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PRESIDENT'S MALARIA INITIATIVE

Malaria Operational Plan – FY2011

MADAGASCAR

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ACRONYMS AND ABBREVIATIONS

ACT	Artemisinin-based combination therapy
AMFm	Affordable Medicines Facility-malaria
ANC	Antenatal care
AS/AQ	Artesunate-amodiaquine
CDC	Centers for Disease Control and Prevention
CHW	Community health worker
c-IMCI	Community Integrated Management of Childhood Illnesses
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
DOT	Directly observed therapy
FANC	Focused Antenatal Care
FBO	Faith-Based Organization
FY	Fiscal Year
Global Fund	The Global Fund to Fight AIDS, Tuberculosis and Malaria
GMP	Global Malaria Program
GoM	Government of Madagascar
HBMF	Home-based management of fever
HMIS	Health Management Information System
IEC/BCC	Information, education, communication/behavior change communication
IPM	<i>Institut Pasteur de 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 (Programme National de Lutte contre le Paludisme (PNLP))
NSA	Global Fund National Strategy Application
NTD	Neglected tropical disease
PAIS	<i>Programme d'Action pour l'Intégration des Intrants de Santé</i> (Health Product Integration Project)
PERSUAP	Pesticide Evaluation Report and Safer Use Action Plan
PMI	President's Malaria Initiative
PSI	Population Services International
PSSE	<i>Postes Sentinelles de Surveillance Epidémiologique</i> (Epidemiologic Sentinel Surveillance Sites)

QA/QC	Quality control/quality assurance
RBM	Roll Back Malaria
RCC	Rolling Continuation Channel
RDT	Rapid diagnostic test
RTI	Research Triangle International
SALAMA	Madagascar central medical stores
SP	Sulfadoxine-pyrimethamine
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USG	United States Government
WHO	World Health Organization

A. EXECUTIVE SUMMARY

Malaria prevention and control are major foreign assistance objectives of the U.S. Government (USG). In May 2009, President Barack Obama announced the Global Health Initiative (GHI), a six-year, comprehensive effort to reduce the burden of disease and promote healthy communities and families around the world. Through the GHI, the United States will invest \$63 billion over the next six years to help partner countries improve health outcomes, with a particular focus on improving the health of women, newborns, and children.

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

In December 2006 Madagascar's selection as a PMI country was announced, with full implementation beginning with FY 2008 funding. Malaria is a major health problem in Madagascar. The epidemiology of malaria varies considerably in different regions of the country. On the East Coast transmission is stable and perennial, and the West Coast has one long, rainy transmission season and a brief dry season. Almost one third of the Central Highlands is above 1,500 meters elevation, where malaria transmission rarely occurs. In the rest of the Central Highlands, however, transmission is seasonal and moderately unstable with occasional epidemics. The semi-desert South has highly seasonal transmission and is also vulnerable to epidemics. In the most recent large-scale epidemic in the late 1980s, an estimated 30,000 people died.

In recent years, Madagascar has been the recipient of several Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) grants: a Round 7, 5-year, \$69 million malaria grant signed in August 2008; a \$64 million Rolling Continuation Channel grant signed in October 2009; and a \$73 million Round 9 National Strategy Application for 2010 to 2012 is due to be signed in late 2010. In addition, Madagascar was selected as a pilot country for the Global Fund-managed Affordable Medicines Facility-malaria (AMFm). The United Nations Children's Fund (UNICEF) has played a major role in the prevention and treatment of malaria during pregnancy, the distribution of insecticide-treated nets (ITNs), and the implementation of integrated community case management of malaria, pneumonia and diarrheal diseases in children under five at the community level. The World Health Organization has been a major source of technical assistance to the *Programme National de Lutte Contre le Paludisme* (National Malaria Control Program; NMCP).

Following the political crisis and *coup d'état* in March 2009, all USG support to the current government, from the central Ministry of Health to the primary care health facility level, was suspended until a freely and fairly elected government is in place. The FY 2011 Malaria Operational Plan has been developed based on the assumption that normal relations will be established in the next year and current USG suspensions will end. Planning for FY 2011 was carried out in Madagascar in June 2010 and included representatives from USAID and CDC staff based in Washington, Atlanta, and Madagascar. The planning team met with implementing and international partners to better coordinate the USG activities targeting communities, the team also met with NMCP and other Government of Madagascar (GoM) personnel. The proposed FY 2011 PMI budget for Madagascar is \$28.8 million.

