

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

PRESIDENT'S MALARIA INITIATIVE

Malaria Operational Plan – FY09

MADAGASCAR

November 14, 2008

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A. EXECUTIVE SUMMARY

In December 2006, President George W. Bush announced that Madagascar had been selected as one of the final eight countries in a five-year, \$1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions in high-burden countries in sub-Saharan Africa.

Malaria is a major health problem in Madagascar. It is reported to account for about 16% of all outpatient visits and 20% of hospital admissions for children less than five years of age. The epidemiology of malaria varies considerably in different regions of the country. On the East and West Coasts, transmission is stable and perennial, while in the Central Highlands it is seasonal and moderately unstable with occasional epidemics. In the most recent large-scale epidemic in the late 1980s, an estimated 30,000 people died. In the semi-desert region of the South, malaria transmission is seasonal, very unstable and in many years almost completely absent.

No up-to-date information is available on nationwide coverage of key malaria prevention and control measures in Madagascar. The last Demographic Health Survey (DHS) was conducted in 2003-2004, well before the recent, rapid scale up of distribution of insecticide treated nets (ITNs) and the introduction of artemisinin-based combination therapy (ACTs) as a first-line treatment for uncomplicated malaria.

The *Service de Lutte Contre le Paludisme* (National Malaria Control Program; NMCP) Round 7 Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) malaria grant request for \$69 million was approved and was signed in August 2008. This comes as Madagascar nears the end of funding from the \$10 million Round 3 and the \$41 million Round 4 Global Fund malaria grants. Madagascar also received more than \$5 million from UNITAID, which is being used to fill gaps in ACTs for 2007 through 2009. The United Nations Children's Fund (UNICEF) has played a major role in the prevention and treatment of malaria during pregnancy, the distribution of ITNs, and the implementation of integrated interventions to diagnose and treat cases of malaria, pneumonia and diarrheal diseases in children under five at the community level. The World Health Organization (WHO) is a major source of technical assistance to the NMCP. PMI will continue to explore opportunities for partnerships in malaria control efforts with large private companies, such as QIT Madagascar Minerals and, potentially, Exxon Mobil.

The following table shows the proposed Year 1 targets and early implementation activities supported by PMI and implementing partners in the initial year.

Proposed Year 1 Targets (PMI and Partners)	Expected Results after 1 Year of Implementation (March 2009)
1 million long-lasting ITNs (LLINs) procured and distributed, of which PMI will provide 710,000.	710,000 LLINs procured by PMI will arrive in Madagascar in late 2008 and early 2009. 460,000 of those will be delivered free through routine service at health facilities and 250,000 will be distributed at community level through social marketing.
1.4 million houses with an estimated population of 7 million will be protected by IRS in the Central Highlands and adjacent regions of the West Coast; PMI will support spraying of 220,000 of those houses with a population of 1.25 million.	The PMI 2008 spraying, planned for Oct – Dec 2008, will reach at least 85% of 220,000 targeted houses with an estimated population of 1.25 million. If Global Fund funds are available in time, the overall spray campaign will reach approximately 1.4 million houses.
ACTs and RDTs will be available and used appropriately in health facilities nationwide, with PMI support for distribution and correct use.	All projected needs for ACTs and RDTs will be met by partners; by the end of Year 1 these will be available in all health facilities nationwide. PMI is providing technical assistance to ensure appropriate use of ACTs and RDTs at all levels.
IPTp will be strengthened in the 92 malaria endemic districts as part of focused antenatal care and targeted retraining of midwives and nurses.	The total projected need for SP will be met by partner organizations. PMI will provide support for health worker training, supervision and quality assurance in the 92 malaria endemic districts where IPTp is being implemented.
PMI will contribute to a nationwide DHS survey, including a malaria module and verbal autopsies.	USAID and PMI will provide support for a DHS with a sample size of than 19,000 households. The DHS will be conducted in late 2008 and early 2009 and results are expected in late 2009.

The Year 2 PMI Operational Plan for Madagascar is based on a planning visit carried out in May 2008 by representatives from the U.S. Agency for International Development (USAID), the Centers for Disease Control and Prevention (CDC), and the Madagascar NMCP. This planning team obtained input from Government of Madagascar (GoM) ministries and officials, WHO, UNICEF, and various NGOs. The PMI plan supports the NMCP national strategy and is coordinated with international and national partners to complement the overall funding and resources.

To achieve the goal and targets of the NMCP and PMI in Madagascar, the following major activities will be supported during Year 2:

Insecticide-treated nets (ITNs): PMI is supporting the existing MoH strategy of providing long-lasting insecticide-treated nets (LLINs) free of charge to pregnant women and children under five through antenatal care (ANC) and immunization clinics. Given that 30% of the Malagasy population lives more than 10 kilometers from a health facility, marketing highly-subsidized LLINs at the community level has provided a successful alternative network for routine

distribution. Between 2003 and 2007, over 2.7 million LLINs were distributed through community-based, social marketing approaches.

Working closely with the partners in Alliance for Malaria Prevention (formerly the Measles/Malaria Partnership), the NMCP coordinated and PMI provided logistic support for the distribution of approximately 1.8 million free LLINs on the West Coast during the October 2007 integrated measles/malaria campaign coupled with the biannual Mother and Child Health Week.

In Year 2 PMI will procure approximately 890,000 LLINs. Of these, 490,000 LLINs will be distributed free-of-charge in a large-scale campaign on the East Coast, in conjunction with the October 2009 Mother and Child Health Week. Other partners are expected to contribute an additional 725,000 LLINs needed to provide nets to all families with children under five years of age in the targeted area. PMI will also support procurement and distribution of 250,000 LLINs through community-based social marketing and 150,000 LLINs to be distributed free at health facilities during routine ANC and immunization clinics. The combination of LLIN distribution approaches is expected to increase the proportion of houses with one or more ITN to 80% in areas with stable transmission and contribute to greater than 60% use among pregnant women and children under five.

Indoor residual spraying (IRS): PMI will continue to provide support for the MOH IRS program that began in the Central Highlands in 1993. As part of the “jump start” activities, PMI supported spray activities in January 2008 that reached 93.8% of 218,979 targeted houses and a population of 1.24 million. In Oct-Dec 2008, PMI and the Global Fund will support an extension of the IRS activities that will include the Central Highlands and adjacent areas on the West Coast. The target for this expanded campaign is a total of 1.4 million houses and a population of about 7 million. Of this PMI Year 1 funds will cover an estimated 220,000 houses with a population of 1.25 million. With Year 2 funds, PMI will provide the same level of support for a second joint campaign, planned for Oct-Dec 2009, which will also target 1.4 million houses.

Intermittent preventive treatment of pregnant women (IPTp): Although it is estimated that 80% of women make one or more antenatal clinic visits, many of these occur late in pregnancy. In June 2004, the MoH adopted IPTp in 92 coastal and lowland districts where malaria transmission is stable or seasonal. Starting in Year 1, PMI supported activities to identify barriers to IPTp coverage, organize and provide training for supervisors on service delivery guidelines and clinical performance standards, and ensure post-training follow-up for supervisors. Sufficient quantities of SP are being procured by other donors to meet all needs for 2008-2009. Building on Year 1 activities, PMI will continue to support increased IPTp coverage through interventions that strengthen the MOH pharmaceutical management and provision of IPTp in focused antenatal care. PMI will also work to include IPTp targets as a part of the “Champion Commune” approach that involves social mobilization and community empowerment and will extend information, education, and communication/behavior change communication (IEC/BCC) messages through community health workers, highlighting the risks of malaria in pregnancy, the importance of early and frequent ANC visits, and the need to take two doses of SP for IPTp. We expect that activities supported by PMI and our partners will increase the proportion of pregnant women receiving two doses of SP to about 40% in the targeted malaria endemic areas.

Case management: Only a small fraction of all malaria diagnoses in Madagascar are based on laboratory examination and the quality of those diagnoses is unknown. With increasing malaria prevention efforts and a lower prevalence of malaria, accurate and timely laboratory diagnosis will increase in importance. Presumptively treating all cases of fever as malaria not only wastes scarce financial resources due to the relatively high cost of ACTs, but it can delay the administration of appropriate treatment for the true cause of illness. For these reasons, the NMCP has established a policy that requires all cases of malaria be laboratory confirmed, if possible. During Year 1 PMI supported assessment of laboratory diagnostic capabilities in Madagascar, developed a detailed plan of action, and will procure approximately 270,000 rapid diagnostic tests (RDTs). Planned Global Fund procurement of RDTs will be sufficient to cover all needs in 2009. In Year 2, PMI's efforts will be directed towards expanding the availability and improving the quality of malaria laboratory diagnostic services through procurement of laboratory equipment and supplies, training, quality control, and supervision of malaria microscopists and health workers using RDTs in public health facilities. PMI will also work to build NMCP capacity in the additional critical areas of pharmaceutical management and quality control for drugs.

Global Fund grants and UNITAID donations are expected to fill all ACT procurement needs in Madagascar in 2009 for both health facilities and community-level distribution. PMI will support the rollout of ACTs to health facilities and community-based distribution networks through training for health workers at all levels. PMI will also continue its support to the rollout of an integrated, community-based child health intervention that includes treatment for malaria, pneumonia and diarrheal diseases by community health workers (CHWs). PMI will also support IEC/BCC interventions to improve management of childhood illnesses and provide technical assistance to strengthen the MoH's pharmaceutical management system and drug quality testing.

Community and NGO mobilization: PMI will build on and expand the USAID Mission's investments in community mobilization, empowering local leaders, civil society, and NGOs to improve maternal and child health at the household and community level. USAID/Madagascar employs an innovative approach called "Champion Commune" or *Kominina Mendrika*, a participatory process that engages all of the commune stakeholders, to set and achieve short-term health objectives that include malaria prevention and control targets. The approach has demonstrated excellent results, including improvements in immunization rates, pre-natal consultations, infant and child nutrition, family planning, and reductions in diarrhea and malaria.

In Year 2, PMI will continue to support these community-based activities and support the NMCP's goal of expanding implementation of these approaches to more than half of the total of 1,560 communes nationwide.

Monitoring and evaluation: The NMCP, with the support of PMI, Global Fund, and other partners, has developed a national malaria M&E strategy and plan. In Year 1, PMI contributed to the 2008-2009 nationwide DHS, including a verbal autopsy component. Year 1 funds also contributed to the expansion of sentinel site surveillance and supported improved supervision for M&E activities at the district level. In Year 1, PMI supported the M&E System Strengthening Tool workshop in collaboration with The Global Fund. In order to strengthen the ability of the

NMCP to collect and analyze high quality data, in Year 2, PMI will continue to support implementation of recommendations from the system strengthening workshop, and, finally, continue the support for surveillance of malaria morbidity and mortality through sentinel sites.

Building NMCP capacity: NMCP is relatively well-staffed but there are specific and critical needs for capacity building within the NMCP and other MoH units that provide vital support in the areas of pharmaceutical management, quality control for drugs, and diagnostic examinations. PMI will continue its support to enhance NMCP supervision, monitoring, and evaluation capacities through training, coaching, and support for information gathering. PMI will also continue its support for the NMCP to improve capacity to test for insecticide resistance and for other MoH departments to improve supply chain management to ensure a steady supply of ACTs, RDTs and LLINs at the facility and community levels.

The proposed FY 2009 PMI budget for Madagascar is \$16.7 million. Of this, 43% will support procurement and distribution of LLINs, 25% IRS and entomological activities, 11% improvement of malaria diagnosis and appropriate use of ACTs, 9% will support community-based interventions, 3% monitoring and evaluation, and 2% will support malaria in pregnancy, including IPTp. More than 52% of the total will be spent on commodities.

ACRONYMS AND ABBREVIATIONS

AS/AQ	Artesunate-amodiaquine
ACT	Artemisinin-based combination therapy
ANC	Antenatal Care
CDC	Centers for Disease Control and Prevention
CHW	Community health worker
CSB	<i>Centre de Santé de Base</i> (Most basic health clinic)
DAMM	<i>Direction de l'Agence du Médicament de Madagascar</i> (Drug Regulatory Authority)
DHS	Demographic and Health Survey
FBO	Faith-Based Organization
Global Fund	The Global Fund to Fight AIDS, Tuberculosis and Malaria
GoM	Government of Madagascar
HBMF	Home-Based Management of Fever
IEC/BCC	Information, Education, Communication/Behavior Change Communication
IPM	<i>Institut Pasteur Madagascar</i> (Pasteur Institute)
IPTp	Intermittent preventive treatment of pregnant women
IRS	Indoor residual spraying
ITN	Insecticide-treated net
LLIN	Long-lasting insecticide-treated net
M&E	Monitoring and Evaluation
MCH	Maternal and Child Health
MoH	Ministry of Health, Family Planning and Social Welfare
NGO	Non-Governmental Organization
NMCP	National Malaria Control Program (Service de Lutte Contre le Paludisme (SLP))
PAIS	<i>Programme d'Action pour l'Intégration des Intrants de Santé</i> (Health Product Integration Project)
PMI	President's Malaria Initiative
PSI	Population Services International
PSSE	<i>Postes Sentinelles de Surveillance Epidémiologique</i> (Epidemiologic Sentinel Surveillance Sites)
RBM	Roll Back Malaria
RDT	Rapid diagnostic test
RTI	Research Triangle International
SALAMA	Madagascar central medical stores
SP	Sulfadoxine-pyrimethamine
SSD	<i>Service de Santé de District</i> (District Health Office)
TRaC	Tracking results continuously survey (PSI)
UGP	<i>Unité de gestion du projet</i> (Global Fund Rd 7 Principal Recipient for public sector activity)
UNICEF	United Nations Children's Fund
UNITAID	French-based donor organization
USG	United States Government
WHO	World Health Organization

B. 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), insecticide-treated bed nets (ITNs), intermittent preventive treatment of pregnant women (IPTp), and indoor residual spraying (IRS).

