

PRESIDENT'S MALARIA INITIATIVE

Malaria Operational Plan (MOP)

RWANDA

FY 2008

November 5, 2007

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EXECUTIVE SUMMARY

Malaria is a major public health problem in Rwanda. In 2005, over 1.5 million episodes of uncomplicated malaria were treated in public sector health facilities and 34% of deaths among children under five at health facilities were attributed to malaria, making the disease the leading cause of death for this age group. The entire Rwandan population of approximately 9.1 million residents is at risk of malaria.

In July 2005, the United States Government 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%. Activities supported by The President's Malaria Initiative (PMI) began in Rwanda in FY 2007. During FY 07, the PMI supported existing National Malaria Control Program (French acronym, PNILP) strategies and coordinated closely with international and national partners to complement their funding and efforts.

Rwanda has rapidly scaled up malaria prevention and treatment interventions during the past two years. The PNILP began implementing a new malaria treatment policy in 2006, including introduction of artemether-lumefantrine (AL), an artemisinin-based combination therapy (ACT), at the health center level in all 30 districts in the country. By mid-July 2007, there was observed and anecdotal information of declines in cases of severe malaria among children under five in health facilities. In addition, since a high percentage of fevers among children under five are treated outside of the public sector in Rwanda, the PNILP is actively engaging community health workers through home-based management of fever (HBM) and the private sector in ACT distribution, with the support of PMI and other donors. Net ownership and usage is also rapidly increasing in both rural and urban areas of Rwanda following the distribution of over 1.5 million ITNs during the September 2006 measles campaign, as well as increased distribution of nets through routine health center system channels during late 2006 and the first half of 2007.

The following table shows the activities supported by PMI during Year 1:

Proposed Year 1 Targets (PMI and partners)	Expected Results after Year 1 Implementation (March 2008)
500,000 LLINs distributed by PMI and partners for routine services following the measles/ITN campaign in 2007.	As of September 2007, over 700,000 LLINs had been distributed by Global Fund and partners to children under five and pregnant women. An additional 450,000 LLINs with PMI Year 1 funding will be distributed to pregnant women, children under five and the poorest of poor by November 2007.
145,000 households protected by IRS	As of October 2007, approximately 155,000 households (850,000 residents) will have been protected by IRS in three districts.
SP available for IPTp reaching 195,000 pregnant women with two or more doses	550,000 doses of SP have been procured and distributed to all health facilities nationwide.
60,000 treatments of injectable artemether for treatment of severe malaria procured and distributed to health facilities	Over 71,000 treatments of injectable artemether have been procured and distributed to health facilities.

Home-based management of fever with ACTs implemented in five districts	By October 2007, 700,000 ACT treatments will have been procured, repackaged and available for distribution to ten home-based management districts.
Malaria treatment with ACTs initiated in the private sector through 50 accredited pharmacies and drug outlets	By December 2007, over 50 registered private sector pharmacies and outlets will have been trained and provided with ACTs for malaria treatment of children under five.

The Year 2 PMI planning mission was conducted in Rwanda in July 2007. The planning team included representation from the U.S. Agency for International Development (USAID), the Centers for Disease Control and Prevention (CDC), and the PNILP. The Year 2 Malaria Operational Plan (MOP) was developed with the active participation of nearly all national and international partners involved with malaria prevention and control in the country. Planning for Year 2 PMI activities was done in the context of Rwanda's submission for the Global Fund to Fight AIDS, TB, and Malaria (Global Fund) Rolling Continuation Channel, which is only offered to countries with well-performing grants. Rwanda's request is for a total of \$95 million over six years (2008-2013) and includes long-lasting insecticide-treated bed net (LLINs), ACTs and severe malaria drugs for health centers nationally, injectable artemether for severe malaria treatment, ACTs for HBM, rapid diagnostic tests and sulfadoxine-pyrimethamine (SP) for intermittent preventive treatment (IPTp).

Based on these discussions and further meetings with the PNILP and other partners, the following major activities will be supported during the second year of the Initiative:

Long-lasting insecticide-treated nets: An estimated 3.6 million nets have been distributed during the past two years in Rwanda with funding from Global Fund grants, including 1.35 million LLINs distributed to children under five in all 30 districts through a nationwide measles immunization campaign in September 2006. Between 2007 and 2008, an additional 1.5 million LLINs are planned for distribution (free and at subsidized cost) to pregnant women and children under five with completed immunizations through routine health services at antenatal clinic (ANC) and expanded program for immunization (EPI) clinics, with contributions from the Global Fund, PMI Year 1, and the Belgian Technical Cooperation (BTC).

In Year 1, PMI supported the procurement and distribution of approximately 450,000 LLINs for poorest of the poor populations and for routine ANC and vaccination services, annual nationwide campaigns and community health insurance associations called "*mutuelles*", strengthening of distribution systems to district and community levels, and increased information, education, communication/behavior change communication (IEC/BCC) activities to promote correct and consistent net use among children under five, pregnant women, and people living with HIV/AIDS (PLWHAs) through targeted campaigns, community mobilization and advocacy.

In Year 2, PMI will continue to support free and highly subsidized LLINs distributed through routine channels by procuring 300,000 LLINs for children under five and pregnant women as well as poorest of poor households. A portion of these nets will also be contributed to the 2009 measles/ITN campaign as replacement nets for children under five. PMI will also invest

in improving net use with community mobilization by existing CHW channels supported through NGO- and FBO- networks and IEC/BCC campaigns. This is expected to bring household ownership of one or more ITN to over 50% nationwide.

Indoor residual spraying: IRS was not part of Rwanda's malaria control strategy and as a result, the development of in-country technical capacity to oversee IRS activities was a priority for PMI in Year 1. The PMI supported IRS in five districts reaching a total combined population of 1.39 million. In addition to financing an environmental assessment, procurement of insecticide and spray equipment, recruitment and training of sprayers, and associated IEC activities, PMI provided technical assistance to the PNILP to increase their entomological capacity for resistance monitoring in the districts targeted for IRS.

Building on the progress of 2007, PMI will expand IRS activities in Year 2 to cover 1.9 million residents. In addition to ongoing IRS capacity building at the national level, continued financial and technical support to develop district-level capacity for planning and conducting IRS campaigns. In anticipation of continued use of IRS in Rwanda, the PMI in Year 2 will also support development of a Rwanda IRS entomology monitoring plan and establishment of an insectary in order to assess IRS duration and monitor insecticide resistance.

Malaria in 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. While the national ANC strategy is consistent with WHO recommendations, few women make their first ANC visit in the first trimester. In Year 1, PMI supported malaria in pregnancy activities as part of integrated focused antenatal care (FANC) training in 12 of 30 districts. Approximately 250 providers were trained in FANC, including IPTp, with the objective of enhancing the quality of ANC service delivery. As part of the PMI launch, 550,000 doses of SP were procured and distributed to health facilities to ensure that pregnant women received both doses of IPTp.

In 2008, PMI will procure one million treatments of IPTp to cover all pregnant women with two doses of SP, continue to train providers in FANC, collaborate with the Global Fund on routine LLIN distribution nationwide at a highly subsidized rate for pregnant women attending antenatal care, and revise the antenatal card to strengthen the data collection on malaria in pregnancy. In addition, PMI will expand district-level service provider training at antenatal facilities and support improved quality of services for pregnant women through training and community mobilization. These activities in combination with support provided by other partners are expected to bring coverage with two doses of SP for IPTp to 75% nationwide.

Case management: As of October 2006, all health facilities officially transitioned to AL as the first-line treatment for uncomplicated malaria. Rwanda's initial experience with HBM began in 2004 with six pilot districts. Since then, expansion of the HBM program to 12 districts has begun with the combined support of Global Fund, the Belgian Technical Cooperation and PMI. In Year 1, PMI supported strengthening laboratory diagnostics, the procurement of 71,000 doses of injectable artemether for treatment of severe malaria (a one year national supply), the transition to AL at health facilities with treatment policy training,

job aids, patient education materials, and strengthening PNILP supervisory capacity to ensure the successful implementation of the new treatment policy. PMI is supporting HBM expansion within ten districts, including training of CHWs, supervision, and logistics; procurement, repackaging, and distribution of AL for the transition from AQ/SP. PMI is also supporting the introduction of AL into the private sector pharmacies and retail outlets through training and distribution of AL to promote appropriate treatment of malaria for children under five.

In Year 2, PMI will continue supporting prompt and effective case management of malaria at health facilities as well as at the household level through HBM and in the private sector. At the health facility level, PMI will contribute to filling identified gaps in the PNILP strategy, including procurement of drugs, strengthening quality assurance/quality control at the national and district levels for accurate malaria diagnostics, and support of the PNILP's supervisory role and capacity to monitor and reinforce the correct use of AL at the health facilities and through HBM. These activities in combination with support provided by other partners is expected to increase the proportion of children under five with fever treated with an ACT within 24 hours to over 40% nationwide.

Monitoring and evaluation: The PNILP uses several sources of routine and periodic data to monitor progress of malaria control activities and make decisions. These include the national HMIS, multiple sentinel sites/demographic surveillance sites, the Demographic and Health Survey (DHS) conducted every five years, the biannual Malaria Indicator Survey, and smaller focused surveys, such as bednet ownership and usage rates. The PNILP is developing a costed national malaria M&E plan and making strides in standardizing indicators across the various data collection systems and surveys. Several activities supported by PMI in FY07 to strengthening the quality of data for the PNILP are nearing completion including a national health facility survey, a community-based information system pilot, and technical support to ten sentinel sites for mortality surveillance and entomological and epidemiological monitoring.

In Year 2, PMI will continue support to existing sentinel sites to enhance entomologic surveillance capacity and expand to support an additional nine new sentinel sites located in epidemic-prone districts. PMI will also support a standardized verbal autopsy to provide estimates of malaria-attributed mortality, support the PNILP in the evaluation of HBM and private sector case management and support the training of programmers for PDA-based information technology network.

