 (100%)	1,000
Total	7,325	10,595	18,000

Table 4**Year 4 (FY10) Budget Breakdown by Partner (\$000)**

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

Partner Organization	Geographic Area	Activity	Budget
DELIVER	National	Procurement of LLINs	3,000
	National	Procurement of iron, folic acid and mebendazole	100
	National	Procurement of laboratory diagnostic commodities	200
	National	Procurement of rectal artesunate	150
	National	Strengthening supply chain	290
Total			3,740
PSI	National	LLIN distribution	500
	IRS districts	IEC and community mobilization for IRS	250
	National	BCC for effective case management	250
	National	IEC/BCC for LLIN use	250
	National	Capacity Building for local NGOs	200
	National	Private sector provision of ACTs	100
	National	Repackaging of ACTs	50
Total			1,600
CDC	National	Entomologic equipment	21
	National	TA support for IRS, Entomology, Diagnostics, Pharmacovigilance, M&E	84
Total			105
EMCAB	IRS districts	Environmental Compliance	30
MCHIP	National	External evaluation of CCM	100
NRL	National	Strengthen malaria diagnostics	150
USP	National	Drug quality	100
SPS	National	Strengthen district and community supply chain	500
	National	Pharmacovigilance	200

Total			700
MEMS	National	M&E reporting unit for USAID	100
Measure	National	Support to 2010 DHS	250
IRS IQC Global Task Order	IRS districts	IRS implementation	6,600
IVM	National	Entomologic monitoring	200
USAID Bilateral Award- ISD	National	Community case management implementation	1,200
	National	Strengthen community MIP interventions	200
Total			1,400
USAID Bilateral Award- TBD	National	Strengthen case management at health facilities	400
	National	Support NMCP supervision	100
Total			500
HS2020-sub to Tulane	National	Monitoring Drug efficacy	100
	National	Support for national ESR plan	500
Total			600
USAID Bilateral-HSS	National	Strengthen district M&E	150
TBD	National	Assessment of LLIN longevity and durability	75
TBD	National	MIP surveillance	250
TBD	National	Support implementation of RDTs at the community	150
TBD	National	Strengthen District and National MIP interventions	200