The President’s Malaria Initiative (PMI) began in three countries in 2006: Angola, Tanzania, and Uganda. In 2007, four countries were added: Malawi, Mozambique, Senegal, and Rwanda. In 2008, eight additional countries were added to reach a total of 15 countries covered under the PMI. Madagascar is one of the eight countries selected for 2008. Funding for PMI began with \$30 million in Fiscal Year (FY) 06 for the initial three countries, and increased to \$160 million in FY 07, \$300 million in FY 08, and will reach \$500 million in FY 10.

In implementing this Initiative, the USG 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 World Health Organization (WHO), United Nations Children’s Fund (UNICEF), Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund), Roll Back Malaria (RBM), the World Bank Malaria Booster Program, 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, are highly consultative and held in collaboration with the national malaria control program and other partners.

This document presents a detailed implementation plan for Year 2 of PMI in Madagascar. It briefly reviews the current status of malaria control, prevention policies and interventions, identifies challenges and unmet needs, and provides a description of planned year two activities under PMI. The document was developed in close consultation with the National Malaria Control Program (NMCP) and with participation of many national and international partners involved in malaria prevention and control in the country. The total amount of PMI funding requested for Madagascar in FY 2009 is \$16.7 million.

C. MALARIA SITUATION

Madagascar has a population of approximately 18 million, 17% of whom are children under five years of age. One of the poorest countries in the world, the average per capita income is only \$255 (World Bank 2005); 46% of the population is illiterate; 70% of the population lives below the poverty line and 49% of children under age five are malnourished (DHS 2003/2004). The most common causes of death among children under five are malaria, diarrheal diseases, and respiratory infections, often associated with malnutrition. Life expectancy hovers at 55 years. This dire social situation springs from several factors: a weak health system, poor economic growth, and a high population growth rate of 2.8%.

The last decade has witnessed marked health improvements in Madagascar, especially among children. According to the 2003/2004 Demographic and Health Survey (DHS), infant and child mortality fell by 43% and 41%, respectively, between 1997 and 2004. Due to lack of confidence in the census data that was used as the basis for DHS sample selection, several partners have raised questions about potential bias and the reliability of the child mortality figure. Nevertheless, other determinants of child survival—such as morbidity and coverage of important health interventions—have improved significantly. For instance, the prevalence of diarrhea in children decreased about 63% and the proportion of anemic children fell about 31% between 1997 and 2004.

Despite these recent improvements in child health indicators, Madagascar still faces major health challenges, which threaten social and economic development. Health service quality is substantially below standard and basic medicines and supplies are regularly in short supply. Public and non-governmental sector capacity to plan effectively and manage health programs is weak, particularly in the areas of financial and administrative management, and the use of data for program planning and monitoring. National health infrastructure, information and commodity management and logistics systems are extremely weak, and much remains to be done at central and regional levels to ensure sustainable health financing.



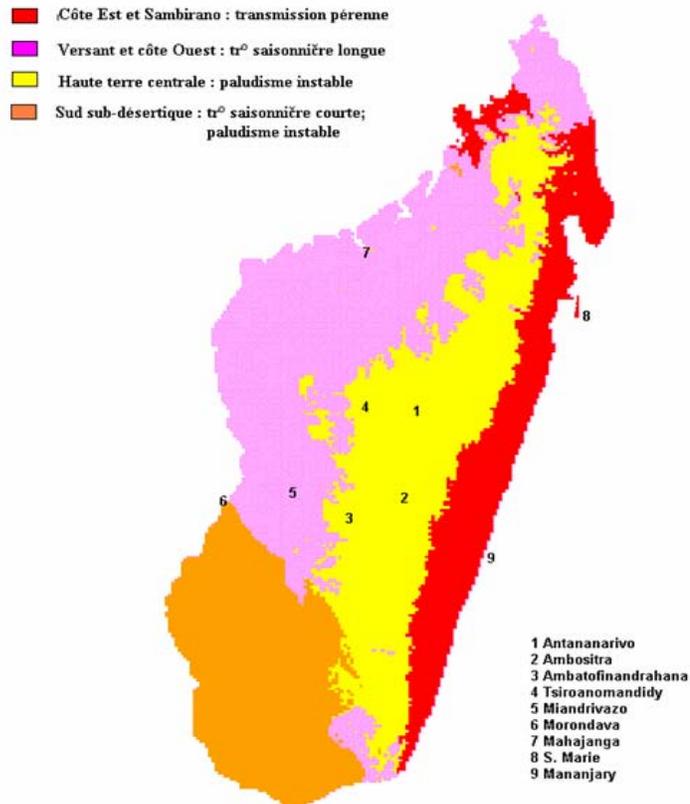
Administratively, the country is divided in 6 provinces (which are being phased out), 22 new regions (created in 2005), and 111 districts.

Malaria transmission and epidemiology

Malaria is endemic in 90% of Madagascar, however, the entire population is considered to be at risk to the disease. Malaria is responsible for about 16% of all outpatient visits while 20% of all children under five years of age admitted to a hospital are diagnosed with severe malaria. It is ranked as a leading cause of under-five mortality and, according to UNICEF, kills approximately 20,000 Malagasy children every year.

The country has been stratified into four distinct malaria epidemiologic zones: the West Coast including the North, the Central Highlands, the East Coast, and the South. For these areas the rainy season usually starts in late October/early November and lasts until April. Cyclone season runs from December to April and the island typically suffers from direct hits or near misses, both accompanied by flooding and increased risk of malaria and communicable diseases.

On the East and West Coasts malaria transmission is stable and perennial (although in the West transmission does decrease somewhat in July and August). In both regions, immunity among adults is reported to be high, therefore morbidity and mortality is mainly among children under five and pregnant women. The Central Highlands has seasonal and moderately unstable transmission. In the semi-desert of the



Malariometric stratification of Madagascar: red, lowland perennial transmission+; pink, lowland long transmission season; yellow, highland unstable seasonal transmission (epidemic prone); orange, semi-desert unstable seasonal transmission (epidemic prone).

South, transmission is also seasonal but very unstable and in many years is almost absent. Immunity is limited in both the Central Highlands and the South and the population in those areas is vulnerable to periodic epidemics, which are often associated with high levels of mortality in all age groups. The most recent large-scale epidemic in the late 1980s killed an estimated 30,000 people. Almost one-third of the Central Highlands lies above 1,500 meters where malaria transmission tends not to occur.

All four species of human plasmodia are endemic in Madagascar. While *Plasmodium falciparum* predominates in all areas, *P. vivax* and two other species may make up as much as 10-15% of all cases, especially in the highlands. The two primary vectors are *Anopheles gambiae* (East and

West Coasts) and *A. funestus* (Central Highlands and South). *Anopheles arabiensis* is also present in all four epidemiological zones. *Anopheles funestus* increases in density during the rice-growing season and was the primary vector responsible for the outbreaks which occurred in the Central Highlands in the late 1980s. Since this vector is highly endophilic, it is quite sensitive to IRS. *Anopheles arabiensis* is also present in the highlands, but is more exophilic.

In addition to PMI, major partners working with the NMCP include the Global Fund, UNICEF, UNITAID, WHO and the World Bank. Key implementing partners include numerous local and international non-government organizations (NGOs) and faith based organizations (FBOs).

D. NATIONAL MALARIA CONTROL PLAN AND STRATEGY

The current national malaria control strategy divides the country into four intervention zones. The interventions in the East and the West Coasts, with stable malaria transmission, focus primarily on LLIN distribution, case management, IPTp, home-based management of fever (HBMF), and community education. The interventions in the Central Highlands focus on IRS, case management, epidemic surveillance and community education. In the South, a semi-arid region with unstable malaria transmission, the main activities are epidemiological surveillance, case management, HBMF, IPTp, LLINs, and community education.

An International Conference on Intensification of Control towards Elimination was hosted in Antananarivo May 28-30, 2008 by the Ministry of Health (MoH) with strong international participation, including representatives from PMI. A key recommendation was that the national strategy be revised to adopt WHO's recommended approach of four program phases: intensification of control, pre-elimination, elimination, and prevention of reintroduction of transmission. A major outcome was that the NMCP was called on to revise its 2007-2012 NMCP National Strategy to integrate this recommendation from the conference. PMI will provide technical and other support as needed to the NMCP to revise the National Strategy and will work closely with the NMCP to adapt approaches as needed to the changing epidemiological situation in Madagascar. For the near-term PMI will continue to fully support the existing NMCP strategies to intensify control of malaria throughout the country.

The four approaches of the National Strategy include:

- Indoor residual spraying in the Central Highlands and South and West Coasts;
- Long lasting insecticide-treated nets (LLINs) distribution in all areas except the Central Highlands, employing several strategies: free LLINs will be distributed to pregnant women at antenatal care (ANC) clinics, to infants at immunization visits, to children under five years of age through large-scale campaigns, and social marketing of highly-subsidized LLINs;
- Improved case management in health facilities combined with increased use of rapid diagnostic tests (RDTs) nationally and community-based treatment with ACTs in areas of stable transmission; and
- Intermittent preventive treatment for pregnant women in all areas except the Central Highlands.

In addition, the National Strategy calls for:

- Epidemic detection and control in the Central Highlands

The strategy also emphasizes the need for comprehensive and effective information, education, communication and behavior change communication (IEC/BCC) and monitoring and evaluation to provide timely feedback on the program's progress.

E. CURRENT STATUS OF MALARIA INDICATORS

Prevention: The most recent DHS survey was carried out between November 2003 and March 2004, during the malaria transmission season. The DHS found that 39% of households owned one or more bednets (of all types) and that 36% of children under five and 35% of pregnant women slept under a bednet the previous night. That survey, conducted before a set of standard malaria indicators was available, and before the rapid scale up of ITNs in Madagascar, did not measure ITN coverage. Results from the May 2008 bednet use survey, conducted by the MoH/NMCP, HealthBridge, CDC, the Malagasy Red Cross and others, with support from PMI, showed increases in net ownership as compared with the 2003/2004 DHS and the 2006 Tracking Results Continuously (TRaC) surveys. The 2008 survey found 71% of households in the endemic areas owned at least one ITN and that 75% of children under five and 62% of pregnant women had slept under an ITN the previous night.

The 2007-2008 IRS campaign covered 94% of targeted houses. This represents 205,383 houses and a population of 1,241,344.

The national HMIS report for 2007 shows an increase from 35% to 39% for women who received the second dose of SP for IPTp.

Treatment: The indicator "children under five years old with fever in the last two weeks who received treatment with ACTs within 24 hours of onset of fever" is not available. The NMCP is in the process of changing the reporting questionnaire so that this indicator can be reported. Currently, the available data show percentages for children of all age groups.

PMI will use the results from the upcoming 2008/2009 DHS as baseline for all indicators.

Recent malaria indicator estimates

Indicator	Estimates
Proportion of children under five years old with fever in the last two weeks who received treatment with ACTs within 24 hours of onset of fever	Not available (not disaggregated by age groups)
Proportion of households with at least one ITN	45% ¹
Proportion of children under 5 years old who slept under an ITN the previous night	38% ¹
Proportion of pregnant women who slept under an ITN the previous night	28% ¹
Proportion of women who received 2 or more doses of IPTp during their last pregnancy in the last 2 years	39% ²
Proportion of targeted houses sprayed with a residual insecticide in the last 12 months (NMCP)	98% ³
Footnotes: 1 – PSI TRaC survey in malaria endemic areas - 2006 2 - Results from national HMIS 2007 report to NMCP. 3 - Results from RTI report	

F. GOAL AND TARGETS OF THE PRESIDENT’S MALARIA INITIATIVE

Goal

The goal of the PMI is to reduce malaria-associated mortality by 50% compared to pre-initiative levels in all PMI countries.

Targets

By the end of 2010, PMI will assist Madagascar 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, and who live in areas where IPTp is recommended by MOH policy, will have received two or more doses of IPTp during that pregnancy;

- 85% of government health facilities will have ACTs available for treatment of uncomplicated malaria; and
- 85% of children under five with suspected malaria will have received treatment with an ACT within 24 hours of onset of their symptoms.

G. EXPECTED RESULTS–YEAR TWO

At the end of Year 2 of PMI in Madagascar (March 2010), the following results will have been achieved:

Prevention:

1. Approximately 1.8 million LLINs will have been distributed during the previous year through a combination of nationwide distribution with routine service and a targeted campaign on the East Coast. Of this PMI will procure and distribute 890,000 LLINs, 490,000 for the campaign. These inputs, along with intense IEC/BCC, also supported by PMI and other partners, will raise the proportion of children under five sleeping under an ITN the previous night to 75 % and of pregnant women to 70%.
2. At least 85% of the 1.4 million houses in the geographical areas targeted for IRS will have been sprayed. PMI will have covered approximately 220,000 houses with a population of about 1.25 million.
3. Proportion of pregnant women who receive two or more doses of IPTp during their pregnancy has increased nationwide to 50 %. PMI will have provided support to expand delivery of IPTp at the CSB level through training and retraining CSB (centre de santé de base; primary health care clinic) staff, provision of job aides, and improved pharmaceutical management.

Treatment:

4. Malaria treatment with ACT has been implemented in health facilities in 100% of the districts nationwide, reaching the estimated 60% of all children under five with malaria who are taken to a health facility, of which 35% receive treatment within 24 hours of onset of fever. ACTs needs will have been filled by Global Fund and other partners; PMI will have supported training and refresher training and supervision for CSB staff in half of the almost 3,000 CSBs nationwide.
5. Home based management of malaria will have been expanded to reach approximately 50% of all communes nationwide, delivering treatment with an ACT within 24 hours of onset of illness to approximately 35% of children under five. PMI, working through local NGOs/FBOs, will have improved performance of community health workers (CHWs) to deliver a package of child health interventions in about half of all communes nationwide.