The proposed FY08 PMI budget for Rwanda is \$17 million. Of this amount, 15% will support procurement and distribution of ITNs, 23% procurement of antimalarial drugs and strengthened malaria laboratory diagnostics, 38% IRS, and 7% malaria in pregnancy activities. Approximately 8% will support monitoring and evaluation. Thirty-two percent of the total budget will be spent on commodities.

ABBREVIATIONS and ACRONYMS

ACT	artemisinin-based combination therapy
AL	artemether-lumefantrine
ANC	antenatal care
AQ/SP	amodiaquine/sulfadoxine-pyrimethamine
BCC	behavior change communications
BTC	Belgian Technical Cooperation
BUFMAR	Office for the Not-for-Profit Medical Facilities in Rwanda
CAMERWA	Central Drug Purchasing Agency for Rwanda
CBO	community-based organization
CCM	country coordinating mechanism
CDC	Centers for Disease Control and Prevention
CHW	community health worker
CNLS	National AIDS Commission
CPDS	Coordinated Procurement and Distribution System
CSHGP	Child Survival and Health Grants Program
DHS	Demographic and Health Survey
EPI	Expanded Program for Immunization
FBO	faith-based organization
Global Fund	Global Fund to Fight AIDS, TB, and Malaria
GOR	Government of Rwanda
HBM	Home-based management
HMIS	Health Management Information Service
IDA	International Development Association
IEC	information, education and communication
IMCI	Integrated Management of Childhood Illnesses
IPTp	intermittent preventive treatment of pregnant women
IRS	indoor residual spraying
ITN	insecticide-treated bed net
LLIN	long-lasting insecticide-treated bed net
MCH	maternal and child health
MIP	malaria in pregnancy
MIS	Malaria Indicator Survey
MOP	Malaria Operational Plan
NGO	non-governmental organization
NRL	National Reference Laboratory
OVC	orphans and vulnerable children
PBF	performance-based financing
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
PNILP	National Malaria Control Program
PSI	Population Services International
PTF	Pharmacy Taskforce
PVO	private voluntary organization

RCC	Global Fund Rolling Continuation Channel
RBM	Roll Back Malaria
RDT	rapid diagnostic test
REMA	Rwanda Environmental Management Authority
RTI	Research Triangle Institute
SP	Sulfadoxine-pyrimethamine
SPA	Service Provision Assessment
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 late June 2005, the United States Government (USG) announced a new five-year, \$1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions in high-burden countries in sub-Saharan Africa. The goal of this Initiative is to reduce malaria-related mortality by 50% after three years of full implementation in each country. This will be achieved by reaching 85% coverage of the most vulnerable groups – children under five years of age, pregnant women, and people living with HIV/AIDS – 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 2007, four countries were added: Malawi, Mozambique, Senegal, and Rwanda. In 2008, eight additional countries were added to reach a total of 15 countries covered under the PMI. Funding began with \$30 million in FY 06 for the initial three countries, increased to \$135 million in FY 07, and will increase to \$300 million in FY 08, and reach \$500 million in FY 10 by 2010.

In implementing the U.S. Government component of this Initiative, the U.S. is committed to working closely with host governments and within existing national malaria control plans. Efforts will be coordinated with other national and international partners, including the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund), Roll Back Malaria (RBM), the World Bank Malaria Booster Program, 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 the PMI, as well as subsequent evaluations, will be highly consultative and held in collaboration with the national malaria control program and other partners.

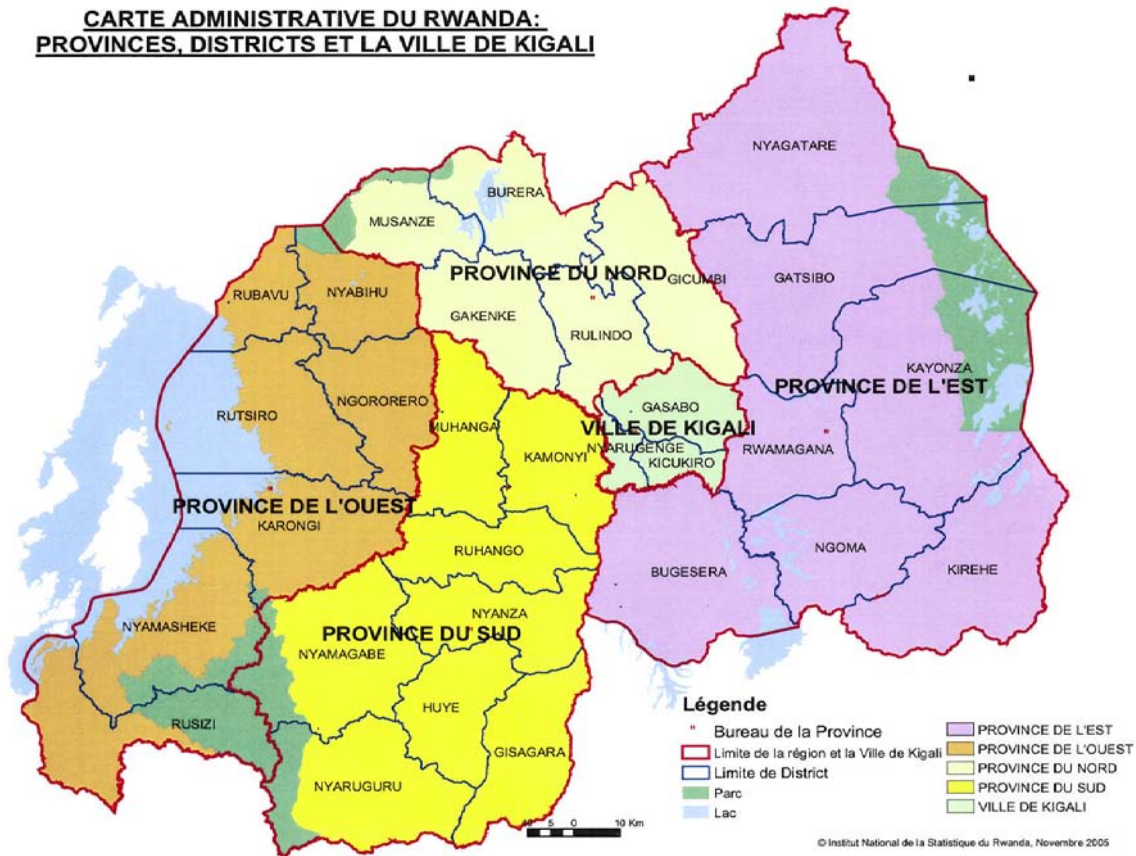
This document presents a detailed one-year implementation plan for the second year of the President's Malaria Initiative in Rwanda. It reviews progress to date under the PMI in Rwanda and the current status of malaria control and prevention policies and interventions, identifies challenges and unmet needs if the goals of the PMI are to be achieved, and provides a description of planned Year Two activities under the PMI. The plan was developed in close consultation with the National Malaria Control Program (French acronym, PNILP) 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 is \$17 million for FY 2008.

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 9.1 million, making it one of the most densely populated countries in Africa. The entire population is at risk for malaria, including an estimated

1,550,000 children under five and 390,000 pregnant women. Administratively the country is made up of 30 districts.

**CARTE ADMINISTRATIVE DU RWANDA:
PROVINCES, DISTRICTS ET LA VILLE DE KIGALI**



Malaria is the leading cause of death among children under five accounting for 34% of health facility deaths in this age group. More than 1.2 million episodes of uncomplicated malaria were treated in public sector health facilities during 2004, along with over 23,790 cases of severe malaria and 1,353 deaths. However, these numbers probably under-represent the total number of annual episodes in the population since only 32% of the population utilized health services during the same period. Fifty-four percent of hospital cases and 53% of the deaths occurred among children under age five. Malaria is also a significant health risk for pregnant women and their unborn children, particularly women in their first and second pregnancies, and women with HIV infection.

In 2005, the number of episodes of uncomplicated malaria treated in public sector health facilities increased to 1.5 million. It is difficult to know whether the apparent increase in case load is attributable to an increase in malaria transmission levels or effective behavior change communication (BCC) campaigns and community health insurance schemes that have created greater demand for health services.

Since the last Demographic and Health Survey (DHS) was carried out in 2005, the level of coverage of malaria interventions, the number of malaria cases, and the malaria case management situation in the country has changed significantly; district-level reports on morbidity and mortality suggest reductions in cases of malaria among children. During October and November 2006, the PNILP finalized and then began implementation of the revised malaria treatment policy guidelines, including introduction of artemether-lumefantrine (AL), an artemisinin-based combination therapy (ACT), at the health center level in all 30 districts in the country. By mid-July 2007, following the nationwide introduction of AL in October 2006, anecdotal information of declines in cases of severe malaria were reported among children under five years in health facilities. The PNILP conducted a National Malaria Indicator Survey during June and early July 2007 to collect up-to-date information on coverage of malaria interventions such as the use of LLINs, IPTp, and prompt, effective treatment of malaria. Preliminary results of this survey summarized in a later section provide a recent documentation on the malaria situation in the country.

Malaria is known to exact a significant financial toll on household income and government revenue. In Rwanda, the direct cost per episode of malaria treated is estimated to be \$2.09 while the indirect costs including loss of wages is over \$5.00. With the majority of children and many adults experiencing more than one episode per year, malaria impedes economic development through lost productivity and opportunity costs of the disease. According to the MOH 2005 Annual Report, a person suffering from malaria misses an average of eight days of work or school.

Geographically, malaria transmission in Rwanda has increased over the last ten years for a variety of reasons, including increased resistance to drugs (e.g. chloroquine and amodiaquine-sulfadoxine-pyrimethanmine (AQ/SP)), greater population density and population movements, and human and economic activities such as rice farming, brick making and mining, which increase breeding areas for mosquitoes and the risk of malaria transmission. Malaria is now found in high altitude areas and other areas where the disease was not previously a public health problem. Often, inhabitants of these areas have little or no immunity to the disease and are therefore prone to more severe forms of the disease. Since 1998, severe epidemics/upsurges of malaria have been observed nationwide almost every two years.