The suspension of direct collaboration with the GoM has impeded full application of the fundamental tenets of the GHI; nevertheless, over the past two years, PMI has focused support on the Madagascar national strategic plan for malaria, increased efficiencies through greater collaboration and programmatic integration with key partners; implementing woman- and girl-centered approaches through its community level programming; and improved and expanded the monitoring and evaluation of the program. The following major activities will be supported with FY 2011 funding:

Indoor residual spraying (IRS): In May 2008, an international conference to address the goal of elimination was held in Madagascar. Based on WHO principles and guidelines for malaria elimination, the new National Malaria Strategy calls for a continuation of IRS in the Central Highlands and Fringe districts, and an extension of IRS to the Western 'transition' zone and the South zone. The IRS goal is to spray at least 80% of targeted structures in 53 health districts (10.25 million inhabitants) for four years (one round/year). This will be followed by targeted IRS in high-risk districts identified using clinical data, backed up by an epidemic response system capable of rapid detection and response to outbreaks. In late 2009, PMI supported spraying in six districts protecting approximately 1.4 million inhabitants. With FY 2010 funds, PMI support has increased and the spraying in late 2010 will cover about 3 million inhabitants in 16 districts, accounting for approximately 30% of the total 53 districts targeted for spraying in 2010.

With FY 2011 funds, and in coordination with Global Fund-supported IRS activities, PMI will cover 13 of the 53 targeted districts and reach an estimated population of 2.6 million. PMI will continue its environmental mitigation measures, as well as expand its support for entomologic monitoring and evaluation.

Insecticide-treated nets (ITNs): PMI is supporting the Ministry of Health goal of universal coverage with two long-lasting ITNs (LLINs) per household in 91 of the 111 health districts where seasonal or perennial malaria transmission occurs. PMI supports free mass distribution campaigns to achieve equitable coverage as well as free routine distribution through antenatal care (ANC) and immunization clinics to pregnant women and children under five, and social marketing of highly subsidized ITNs at the community level.

In response to the GoM goal of universal coverage in all 91 malaria endemic districts by the end of 2010, PMI is supporting a rolling mass distribution campaign from November and December 2009 through November 2010. PMI's contribution of 3.6 million LLINs towards free mass distribution represents 49% of the nets needed to scale up to universal coverage by the end of 2010. Donor-coordinated mass distribution of LLINs in 2009-2010 is expected to increase the proportion of houses with two nets to over 80% and usage among pregnant women and children under five to over 85%.

With FY 2011 funding, PMI will procure approximately 1.8 million LLINs for free distribution in 2012 to replace those LLINs delivered to 19 districts in the East and Southeast, in 2009 as part of the universal campaign. Global Fund will support the distribution of additional LLINs through community-based social marketing and subsidized sales, as well as routine keep-up distribution in ANC and immunization clinics.

Intermittent preventive treatment of pregnant women (IPTp): IPTp using sulfadoxine-pyrimethamine (SP) was adopted as a national policy in late 2004 in the 91 districts where stable malaria transmission occurs. A column to record SP administration during ANC visits has been added to the ANC card and register. The 2008/2009 Demographic Health Survey (DHS) showed that 86% of pregnant women reported making two or more ANC visits. Despite this high rate of ANC attendance and relatively early attendance, the percentage of women in zones targeted for IPTp who reported receiving at least one dose of SP during an ANC clinic visit was only 15%, and only 8% reported receiving two or more doses. The causes for the poor uptake of IPTp are unclear. Because of the political constraints related to working with GoM since March 2009, PMI has focused the malaria in pregnancy efforts on IEC to promote early and frequent ANC clinic attendance and an improved understanding among the population of the benefits of IPTp for pregnant women. With FY 2011 funding, PMI will continue to support client-targeted IEC/BCC and will resume collaboration with the NMCP and the Division of Mother and Child Health to improve delivery of IPTp during ANC visits.