H. INTERVENTIONS–PREVENTION

1. Insecticide-treated nets (ITNs)

Current Status:

Since 2004, the GoM has focused its distribution strategy on LLINs, with a target of two nets per household in all areas except the Central Highlands. The ITN distribution strategy varies by region; the priority area is the highly-endemic East Coast, followed by the West Coast, with somewhat lower transmission. In addition, the epidemic-prone South is now being targeted for routine ITN distribution. There is a culture of net use in Madagascar, with relatively high coverage of locally-made nets, which are generally untreated, and high community awareness and demand for ITNs.

Madagascar has supported a multi-pronged approach for ITN distribution as outlined in the table below:

Net Distribution Strategies:

Approach	Target Pop	Target Areas	Method	Current Donors
Mass distribution	All under fives except in Central Highlands (maximum 2 per household)	Districts selected at time of campaign	Free of charge	Varies by campaign
ANC and EPI clinic distribution	Pregnant women and children under five	Whole country except Central Highlands	Free of charge	PMI and Global Fund
Social marketing to communities	Pregnant women and children under five	Whole country except Central Highlands	Sold for \$1.80 by community health workers	PMI and Global Fund
Social marketing commercial	Those who can afford subsidized nets	Urban centers	Sold in shops and markets for \$1.80	PMI and Global Fund

The strategy supports both the free distribution and the sale of highly-subsidized ITNs. Free distribution of LLINs through large scale campaigns has allowed Madagascar to achieve a relatively high coverage. Routine delivery through ANC and EPI clinics has helped maintain the high coverage levels. In addition, social marketing of highly-subsidized ITNs through volunteer community health agents and commercial outlets is a complementary strategy to establish market demand and expand rural reach. Volunteer community health workers are trained and supported by NGOs to provide health education, home-based management of fever (HBMF), and many other health services, including social marketing of ITNs.

Given that 30% of the Malagasy population lives more than 10 kilometers from a health facility, community and commercial distribution has offered an alternative network for routine distribution of highly subsidized ITNs. Population Services International (PSI), a Principal Recipient of the Round 4 Global Fund grant, working in cooperation with a network of local and international NGOs, has been a major distributor of ITNs through social marketing. PSI introduced the social marketing of LLINs through the commercial sector in 2001 and sold 141,000 ITNs at full cost recovery of \$6/net. In 2003, with the support of USAID, the Global Fund, and World Bank/CRESAN, PSI marketed subsidized LLINs for US\$1.80. Following this price reduction, shops and CHWs sold 1,848,000 PSI-marketed LLINs by the end of 2006. Approximately 915,000 LLINs were sold in 2007.

From 2006 to 2008, 5.599 million LLINs were distributed as outlined in the chart below.

Summary of LLINs distributed since 2006

Year	2006	2007	2008
Campaigns		1,810,000	
Social marketing	796,000	915,000	250,000 PMI 350,000 GF 7
Routine	818,000 in East		460,000 PMI
Emergencies		200,000	
Total	1,614,000	2,925,000	1,060,000

Results from a national evaluation by the MoH/NMCP, HealthBridge, CDC, the Malagasy Red Cross and others, conducted six months after the 2007 regional campaign, with support from PMI, are shown in the table below. High LLIN ownership and use by both children under five and pregnant women was found in areas targeted by the 2007 integrated measles/malaria campaign (the West Coast, the South and the North). The results also show high ownership and use in endemic areas where there was no campaign in 2007, providing evidence that the multi-pronged approach has been successful in achieving and maintaining high LLIN coverage and use.

**Final report of the bednet ownership and use survey – June 2008
(prepared by Health Bridge and CDC)**

	Non-campaign targeted, endemic districts– excluding Central Highlands	Campaign-targeted endemic districts only
ITN Ownership*	65%	77%
ITN ownership* in houses with children U5	78%	90%
ITN use in children U5	68%	81%
ITN use by pregnant woman	56%	69%

*ITN ownership with at least one ITN

In the areas covered by the campaign there was remarkable equity across economic quintiles. One factor that may have contributed to high usage rates were visits made by Malagasy Red Cross volunteers to households before, during, and after the campaign to promote demand for and use of LLINs (although they did not hang nets). The Malagasy Red Cross mobilized more than 20,000 volunteers for this effort.

In May 2008, an international conference on malaria was held in Madagascar to realign the national malaria control strategy towards malaria elimination. As a result, the national strategy and goals for malaria control over the next five years are currently being revised. By the end of 2009, Madagascar is aiming to achieve 100% coverage of households with two LLINs per household in targeted areas. Using a baseline estimate of current national net coverage (all districts excluding the central highlands) of 71% of households with at least one LLIN and 27% of households with two LLINs (from the 2008 March post-campaign HealthBridge/CDC study) a revised net gap was calculated as shown in the table below. In 2009, an estimated 2,767,278 nets will be needed. PMI will provide 890,000 nets (32% of need) as described in the table below, other donors (GF7 and UNICEF) will provide 523,596 nets (19% of need). Currently additional efforts are underway to apply for and seek donor support for the remaining gap.

The table below shows the LLIN gap analysis for Madagascar for 2008 to 2012.

ITN GAP ANALYSIS

Year (Jan - Dec)	2008	2009	2010	2011	2012	Total
Targeted Population (Population in Madagascar outside of the Highlands)	13,175,803	13,535,477	13,902,691	14,291,966	14,692,141	
Number of targeted households (population/ 5 people per household)	2,635,161	2,707,095	2,780,538	2,858,393	2,938,428	
Target coverage (2 LLINs/household)	70%	100%	100%	100%	100%	
Total number of ITNs needed	3,689,225	5,414,191	5,561,076	5,716,786	5,876,857	26,258,135
ITNs in the field ¹	2,574,552	3,308,642	4,060,509	3,360,811	3,138,649	
Anticipated loss 20%	514,910	661,728	812,102	672,162	627,730	
ITN NEED by year (ITNs need - ITNs in the field + replacement nets for anticipated loss)	1,629,583	2,767,278	2,312,669	3,028,137	3,365,937	
SOURCES of ITNs						
PMI	750,000	890,000				1,640,000
GF 4 (UGP)	125,000					125,000
GF 4 (PSI)	280,000					280,000
GF 7		223,596	112,404	450,000 ⁺	750,000 ⁺	1,536,000
UNICEF	69,000	300,000				369,000
JICA	25,000					25,000
ITNs available	1,249,000	1,413,596	112,404	450,000	750,000	3,975,000
GAP (ITN need - ITNs available) ²	380,583	1,353,682	2,200,265	2,578,137	2,615,937	9,128,605
Notes	1 Best estimate based on the 2008 national post integrated measles/ITN campaign evaluation					
	2 Note that LLIN GAP is cumulative					
	⁺ to be confirmed by Phase 2 GF7					

Since 2003, all nets procured on behalf of the MoH by PSI, UNICEF and Global Fund have been LLINs. Recently the GoM decided to procure larger LLINs, moving away from a standard-sized 150x180x190cm to 190x180x180cm net, citing national preferences. These larger nets will likely cost at least \$0.50 more than standard-sized nets with potentially longer lead times for

production. This additional cost, combined with high transportation costs, places the estimated cost per delivered LLIN in Madagascar at \$8.50.

Progress to Date:

1. Free distribution in campaigns:

In October 2007, the NMCP, with assistance from the Measles/Malaria Partnership (now known as the Alliance for Malaria Prevention), coordinated a LLIN campaign during the semi-annual mother and child health (MCH) week in October 2007. A total of 1.8 million LLINs were distributed on the West Coast, the North and the South covering 59 districts and targeting all children under five years of age with a maximum of two nets per household. This included about 936,000 LLINs procured by the Global Fund Round 4 grant, 110,000 LLINs donated by Malaria No More and 491,800 LLINs provided by the Canadian Red Cross. PMI contributed a total of \$1 million for logistics, IEC/BCC, and post-campaign evaluation of net ownership and use. During March and April 2007, UNICEF distributed 200,000 LLINs free of charge as part of the emergency relief response in the South following a major flood.

2. Free distribution through health centers during ANC and immunization clinic visits:

The MoH has adopted a strategy of distributing free LLINs to pregnant women during their first ANC visit and to infants upon completion of routine immunizations, at around nine months of age. In 2007, 324,000 LLINs were distributed through CSBs in the country. PMI will procure 460,000 LLINs for this routine distribution in July 2008 following the release of FY08 funds.

3. Social marketing of highly-subsidized ITNs through community health workers and rural shops:

These outlets are expected to sell 600,000 LLINs with funds made available in 2008 (250,000 from PMI and the remainder from the Global Fund). Revenue from the sales of the nets is reinvested by commercial shop owners and community health workers toward the purchase of additional LLINs.

Information, education, communication/behavior change communication

NGOs have used a variety of IEC/BCC mechanisms to increase ITN ownership and correct usage. Some employ teams of educators who stage performances, show videos, and/or use puppets which are popular in Madagascar. One has produced short movies starring popular Malagasy personalities in which ITNs figure prominently. Radio spots are also used. Many of the community health agents that distribute socially-marketed products are also responsible for educating local residents on how malaria can be prevented by proper use of ITNs.

Monitoring and Evaluation

Partners involved in distribution keep records of ITNs distributed to each area; CSBs and community volunteer health agents also keep records of how many ITNs they have distributed. The 2008/2009 DHS will provide nationwide data on ITN coverage and use. Monitoring of insecticide resistance is done every two years in two districts by NMCP with support from the Institut Pasteur. Support for this activity was included in the FY08 MOP so support is not needed in FY09 for this activity.

PMI strategic approaches:

PMI will continue to support both routine distribution of LLINs free of charge through the health facilities during ANC and EPI visits and social marketing of LLINs at the community level through CHWs.

In addition, PMI will support a mass LLIN distribution including the East Coast in 2009. This is based partly on the highly successful 2007 integrated measles/malaria campaign coupled with the biannual MCH week, where ITN distribution was conducted in the North, West and South, resulting in high rates of ITN ownership and use in targeted areas. The NMCP and its partners would like to conduct another mass LLIN campaign in October 2009 to cover the East Coast, which was not reached in the October 2007 campaign. The East Coast was the target of a 2006 campaign where 818,000 ITN were distributed to pregnant women and children under five. The timing of the proposed 2009 campaign is based on recent evidence indicating that a large majority of polyester LLINs lose their effectiveness by the third year of use in Madagascar. The 2009 mass LLIN distribution will be integrated with the scheduled October MCH campaign (in which Vitamin A, routine immunizations, and mebendazole for deworming will be made available to under-five children). The highly-endemic East Coast has a total population of approximately 5,000,000 persons and approximately 1.2 million nets would be needed to provide full coverage for all under-five children and pregnant women. The MoH would again like to involve the volunteers of the Malagasy Red Cross in the 2009 campaign.

We recommend supporting the 2009 campaign for the following reasons:

- The 1.6 million LLINs distributed in 2006, of which about 900,000 were distributed free of charge or sold on the East Coast, will be on average about 3.5 years old in late 2009. Based on anecdotal reports, many of these nets will have been washed more than 20 times, the number of washes identified by the WHO as the limit after which insecticide efficacy can no longer be guaranteed. These nets should be replaced.
- The consensus of the NMCP and its partners is that the October 2007 campaign was highly successful in boosting ITN ownership and use in the West Coast, North and South.
- The proposed campaign would be aimed at those districts in the East Coast that were not targeted in the 2007 campaign. A national survey found substantially lower ownership on the East Coast than in other areas covered by the October 2007 campaign. A campaign targeting the East Coast would permit Madagascar to achieve very high levels of protection for the entire country.

LLIN needs (000's) for Campaign for East Coast in October 2009

	2009
Estimated population at risk	5,000
Estimated under-five population¹	1,000
Estimated number of pregnant women	225

Estimated total need	1,225
PMI planned	490
Gap – To be requested from other partners	725
Footnote: 1. Assumes about 20% of population is under-five years of age	

Proposed Year 2 activities: (\$7,200,000)

PMI proposes a continuation of its multi-faceted support to LLINs distribution in Madagascar. This approach ensures that high coverage is achieved quickly and that access to LLINs is provided to new cohorts of pregnant women and infants.

1. *Support for LLIN campaign:* PMI will provide approximately 490,000 LLINs for distribution to families of children under 5 years of age through an integrated child health campaign planned for October 2009. This will be focused on the East Coast and the objective is to distribute a minimum of 1.2 million LLINs to areas that were not targeted by the October 2007 mass distribution. Given the success of the October 2007 campaign we believe that other partners (e.g., Canadian Red Cross, Malaria No More, etc.) can be recruited to fully fund this event. The NMCP has set a cut-off date of March 2009 for the partners to commit the resources needed for the campaign. If insufficient resources are raised, the campaign will be canceled and the 490,000 LLINs planned by PMI will be divided between social marketing and routine distribution. (\$4,000,000)
2. *Support social marketing of LLINs through CHWs and rural shops:* PMI will support social marketing of approximately 250,000 LLINs through community health workers and rural shops as outlets in areas with poor access to health facilities. This will be in conjunction with IEC/BCC to promote demand for and correct use of ITNs in these areas. This continues PMI support for an approach that has been highly successful and received multi-donor support in Madagascar over the past several years. (\$2,000,000)
3. *Support for distribution of free LLINs through routine services:* PMI will support free distribution of approximately 150,000 LLINs through ANC and Expanded Program on Immunization (EPI) services at CSBs on the East and West Coasts and in the South. These nets would complement the 525,000 LLINs included in the FY08 MOP and provide a substantial start for the MoH's routine LLIN distribution program. Due to the challenges of getting the LLINs from the districts to the CSBs, this component will likely take several years to scale up. (\$1,200,000)
4. *Support for national level mass media and community IEC/BCC:* This activity will promote correct use of ITNs, communicate the risks and danger signs of malaria in children under five years, and educate pregnant women about the benefits of prenatal care, including iron/folate, IPTp, and ITNs. (Costs covered in Community-based interventions section)

5. *Training, supervision and community mobilization for a community package of interventions:* Work with the NMCP and other partners to strengthen community interventions, including community-based malaria treatment; strengthening links between community health workers and CSBs; and developing uniform training modules for community health workers. (*Costs covered in Community-based interventions section*)

2. Intermittent preventive treatment of pregnant women (IPTp)

Current Status:

The 2003/2004 DHS estimated that 80% of women made one or more antenatal clinic visits, although many of these occur late in pregnancy. In June 2004, the MoH adopted the strategy of providing two doses of directly observed SP, free of charge to pregnant women, for the prevention of malaria during pregnancy in 92 coastal and lowland districts, where malaria transmission is stable or seasonal. Nineteen districts in the Central Highlands, which are epidemic-prone, were excluded from this policy. The first dose of SP is to be given when the mother first senses fetal movements, but not before the 16th week of gestation, with a second dose not less than 30 days later. A third dose is recommended for HIV-positive mothers. Voluntary counseling and testing is available, although the prevalence of HIV is low. SP is provided free of charge at CSBs by personnel with a medical, nursing, or midwifery background. All antenatal care activities, including tetanus vaccination and malaria prevention activities are integrated at the level of the CSB. The NMCP works closely with the *Direction Santé Familiale* (Directorate of Family Health) to plan and implement IPTp and malaria in pregnancy activities.