The PNILP is committed to reaching the most vulnerable populations, including children under five, with prompt and effective malaria treatment and malaria prevention activities. In addition to rolling out ACT at the health facility level, PNILP is engaging community health workers (CHWs) through home-based management of fever (HBM) and the private sector in provision of ACTs. Recent district-level studies have documented local improvements in treatment-seeking behavior resulting from implementation of the HBM approach. In Kibogora in southern Rwanda, between 2004 and 2006, the number of malaria cases in children less than five years treated within 24 hours increased from approximately 40% to 80% within the catchment area for a population of 300,000. According to the MOH and based on findings from an external evaluation of the pilot of HBM, positive results on rapid treatment-seeking were also documented in the communities around Kibilizi Hospital, Gisagara District in southern Rwanda during 2006. Following the distribution of over one million ITNs during the September 2006 measles campaign as well as increased distribution

of nets through routine health center system channels during late 2006 and the first half of 2007, net ownership and usage is also rapidly increasing in both rural and urban areas of Rwanda.

Rwanda is the recipient of Round 3 and Round 5 malaria grants from the Global Fund, with approximately \$46 million disbursed thus far. Implementation of the Round 5 grant is underway and approval was received to begin phase 2 of the Round 5 grant. The Global Fund is funding prevention and treatment activities, including procurement of long-lasting insecticide-treated bed nets (LLINs) that were distributed primarily through the national measles campaign in September 2006 and ACTs which were made available to all age groups in public sector health facilities beginning in October 2006. In 2007, Rwanda submitted a proposal for the Global Fund Rolling Continuation Channel, a funding channel offered only to countries with well-performing grants, for a total of \$95,590,956 over six years (2007-2013). The budget in this request includes LLINs, ACTs for health centers nationally, ACTs for HBM at the community level, rapid diagnostic tests, and sulfadoxine-pyrimethamine (SP) for IPTp.

The PMI is working closely with the PNILP and other donor organizations to ensure that the Government of Rwanda (GOR) meets the malaria control goals and objectives set out in the PNILP's Five Year Plan of Action. The Belgian Technical Cooperation (BTC) is a key donor for malaria control activities in Rwanda. BTC provides technical assistance to the PNILP through a malaria advisor who sits at the PNILP, and also focuses on capacity building at the district level, performance-based financing (PBF) including malaria-related activities, pharmacy management, Malaria Early Warning System (MEWS) development, testing of new strategies, *in vivo* drug efficacy testing, research (for example, comparing IPTp with SP to placebo among women given ITNs), maintenance of sentinel surveillance sites and support for an entomologist located at the PNILP beginning in September 2007. The BTC is investing approximately \$1,000,000 in 2008 in malaria activities including technical support to the PNILP. The Clinton Foundation, Partners in Health, and Millennium Promise are interested in partnering in malaria control activities in Rwanda.

NATIONAL MALARIA CONTROL PLAN AND STRATEGY

The PNILP has strong leadership and has recently developed a strategic plan that will cover 2006 – 2010. The objectives of the plan, similar to those of the PMI, are to ensure that:

- Prompt, appropriate, and affordable treatment is available for 80% of children under five years of age with malaria within 24 hours of onset of symptoms, through health centers and HBM;
- Access to IPTp is available for 80% of pregnant women;
- At least 80% of pregnant women and children under five sleeping under an ITN;
- At least 90% of malaria patients who attended health facilities are treated in conformity with the national policy; and
- At least 90% of malaria epidemics are identified and controlled within two weeks of onset.

During May 2007, a WHO consultant provided assistance to the PNILP to assess progress towards achievement of the 2005 - 2010 Malaria Control Plan and review the strategic plan. The assessment report recommended scaling up ACTs at community and health center levels, increasing activities to promote further ITN coverage, and strengthening of monitoring and evaluation activities.

Over the last year, decentralization has re-defined the administrative and health districts, by reducing the number of districts from 42 to 30 in the country. Each of the districts has a health department which is responsible for health activities at the district, sector, and health facility level. Elected district mayors hold contracts with the central government which typically include commitment to improving health status among their populations. For example, currently, mayors have agreed to actively increase net coverage to 100 percent with at least two insecticide-treated bed nets per household. At the community level, elected health workers serve as volunteers and play a critical role in delivering household-level health services, including HBM. There are a total of 40 district hospitals and 406 health centers.

In order to improve access to health services, Rwanda has pioneered an innovative health insurance scheme (*mutuelle* system) to ensure that all members of the population, including the poorest, have health coverage. Different *mutuelle* groups exist throughout the country, and citizens who do not carry private insurance can register as a member of a *mutuelle* in their area. Each group is sustained in part by its members, but funding also comes from the GOR with assistance from the World Bank and the European Union. Fees for membership vary depending on the number of family members receiving coverage; however, it typically costs approximately Rwandan francs (FRW) 2,000 to join, with a yearly fee of FRW 1,000, for each family member. Many district governments subsidize membership fees for their indigent citizens, as do some international non-governmental organizations (NGOs). This insurance scheme covers 90% of the costs of treatment at government and religious health facilities. Previously, members were limited to treatment at the health center where their *mutuelle* had registered, but recently the system was adapted to ensure coverage for any *mutuelle* member at any government or church-supported facility. Consultations with private providers are not covered. Since the *mutuelle* system was adopted the number of Rwandans covered has grown rapidly, as has treatment-seeking among low income Rwandans. According to the MOH, approximately 74% of Rwandans are now members of *mutuelles*.

CURRENT STATUS OF MALARIA INDICATORS

The PMI, Global Fund, BTC, and WHO are currently working with the PNILP to reduce malaria morbidity and mortality in the country. In June and July of 2007 a national Malaria Indicator Survey (MIS) was carried out by the PNILP, School of Public Health, and the Rwanda Bureau of Statistics with technical support from WHO. The survey was financed by the Global Fund and BTC. Preliminary findings show that 53.8% of households surveyed had one or more ITNs.

Recent Estimates of Malaria Indicators: 2007 MIS Survey	
Indicator	Estimate
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	Pending
Proportion of households with at least one ITN	53.8%
Proportion of children under five years old who slept under an ITN the previous night	Pending
Proportion of pregnant women who slept under an ITN the previous night	Pending
Proportion of women who received two or more doses of IPTp during their last pregnancy in the last two years	Pending
Proportion of targeted houses adequately sprayed with a residual insecticide in the last 12 months (NMCP)	Pending

Sources: Routine PNILP Monitoring Reports 2006, 2007; Preliminary results from Rwanda MIS, 2007

GOAL AND TARGETS OF THE PRESIDENT'S MALARIA INITIATIVE

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

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

Prevention:

1. At least 600,000 LLINs (of which PMI will contribute 300,000) will have been distributed by partners to families with children under five and/or pregnant women to support achievement of nationwide household ownership of ITNs of more than 65%.

2. At least 85% of houses (approximately 310,000 households) in geographic areas targeted for IRS during Year 2 will have been sprayed.
3. At least 1,000,000 SP doses will have been procured to cover 100% of pregnant women with two or more doses of IPTp.
4. At least 530 healthcare providers will have been trained according to the national policy to deliver at least two doses of IPTp during ANC visits.

Case Management:

1. At least 125,000 treatments of injectable artemether will have been procured and distributed to the public health facilities to cover the annual projected cases of severe malaria requiring referral to a higher level of care.
2. At least 900,000 ACT treatments will have been procured, repackaged and distributed for use at the community-level through home-based management of fever in 10 districts.
3. Roll out of malaria treatment with ACTs in the private sector through at least 100 accredited pharmacies and drug outlets with specially packaged ACT treatment for children under five.

INTERVENTIONS: PREVENTION

Insecticide-Treated Nets

Current Status:

The PNILP supports increased LLIN coverage targeting pregnant women and children under five as well as reaching the poorest of the poor Rwandans (those in the lowest income quintile). The current distribution channels include ANC centers, routine vaccination sites, social marketing/commercial sector, national campaigns and PLWHA organizations. With regard to PLWHAs, the basic package of services provided under existing PEPFAR programs calls for provision of LLINs to both adults and children. LLINs and other public health products/medical supplies required for malaria prevention and control are exempt from taxes and tariffs. Non-LLINs are being phased out and replaced with large stocks of LLINs. Since the last retreatment campaign in 2005, the PNILP has no further plans to support net retreatment activities.

PMI Progress to Date:

A nationwide measles immunization campaign took place in September 2006 and included oral polio vaccine, Vitamin A, mebendazole and LLINs. Approximately 1.35 million LLINs procured through the Global Fund Round 5 grant were distributed to children under five in all 30 districts. One LLIN was distributed for each child under five with a maximum of three

nets per household. PMI supported the nationwide campaign effort by providing resources for PNILP supervision and follow-up activities. In addition to the ITNs distributed through the measles campaign, approximately 700,000 LLINs were distributed through routine health services at ANC and EPI clinics to pregnant women and children under five with completed immunizations. LLINs distributed to children under five are free and highly subsidized nets are available to pregnant women at ANC clinics. PNILP distributed 80,000 LLINs for PLWHAs with the assistance of local NGO and FBO networks. In addition, 300,000 ITNs were procured for social marketing purposes; half of these were sold to urban consumers by participating wholesalers.

Early results from the Malaria Indicator Survey conducted in June 2007 provide the most current coverage information for Rwanda. The survey found that 92% of children under five years had slept under an ITN the previous night, and that 52% of households surveyed had at least one ITN. Final findings from the MIS should be available in a few weeks and will provide verification and further confirmation of high household ownership. The 2007 MIS data for children under five indicate significant gains from reports of net coverage during the period 2000 to 2005, when household coverage increased only modestly from 6.6% to 14.7% and net use by children under five years rose from 4% to 13%. District-level surveys by the Expanded Impact Project, supported by the PMI and the Child Survival and Health Grants Program, carried out in southern rural Rwanda indicate that net usage among children under two was a median of 74% for the six rural districts surveyed. The range of net coverage among the same age group ranged from 67% in Nyaruguru District to 80% in Ngoma District.