Case management: The NMCP policy requires that, where possible, all cases of malaria be diagnosed by microscopy or a rapid diagnostic test (RDT); however, only a fraction of suspected malaria cases in health facilities are properly diagnosed. PMI activities to improve diagnostics, supply chain management and case management at the health facility level were suspended in FY09 and FY10. The restrictions on work with the GoM and public health care system during the past two years resulted in greater investment by PMI in community-based interventions. PMI supported community-based treatment for malaria, pneumonia and diarrhea in communities more than five kilometers from the nearest health facility and has reached about one-third of those communities nationwide. To date, PMI has supported training of about 1,900 community health workers (CHWs) in community case management including use of RDTs for the diagnosis of malaria.

With FY 2011 funding, PMI will resume support to improve malaria laboratory diagnosis including procurement of laboratory equipment and supplies, and implementation of training,

quality control, and supervision of health workers, with a focus on primary health care facilities. All ACT needs for facility and community levels are expected to be met through 2012 by Global Fund grants and UNITAID donations. PMI will resume work with the NMCP to build capacity in critical areas of pharmaceutical management and monitoring drug quality. PMI will continue its support to the rollout ACTs and RDTs and training for integrated case-management of malaria, pneumonia and diarrheal diseases for health workers at facility and community levels.

IEC/BCC: PMI continues its support for the *Champion Commune* approach, which works with the MoH, NGOs and Roll Back Malaria partners to establish an innovative and effective community empowerment and mobilization program. This approach is comprehensive in scope, and program monitoring results indicate improvements in immunization rates, pre-natal consultations, family planning, and reductions in the prevalence of diarrhea, pneumonia and malaria. In addition, PMI supports a variety of IEC/BCC strategies to promote healthy behaviors. PMI partners 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.

In FY 2011, PMI will work with the NMCP and partners to strengthen IEC/BCC approaches for malaria prevention and treatment at the community level. This will include expansion of the *Champion Commune* approach, with a particular focus on an integrated community management of pneumonia, diarrheal diseases, and malaria. PMI will be a major contributor to IEC/BCC activities supporting the national LLIN campaigns. PMI will also collaborate with Peace Corps Volunteers on activities to improve treatment-seeking and prevention behaviors.

Monitoring and evaluation (M&E): The NMCP, with the support of PMI, Global Fund, and other partners, has developed a National Malaria M&E Strategy and Plan. PMI contributed to the nationwide 2008/2009 DHS and has continued support for fever surveillance at 15 sentinel sites through *Institut Pasteur Madagascar*. PMI has and will continue to provide support for planning of the 2011 Malaria Indicator Survey and is working with partners to strengthening M&E for community-based interventions.

With FY 2011 funding, PMI will strengthen M&E nationally by supporting expansion, improved reporting quality and timeliness of epidemic surveillance. PMI will also continue to support high quality data reporting of malaria indicators from the 15 sentinel sites and national integration of key malaria indicators into the Health Management Information System.

Health system strengthening: Because of restrictions on working directly with or supporting the government, PMI has not been able to address the issue of weak health systems in Madagascar since early 2009. Consistent with GHI principles, with FY 2011 funds, PMI will support the NMCP to improve implementation of the “Three Ones” principles (one national strategy, one coordinating body, and one M&E plan), which the revised National Malaria Strategic Plan identified as a major weakness of the NMCP. With FY 2011 funding, PMI and its partners will help build capacity in the public sector at national, district and health center levels through training and mentoring of local staff for improved diagnostics, case management, supply chain management, supervision, and collection and use of data to improve programming. PMI will also contribute to increased NMCP capacity by providing office and computer equipment for the new NMCP headquarters, as well as equipping a new insectary.

B. INTRODUCTION

Global Health Initiative

Malaria prevention and control is a major foreign assistance objective of the U.S. Government (USG). In May 2009, President Barack Obama announced the Global Health Initiative (GHI), a six-year, comprehensive effort to reduce the burden of disease and promote healthy communities and families around the world. Through the GHI, the United States will invest \$63 billion over six years to help partner countries improve health outcomes, with a particular focus on improving the health of women, newborns and children. The GHI is a global commitment to invest in healthy and productive lives, building upon and expanding the USG's successes in addressing specific diseases and issues.