It is national policy to treat malaria infections during pregnancy with quinine during the first trimester and ACTs during the second and third trimesters, however this practice is highly variable. Some health workers prescribe chloroquine during the first trimester and SP during the second and third trimesters.

According to the 2003/2004 DHS, 50% of pregnant women are anemic. The MoH began training health workers in the CSBs on delivery of IPTp in late 2004 with support from USAID. To date, 2,300 CSB staff, mostly midwives, have been trained in delivery of SP for IPTp and in distribution of ITNs in 92 districts. An additional 14 trainers and 6 regional supervisors have been trained, and a training manual, materials for midwives, and wall posters for health clinics have been developed. The training focused on public health care providers and thus far has not included the private health sector, although this is planned as part of the national malaria control strategy. There are currently no plans to involve CHWs in the delivery of IPTp, however, these workers play an essential role in promoting the use of antenatal services.

Documentation of SP administration is noted on the ANC card and the ANC register. CSBs collect and report data on the number of women who attend prenatal consultation and receive one or two doses of SP and forward this aggregated information to the district level monthly. The availability of the new updated, standardized recording and reporting forms at the CSB level is variable. In 2007, CSBs began reporting the number of women who receive both the first and second dose of SP to the central level. The data transmitted are of variable quality and reporting from the district to the central level is incomplete. As a result, accurate national figures for

coverage of IPTp are not yet available. For 2007, data regarding the number of women who took the first and second doses of SP are available for 30 districts, with fairly even geographic distribution throughout the country. Of the 30 districts that reported, 50% of women attending ANC services took at least one dose of SP, and 39% took the second dose. It is unclear why the proportion of women who receive IPTp is so much lower than those who receive prenatal care.

In 2009, a projected 2,800,000 SP tablets will be needed to treat an estimated 470,000 pregnant women expected to attend ANC clinics in the 92 selected districts. UNICEF will donate all of the SP required for IPTp from 2008-2011 and will use its own distribution channels to deliver the drug to the district level. The *Service de Santé de District* (District Health Office) is responsible for assigning the estimated amount of SP needed by each CSB. CSB staff or community members are responsible for transporting the SP from the District Health Office to their local CSB. The SP administration kits include cups for administration of SP and a water purifier.

An area of need within the system is strengthening the package of services offered to pregnant women through the CSBs, especially improving supply chain management and distribution systems to ensure that ITNs and SP will be available when women seek prenatal care. Though health care providers at CSBs have been trained in IPTp, there is need for supervision and reinforcement of training both in IPTp and in treatment of malaria during pregnancy (as part of focused antenatal care), particularly the need to use quinine, not ACTs, for treatment of malaria during the first trimester. In addition, support and continued training of CHWs is necessary to promote demand for and utilization of prenatal services.

Estimated SP needs and gaps for IPTp at ANC clinics from 2007-2010¹

	2007	2008	2009	2010	Total
Est. target population ²	12,415,876	12,763,521	13,120,899	13,488,285	51,788,581
Est. number of new pregnancies ³	558,714	574,358	590,440	606,973	2,330,486
Est. number of pregnancies seen at ANC ⁴	391,100	430,769	472,352	485,578	1,779,800
No. of SP needed (tablets) ⁵	2,346,601	2,584,613	2,834,114	2,913,469	10,678,797
Planned SP purchases for IPT ⁶	UNICEF has committed to purchasing the required SP through 2011				
Gap	0	0	0	0	0

Notes:

¹ This quantification does not make any adjustments for expected uptake of the policy. Preliminary consumption data for the first quarter of 2007 show that approximately 75% of the SP for IPT distributed for use in that quarter had actually been used. If this situation does not change, then these requirements may represent an overestimation of the real requirements. Timely and accurate consumption tracking will be required to track use and make the required adjustments to these estimated requirements.

² Assumes that IPT will be applied to only 92 of the 111 districts, (excluding the districts in the central highlands, which are in Antananarivo and Fianarantsoa provinces) and that the population will continue to grow at 2.8% annually

³ Assumes that pregnant women constitute 4.5% of the population each year.

⁴ Using the estimated number of pregnancies in 2004 and the number of ANC consultations from the 2004 HMIS (Health Management Information System) data, we calculated that 68% of pregnant women are seen at the ANC each year.

Thus, this quantification assumes that the proportion of pregnant women who will have prenatal care at the CSB, and thus receive IPT, will be 70% in 2007; 75% in 2008; 80% in 2009; 85% in 2010.

⁵ Assumes each pregnant woman will receive 2 doses of SP (6 tablets) during the course of a pregnancy.

Progress to date:

In 2008, PMI has supported activities to strengthen the implementation of IPTp as part of ANC services in the 92 districts where malaria transmission is stable or seasonal. This includes: 1) a desk review of existing reports, program data and program evaluations to identify barriers to IPTp uptake; 2) organization of a central-level orientation course and dissemination of integrated service delivery guidelines and standards using the Madagascar malaria in pregnancy learning resource package (validated and standardized training aids) and 3) plans to support supervision including monitoring of program implementation and strengthening recording and reporting at the district level.

Proposed Year 2 activities: (\$300,000)

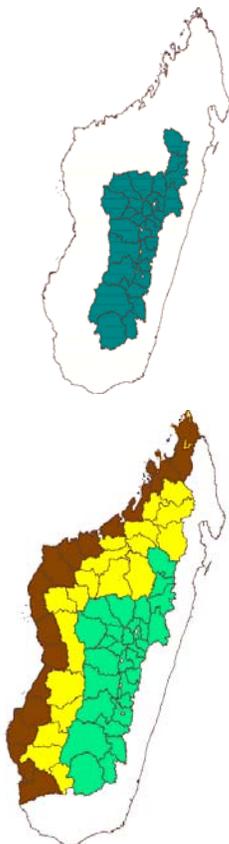
The MoH has trained CSB staff and implemented IPTp delivery through ANC clinics in 92 districts (excluding the Central Highlands). Training thus far has focused on public service providers. CHWs, through the vast network of NGOs, play an important role in IEC/BCC. ANC clinic attendance rates are approximately 80%, but the percentage of women who complete two doses of SP is only an estimated 39%. Key needs are: increasing early and frequent prenatal

clinic attendance through IEC/BCC interventions, improving the quality of prenatal services to increase the proportion of pregnant women who receive two or more doses of IPTp, ensuring continuous SP and LLIN availability and consistent and accurate reporting of prenatal clinic attendance, including doses of SP given, to the central level. For FY 2009, PMI will not purchase SP as all needs are met through funding from UNICEF.

1. *Continue to strengthen implementation of IPTp:* PMI will support strengthening IPTp as a part of Focused Antenatal Care at the decentralized CSB level. PMI will support refresher trainings, integrated, supportive supervision of ANC services, quality monitoring and evaluation of IPTp. Training will be expanded to include private and civil society service providers so that all are trained in the current national policies and guidelines regarding ANC services and IPTp. (\$300,000);
2. *Continue to support IEC/BCC interventions to improve IPTp outcomes:* PMI will support IEC/BCC activities aimed to increase the number of pregnant women who make ANC visits early and frequently during their pregnancy. (Costs covered in the *Community-based Interventions* section).

3. Indoor Residual Spraying (IRS)

Current Status:



IRS is an important component of the malaria control strategy, especially in the Central Highlands (shaded area, upper map). Until it was discontinued in 1970, IRS interrupted seasonal transmission and reduced perennial transmission in coastal areas. A resurgence of malaria between 1985 and 1988 prompted the re-introduction of IRS in 1989. IRS is currently applied selectively, targeting at-risk areas in the Central Highlands.

To slow the development of insecticide resistance, beginning in 2004 synthetic pyrethroids have replaced DDT (dichlorodiphenyl-trichloroethane) as the insecticide of choice for IRS. In 2005, WHO proposed rotational use of different classes of insecticides, a pyrethroid, followed by a carbamate, followed by DDT, over a 3-year period, to further slow selection of resistance.

Communes of between 4,000-15,000 inhabitants are selected for IRS using several criteria, including: (1) altitude between 900 and 1500 meters; (2) exclusion from the previous two spray campaigns and/or (3) reported case loads exceeding an epidemic threshold.

WHO has proposed an IRS-based malaria elimination strategy for the Central Highlands. The strategy, incorporated into the National Strategic Plan, calls for IRS in 90% of houses in the Central Highlands and its western ‘transitional’ zones, a total of 72 health districts (shaded area, lower map). With this expansion, IRS coverage will include approximately 1.4 million dwellings and an estimated population of 7 million. The “checkerboard” strategy calls for one IRS round/year of ‘full’ ($\geq 80\%$ coverage) for three years, followed by a return to ‘targeted’ IRS during the two subsequent years. A key component of this strategy is PMI’s continued support for an annual IRS campaign reaching approximately 220,000 houses and a population of 1.25 million. The Global Fund Round 7 grant will provide the resources needed to reach the additional coverage called for in the elimination plan. It is unclear whether those funds will be available in time to support the October–November 2008 IRS campaign.

PMI is committed to the current level of support for IRS in the coming years to allow for an expanded program based on PMI and Global Fund support. Building on the International Conference on Intensification of Control towards Elimination hosted in Antananarivo May 28-30, 2008 PMI will actively engage in discussion with the MoH and partners to identify the longer term role of IRS in elimination strategies.

Progress to date:

The “checkerboard” strategy, described above, was used to select IRS target communes during the (PMI Round 1) IRS campaign. USAID/Madagascar also provided commodity support for this round of IRS through a World Bank-funded IRS project, CRESAN II.

IRS coverage provided by PMI Round 1 (March 2008)

Province	Districts	Communes	Structures sprayed	Population protected
Antananarivo	15	54	124,510	711,882
Fianarantsoa	10	42	80,873	529,462
Total				1,241,344

During PMI round one, PMI provided technical assistance and commodities to the NMCP IRS program. At the end of the round in March 2008 an assessment was conducted by the USAID Regional Environmental Officer to evaluate compliance with PERSUAP (Pesticide Evaluation Report and Safe-Use Action Plan) requirements, identify aspects of the IRS program in need of strengthening, and to recommend follow-up actions. The major recommendations included capacity building to strengthen:

- Preparation and use of detailed operational work plans;
- IRS operational capacity at district and community levels;
- Pesticide storage capacity;
- Understanding and use of personal protective gear;
- Adoption of best practices for rinsing IRS equipment and disposal of waste water/pesticide;

- Involvement of National Office of the Environment (ONE) for insecticide selection; and
- Entomological IRS monitoring and evaluation capacity.

An IRS monitoring and evaluation plan, including an insecticide resistance monitoring plan, was implemented before the PMI IRS Round 1 (January 2008). Results confirmed vector susceptibility to alpha-cypermethrin, the insecticide to be used during the PMI IRS Round 2 (November-December 2008). In the past, resistance surveillance has been ‘ad hoc’, based on available funding. The current plan, however, includes a budget that will allow the NMCP to evaluate other parameters in addition to vector insecticide resistance including: vector species composition, vector biting density, and insecticide decay rates following IRS. It will also allow the NMCP to conduct resistance surveillance across the extensive area targeted by the Global Fund IRS program.

One advantage of IRS is that it does not require individual behaviour change or community normative change. However, a safe and effective IRS campaign does require community leader support and comprehensive information for the population about what to expect and what to do when their house is sprayed. To date, the IEC efforts around IRS campaigns have been carried out by the NMCP staff and the people hired to do the spraying. IRS campaigns have been conducted over the past 14 years and are generally well-accepted by the population. If the MoH and partners reach consensus to extend the IRS campaign to areas where IRS is new, it is likely that a more robust and adapted IEC campaign will be required.

Proposed Year 2 activities: (\$4,155,000.)