An estimated 3.6 million nets have been distributed over the past two years in Rwanda with funding from Global Fund grants. An additional 1.5 million LLINs are planned for distribution between 2007 and 2008 with contributions from the Global Fund (970,000), PMI Year 1 (450,000), BTC (25,000) and the remaining LLINs for social marketing (150,000). The main target groups are pregnant women and children under five; however, additional high risk vulnerable groups have been identified. Poorest of the poor households (those in the lowest income quintile), orphans and vulnerable children (OVC) and PLWHAs will receive a free LLIN through health centers, mutuelles, and community associations. There are also plans to provide LLINs to elected community health workers (CHWs) as incentives as part of the new community health strategy establishing two CHWs (one man and one woman) in every village in Rwanda.

Source of LLINs	Quantity Distributed	Purpose/Target Group
Global Fund Round 3	1,050,000	Routine services for pregnant women and children under five
Global Fund Round 5 (2006)	1,650,000	1.35 million for mass campaign in 2006 for children under five; and 300,000 for routine services
Global Fund Round 5 (2007)	737,892	Children under five and pregnant women
Global Fund Round 5 (2007)	35,000	Orphans and vulnerable children
Global Fund Round 3	150,000	Urban populations through social marketing
Total	3,622,892	

LLINs Planned 2007-2008	Quantity	Purpose/Target
Global Fund Round 5 (2008)	971,000	Routine services, poorest of the poor, orphans and vulnerable children
BTC	25,000	<i>mutuelles</i>
Global Fund Round 3	150,000	Urban populations through social marketing
PMI Year 1	450,000	Poorest of the poor
Total	1,596,000	

Under the Global Fund Rolling Continuation Channel (RCC) proposal, approximately six million LLINs are planned for distribution to targeted vulnerable groups over a six-year period (2007-2013). In the RCC, PNILP proposed to increase its national coverage target of pregnant women and children under five from 80% to 90%; increased the target group coverage to include poorest of the poor households (estimated at 20% of total population) with at least two LLINs; and proposed an additional 370,000 LLINs for PLWHAs and OVCs. Since PNILP supports replacement of LLINs after three years, the RCC also provides for 90% LLIN replacement coverage with the procurement of 1.6 million LLINs for distribution in 2009 through a nationwide integrated measles/ITN campaign.

The PNILP supervised the quantification and planning of ITNs with two staff members tracking district needs and quantities. CAMERWA, the Central Drug Purchasing Agency for Rwanda, (French acronym), the principal procurement agent for the Global Fund LLINs, managed warehousing and stocking at the central level and contracted with Population Services International (PSI) to distribute LLINs to the districts and directly to health centers where needed. PSI provided additional support by responding to requests from the districts for restocking and supplies with PNILP approval. An integrated monitoring team conducted quarterly verification visits using health facility registers to track LLINs to selected households. They found few reports of stock outs at the health centers or signs of resale of highly subsidized public sector LLINs, but there were reports of incorrect use of nets in households. The public and private sector LLINs were distinguished by different outer packaging and colors. CHWs and health animators provided key malaria prevention messages and visited households to verify correct use. BCC campaigns were conducted at national and district levels.

According to a tracking survey, carried out in 2006, key determinants of ITN use among women surveyed included brand preference, partner support and reinforcement, and risk perception for themselves and their children. A more robust ITN tracking and behavior survey will be carried out in 2007 with results intended to inform a national behavior change communication strategy.

Proposed PMI Year 2 Activities: (\$2,550,000)

PMI will continue to support the PNILP in efforts to achieve 90% LLIN coverage of pregnant women and children under five through routine services as well as contributing to replacement needs and to coverage of targeted vulnerable groups such as the poorest of poor

households. PMI will also continue to strengthen supply chain and distribution systems through various partners and explore opportunities for building longer-term capacity in this area. Efforts to strengthen and expand IEC/BCC activities at national level and with existing CHW associations through networks of NGOs, faith-based organizations (FBOs) and community-based organizations (CBOs) will be supported to ensure that messages related to proper hanging, care and use of ITNs are appropriately emphasized. Specific activities include:

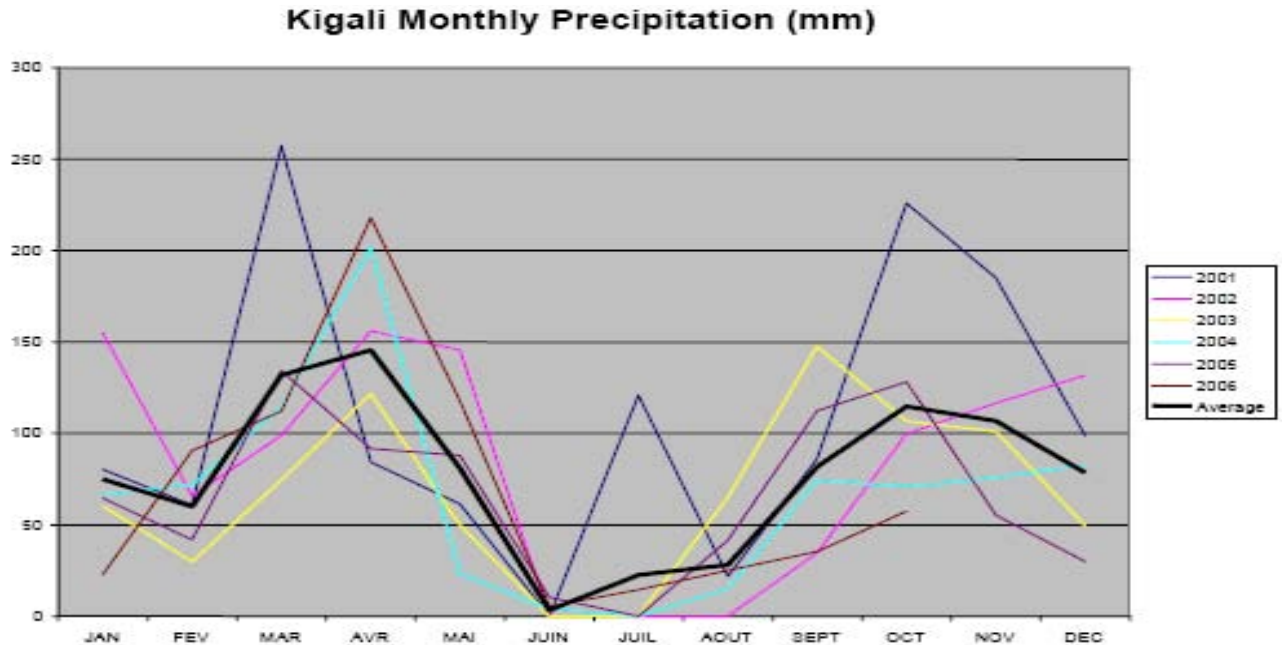
- *Procuring 300,000 LLINs:* Support the procurement of 300,000 LLINs to contribute to distribution channels targeting 90% of children under five and pregnant women as well as poorest of poor households. Approximately 180,000 of these nets will be targeted for the 2009 measles/ITN campaign as replacement nets for children under five (\$1,800,000);
- *Distribution of LLINs:* Support distribution of LLINs for routine services and campaign distribution as well as for private sector and social marketing purposes (\$300,000);
- *Community IEC/BCC for net usage:* In order to mobilize communities and extend key malaria messages, PMI will consider expanding to wider partner networks through NGOs, CBOs, and FBOs. As the number of CHWs increases nationwide, PMI will support the expanded CHW role and CHW associations through NGOs, FBOs and CBOs and ensure adequate training and routine monitoring through household visits. This will be a joint PMI-PEPFAR effort (see HIV/AIDS and Malaria section for more details) (\$300,000);
- *National IEC/BCC for net usage:* PMI will support the scale-up BCC/IEC efforts based on findings from MIS and ITN surveys and support national campaigns through various media channels. PNILP and partners have plans to conduct routine sensitization and community mobilization activities throughout the year. Two BCC campaigns for Africa Malaria Day and following the rainy season are planned for 2008 with full media coverage and key messages aimed at different target groups. Various promotional activities will be explored including mobile theater and communication vehicles and encouraging competitions in schools (\$150,000);
- *LLIN management and coordination:* PEPFAR and PMI will support the national supply chain management system in-country and provide USG support to strengthen the management and distribution capacity of CAMERWA for all commodities and coordinate with PNILP on a central procurement and distribution system (no additional cost to PMI).

Indoor Residual Spraying

Current Status:

PNILP supports the use of IRS although large-scale preventive IRS was not included in the national strategy plan due to cost considerations. IRS has, therefore, been used on a limited basis in response to malaria epidemics and unusually high “seasonal peaks” in malaria illness.

There are two main rainy seasons in Rwanda; between February and April and then again between September and November. Meteorological data provided by the Rwanda Meteorological Services (table below) illustrates the monthly precipitation for Kigali between 2001 and 2006.