IRS is a major strategy for the prevention and control of malaria in the Central Highlands and in response to epidemics. The current National Malaria Control Strategy proposes blanket spraying in the highlands as well as expansion to the West Coast. In 2009, PMI will partner with the Global Fund to support this strategy. Specifically, PMI will support the following activities in FY2009:

1. *Support the IRS campaign in the Central Highlands* to cover approximately 220,000 houses with an estimated population of 1.25 million. Target communities to be determined by NMCP based on: the National Plan, IRS target selection criteria, and availability of resources. Logistics and technical assistance as described in the Memorandum of Understanding between the NMCP and the PMI IRS contractor, training, and IEC/BCC to ensure public safety. A small amount of insecticide will be held in reserve for targeted IRS needed in response to outbreaks detected by the epidemic surveillance system. (\$3,000,000);
2. *Support for implementation of IRS environmental assessment recommendations* including 1) IRS capacitation at local level; 2) implementation of the IRS M&E protocols; 3) upgrading the storage facilities at all levels to meet best practices; and 4) upgrading waste management systems (rinsing stations and soak pits). (\$1,000,000);

3. *Conduct environmental assessment of IRS in Madagascar:* Provide an independent evaluation of the adherence to environmental guidelines during the Madagascar IRS campaign. (\$35,000);
4. *Provide technical assistance to PMI IRS activities:* Two CDC TDYs to support implementation of IRS M&E plan and to coordinate with Global Fund on IRS partnership to support national strategic plan with the NMCP. (\$25,000)

I. INTERVENTIONS – CASE MANAGEMENT

1. Malaria Diagnosis

Current status:

The national policy on malaria diagnosis states that malaria cases should be confirmed by microscopy at hospitals, and, if possible, by RDTs at CSBs. Where these examinations are not available, diagnosis is based on clinical evaluation after all other causes of fever have been eliminated. Malaria treatment in areas where community health agents are present remains based on the presence of fever

To implement the policy for the use of laboratory diagnostics, the NMCP has been rolling out training and reinforcing supervision for both RDTs at CBSs and microscopy at district hospitals. The NMCP began training on the use of RDTs in the Central Highlands and the East Coast in 2005–2006. In the following year, the RDT training continued to the West Coast and the southern, semi-arid region. Since the initial wave of training the GoM has changed its national strategy to recommend that all age groups receive a diagnostic test for malaria before receiving an antimalarial. A large part of the RDT roll out (including training, supervision, procurement) was implemented before the PMI program began in Madagascar.

The RDT implementation strategy has been linked to training and compliance—the NMCP has continued to train technicians in the use of RDTs throughout the country and will be providing refresher training and supportive supervision with the support of PMI. With Year 1 funds PMI supplied about 270,000 RDTs. A continuation of PMI funding will depend on training and appropriate use of RDTs. The PMI team will work closely with the implementing partner during supervisory visits and will develop a quality assurance system that will report on the progress of RDT use.

In order to improve malaria diagnosis by microscopy, 24 regional laboratory supervisors were hired to provide training and to perform quality control of the malaria slides in all 22 regions. To date, approximately half of all districts nationally—54 districts on the East and West Coasts—have received refresher training in microscopy. Health workers from both the public and private sectors have been involved in these training sessions. Financial support for these activities has been provided through GF Round 4 and the African Development Bank.

Although CHWs were providing chloroquine treatment to children under five years based on the clinical finding of fever in accordance with current HBMF policy in Madagascar, the NMCP, in

collaboration with the Institute Pasteur of Madagascar (IPM) and other partners, is conducting a study to evaluate the feasibility, acceptability and effectiveness of the combined formulation of AS/AQ delivered in the community. Specific objectives of this study include the feasibility and effectiveness of the use of RDTs by the CHWs, pharmacovigilance of the co-formulated AS/AQ, and to evaluate the incidence of malaria in children under five years. Results of this study will be available in May 2009 and may affect the HBMF policy in the future.

The apparent availability of diagnostic supplies for microscopy is difficult to interpret because of the significant under-utilization of the existing laboratory services at the hospitals. The fee charged to the patient for malaria microscopy is set by the hospital, at approximately \$1 per test, and is used to support its operations. Healthcare workers attribute the low use of microscopy to the reluctance or inability of the patient to pay for the test. This situation is different for RDTs which are free of charge to the patient. However, observations from field visits and supervisory visits confirm that RDTs are also under-utilized with stocks of RDTs expired or near expiry. To improve this situation, the NMCP began collecting average monthly consumption data in 2008 to more accurately estimate the number of RDTs needed for procurement and distribution. The current estimate of RDTs needed for 2009 is 1,690,147 (see table titled “Estimation of ACT and RDT needs for health facilities in 2009” below in Treatment section). As shown in the table below this has been covered by Global Fund Rounds 3 and 7.

RDT supply for 2008 to 2010			
Source of RDTs	Year		
	2008	2009	2010
UGP GF Rd 3 and 7	1,308,278	1,690,147	1,399,356
PMI	270,000		
TOTAL RDTs	1,578,278	1,690,147	1,399,356

Also, financial support for some microscopy supplies at the 63 *Centres Hospitaliers de District* (District Hospital) has been included in Global Fund Round 7.

A quality assurance/quality control system for microscopy has yet to be clearly developed; however, standard quarterly reports from regional supervisors on their quality control of slides at the District Hospital are expected. For ensuring the quality of the RDT kits, lot testing at the central level is conducted by IPM. In addition to this, a system of QA/QC for the implementation of RDTs at the CSBs will also need to be developed to ensure the accuracy of the diagnostic test results when performed by the healthcare workers.

Progress to date:

The 2008 PMI support to the NMCP plan to reinforce Madagascar’s national strategy on malaria diagnostics has begun with a rapid laboratory assessment of nine health facilities with microscopy capacity representing the Central Highlands and both coasts. The goal of the assessment was to inform future training needs and to guide the development of a QA/QC system (including an external quality assurance system). Preliminary findings indicate that health care workers are not following standard guidelines for the use of diagnostic tests, patients

are still treated with antimalarials despite negative test results, blood slides can cost up to \$1 for the patient, there is no maintenance for laboratory equipment, available laboratory services are under used, and data reporting is inconsistent and incomplete. The results from this initial assessment, along with an evaluation of the use and the accuracy of RDT results at the level of the CSBs (currently in development), will be used to develop a detailed written national malaria diagnosis plan/technical guide including standards and procedures. The 2008 PMI plan also allotted support for the implementation of the QA/QC system, implementation of the national malaria diagnostics plan, training and supervision of laboratory technicians, and procurement of 270,000 RDTs. Also, the PMI activity to strengthen the national commodity management system, which includes RDTs, has begun with an initial needs assessment and the development of a work plan.

Proposed Year 2 activities: (\$788,000)

For the second year of PMI in Madagascar, the laboratory diagnostics activities will build upon those of the first year and assist the NMCP in scaling up its strategy to increase laboratory diagnostics capacity, ensure accuracy of test results, increase the supervisory support to the districts through a decentralized structure, and support the increased utilization of microscopy and RDTs. Although additional RDTs will not be needed from PMI in year 2, support for laboratory equipment and other commodities will be needed for the 108 hospitals in order to improve microscopy. Finally, the financial barrier (i.e., fee charged to the patient) which prevents the use of microscopy will need to be addressed by working with the GoM to promote a policy change and by providing the supplies needed for microscopy.

1. *Procure laboratory microscopy equipment based on recommendations from Year 1 assessment*; items may include additional microscopes or parts for maintenance, EARL lights, teaching microscopes, otoscopes/stethoscopes or other diagnostic equipment required for accurate fever evaluations, adjustable laboratory stools, bench aids, slides and stains/reagents. (\$150,000);
2. *Continue development and implementation of the QA/QC system* for microscopy and RDTs including development of standards and procedures, development of supervisory tools/registers/guidelines, training of supervisors or trainers, extension of lot quality testing for RDTs to level of the community and district pharmaceutical depots, logistics and human resources reinforcement. (\$450,000);
3. *Technical support for the continued development and implementation of the QA/QC system* for microscopy and RDTs nationally, improving availability and usage of diagnostic testing, improving link between laboratory services and case management (improve ease of ordering a diagnostic test and receiving results in order to use it for clinical management), addressing the practice/policy of charging the patient for microscopy. (\$162,000);
4. *Provide technical assistance for QA/QC activities*: three CDC TDYs to support implementation of national QA/QC system for microscopy and RDTs. (\$26,000);

5. *Continue to coordinate activities with partners supporting the strengthening of the pharmaceutical and commodities management system (including forecasting based on consumption data, reliable storage, distribution, and monitoring of stocks) and with partners for case management to increase the appropriate use of ACTs based on diagnostic testing (Costs covered in Pharmaceutical and Commodity Management).*

2. Malaria Treatment

Current status:

Uncomplicated malaria. In 2005 AS/AQ combination therapy was adopted as the first-line treatment for uncomplicated malaria in Madagascar. The guidelines for the malaria treatment policy as outlined in the *Politique Nationale de Lutte Contre le Paludisme à Madagascar, 2005*, were distributed along with a training that began on the East Coast in 2006. The treatment and referral guidelines are in line with Integrated Management of Childhood Illnesses protocols.

There are no consultation fees for sick child visits and treatment for uncomplicated malaria is free. The policy calls for diagnostic testing in facilities for all suspected cases of malaria but where this is not possible, patients should be treated based on clinical signs. In line with this, the early rollout of ACTs has been done in coordination with distribution and training on the use of RDTs, including at the CSB level where RDTs will be the sole diagnostic test.

In malaria endemic areas, the national policy supports presumptive treatment at the community level with an appropriate antimalarial of all children under five years of age with a fever. In 2003, PSI began distribution of prepackaged chloroquine, PaluStop[®], for children under five years of age, through CHWs and community shops at a cost of 50 ariary (~ \$0.03) per treatment. CHWs, working through a consortium of international and local NGOs supported by USAID and other donors, distributed an estimated 600,000 treatment doses of PaluStop[®] annually between 2005 and 2008. The private sector distribution points, which include pharmacies, pharmacy depots and community shops, have distributed an estimated 1,000,000 doses annually during this same period, with the community shops accounting for a large majority of sales.

In mid-2008 PSI helped the NMCP transition to a co-blister pack of artesunate/amodiaquine, marketed as ACTipal[®], for children under five. This is sold for 100 ariary (~ \$0.06) per treatment, and is also available through CHWs, pharmacies and medical stores.

Severe malaria: Quinine is the drug of choice for severe malaria. The policies do not include a recommendation for pre-referral treatment. Confirmed cases of malaria in pregnant women are treated as severe malaria. In the first trimester a pregnant woman with malaria should be treated with quinine, 10 mg/kg every 8 hours for 7 days. Pregnant women in the second and third trimester should be treated with AS/AQ at the recommended dose. All patients with severe illnesses identified in peripheral outpatient health facilities should be referred to a health facility with an inpatient ward or a hospital. The NMCP confirmed that there is no need to procure additional quinine for 2008, as adequate supplies are being provided by the Global Fund.

Monitoring Drug Efficacy: Responsibility for *in vivo* monitoring of therapeutic efficacy of antimalarial drugs is being transferred from the *Institut Pasteur Madagascar* to the NMCP. There are plans to reduce the number of monitoring sites and to conduct monitoring activities every two years. Training in monitoring of molecular PCR (polymerase chain reaction) and other laboratory techniques has improved the capacity of the NMCP. The IPM will retain responsibility for *in vitro* drug resistance monitoring.

Progress to date:

By July 2008, national level coverage for treatment with AS/AQ at facilities had been achieved including distribution of prepackaged treatment doses and training of health workers to the CSB level. However, uptake of AS/AQ has been relatively slow. Many facilities continue to have significant stocks of chloroquine and discussions with the NMCP and partner personnel indicate that other factors, including a reluctance to use AS/AQ when diagnostic tests are not available, may be obstacles to its consistent use. Additional training for CSB health workers and removal of chloroquine from health facilities are needed.

USAID/Madagascar has supported the Champion Commune or *Kominina Mendrika* approach for community mobilization. Through collaboration with NGOs, and the public and private sectors, the Champion Commune provides the platform for CHWs. As of mid-2008, CHWs are delivering malaria treatment in approximately 400 communes. Subsidized ACTipal are sold for 100 Ariary (~ \$0.06) by CHWs. Madagascar delayed ordering AS/AQ for community-level distribution based on information that WHO pre-approval for an AS/AQ co-formulation was imminent. In addition to the fact that the co-formulation will be much simpler to use, the NMCP wanted to avoid training CHWs on appropriate delivery of a combination dose and later retrain them on the use of the co-formulated AS/AQ. Unfortunately, by the end of the first quarter of 2008 WHO pre-approval had still not been obtained and orders were placed for co-packaged AS/AQ, which arrived in June 2008.

In 2005, with support from UNICEF, BASICS and MCDI, the MoH piloted an integrated, community-level child health program in 12 high-prevalence districts. This program included treatment for malaria, pneumonia and diarrheal diseases by CHWs. This approach has been adopted as a national strategy and the MoH goal is to complete training of CSB personnel in 50% of the 111 health districts by the end of 2008. Each CSB will oversee the activities of six CHWs, two each in three Fokontany (a group of two or more villages). CHWs in these districts will be trained in the identification, treatment and referral of these three diseases. The CSBs will be responsible for monthly coaching of the CHWs, and CHWs will submit monthly reports to the CSBs.

The private sector has played a significant role in distribution of malaria treatment for children, with about 1,125,000 treatments of PaluStop being sold in pharmacy depots and general shops in rural areas in 2006. ACTipal will be available to pharmacies and pharmacy depots, but is not classified as an over-the-counter drug and cannot be sold through the community shops, which had accounted for a majority of the private sale of PaluStop. This will likely reduce the availability of appropriate antimalarials and could be a significant problem in some rural areas.

Quantification of AS/AQ: The absence of consumption data for antimalarials at the facility level in Madagascar makes accurate estimation of requirements challenging. Using projected facility use by the population and percentage of fever cases due to malaria, the Global Fund partners developed a spreadsheet to estimate the needs, by district, for ACTs and RDTs at the facility level. These figures are, at best, a rough estimate of the actual needs for ACTs and RDTs, however, until consumption data are available these provide a guide to facility-based needs for ACTs and RDTs in 2009.

The table below presents the estimation of RDT and ACT needs for government health facilities in 2009

Estimation of ACT and RDT needs for health facilities in 2009

Region	General Population	Number of outpatients: Primary health centers utilization ¹	Number suspected malaria cases: among all outpatients ²	Needs in RDT for primary health center	Confirmed malaria cases ³	Needs in ACT for primary health center
Central Highlands	5,940,154	3,564,092	249,486	249,486	62,372	62,372
Margins area	2,500,401	1,500,240	187,216	187,216	46,804	46,804
East	5,269,879	3,161,928	632,386	632,386	158,096	158,096
West	4,027,282	2,416,369	483,274	483,274	120,818	120,818
Sub-desert south	1,148,211	688,926	137,785	137,785	34,446	34,446
Total	18,885,927	11,331,555	1,690,147	1,690,147	422,536	422,536
Assumptions:						
1. Percentage of ill individuals that visit to a facility = 60%						
2. Percentage of outpatients at a facility that are presumed to have malaria = 7% for non-endemic area in the highlands; 20% for other areas.						
3. Percentage of positives among the presumed cases = 25%						

in 2009.

Home or community management of malaria will be implemented only in 92 districts (excluding the low transmission districts in the highlands). As with projecting an estimated need for health facilities, the Global Fund's partners had to use a set of assumptions that can at best provide a gross guide for the needs. This is compounded by the fact that the program for delivery of AS/AQ at the community level is currently being rolled out and is only operational in a relatively low proportion of communes. The table below shows the estimated needs for AS/AQ at the community level for 2009

Estimation of ACT needs for community based treatment in 2009

Region	Total Population	Number of children from 0 to 4 years	Number of fever attack in children from 1 to 4 years ¹	Coverage rate for delivery HBMF ²	Number of children under five to be treated ³	ACT needs for home based management in children under five
Central Highlands	0	0	0	0	0	0
Margins area	2,500,401	400,064	640,103	512,082	230,437	230,437
East	5,269,879	843,181	1,349,089	1,079,271	485,672	485,672
West	4,027,282	644,365	1,030,984	824,787	371,154	371,154
Sub-desert south	1,148,211	183,714	293,942	235,154	105,819	105,819
Total	12,945,773	2,071,324	3,314,118	2,651,294	1,193,082	1,193,082
Assumptions 1. On average, each child under 5 years of age will have 1.6 episodes of fever per year 2. The CHWs will reach 80% of children in rural areas 3. Forty-five percent of children live more than 5 Km from a health facility and will be served by the CHWs.						

The total projected need for facility and community is 1,615,619 treatment doses of AS/AQ.

The project procurement of AS/AQ, shown in the table below, indicates that for 2009 the supply will be adequate to meet the needs and thus there are no plans for PMI to procure ACTs in 2009. The situation for 2010 is uncertain and PMI may find a need to assist with procurement in the future.

The table below shows the planned ACT procurements for 2008 to 2010.

Source of ACT	Year		
	2008	2009	2010
PSI UNITAID	1,000,000	2,000,000	
UGP UNITAID	1,389,000		
UGP GF7		676,647	422,537
Donated by China	186,000		
Total ACTs	2,575,000	2,676,647	422,537

Proposed Year 2 Activities: (\$500,000)

Using Global Fund and UNITAID funds, the projected purchases of AS/AQ for 2009 will be sufficient to cover all needs. PMI has identified several key areas that will directly support the implementation of ACTs nationwide, both at the facility and community level. These include training and supervision at all levels of the health system. Through the new SanteNet bilateral project, PMI will support the continuation of a MoH-guided initiative that will roll out an integrated package of community-based treatment for malaria, pneumonia and diarrheal diseases in 50% of the 111 districts in 2008. PMI will also support broad public awareness campaigns utilizing mass media and community mobilization activities. These IEC/BCC activities will continue to promote ACTs as the drug of choice for malaria. PMI will also invest in

strengthening the pharmaceutical and commodity supply chain to ensure that a continuous supply of ACTs is available at all levels.

1. *Support implementation of ACTs at the CSB level:* Training and refresher training, along with increased monitoring and supervisory visits will be used to ensure proper use of ACTs based on results of RDTs or microscopy; emphasis will be placed on how to manage both a positive or negative test result during trainings. This activity will be coordinated with the laboratory diagnostics activity focused on ensuring the accuracy of the test results. (\$300,000);
2. *Technical assistance to support the roll out and supervision of ACT at the CSB:* PMI will provide technical support to ensure quality of implementation and supervision of delivery of ACTs in health facilities. (\$200,000);
3. *Support for national level mass media and community IEC/BCC* that will address introduction of ACTs in health facilities and through HBMF through educating care givers about the dangers of malaria in children under five, the signs of severe illness and the need to refer severely ill patients to a health facility (*Costs covered in Community-based Interventions section*);
4. *Training, supervision and community mobilization for a community package of interventions.* PMI will work with the NMCP and other partners to strengthen community interventions, including community-based malaria treatment, strengthening links between community health workers and CSBs, and developing uniform training modules for community health workers (*Costs covered in Community-based interventions section*);
5. *Support and strengthen pharmaceutical and commodity management systems.* PMI will encourage collaboration with and give support to the existing supply chain management system with the goal of ensuring availability of ACTs in all health facilities and at community level. For FY 2009, PMI will not purchase ACTs as the needs are being met through funding from Global Fund and UNITAID (*Costs covered in Pharmaceutical and Commodity Management section*).

3. Pharmaceutical and Commodity Management

Current Status:

Public Sector: SALAMA, the central purchasing agency of the MoH, is responsible for procurement of products for use in the public sector and for their distribution to the district level. SALAMA is an autonomous, non-profit organization that was established in 1997 with the support of various donors. SALAMA finances all its activities from the resources generated by sales.

At the regional level, the district pharmaceutical depots are the intermediary points in the public sector supply chain. They are managed primarily by NGOs under a contract with the MoH

through the Department of Pharmacies, Laboratories and Traditional Medicine. The district pharmaceutical depot adds a 7% margin to its sales to the health facility pharmacies.

The health facilities can use the money they generate as part of the cost recovery process to make additional purchases from SALAMA (and this is usually the only option available once they have exhausted their line of credit). All medicines dispensed at public health facilities are sold at a margin of 35% of the SALAMA price which is used to purchase additional medications, contribute to the equity fund, support health facility environment maintenance, and maintain management of the community pharmaceutical depot.

The introduction of the free distribution of some antimalarial products through the public sector has resulted in alternative procurement and distribution channels for these products. The CRESAN Project, a principal recipient of the Global Fund Round 3 and 4 grants, and UNICEF have each procured ACTs, RDTs, ITNs, SP and/or laboratory equipment and distributed these to the district level as part of their donations or on behalf of other agents including PSI and Japanese International Cooperation Agency. UNICEF also contracts out the transportation of the products to the district level as needed.

As with the central level distribution, there are multiple channels for distributing antimalarial medicines and products at the district level. The free and donated antimalarial products are received and managed by the District Health Office while the products from SALAMA are managed by the district pharmaceutical depots. In both circumstances, CSBs are responsible for the actual collection and transportation of their supplies from the district level, thus limiting the quantities that most of them can transport at any one time as they mainly rely on public transportation.

In response to the multiple procurement and distribution strategies in use, the MoH, with support from UNICEF, established the health product integration project, PAIS (Programme d'Action pour l'Intégration des Intrants de Santé). The final version of the PAIS strategic plan, developed by a UNICEF-supported consultant, should be available by mid-2008. To assist with implementation, the MoH will recruit a UNICEF-funded technical person and administrative assistant.

Private sector: PSI has been the largest distributor of chloroquine and ITNs in the private sector and the community as part of its social marketing strategy. Chloroquine for children under five, marketed as PaluStop[®], has been phased out and replaced with the new AS/AQ product, ACTipal[®]. Highly-subsidized ACTipal[®] and LLINs are distributed to NGOs, private sector pharmacies, pharmacy depots, and private doctors through PSI-contracted pharmaceutical wholesalers. PaluStop was also available as an over-the-counter product in community shops. ACTipal has not been classified as an over-the-counter drug, so it will not be available in community shops. PSI determines the margins at which these items are sold to the consumers by these private providers.

There is also a small but active distribution system of antimalarials in the commercial private sector, particularly in urban areas. There are at least three local manufacturers who mostly import finished products for repackaging and sales, approximately 20-30 wholesalers, approximately

200 private pharmacies and approximately 2000 pharmacy depots. As of February 2007 the largest local manufacturer was producing chloroquine, amodiaquine, artesunate, AS/AQ, quinine and SP.

Quality Assurance: The *Direction de l'Agence de Medicament de Madagascar* (DAMM) is responsible for testing most pharmaceutical products destined for use in the country, and products already on the market. The DAMM is able to conduct tests of AS/AQ and conducts testing of most antimalarial pharmaceutical products on behalf of SALAMA and CRESAN, the two main agents currently procuring antimalarials in the country. The DAMM has established four peripheral minilabs and two additional sites are planned. Approximately 50 samples are analyzed at each minilab site per trimester.

Pharmacovigilance: In early 2006, Madagascar's national pharmacovigilance center and system were established. Since then, the center has developed its national strategy, developed a national adverse events reporting form, conducted a training of trainers workshop (with the assistance of the Moroccan pharmacovigilance center) and conducted trainings in four districts of the Atsinanana region (around Toamasina) which were coupled with the scheduled ACT trainings implemented by WHO/Madagascar and NMCP. In addition, a second pharmacovigilance focal person for the DAMM was hired and received training. The impetus for the development and establishment of an effective pharmacovigilance system has come from the NMCP as part of the introduction of the new treatment policy.

Progress to Date:

In the FY 2008 MOP, PMI provided support to strengthen the pharmaceutical and commodity management system. Prior to the release of FY08 funds, SPS and DELIVER undertook a joint mission to Madagascar to collect information, establish contacts in-country and develop work plans. Their participation will accelerate and strengthen the PAIS strategy for commodity management.

In 2006, 72 adverse events/adverse drug reactions (AEs/ADRs) were detected by the national pharmacovigilance center (which works in close collaboration with the NMCP), including 25 ADR reports on anti-malarial drugs. The pharmacovigilance center received 200 ADR reports in 2007 and it has been tasked to conduct active surveillance of adverse drug reactions to sulfadoxine/ pyrimethamine used in a pilot study for intermittent preventive treatment in infants (IPTi). This study is sponsored by UNICEF. The success of the PV program in Madagascar has fostered continuous South-to-South collaboration with other African countries seeking help and expertise from Madagascar's national pharmacovigilance center and the NMCP to learn from their experiences (e.g. Malawi, Rwanda).

Proposed Year 2 Activities: (\$600,000)

By initiating the health product integration project the MoH has taken on a major reorganization of the supply chain management system. PMI partners are in a position to support this important activity and offer leadership some aspects of this process. PMI will also provide support to

strengthen SALAMA's capacity to store, deliver and forecast commodity needs so as to ensure a steady supply of ACTs, SP, RDTs and other drugs and commodities.

Pharmaceutical and supply chain strengthening activities will also include end-use verification/monitoring of availability of key antimalarial commodities at the facility level. Specifically, this will entail regular supervisory/monitoring visits to a random sampling of health facilities and regional warehouses to detect and trigger further action on the following critical areas: ACT (or other drug) stockouts; expiration dates of ACTs at health facilities; leakage; anomalies in ACT use; and verifying quantification/ consumption assumptions.

1. *Support to the MoH pharmaceutical and commodity management system.* PMI will provide support to strengthen SALAMA's capacity to forecast, store, and distribute commodities, in particular ACTs, RDTs and LLINs. (\$500,000);
2. *Support to strengthen the national systems for drug quality control and pharmacovigilance.* PMI will support the DAMM to strengthen its capacity to perform frequent and rigorous testing of antimalarials, especially ACTs, in order to ensure high quality ACTs in health facilities and communities, and to strengthen and expand the national pharmacovigilance system. (\$100,000)

J. COMMUNITY-BASED INTERVENTIONS

Current Status:

Mobilizing traditional and religious community leaders and civic organizations to support and promote malaria prevention and control is critical for achievement of the national malaria strategy and PMI objectives. These include activities that promote the use of LLINs by pregnant women and children under five, correct prompt treatment of suspected malaria and antenatal clinic attendance for IPTp.

Through the Champion Commune program, the MoH, with NGOs and RBM partners, has established an innovative and effective community empowerment and mobilization program. This approach empowers the community to make positive changes that improve the overall health and well being of the population. The results have been comprehensive in scope, including improvements in immunization rates, pre-natal consultations, family planning, and reductions in diarrhea, pneumonia and malaria.

The Champion Commune approach is complemented by a comprehensive behavior and community norm change strategy that makes full use of a variety of information, education and communication channels. The MoH and RBM partners have recognized the need to establish a more harmonized IEC/BCC strategy for malaria prevention and control based on existing best practices. Partners currently use mass media, including radio shows, mobile videos with local actors and print materials for broad dissemination of key malaria prevention and treatment education messages.

To complement these mass media efforts, interpersonal communication and community-based behavior change interventions are implemented through NGOs and CHWs. CHWs work with local civic groups to implement malaria prevention education through participatory radio listening groups, skits and local drama, small group education sessions, mobile videos, and puppets, which are popular in Madagascar. CHWs can also be instrumental in getting pregnant women and women with children needing immunizations to visit the health center for ANC and EPI clinics and to receive a free ITN. These efforts have been limited to date because of the unreliability of ITN stocks at the public health centers.

The MoH, with support from UNICEF, BASICS and MCDI, piloted an integrated, community-level, child health intervention in 12 high prevalence districts. The intervention included treatment for malaria, pneumonia and diarrheal diseases by CHWs. This activity builds on the existing Champion Commune platform and has been adopted as a national strategy. The MoH goal is to complete training of CSB personnel in 50% of the 111 health districts by the end of 2008.

CHWs and NGOs help support the nationwide, biannual mother and child health weeks, which provide catch-up immunizations, vitamin A, deworming medicine and, at times, free ITNs for children under five years. The CHWs that distribute socially-marketed products are also responsible for educating local residents on ITNs and their use. These agents will also be responsible for educating care givers on prompt, correct treatment with ACT for children under five at the household level, and understanding the danger signs of severe malaria that will need treatment at the clinic. The MoH and partners are finalizing a community policy that will standardize the approach to community case management and community mobilization.

Progress to date:

With FY 07 plus-up funding, PMI supported the community mobilization and education components of the October 2007 Mother and Child Health week and integrated measles/malaria campaign. In collaboration with the American and Malagasy Red Cross, PMI supported training for 1,386 volunteers who in turn provided malaria prevention education and mobilized communities before, during and after the campaign in seven regions. PMI also supported the dissemination of malaria messages through national and local radios as well as through community agents. The IEC activities for the campaign included increasing understanding and knowledge of the dangers of contracting malaria and how to prevent it by sleeping under an ITN.