PMI Progress to Date:

The PMI in Year 1 will support IRS in five districts. The three Kigali-ville districts of Gasabo, Kicukiro, and Nyarugenge (estimated total population of 935,796) are being sprayed from August through October, 2007. The IRS program target is 155,000 households in the first three districts; over 136,000 households were sprayed with ICON by 490 trained spray operators in the first seven weeks of the ten-week spray operations. In addition, the PNILP trained health personnel to manage and respond to any potential side effects to the insecticide and policemen and military personnel to assist with IRS activities. Two additional rural districts outside of Kigali, Kirehe and Nyanza (estimated combined total population of 324,072), are scheduled to be included in the second round spraying campaign in January 2008. Since IRS has not recently been part of Rwanda's malaria control strategy before PMI, and as a result, the development of in country technical capacity to oversee IRS activities was a high priority for Year 1 of PMI. In addition to financing components of the IRS campaign including environmental assessments, procurement of insecticide, spray and personnel protective equipment, recruitment and training of sprayers, and associated BCC/IEC activities, PMI provided technical support to the PNILP to increase entomological capacity for vector monitoring, parasitological evaluations, and resistance monitoring for the districts targeted for IRS and for the existing ten sentinel sites. In order to manage IRS operations at the district level, training of at least ten program managers for vector control strategies will be supported in Year 1. The PNILP Cabinet paper, 'Indoor Residual Spraying (IRS) Project for Malaria Control in Rwanda', presented to and approved by the Cabinet of Ministers in July

2007 also details the PMI Year 1 plan. PMI support to spraying influenced the GOR to establish a policy on IRS.

Building on the progress of 2007, PMI will expand IRS activities from five to seven districts in 2008. In addition to ongoing IRS capacity building at the national level, continued financial and technical support for district-level vector control training primarily to develop district capacity for oversight of IRS campaigns will be included. In anticipation of continued use of IRS in Rwanda in Year 2, PMI will support implementation of a Rwanda IRS entomology monitoring plan and establishment of an insectary in order to assess IRS duration and monitor insecticide resistance. A monitoring plan, developed by PNILP, CDC, and the IRS contractor is already in place.

The PMI strategy for Year 2 will incorporate the use of a long-lasting formulation of the insecticide currently being used, lambda-cyhalothrin, or ICON-CS (as opposed to ICON-WP used in the first round). Testing of ICON CS in Uganda in 2007 showed insecticidal effects lasting nine months or more, which is long enough for one round of spraying to provide adequate protection. The new formulation will cost the same amount as ICON WP, therefore, a cost savings will be realized by changing formulations. These savings could support an IRS scale up in 2008. To monitor the transition of ICON-WP to ICON-CS, surveillance of mosquito mortality on IRS-treated walls by means of the WHO cone bioassay will be carried out.

Proposed PMI Year 2 Activities: (\$6,470,000)

Several considerations will affect the scope of IRS activities in 2008. Beginning in July/August 2008, IRS will be done with ICON-CS rather than ICON-WP; additional monitoring, supported by the insectary activity, will be necessary to verify extended efficacy of the new formulation but it is expected to remain effective until May/June 2009. Thus, one round of IRS with the new formulation will provide protection during both of the higher transmission periods (e.g. September through November and March through June). PMI Year 1 funding will cover most, if not all, costs associated with the January/February 2008 IRS activities in the three Kigali-ville districts as well as the additional two new districts, Kirehe and Nyanza. In Year 2, IRS activities will be scheduled for January – February 2008 and July-August 2008; the decision of whether to use ICON-CS or WP will be made based on availability, cost and in anticipation that the results of ICON-CS monitoring will have confirmed the extended longevity of this formulation.

After the initial use of ICON-CS, existing IRS sites will need to be sprayed once per year until surveillance data indicate that the transmission pattern is changing (e.g. from endemic to focal/seasonal transmission) and alternative strategies (e.g. LLINs targeting 100% of the population) are put in place. It is expected that once a district has been sprayed, entomological and parasitological surveillance activities will continue. The following table presents a proposed plan for the IRS scale-up in FY 2008.

PMI Rwanda IRS Activities (ongoing and proposed for 2008-2009)

Setting	District	Round	Period	Population based on 2007 Estimates	Total Population (Number of Households*)
Endemic	Gasabo	2	January/February 2008	365,388	1,390,803 (267,462)
	Nyarugenge	2		270,169	
	Kicukiro	2		236,914	
	Nyanza	1		256,738	
	Kirehe	1		261,594	
Endemic	Gasabo	3	July/August 2008	365,388	1,390,803 (267,462)
	Nyarugenge	3		270,169	
	Kicukiro	3		236,914	
	Nyanza	2		256,738	
	Kirehe	2		261,594	
Endemic	Additional 2 districts included in expansion: To be determined	1	July/August 2008		507,000 (97,500)

* household numbers based on 5.2 persons per household

Specific activities for PMI Year 2 include:

- *IRS implementation in five districts with potential expansion:* Continuing to support IRS in five districts and expansion in two more districts, including support for baseline and post-spraying data collection (entomology and parasitology), safe pesticide storage, training of sprayers and supervisors, IRS communications, and technical support to REMA and the PNILP/MOH. The ultimate decision to expand IRS activity beyond the five districts will be based on availability of in country capacity/human resources and verification extended insecticidal duration of ICON-CS on walls (\$6,000,000);
- *Capacity building of PNILP to plan and monitor IRS:* Building capacity at the PNILP to monitor and plan IRS activities including establishment of insectary and consumable materials to ensure continued operations. Two CDC technical assistance visits will be supported in this activity (\$175,000);
- *Development of Integrated Vector Control Policy:* Providing technical support for continued refinement of the national Integrated Vector Control Policy, including collection of baseline data monitoring and implementation of IRS (includes entomology and some parasitology as described in IRS monitoring plan), and incorporation of guidelines/recommendations for continued assessment and monitoring of mosquito vectors (\$25,000);
- *Capacity building of district teams to implement and maintain IRS activities:* Support the district-level capacity building through practical training courses in all aspects of

IRS interventions as well as general program management for selected program managers based at the district level (\$150,000);

- *Capacity building of PNILP in integrated vector control:* Support for Rwanda's integrated vector control program by providing advanced training in vector control and malaria epidemiology to two PNILP senior staff members. (\$120,000).

INTERVENTIONS – CASE MANAGEMENT

Malaria diagnosis

Current Status:

National policy in Rwanda states that treatment of malaria should be based on a laboratory confirmed diagnosis for children older than five years and for all adults. The proportion of laboratory confirmed malaria cases nationwide was 45% in 2005. Treatment at the level of the community through HBM for children under the age of five is presumptive based on clinical diagnosis alone. The PNILP has sought to increase the use of laboratory confirmation using microscopy by improving the laboratory equipment available in health facilities, and by supporting the national quality assurance and quality control program through the National Reference Laboratory (NRL). The possibility of introducing the use of RDTs in health facilities without microscopy has been raised and an implementation plan is being developed. Of note, the recent Malaria Indicator Survey compared three brands of RDTs to evaluate their performance compared to microscopy. Preliminary results of this evaluation are pending.

Due to decentralization of the health system, GOR district hospitals and faith-based health facilities are now responsible for the quality of laboratory diagnostics. The rate of discordant results of malaria microscopy readings between these results and the reference readings performed by the NRL was on average 23% in the last two trimesters of 2007. Currently, malaria microscopy QA/QC system requires that the health facilities submit 15% of the thick smears to the district hospital for quality control; following this first level of control, the district hospital submits a total of 30% of the slides (15% from the health facilities and 15% from the district hospital) to the NRL for a second level of quality control. This process is conducted every three months. 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 conducted and refresher training is carried out. Recent revisions to the QA/QC system have increased the number of slides that are reviewed for accuracy. However, the challenge to carrying out the QA/QC procedures is the lack of personnel.

Integrated laboratory training for malaria, HIV, and TB through the NRL began within the past year, and integrated supervision for HIV and TB has begun with the plan to include malaria supervisory activities as well. The number of staff available at the NRL and at district hospitals that are qualified and available to conduct supervisory visits to the approximately 406 health facilities has been insufficient.

PMI Progress to Date:

The PMI Year 1 plan addressed the key elements needed to promote the availability and accuracy of malaria laboratory diagnostics by supporting laboratory technician training in malaria microscopy or RDT use, supervision from the central level to the districts, additional laboratory staffing at the central or district levels, purchase of slides, Giemsa stain, and other laboratory supplies, and the development of an RDT implementation strategy. To date, the emergency procurement of laboratory supplies, an initial integrated training covering parasitological diagnosis supported primarily through PEPFAR, and a cross-sectional, qualitative laboratory capacity assessment conducted with the NRL have been completed. This assessment evaluated the NRL, reference and district hospitals and health center facilities and found that all the “necessary components for accurate and reliable laboratory diagnosis of malaria exist in Rwanda.” However the report also highlighted the need for continued quality control, standardization of procedures and ongoing training to improve malaria diagnostic capabilities in the country. In addition, a large national health facility assessment (Services Provision Assessment) which includes information on existing laboratory staffing and capacity is currently nearing completion. Other activities have been delayed due to the timing of USG funding under the continuing resolution. However, planning for an integrated approach to laboratory activities for malaria, HIV and TB has continued and the activities funded under the Year 1 will be incorporated into this integrated approach. The major challenge to ensuring the availability of accurate malaria diagnostics continues to be the lack of human resources. Reinforcement of malaria diagnosis training at the national teaching institutions and support for laboratory technicians in areas with critical shortages was supported in the Year 1 and will continue through Year 2.

Proposed PMI Year 2 Activities: (\$400,000)

The PMI considers accurate diagnostic capacity a critical component of malaria case management and will continue to support the PNILP in efforts to increase use of laboratory confirmation using microscopy by improving laboratory infrastructure, and supporting the national quality assurance and quality control program through the NRL. PMI will work with other partners including coordinating laboratory diagnostics activities with PEPFAR, Global Fund, BTC, and other donor-funded activities, to ensure improved quality and availability of malaria diagnostics in Rwanda in Year 2 by:

- *Laboratory diagnostic commodities:* Procure laboratory equipment and supplies for malaria diagnostics, including slides, Giemsa stain, replacement microscopes, or RDTs as needed for malaria diagnostics at the National Reference Laboratory or district health facilities. A common basket for all laboratory supplies is currently supported by the NRL, CAMERWA, UNICEF, and PEPFAR; funding from PMI will support this coordinated effort for the specific malaria components (\$100,000);
- *Laboratory diagnostic quality control:* Support integrated national QA/QC system for malaria diagnostics to improve the accuracy of malaria microscopy by increasing the availability of supervisory staff at the national, regional or district levels, supporting transportation to conduct supervisory visits to the district hospitals or the health centers, coordinating laboratory technician training and supervision with HIV and TB

laboratory activities, and increasing the availability of malaria diagnostics (possibly with the use of RDTs) in areas where the laboratory capacity is currently limited (\$300,000).