To implement community-based distribution of ACTs and to build on and scale-up the successful community Integrated Management of Childhood Illnesses and Champion Commune approaches, PMI worked closely with the NMCP and other RBM partners to develop a costed implementation plan that includes a budget for the rolling out of malaria community case management in 45 districts. With NMCP and partners, PMI supported a situation analysis of the different community malaria prevention and control approaches used by NGOs and a mapping of the communes where NGOs are active.

With FY 08 funding PMI will provide grants to NGOs and FBOs that already implement community health interventions in hard-to-reach rural communities. The grants will support

training and supervision of CHWs to improve and extend implementation of a package of interventions as well as ongoing community education and malaria prevention promotion. This will include community-based malaria treatment, ITN distribution and promotion of ANC attendance to receive IPTp and a free ITN.

Proposed Year 2 Activities: (\$1,500,000)

To ensure viability of the NGO interventions and the social marketing program, and to have broad national reach, PMI will continue its support to the malaria prevention and treatment communications campaign that is based on qualitative and quantitative research studies. The channels of communications are focused on rural areas and will include community-based interpersonal communications, mobile video unit activities and radio spots. In addition, PMI supported national level mass media and community IEC/BCC for increasing knowledge and enabling behaviors related to IPTp through ANC visits, and malaria case management at health facility and community levels. PMI will continue support for the NMCP's goal of implementation of community case management of malaria, pneumonia and diarrheal diseases in all districts with stable malaria transmission.

1. *Support for on-going IEC/BCC campaigns:* This will support the national and targeted mass media campaigns to promote ITN use and appropriate treatment. This will also support community-based mobile video activities, radio spots as well as promotional activities during national events such as World Malaria Day. PMI will support an integrated, national-level IEC/BCC strategy and, as indicated under other sections, funds listed here will also support IEC/BCC for IPTp and case management. TRAC surveys will be conducted in late 2008 and 2010 to measure the success and reach of the IEC/BCC interventions. (\$700,000);
2. *Support for specific IEC materials and job aids:* These tools will be targeted for NGOs, CSBs and CHWs. For example, the tools and materials might include something similar to the family planning invitation cards to encourage pregnant women to go to the health center for SP and her other prenatal care. This could also include easily understood counseling cards that would help CHWs provide correct information on treatment to care givers. This support could also extend malaria prevention and treatment messages and promotion through the existing “Ankoy” scouts program with a set of activities and materials. (\$300,000);
3. *Support for NGO grants to implement community-based interventions:* These grants will be principally for implementation of integrated, community-based delivery of treatment for malaria, pneumonia and diarrheal diseases in children under five years of age. (\$545,000)

K. MONITORING AND EVALUATION PLAN

Current Status:

In the context of malaria elimination, monitoring and evaluation has become a critical component of the national strategy requiring the establishment of a M&E system that would be integrated into the existing national health information system. Thus, the M&E strategy for malaria has been developed to facilitate the collection, analysis and quality assurance of data from health centers, partners, communities, sentinel sites, and household surveys.

As a key component of the M&E strategy, the NMCP will expand the 12 sentinel sites for epidemiological surveillance (PSSE) from the Central Highlands and the semi-arid southern region to the margins of the plateau and the West Coast first, then throughout the remainder of the country. This planned expansion incorporates the objectives of the former sentinel site system which collected RBM indicators (PSSI; *Postes Sentinelles de Surveillance des Indicateurs* 12 sites functioning until December 2006) in the zones with stable transmission. Although the single, unified surveillance system will serve the primary purpose of early detection, warning and response to an increase in malaria cases and threat of epidemics as malaria transmission is controlled, this surveillance system will also serve to collect indicators of malaria program impact and to provide intensive M&E support to the level of the CSBs. The NMCP strategy plans for a total of 66 sites in 44 districts (two per region) to be functional by 2010—the 12 currently existing PSSE sites are funded by GF Round 3 through 2008, 16 new sites will be developed with Global Fund Round 7 funds, and 16 will be funded by PMI.

Another complementary surveillance system developed by the *Direction des Urgences et de la Lutte contre les Maladies Transmissibles, Service de la Lutte contre les Maladies Emergentes et Ré-émergentes, Service de la Surveillance Epidémiologique*, the NMCP, and IPM is actively collecting data on fever cases from 13 sites. These sites use syndromic surveillance coupled with biologic confirmation to systematically classify all fever cases as a laboratory-confirmed malaria case, a suspected case of an outbreak-prone disease (i.e., arbovirus, influenza), or other fever. Supported by World Bank funding since March 2007, thirteen sites were established in CSBs representing the four epidemiological zones. Aggregate data of number of cases is transmitted daily to the central level from each site using short message service phone technology; patient level data including demographic information, clinical symptoms, RDT or thick blood smear results, and history of antimalarial treatment before clinical consultation are recorded on triplicate forms and sent to the central level on a weekly basis. Of note, some of these fever surveillance sites are also used in monitoring antimalarial resistance. Weekly feedback on reported data is provided by IPM to the sentinel sites, and a monthly newsletter summarizing the reported cases and trends is distributed to the MoH and partners. To summarize the aggregate data collected from April–December 2007, of the 55,140 outpatient cases evaluated at the 13 sites, 12% of consultations were for fever. Among the fever cases, 13% were laboratory confirmed as malaria cases, 20% suspected arboviral infections, and 17% suspected influenza cases. Promptness of reporting and quality of data appears to be good—the aggregate reports were received daily 96% of the time, and there was on average less than 5% of reports requiring correction of errors or episodes of interruption in activities.

Current data on coverage of malaria interventions and program indicators will be available this year from multiple sources. Compilation of malaria data reported through the routine national health information system has been completed with the assistance of a data manager financed by UNICEF—all submitted reports through 2007 have been entered into the central database. A

post-campaign survey of ITN ownership and usage was completed in May 2008 to assess the success of the integrated measles-malaria campaign conducted in October 2007. The 2008/2009 DHS, scheduled to begin in November 2008, will provide regional-level program information and anemia measurement, and will be followed by a verbal autopsy of deaths in children under five years that have been identified during the DHS. Also scheduled during the same period as the DHS, PSI will conduct its national survey, *Tracking Results Continuously*, which will measure a standard set of indicators assessing behavior/knowledge of risk-reducing behavior and exposure to social marketing (e.g., ITN usage and exposure to IEC radio spots). In early 2009, a malaria parasite prevalence survey, is planned and in 2011 a full *Malaria Indicator Survey* including parasitemia measurement is planned. These surveys will be supported by Global Fund Round 7.

The creation of a central M&E unit in the NMCP, consisting of one epidemiologist, one computer expert and an assistant will also be supported by Global Fund Round 7. The staff of the central M&E unit will train regional staff and create 22 regional M&E units that will assist in data collection and analysis. All sites will be equipped with computer equipment (desktop and printer), office equipment, and a motorcycle.

Progress to date:

The 2008 PMI plan supported the following activities which are currently underway: 1) support for the verbal autopsy component of the 2008/2009 DHS; 2) support for up to 16 sentinel sites within PSSE (former *Postes Sentinelles de Surveillance des Indicateurs RBM*; RBM Sentinel Surveillance Sites); 3) strengthening NMCP M&E capacity at central and district levels; and 4) support to a national workshop using the MESST in collaboration with the Global Fund occurring in June 2008. Since completion of the PMI Year 1 plan, supporting the malaria component of the fever surveillance sites has been included. The 13 original sites for fever surveillance will also be supported with year 1 funds in order to monitor the impact of malaria control interventions in their catchment areas; these sites present a unique opportunity since they have been systematically collecting data on all fever cases seen at the level of the CSB and testing for parasitemia. At the present time, both the PSSE and the fever surveillance sites provide useful, complementary information for malaria control; future coordination of both systems' sites and activities will allow for synergy between their individual contributions to malaria control and to epidemic early warning.

Proposed Year 2 activities: (\$575,000)

In Year 2 of PMI, continued strengthening of central-level as well as district-level M&E activities will be achieved through implementing the recommendations that result from the MESST workshop, and through continued support for sentinel surveillance sites which will provide data on malaria indicators and function as early warning sites for malaria epidemics. In addition to this, the extensive reach of the surveillance sites will essentially provide a structure for decentralized M&E supervision at the district level. This strategy will improve the quality and availability of the malaria-specific data collected at health facilities in order to better monitor progress and guide program decisions. Support for the fever surveillance sites at CSBs with possible expansion to include two hospitals will also continue; these sites will be coordinated

with the expansion and development of PSSE sites. The rationale for supporting both “sentinel site” systems is that the PSSE will provide the framework for decentralized supervision for M&E activities (these sites are now under development in the stable transmission zones and will require some time before they are fully functional) while the fever surveillance sites (functioning since March 2007) will provide complementary information on trends of confirmed malaria cases and other fever cases. Both systems will be coordinated, and the possibility of merging the systems in the future will need to be explored. Finally, coordination with other partners working on the control of other epidemic-prone infectious diseases will be actively pursued in order to leverage resources for the non-malaria components of the fever surveillance sites.

PMI will also provide support to the verbal autopsy, which is part of the 2008/2009 DHS.

1. *Continue support for 13 sentinel sites of the fever surveillance system* with possible expansion to two associated district or referral hospitals in order to monitor impact of program interventions on severe malaria within the same catchment areas as the CSB level sentinel sites; selection of hospital sites will be coordinated, and indicators will be harmonized between the fever surveillance sites and the PSSE. (\$250,000);
2. *Support strengthening of NMCP M&E capacity* through implementation of recommendations developed from the MESST workshop. (\$100,000);
3. *Continue support of PSSE activities* including increased frequency of supervisory visits to ensure complete and accurate data collection, additional trainings or refresher training to reinforce the analytic capacity at the district levels, equipment or supplies needed for data collection, and transportation support. (\$163,000);
4. *Provide support for the organization of the verbal autopsy* component of the DHS. (\$50,000);
5. *Technical assistance* to support strengthening NMCP M&E capacity: one CDC TDYs. (\$12,000)

L. EPIDEMIC PREVENTION, PREPAREDNESS, AND RESPONSE

Current Status:

The Central Highlands and the transition zones between the highlands and the coast are the areas where epidemics can occur in response to meteorological factors favoring transmission. In preparation for epidemics, medicines, insecticides, RDTs, and ITNs are pre-positioned at the regional level for deployment. The response using targeted IRS is based on surveillance information, altitude and monitoring of key entomological, environmental, and demographic variables. The response also uses mass treatment with AS/AQ distributed by CHWs in targeted areas. To illustrate the epidemic response in the Central Highlands, a recent outbreak of malaria cases was detected in the village of Marinarivo in late December of 2006. One week after the epidemic was confirmed, 2,500 doses of AS/AQ were given over a 17-20 day period to all children under five in the affected communities and to all household members of the cases.

Indoor residual spraying was not conducted during this outbreak, because the community had already been sprayed in early December, although this occurred later than programmed.

The PSSE will expand epidemiological surveillance into the semi-arid southern part and eventually nationwide to address the increasing risks of epidemics as prevalence falls. PMI will continue to provide support to increased supervision and training to improve the quality of data and improve the analytical capacity at the district levels to reduce response time to outbreaks. In addition PMI will support distribution of LLINs, prompt case management, and IEC to prevent and contain malaria epidemics. During emergencies related to cyclones and flooding, risk factors are assessed and interventions put in place to respond to the situation.

Proposed Year 2 activities: (No additional costs to PMI)

1. *PMI will support the early warning system for epidemic detection (PSSE) and PMI in-country staff will work with the NMCP and other partners to revise, update, and strengthen the national plan for epidemic prevention, preparedness and response. (Costs covered in Monitoring and Evaluation section)*
2. *PMI is prepared to support targeted IRS in response to an outbreak following the NMCP protocol. (Costs covered in the IRS section under the annual spray campaigns)*

M. HIV/AIDS AND MALARIA

The seroprevalence of HIV infections remains low in Madagascar at approximately 1%. Areas where integration has been pursued between the HIV/AIDS program and the NMCP include promoting adherence to universal precautions when taking blood samples, integrating pharmacovigilance activities, providing LLINs to people living with HIV/AIDS, and ensuring appropriate malaria prevention services at PMTCT (Prevention of Mother-to-Child Transmission) clinics. As in Year 1, PMI will continue to collaborate with the NMCP and other partners to maximize any potential area for synergy between the two programs.

N. CAPACITY BUILDING WITHIN NATIONAL MALARIA CONTROL PROGRAM

Current Status:

Although Madagascar has made many improvements in child health indicators, it still faces major health challenges, which threaten social and economic development. Health service quality is substantially below standard and basic medicines and supplies are regularly in short supply. Public and non-governmental sector capacity to plan effectively and manage health programs is weak, particularly in the areas of financial and administrative management, and the collection and use of data for program planning and monitoring. National health infrastructure, information and commodity management and logistics systems are extremely weak, and much remains to be done at central and regional levels to ensure sustainable health financing.