Malaria Treatment and Pharmaceutical Management

Malaria Treatment

Current Status:

As of October 2006, all health facilities officially transitioned from using AQ/SP to AL as the first-line treatment for uncomplicated malaria. This decision was based on the increasing rates of treatment failure ranging from 15 - 50% when using AQ/SP. 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 or intrarectal quinine until the patient can take oral formulations. Cases of severe malaria should be treated at district hospitals or referral hospitals with intravenous quinine according to national guidelines. The parenteral formulations of artemether and quinine are recommended for pre-referral treatment of malaria cases during transfer from a peripheral health facility to the higher level of care. The PNILP conducts drug efficacy testing at select sentinel sites supported by Global Fund and BTC.

Funding from Global Fund Round 5 provided adequate quantities of AL for facility-based health care covering all age groups until September 2009, and Global Fund Round 3, phase 2 will provide quinine for 2007. The recently submitted RCC application includes funding for AL, quinine, and other supplies (e.g., IV infusion kits) needed to treat all cases of malaria at the health facilities.

PMI Progress to Date:

In Year 1, PMI supported: 1) the purchase of 71,000 doses of injectable artemether (a one year national supply), 2) the health facility based transition from AQ/SP to AL with treatment policy training, job aids, patient education materials, and 3) the PNILP supervisory capacity to ensure the successful implementation of the new treatment policy.

Malaria Treatment in the Community:

Current Status:

Rwanda's experience with HBM began in 2004. Six pilot districts were selected for initial implementation of the HBM strategy based on malaria epidemiology and availability of partner support. The initial implementation was provided by NGO partners and the PNILP. CHWs are volunteers, elected by the communities and trained by the NGO partners and PNILP. Since then, expansion of the HBM program has begun with the combined support of Global Fund, BTC, and PMI. Currently, 12 districts have functioning HBM programs: Nyamasheke, Nyanza, Ruhango, Kamonyi, Kirehe, Ngoma, Kayonza, Nyarugenge, Kicukiro, Gisagara, Gasabo, and Gatsibo. Of these, eight are in process of transitioning to using ACTs

(Nyamasheke, Nyanza, Kamonyi, Kirehe, Ngoma, Gisagara, Gasabo, and Gatsibo). In these districts, 7,719 CHWs dispensed treatments to 346,993 children between 2004 and 2006. CHWs are being trained in three-day sessions by two PMI implementing partners and given orientation programs by PNILP, which is the preferred training model for Rwanda as opposed to training of trainers.

PMI Progress to Date:

In October 2006, PNILP, in collaboration with USAID, BASICS, RPM plus, and other partners carried out an evaluation of the existing HBM strategy, sampling health center catchment areas in four of the six pilot HBM districts. Of note, the evaluation was conducted during the transition of first-line treatment from AQ/SP to AL in health facilities while CHWs were still dispensing AQ/SP. In general, the findings showed an increase in the percentage of children under five years receiving antimalarial treatment within 24 hours and a high rate of treatment cure. Key findings from review of existing data sources are below:

- Based on CHW records from sites representing three districts, an average of 80% of children seeking treatment through HBM did so within 24 hours of fever onset.
- Review of PNILP data showed that treatment cure rates for children managed by CHWs were at least 96% for each of the six pilot HBM districts.
- According to routine malaria case reports collected one year pre- and post- HBM implementation, 10 of 15 health centers included in the external evaluation demonstrated a noticeable decrease in malaria cases in children less than 5 years during peak transmission season (January – March). Three of the remaining five health centers experienced either little or no reduction in malaria cases, and two reported an increased number of cases.
- At Kirehe district hospital, the number of severe malaria cases decreased from approximately 180 to 55 cases per year and the number of hospital deaths decreased from approximately 25 to 10 from 2004 to 2005 (pre- and post-HBM implementation).

These findings coupled with data from the six pilot HBM sites showing that CHWs treated 2.5 to 3 times the number of malaria patients at health centers, offers encouragement that the goal of 85% for treatment within 24 hours is achievable if national scale up of HBM is continued.

Additional qualitative information gathered from focus group discussions and informal interviews provided insight into the HBM program components which are likely essentials to the success of the strategy:

- Election of the CHWs by the community itself and the use of the same drugs as those used in health facilities in the district promoted trust in the HBM program.
- CHWs were satisfied by their work because of the status associated with the responsibility and the ability to contribute to their community.
- Integration of the strategy in other programs of community health, and the motivation of the CHWs were found to be the pillars for sustainability of HBM.

PMI is supporting HBM introduction/expansion within ten districts, including training of CHWs, supervision, and logistics; procurement, repackaging (to ensure correct pediatric dosing and control of subsidized medication in community and private sector), and initial distribution of 700,000 AL treatments; production of materials for community awareness and training in IEC/BCC to promote appropriate recognition of malaria symptoms, knowledge of new drug, and adherence to new treatment regimen, and provision of training in case management for CHWs. The PMI also provided support to initiate a pilot performance-based financing (PBF) model to promote appropriate and timely referral of severe malaria cases to health facilities. PBF utilizes incentives for achieving national indicators to strengthen HBM and referrals by CHWs from the household to health facility level. Results from the pilot in three provinces were encouraging and the MOH views PBF as a priority to a successful HBM program. Under the leadership of PNILP, and in collaboration with BTC, UNICEF, and Global Fund, PMI-supported activities for HBM expansion have begun with procurement and delivery of AL, development and field testing of a training manual and training of trainer sessions, recruitment of new CHWs through holding community elections, and distribution of AL treatments as part of the CHW kits. The major challenge PMI implementing partners are facing is the large number of CHWs to be trained at district level in the short time that is required for HBM rollout, while respecting the training guidelines which require small sessions to preserve the quality of the training. PNILP and the partners are working together to find appropriate solutions.

The PNILP has identified 19 high transmission malaria endemic districts for the expansion of HBM and is planning for a modified strategy for the prevention and control of malaria in 11 non-endemic districts with the adaptation of IMCI. The PNILP allocated the 19 malaria endemic districts as follows: ten will be primarily supported by PMI, nine by the PNILP with Global Fund funds, and one by BTC. BTC has also offered to repackage the ACT procured by Global Fund for HBM. All PMI-supported partners will continue to provide technical support and monitoring of HBM during 2008; each will provide support for motivating CHW associations to carry out sustainable income generating activities, revolving fund activities, and cooperatives where appropriate all of which are part of the incentives for continued CHW involvement without direct compensation. This theme group will help improve consistency and coordination among partners in response to PNILP.

Specifically, PMI will provide technical support and contribute to the full package of HBM activities, drugs and training through an implementing partner in the following districts: Nyarugenge, Kicukiro, Gasabo, Ruhango, Bugesera (may exchange with Global Fund for Kamonyi or Kayonza), and Nyagatare through a PMI sub-grant to PNILP as implementing partner. PMI will support another implementing partner consortium to carry out training and implementation of HBM in the following districts: Kirehe, Gisagara, Nyamasheke and Ngoma. Global Fund funds will provide drugs, orientation and mobilization for HBM in the following districts: Rwamagana, Kamonyi, Gatsibo, Kayonza, Nyanza, Nyaruguru, Rulindo, Muhanga, and Rusizi. BTC will support the full package of HBM activities in Huye District.

In addition to roll-out of HBM for malaria, the MOH is committed to integration of community IMCI with the HBM program. A USAID-funded partner consortium working in four districts (Kirehe, Ngoma, Nyamasheke, and Gisagara) will soon begin training to incorporate treatment of diarrhea with oral rehydration therapy/zinc and treatment of acute

respiratory infection with amoxicillin into the HBM program (HBM with ACTs will be updated in these districts). In collaboration with the MCH taskforce, a strategy to expand HBM integrated with community IMCI to the remaining eleven districts (non-endemic for malaria) has been developed; considerations such as the need for accurate malaria diagnostics rather than the use of presumptive treatment will need to be addressed.

During 2007 and continuing into 2008, PMI will work with the MOH to assemble and refine a common tool for HBM monitoring and evaluation.

Malaria Treatment in the Private Sector:

Current Status:

The PNILP 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 business practices, and developing a marketing and subsidized pricing scheme that would promote appropriate treatment of malaria for children under age five. In addition to increasing accessibility to AL, this strategy serves to discourage the sale and use of non-recommended antimalarials that are either no longer efficacious (e.g., SP) or that could undermine the efficaciousness of the newly introduced treatment by promoting drug resistance (e.g., artemisinin monotherapy). The current private sector strategy will provide highly subsidized AL to a population most at risk for severe malaria and subsequent death; however, recent PNILP discussions have included extending the strategy to cover malaria treatment for adults as well. Although adults are not at as great a risk of serious complications due to 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.

PMI Progress to Date:

In 2007, PMI supported procurement and repackaging of AL for private sector outlets, training and supervision for outlet personnel in appropriate case management and referral, support to BCC/IEC to promote timely treatment seeking and proper use of AL, and to support for household surveys of care-seeking behavior. During July 2007, a mapping exercise and national assessment identified and located 228 registered private sector outlets. The distribution of these outlets is national with a higher concentration in Kigali and Butare, Rwanda's two largest cities. Interviews with managers and staff at private facilities collected information on the types of drugs currently sold, etc. Of note, none of the private outlets were marketing chloroquine, 12 were marketing artemisinin monotherapies, 94 outlets had SP monotherapy for the treatment of acute malaria, and non-subsidized, privately stocked AL was found at 44 outlets at an average cost of FRW 4,350 in contrast to the health facility subsidized cost of FRW 200. PMI has supported the procurement of 700,000 treatments of which 200,000 will be repackaged and distributed to accredited, registered outlets in 2007.

PMI-supported training of private sector outlet personnel is also underway. A training manual has been finalized and training of trainers involving one representative from each registered outlet will take place from September to December 2007. Private sector outlet providers will receive a comprehensive one-week training and a checklist for presumptive

diagnosis, treatment and referral based on IMCI guidelines. Biweekly follow-up by malaria program trained personnel will assess the quality of services including the expiration dates of medications and the occurrence of stock-outs. Mystery clients will also be employed to evaluate services. To further evaluate the consumer experience, the use of registers recording names of patients will allow for periodic follow up to assess the quality of services they received, their knowledge of why the medication was dispensed, the actual price paid, and adherence to treatment regimen.

Other activities such as BCC/IEC to promote recognition of malaria symptoms prompt treatment, the importance of adhering to treatment regimes, and awareness and demand for AL are scheduled to begin within 2007. Household surveys collecting behavioral data (including 24 hour treatment rates) to inform the campaigns and both the HBM and private sector strategies will begin December 2007.

Drug Supply and Pharmaceutical Management:

Current Status:

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 for Rwanda currently procures about 60% of all health facility drugs and supplies. In 2004, a larger proportion of its funds came from its own resources and additional support from the Global Fund. The second provider is BUFMAR, another autonomous non-governmental and non-profit organization set up by FBOs in Rwanda.

Medicines for Rwanda's primary care system are managed through a "pull" system with transportation provided to district level warehouses. The pull system extends down to the peripheral levels where health facilities pick up their stocks from the warehouse and community health workers replenish their stock of medications from the health facility. Each district pharmacy determines the quantities of medicines to be ordered based on the recommended standard treatments for the key priority conditions and the number of patients expected to be treated within a given time frame. However, the supply chain of CAMERWA from the central- to community-levels is limited in capacity and does not have the capability to prevent routine stock-outs of essential drugs. The district level pharmacy system is also weak. Lastly, malaria drugs are currently not being quantified by the Coordinated Procurement and Distribution System (CPDS) which assists the GOR in procurement planning as well as donor coordination.

PMI Progress to Date:

During Year 1 of PMI, a monitoring tool for the rational use of injectable artemether and AL was developed and staff in selected sites will be trained in the coming months on the proper use of the tool. The possibility of adding questions relating to pharmacovigilance is being considered.

Regulation and Drug Quality Control: In 2005, several Ministerial decrees specific to pharmaceutical industry, included the formation of a national committee, the Pharmacy Taskforce (PTF), to oversee pharmacy retailers with responsibilities for quality control, inspection, licensure, and ensuring a basic package of pharmaceutical products. A list of these products has been developed, and is reviewed annually. Drug importation laws have been revised recently to ensure quality control upon receipt. Visas and import licenses are issued by the PTF only after certification and other requirements are met by the exporter. Requirements include documentation of manufacture, wholesale, and export of pharmaceuticals' licenses, certification of good manufacturing and distribution practices, and accurate packing lists with batch numbers, manufacture dates, appropriate expiry dates (minimum of 2/3 the shelf life of the product), quantities of pharmaceuticals, and the country of origin. While the PTF has the regulatory authority, capacity is nascent and will require support to carry out duties including quality control of incoming and circulating drugs. Recently, Global Fund funds had been used to purchase equipment for drug quality testing which is being located at the University of Kigali. In addition to the drug quality testing at the national level (port of entry) there is a need for quality assurance activities between the district level and the health center level. No specific PMI funded activities to support regulation and drug quality control were proposed in Year 1; however, PMI does have plans to build the PTF's capacity in Year 2 to undertake some of these activities.

Drug efficacy: *In vivo* drug efficacy monitoring has been ongoing in three sites under the East African Network for Monitoring Anti-Malarial Treatment in selected sites in Rwanda 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. Regular monitoring of AL efficacy is planned. All support for drug efficacy monitoring has been provided by Global Fund and BTC.

Pharmacovigilance: Safety data on ACTs is limited, especially in Africa. National pharmacovigilance systems are needed to monitor adverse drug reactions. Currently Rwanda does not have a national pharmacovigilance system. In FY07 PMI provided support for the start-up of a pharmacovigilance system; however, little progress has been made beyond initial discussions due to the late arrival of funds.

Proposed PMI Year 2 Activities: (\$3,555,000)

In Year 2, PMI will continue support for prompt and effective case management of malaria at health facilities, through HBM and in the private sector. At the health facility level, PMI will fill gaps in the PNILP strategy, including procurement of drugs and support of the PNILP's supervisory role and capacity to monitor and reinforce the correct use of AL at the health facilities. PMI will also continue to support HBM activities in 10 districts as well as a HBM workshop in February – March 2008 to share lessons learned. In addition, PMI, in collaboration with PEPFAR, will work with the MOH to identify a platform for the Rwandan pharmacovigilance system and will support a sensitization workshop including all health programs and main partners to draft a national pharmacovigilance strategic plan and to develop an adverse events reporting form. In addition PMI in collaboration with PEPFAR will support the MOH to organize a training of trainers, followed by a cascade of trainings to

Table 2

**President's Malaria Initiative - Rwanda
Planned Obligations for FY08 (\$000)**

Proposed Activity	Mechanism	Budget (<i>commodities</i>)	Geographic Area	Description of Activity
PREVENTIVE ACTIVITIES				
ITNs				
Procure and distribute 300,000 LLINs	DELIVER (1,800) TBD (300)	2,100 (2,100)	National	Procure 300,000 LLINs and distribute through routine channels and poorest of poor
Community IEC/BCC for net use ¹	New procurement	300	National	Joint PMI-PEPFAR RFA to identify appropriate new partner or umbrella organization to work at household level to ensure consistent net use and expand coverage
National IEC/BCC for net usage	TBD	150	National	National IEC/ BCC campaign to increase consistent net usage
IRS				
IRS implementation in seven districts	IRS IQC	6,000 (2,000)	5-7 districts	Procurement of insecticides and other IRS supplies/equipment; training and other operational costs for IRS activities; IEC/BCC, etc.
Capacity building of PNILP to monitor and plan IRS	IRS IQC (150) CDC (12.5)	175 (25)	n/a	Initial start up costs for insectary, staff, consumables. Two CDC technical assistance visits will be included.
Entomological M&E	IRS IQC	25	IRS districts	Data collection and monitoring of IRS program in 8 districts
Capacity building of district teams to implement and maintain IRS activities	Tulane	150	IRS districts	IRS operational training of district program managers in 5-7 districts

¹Community 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 IPTp 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 (<i>commodities</i>)	Geographic Area	Description of Activity
Capacity building for PNILP in integrated vector control	Tulane	120	n/a	Two candidates trained in integrated vector control and epidemiology with expectation of being based at PNILP
IPTp				
Procurement of SP and folic acid for IPTp	DELIVER	80 (80)	National	Procurement of 1million doses of SP for pregnant women; strengthen supply chain
Strengthening of FANC and IPTp uptake at national level	JHPIEGO/ ACCESS	450	National	Strengthen national-level tools and resources, supervisory checklist; support supervision and follow up by PNILP, and coordination with MCH national programs. Training for 18 districts with other partners.
Strengthen District Level FANC services	Twubakane and an existing clinical partner	350	National	Coordination, planning and technical support for integrated FANC training, advocacy and quality improvement of FANC (Twubakane: 150 / TBD: 200)
MIP Advisor at PNILP	WHO/AFRO	60	n/a	Ongoing support for MIP Advisor sitting at PNILP
Community IEC/BCC to increase IPTp demand	New procurement	250	National	Joint PMI-PEPFAR RFA to identify appropriate new partner or umbrella organization to work at household level to promote increased demand for IPTp
SUBTOTAL: Preventive		10,210 (4,205)		
CASE MANAGEMENT ACTIVITIES				
Diagnosis				
Laboratory Diagnostic commodities	DELIVER	100 (100)	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.
Laboratory Diagnostic Quality Control	PIL to NRL	300	National	Training, supervision, transportation and supporting malaria diagnostic capacity
Pharmaceutical Management and Treatment				

Proposed Activity	Mechanism	Budget (<i>commodities</i>)	Geographic Area	Description of Activity
Procurement of Injectable Artemether and severe malaria commodities	DELIVER	195 (195)	National	Procure 125,000 doses of injectable artemether for use in the initial treatment of malaria cases that cannot tolerate oral regimens or for the pre-referral treatment of cases of severe malaria. Procurement of severe malaria drugs.
Procurement of ACTs for HBM and Private Sector	DELIVER	800 (800)	10 HBM districts, private sector outlets	Procurement of AL for HBM and private sector
Strengthen commodity supply chain	DELIVER	200	National and district levels	Continue support to strengthen supply chain using previously developed tools and software, including collaboration with CAMERWA and districts to track drugs at district pharmacies and health centers.
Repackaging of ACTs	TBD	75 (75)	10 HBM districts, private sector outlets	Printing and re-packaging ACTs for HBM and private sector
HBM Implementation	Twubakane (1,200), EIP partners (200) CDC (12.5) USAID (10)	1,422.5	10 HBM districts	Support CHW associations and conduct HBM training in nine districts, as well as integration with community IMCI in EIP districts. One CDC and one USAID TDY will be included in this activity.
PNILP Supervision for HBM and other activities	Twubakane with sub-grant to PNILP	250	National	Support PNILP's supervisory capacity to monitor and reinforce the correct use of AL at the health facilities and through HBM.
Performance-based financing for HBM	MSH Bilateral PBF Project	100	National	Support PBF approaches to strengthen HBM and referrals
Private Sector provision of ACTs	TBD	400	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.
Pharmacovigilance	SPS (100) CDC (12.5)	112.5	National	Workshop to develop strategic plan; identification of platform for national pharmacovigilance system. One CDC TDY will be included.
SUBTOTAL: Case Mgmt.		3,955 (1,170)		