Proposed Year 2 activities: (No additional costs to PMI)

The three-year strategic plan for malaria prevention and control in Madagascar is designed to begin addressing the complex issues of long-term sustainability and building national capacity over time. With malaria program resources expanding rapidly, the NMCP must acquire adequate managerial and technical capacity to provide effective leadership and coordination within the MOH, with other Government ministries and with partners. In its first year of the NMCP strategic plan, PMI will contribute to this capacity building as follows:

1. *PMI will strengthen entomological capacity of the NMCP concerning entomological and insecticide resistance monitoring through trainings and supportive supervision. (Cost covered in IRS section);*
2. *PMI will provide support to the NMCP for training and supportive supervision of malaria case management and diagnosis activities at the central, regional and district levels. (Costs covered in Case Management section);*
3. *Strengthen the MoH pharmaceutical and commodity management system, including support to SALAMA's capacity to store, distribute and forecast commodity needs. Support will also be given to DAMM to strengthen the national drug quality control and pharmacovigilance systems. (Costs covered in Pharmaceutical and Commodity Management section);*
4. *The PMI will work with the NMCP, the Global Fund, and other partners to develop a single national malaria monitoring and evaluation plan to which all partners can contribute. PMI will support M&E activities through increased frequency of supervisory visits; additional trainings, and refresher training, to reinforce the analytic capacity at the central and district levels, and support for the development of a system to promote the centralization and warehousing of data (including surveys and program reports) gathered by various NGOs, implementing partners, and other donors. (Costs covered in Monitoring and Evaluation section).*

O. COMMUNICATION AND COORDINATION

Current Status:

Commitment to malaria elimination is evident at the highest levels of the GoM and this has helped foster strong coordination and communication among partners. The Global Fund Country Coordinating Mechanism and the Health Donors Group, which includes USAID and a representative of the MoH, meet on a monthly basis to discuss issues of mutual interest. In addition, the RBM Partnership is very active in Madagascar with meetings every two to three months. The President of Madagascar has established The Malaria Executive Secretariat (*Secretariat Executif de Lutte contre le Paludisme*) which is under the Secretariat General of MOH. The role of this office is to directly communicate with the Presidency on the malaria

activities and results. This will provide advocacy opportunities at the highest levels of government.

Progress to date:

During Year 1, the CDC and USAID PMI Advisor positions were filled. Combined with the two Malagasy employees, there are a total of four fully-funded PMI staff. The PMI Advisors will spend a significant amount of time at the NMCP, where they share an office with the WHO advisors. The PMI staff have been engaged with partners on key activities. This included development of the Global Fund Round 7 Malaria proposal, routine RBM meetings, and numerous *ad hoc* meetings with various partners. PMI provided financial support and worked with other partners to develop a framework and coordinate a malaria elimination conference in May 2008 that was attended by numerous international experts.

At the planning and implementation levels, PMI and other partners continue working together to effectively fill commodity and human resource gaps. PMI worked with others in USAID to ensure coordination of PMI-supported activities within the broader context of the health strategies of two new bilateral projects to be awarded in mid-2008.

In June 2008 PMI, in collaboration with Global Fund, supported a workshop to develop a costed national M&E plan for malaria. This plan lays out the NMCP needs and roles of major donors in achieving a coordinated national M&E strategy for malaria.

Proposed Year 2 activities: (No additional costs to PMI)

PMI, led by the PMI in-country team, will work closely with two new USAID bilateral projects and other health-related programs in Madagascar to provide integrated services at facility and community level. These will focus on childhood illnesses, but also include maternal, newborn and child survival programs, family planning, HIV/AIDS activities and others. These approaches will ensure the most cost-effective implementation of prevention and treatment measures.

To promote close coordination of the activities supported by PMI in Madagascar with the NMCP, office space has been negotiated with the NMCP that will allow the PMI advisors to spend a significant portion of their time working closely with the NMCP staff on program implementation, monitoring and evaluation.

1. *Continue to support coordination among national and international NGOs working on malaria in Madagascar (Costs covered in Community-Based Interventions).*

P. PUBLIC-PRIVATE PARTNERSHIPS

Current status:

Opportunities exist in Madagascar to collaborate in malaria control with private national industries or with international industries with in-country operations. Two prime examples of potential public-private partnerships are with QIT Minerals Madagascar (QMM--a subsidiary of Rio Tinto) and ExxonMobil. Investments by private companies to improve the health of their workers and their families have repeatedly been shown to be economically sound investments.

Other opportunities exist for collaboration with international private voluntary organizations and NGOs. Distribution of ITNs is a major area for this particular public-private partnership. PMI has partnered on ITN campaigns in several countries with Malaria No More, Regional Red Cross societies and other private sector partners.

Progress to date:

In October 2007 PMI provided support to a bednet campaign that distributed approximately 1,810,000 LLINs to families with children under five years of age in the West, South and North of Madagascar. Partners included Malaria No More, Canadian Red Cross, American Red Cross, UNICEF, Global Fund and others.

Proposed Year 2 Activities:

PMI will continue to discuss and plan with the NMCP and private sector partners the complementary activities and support to the national malaria control strategy that could result from the partnership. The activities supported by the private sector partners will be in line with the national strategy and should fill identified gaps.

1. *PMI will work with international and local companies in Madagascar to identify opportunities to provide cost-effective malaria interventions;*
2. *PMI has budgeted \$4 million to procure approximately 490,000 LLINs for distribution in a large scale campaign in the East of the country in October 2009. This activity will depend on a public-private partnership to reach a tentative goal of distributing approximately 1.2 million LLINs. (Costs covered in ITN section)*

Q. STAFFING AND ADMINISTRATION

Two new health professionals have been hired to oversee the PMI in Madagascar, one representing CDC and the other representing USAID. In addition, two Malagasy have been hired as Foreign Service Nationals to support the PMI team. All PMI staff members are part of a single inter-agency team led by the USAID Mission Director or his designee in country. The PMI team shares responsibility for development and implementation of PMI strategies and work plans, coordination with national authorities, management of collaborating agencies and supervision of day-to-day activities.

The two PMI professional staff work together and oversee all technical and administrative aspects of the PMI in Madagascar, including finalizing details of the project design,

implementing malaria prevention and treatment activities, monitoring and evaluation of outcomes and impact, and reporting of results. Both staff members report to the USAID Mission Director or his designee. The CDC staff person will be supervised by CDC, both technically and administratively. All technical activities will be undertaken in close coordination with the MoH/NMCP and other national and international partners, including the WHO, UNICEF, the Global Fund, World Bank and the private sector.

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

ANNEX 1

Tables

Table 2

**President's Malaria Initiative – Madagascar
Planned Obligations for FY09 (\$000)**

Activity	Overall budget	Commodity	Mechanisms	Geographic Area	Activity Details	Relation to Intervention
PREVENTION						
ITNs						
Procure LLINs for mass distribution	4,000	4,000	DELIVER	East Coast	Approximately 490,000 LLINs for mass distribution campaign October 2009; this will be done in partnership with other donors to provide all LLINs needed and a complete distribution package.	ITNs
Procure LLINs for social marketing	2,000	2,000	PSI	Nationwide	250,000 LLINs for social marketing; this includes distribution and promotion costs for highly subsidized LLINs.	ITNs
Procure LLINs for routine distribution	1,200	1,200	DELIVER	Nationwide	150,000 LLINs for routine distribution through CSBs; this includes distribution costs	ITNs

IPTp						
Strengthen implementation of IPTp	300	0	SanteNet Bilateral	Nationwide	Support to IPTp activities at the CSB level, along with implementation research such as providing job aids to increase IPTp participation	IPTp
IRS						
IRS campaign in the Central Highlands and TA to support GF spraying campaigns	3,000	1,350	RTI	Central Highlands	Spraying of 220,000 houses, storage for insecticides, training and salaries of sprayers, soak pits and progressive rinsing	IRS
Implementation of environmental assessment recommendations	1,000	0	RTI (subgrant to NMCP)	Central Highlands and West Coast	Insecticide resistance testing, sub-grant to local technical support	IRS
Environmental assessment of IRS	35	0	New Field Support Mechanism	Central Highlands	Independent evaluation of the environmental effects of IRS	IRS
Provide technical assistance to PMI IRS activities	25	0	CDC/IAA	Central Highlands	2 CDC TDYs to provide technical support for IRS	IRS
Subtotal Prevention	11,560	8,555				

DIAGNOSIS AND CASE MANAGEMENT

Diagnostics

Procure laboratory microscopy equipment and supplies	150	150	DELIVER	Nationwide	Provide needed microscopes and supplies including slides and reagents to improve diagnostics at the hospital level, specifically to the two hospital sites which will become sentinel sites.	Diagnostics
Implementation of the QA/QC system for microscopy and RDTs	450	0	SanteNet Bilateral	Nationwide	Continuation of QA/QC implementation based on IMaD activities from FY08; this will include training, RDT QA/QC, Microscopy QA/QC at the hospital and CSB level.	Diagnostics
Technical support for development and implementation of the QA/QC system for microscopy and RDTs	162	0	IMaD	Nationwide	Improve availability and usage of diagnostic testing, improve the link between laboratory services and case management	Diagnostics
Provide technical assistance for QA/QC activities	26	0	CDC/IAA	Nationwide	Two TDYs for CDC to provide technical support diagnostics	Diagnostics

Treatment						
Facilitate implementation and supervision of case management with ACTs at CSB level	300	0	SanteNet Bilateral	Nationwide	Provide support for training/refresher training and routine supervision of health workers at SCB level for appropriate use of ACTs.	Case Management
Technical assistance to support the roll out and supervision of ACT at the CSB	200	0	SPS	Nationwide	Provide technical support to ensure quality of implementation and supervision of delivery of ACTs in health facilities.	Case Management
Pharmaceutical and Commodity Management						
Strengthening the Pharmaceutical System	500	0	DELIVER	Nationwide	Strengthening the pharmaceutical management system, forecasting, management and distribution of pharmaceuticals and RDTs. Avoiding stockouts and ensuring that expired drugs are disposed of properly.	Case Management
Drug quality control and pharmacovigilance for antimalarials	100	0	USP	Nationwide	Support for drug quality control and pharmacovigilance activities	Case Management
Subtotal Case Management	1,888	150				

COMMUNITY-BASED INTERVENTIONS						
National and targeted mass media and community focused IEC/BCC campaigns to promote ITN use and appropriate treatment for malaria	700	0	PSI	Nationwide	IEC/BCC and LLIN promotion, including Africa Malaria Day events	CM, LLINs
Communication regarding treatment and prevention	300	0	C-CHANGE	Nationwide	Prevention, care, and treatment messaging and job aids	CM, LLINs, IPTp
Implement community-based interventions through NGOs/FBOs	545	0	SanteNet Bilateral	Nationwide	Support for NGO/FBO grants to implement community-based interventions	CM, LLINs, IPT
Subtotal Community-based Interventions	1,545	0				
MONITORING AND EVALUATION						
Sentinel Sites (fever surveillance system)	250	0	IPM	Nationwide	Support to 13 sentinel sites for malaria monitoring, maintaining a febrile database, amassing malaria outpatient data, and add two hospital sites to track severe malaria cases.	M&E

Implement recommendations from the MESST workshop	100	0	SanteNet Bilateral	Nationwide	Support strengthening of NMCP M&E capacity through implementation of MESST recommendations	M&E, Capacity building
Continue support of PSSE activities (epidemiological surveillance sites)	163	0	SanteNet Bilateral	Nationwide	Supportive supervision of increased frequency, additional trainings or refresher trainings to reinforce the analytic capacity, procurement of equipment or supplies as needed	M&E
Support to verbal autopsy	50	0	Measure Evaluation Phase III	Nationwide	Support to verbal autopsy as part of DHS survey	M&E
Technical Assistance for M&E	12	0	CDC/IAA	Nationwide	One TDYs for CDC to provide M&E technical assistance to the NMCP	M&E
Subtotal M&E	575	0				
IN-COUNTRY MANAGEMENT AND ADMINISTRATION						
In-country staff and administrative expenses	1,132	0	USAID/CDC	Nationwide	Salaries, benefits of in-country PMI staff, support staff, office equipment, and supplies	All interventions
Subtotal Admin	1,132	0				
GRAND TOTAL	16,700	8,700	Commodities represent 52% of total budget			

Table 3**Madagascar Year 2 (FY09) Estimated Budget Breakdown by Intervention (\$)**

Area	Commodities (%)	Other (%)	Total
Insecticide-treated Nets	7,200,000 (100%)	0	7,200,000 (100%)
Indoor Residual Spraying/vector control	1,350,000 (33%)	2,710,000(67%)	4,060,000 (100%)
Intermittent Preventive Treatment	0	300,000 (100%)	300,000 (100%)
Case Management	150,000 (8%)	1,738,000 (92%)	1,888,000 (100%)
Community based interventions	0	1,545,000 (100%)	1,545,000 (100%)
Monitoring and Evaluation	0	575,000 (100%)	575,000 (100%)
Administration	0	1,132,000 (100%)	1,132,000 (100%)
Total	8,700,000(52%)	8,000,000 (48%)	16,700,000 (100%)

Table 4**Year 2 (FY09) Budget Breakdown by Partner (\$000)**

Partner Organization	Geographic Area	Activity	Budget* \$(000)
C-CHANGE	Nationwide	Prevention, care and treatment messaging and job aids	300
CDC	Nationwide	TA support for various activities: IRS/ entomology, Diagnosis, M&E	63
DELIVER	Nationwide	Procurement of LLINs (for campaign and routine distribution) and diagnostic supplies; strengthen supply chain management/distribution systems	5,850
IMaD	Nationwide	Strengthen diagnostic capabilities; support development and implementation of technical guidelines regarding laboratory diagnosis (RDTs and microscopy), continue QA/QC activities started in Year 1	162
Institut Pasteur Madagascar	Nationwide	Continuation of sentinel sites activities funded by a USP pass through in Year 1	250
Measure Evaluation III	Nationwide	Support to Verbal Autopsy	50
New Field Support Project	Central Highlands	Activities to ensure environmental compliance during IRS operations	35
PSI	Nationwide	Procurement of LLINS for social marketing; implementation of community based interventions	2,700
RTI	Central Highlands	IRS spray campaigns in the Central Highlands; implement environmental upgrades	4,000
SanteNet	Nationwide	Support implementation of: IPTp, sentinel sites, strengthening NMCP monitoring and evaluation capabilities, rollout of ACT, community mobilization	1,858
SPS	Nationwide	Continued support to quality delivery of ACTs at all level within the health system	200
USP	Nationwide/Antananarivo	Continue to develop and expand the system of drug quality assurance and pharmacovigilance	100

* Staffing, administration and USAID/CDC Core TA not included