Proposed Activity	Mechanism	Budget (<i>commodities</i>)	Geographic Area	Description of Activity
EPIDEMIC SURVEILLANCE & RESPONSE ACTIVITIES				
Support to PNILP strategic plan and implementation for ESR	RTI IRS IQC	142.5 (50)	TBD	Support to PNILP in epidemic preparedness and response based on recommendations of needs assessment
Entomological surveillance at sentinel sites	RTI IRS IQC	100	TBD	Develop and implement entomological surveillance strategy in up to nineteen sentinel sites
SUBTOTAL: ESR		242.5 (50)		
MONITORING & EVALUATION ACTIVITIES				
Capacity building in M&E for malaria programs, HMIS and data management	TBD	285	National	MOH systems strengthening in M&E, HMIS strengthening, improving service quality
Technical support to PNILP on evaluation of HBM and private sector	BASICS (50) TBD (85)	135	National	Evaluation of HBM and the private sector approaches after transition to ACTs
Support to Sentinel Sites	Tulane (100) CDC (12.5)	112.5	19 sites	Strengthen data collection at sentinel sites in malaria case surveillance and entomological monitoring. One CDC TDY will be included in this activity
Collection of cause-specific mortality data	Measure DHS (380) Global Health M&E Task Order (100)	480	National	Verbal autopsy component of the mini-DHS
Community-based information system	Twubakane	40	HBM districts	Community-based systems with community health agents to monitor ITN/ACT use, tracking comm. level indicators and treatment adherence
Support Information Technology Network	Tulane	50	Ten sentinel sites	Continue technical support to 10 sentinel sites with an information technology network including GPS/GIS/PDAs for real time evaluation of LLINS and IRS coverage.

Proposed Activity	Mechanism	Budget (<i>commodities</i>)	Geographic Area	Description of Activity
Support of 2009 MIS	Tulane	50	National	Initial contribution for preparation of 2009 MERG Malaria Indicator Survey
Support for one staff accountant at PNILP	TBD	100	National	Support an Accountant, 2 years, at PNILP to track PMI resources; capacity- building for streamlining financial systems
M&E and reporting unit in Mission	USAID	100	n/a	Supervise overall program inputs and facilitate performance measurement and reporting responsibilities in achieving objectives among PMI implementing partners.
SUBTOTAL: M&E		1,352.5		
STAFFING & ADMINISTRATION				
USAID and CDC staff and associated administrative expenses	USAID/CDC	900	n/a	Full package of support for USAID & CDC Malaria Advisors, plus associated ICASS charges for these two staff persons.
FSN staff and other in-country administrative expenses	USAID	340	n/a	Malaria Program Specialist for PMI, PMI retreat costs, partial salaries for USAID support staff such as program assistants
SUBTOTAL: Mgmt. and Admin.		1,240		
GRAND TOTAL		17,000 (5,425)	<i>Commodities represent 32% of total budget</i>	

Table 3

**Rwanda – Year 2 Targets
Assumptions and Estimated Year 2 Coverage Levels**

Year 2 PMI Expected Results:

Prevention:

1. At least 600,000 LLINs (of which PMI will contribute 300,000) will have been distributed by partners to families with children under five and/or pregnant women to support achievement of nationwide household ownership of ITNs of more than 65%.
2. At least 85% of houses (approximately 310,000 households) in geographic areas targeted for IRS during Year 2 will have been sprayed.
3. At least 1,000,000 SP treatments will have been procured to cover 100% of pregnant women with two or more doses of IPTp.
4. At least 530 healthcare providers will have been trained according to the national policy to deliver at least two doses of IPTp during ANC visits.

Case Management:

1. At least 125,000 treatments of injectable artemether will have been procured and distributed to the public health facilities to cover the annual projected cases of severe malaria requiring referral to a higher level of care.
2. At least 900,000 ACT treatments will have been procured, repackaged and distributed for use at the community-level through home-based management of fever in 10 districts.
3. Roll out of malaria treatment with ACTs in the private sector through at least 100 accredited pharmacies and drug outlets with specially packaged ACT treatment for children under five.

Assumptions:

Population of country (estimated): 9,100,000

Pregnant women: 4.3% of total population = 391,300 pregnant women

Infants (children <1): 3% of population = 273,000 infants

Children <5: 17% of population = 1,547,000 children under five

Average number of malaria-like illnesses per year and cost per treatment (costs given are for artemether-lumefantrine):

Children <5:	2 illnesses/year at \$0.52 and \$1.04 each
Older children	1.5 illnesses/year at \$1.56 each
Adults	0.5 illness/year at \$2.08 each (assume that the PMI will cover only one-third of adult episodes)

Cost of a LLIN = \$6.12; average of 2.5 nets/household needed to cover all pregnant women and children under five in family (distribution, and fees associated with handling, customs clearance, and other, are not included)

Cost of spraying a house with an average of 5-6 inhabitants = \$15.00

Inter-vention	Needs for 100% Nationwide Coverage over 3 Years*	Needs for 85% Nationwide Coverage over 3 Years*	Annual Needs to Achieve 100% Coverage	Needs to Achieve Year 2 PMI Targets	Year 2 Contributions
IPTp	391,300 pregnant women x 2 treatments/woman = 782,600 treatments/year x 3 years = 2,347,800 treatments	1,995,630 treatments	782,600 treatments	Target: 75% of pregnant women (293,475) receive 2 doses of IPT = 586,950	PMI contribution: \$80,000 will purchase 1 million SP treatments 100% of Year 2 PMI targets will be met
LLINs	1.82 million households x 2.5 nets/household = 4.55 million nets	4.1 million LLINs needed for >90% coverage	One-third of 4.55 = 1.5 million LLINs One-third of 90% of 4.55 = 1.36 million LLINs	Target: 65% of households own at least 1 net = 884,000 LLINs	PMI Year 1 contributed 450,000 with an additional 300,000 LLINs planned for Year 2. In addition Global Fund RCC will distribute 6 million LLINs from 2007-2013. 100% of Year 2 PMI targets will be met with PMI and other partner contributions
ACTs – children < 5 ACTs – older children	1,547,000 children under 5 x 2 episodes/year = 3,094,000 treatments/year x 3 years = 9,282,000 3,640,000 older children x 1.5 episodes/year = 5,460,000 treatments/year x 3 years = 16,380,000	9,282,000 treatments/year for 3 years x 85% = 7,889,700 treatments 16,380,000 treatments/year for 3 years x 85% = 13,923,000	3,094,000 treatments 5,460,000 treatments	Target: 40% of children under 5 receive ACTs = 1,237,600 treatments	PMI will procure 900,000 ACT treatments for HBM in 10 districts and for selected private sector pharmacies. Global Fund is contributing an estimated 3 million ACTs for all age groups. PMI's contribution will meet 100% of the Year 2 target needs for HBM.

ACTs - adults	3,913,000 adults x 0.5 episodes/year = 1,956,500 treatments/year x 3 years = 5,869,500	treatments 5,869,500 treatments/year for 3 years x 85% = 4,989,075 treatments	1,956,500 treatments 10,510,500		
TOTAL	31,531,500 treatments	26,801,775			
IRS			365,000 households	Target: 85% of <i>targeted houses to be sprayed:</i> 310,250 households to be sprayed =	PMI will support IRS in all 7 districts or 365,000 households in Year 2. Thus 100% of IRS needs will be covered in Year 2.

Table 5**Year 2 (FY08) Budget Breakdown by Partner (\$000)**

Partner Organization	Geographic Area	Activity	Budget
DELIVER	National	Procurement of LLINs	\$1,800
		Procurement of SP	\$80
		Procurement of laboratory diagnostic commodities	\$100
		Procurement of injectable artemether and severe malaria commodities	\$195
		Strengthening commodity/supply chain management	\$200
	10 districts for HBM, private sector retail outlets	Procurement of ACTs for HBM and Private Sector	\$800
RTI IRS IQC	5-7 districts	IRS commodities and operational costs	\$6,000
	National	Capacity building of PNILP to monitor and plan IRS	\$150
	IRS districts	Entomological M&E	\$25
	9 sentinel sites	Support to Sentinel Sites	\$100
	National	Support of ESR plan/strategy	\$142.5
Tulane	IRS districts	Capacity building of district teams to implement and maintain IRS activities	\$150
	National	PNILP capacity building in	\$120

Partner Organization	Geographic Area	Activity	Budget
		entomology	
	9 sentinel sites	Support to Sentinel Sites	\$100
	10 sentinel sites	Support Information Technology Network	\$50
	National	Support of 2009 MIS	\$50
Twubakane	12 districts	Strengthen District Level FANC services	\$150
	6 districts	HBM Implementation	\$1,200
	National	PNILP Supervision for HBM and other activities	\$250
	12 districts	Community-based information system	\$40
JHPIEGO/ACCESS	National	Strengthening of FANC and IPTp uptake at national level	\$450
WHO/AFRO	National	Support of MIP advisor at PNILP	\$60
CSHGP EIP	4 districts	HBM implementation	\$200
MSH	10 districts	PBF for HBM	\$100
SPS	National	Pharmacovigilance	\$100
BASICS	National	Technical support to PNILP and evaluation	\$50
TBD	National	Private Sector ACT evaluation	\$85
Measure DHS	National	Collection of mortality data	\$380
Global Health M&E Task Order	National	Technical assistance on collection of mortality data	\$100
TBD	National	Joint PMI-PEPFAR RFA to identify appropriate new partner or umbrella organization to work at household level	\$550

Partner Organization	Geographic Area	Activity	Budget
PIL with NRL	National	Laboratory Diagnostic Quality Control	\$300
PIL with PNILP	National	MOH capacity building in M&E and data management	\$285
TBD	Districts TBD	Strengthen district-level FANC	\$200
TBD	National	Distribution of LLINs	\$300
TBD	National	National IEC/BCC for net usage	\$150
TBD	National	Repackaging of ACTs	\$75
TBD	National	Private Sector provision of ACTs	\$400