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

President's Malaria Initiative

The President's Malaria Initiative (PMI) is a core component of the GHI, along with HIV/AIDS, maternal and child health, and tuberculosis. The PMI was launched in June 2005 as a 5-year, \$1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions and reduce malaria-related mortality by 50% in 15 high-burden countries in sub-Saharan Africa. With passage of the 2008 Lantos-Hyde Act, funding for PMI has now been extended through FY 2014 and, as part of the GHI, the goal of the PMI is now to reduce malaria-related mortality by 70% in the original 15 countries by the end of 2015. This will be achieved by reaching 85% coverage of the most vulnerable groups — children under five years of age and pregnant women — with proven preventive and therapeutic interventions, including artemisinin-based combination therapies (ACTs), insecticide-treated nets (ITNs), intermittent preventive treatment of pregnant women (IPTp), and indoor residual spraying (IRS).

Madagascar was selected as a PMI focus country in 2006 and began activities in 2007. This FY 2011 Malaria Operational Plan presents a detailed implementation plan for the fourth year of PMI in Madagascar, based on the PMI Multi-Year Strategy and Plan and the National Malaria Control Program's (NMCP) National Strategic Plan. It was developed in consultation with the Madagascar NMCP, with participation of all national and international partners involved with malaria prevention and control in the country. The activities that PMI is proposing to support fit in well with the 2008-2012 National Malaria Control Strategy and build on investments made by PMI and other partners to improve and expand malaria-related services, including the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund) Rolling Continuation Channel (RCC) 4, Round 7 and National Strategy Application grants. This document briefly reviews the current status of malaria control policies and interventions

in Madagascar, describes progress to date, identifies challenges and unmet needs if the targets of the NMCP and PMI are to be achieved, and provides a description of planned FY2011 activities.

Due to the political crisis in Madagascar and the USG suspension in March 2009 of non-lifesaving assistance and direct support to the Government of Madagascar (GoM), the PMI team reprogrammed FY2010 funds from activities that would have required working with or engaging the GoM to activities using international and local non-government organizations as implementing partners. The FY 2011 MOP has been developed based on the assumption that suspension of USG assistance will be lifted within the next 12 months and by the time FY 2011 funding becomes available. Should the suspension not be lifted prior to implementation of Year 4 activities, most of the planned activities involving direct support to the GoM will need to be reprogrammed along the lines of the FY10 reprogramming exercise.

C. MALARIA SITUATION IN MADAGASCAR

Madagascar has a population of approximately 20.3 million, 19% of whom are children under five years of age and an estimated 4.5% are pregnant women (INSTAT, 2010). One of the poorest countries in the world, the average per capita income in Madagascar is only \$471 (World Bank, 2008); 24% of the population 15-49 years old is illiterate; 68% of the population lives below the poverty line; and 50% of children under age five are malnourished (DHS 2008/2009). 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 63 years.

The last decade has witnessed marked health improvements in Madagascar, especially among children. According to the 2008/2009 Demographic and Health Survey (DHS), infant and child mortality fell from 159 per 1000 live births in 1997 to 72 per 1000 live births by 2008. Other determinants of child survival—such as morbidity and coverage of important health interventions—have improved significantly during this period. For instance, between 1997 and 2008, the prevalence of diarrhea in children decreased by about 70%, and respiratory infections by approximately 87% and the proportion of moderately or severely anemic children fell 59% between 1997 and 2008.

Figure 1: Madagascar



Despite 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 often 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, as is 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. A political crisis starting in January 2009 and culminating in a *coup d'état* on March 17, 2009, led to the suspension by the USG and many other partners of financial and technical assistance to the current transitional government. In addition, the overall government-financed health budget for FY 2009 was reduced by approximately 30%. This will have a significant impact on the overall health and malaria activities at every level of the public health system.

As a result of these actions, there have been delays in planned health policy reform, decreased supervisory and monitoring visits due to security issues and lack of funds, delayed data reporting, and interruptions in the supply chain of essential medicines down to the health facility level resulting in stock outs. The non-governmental sector has reported difficulties due to insecurity in the field and reduced capacity of the health sector at the decentralized level as a result of changes in personnel and delays in fund disbursements.

Administratively, Madagascar is divided into 22 regions, 111 health districts (119 administrative districts), 1,557 communes and 17,500 fokontany, which is the smallest administrative unit.

Malaria transmission and epidemiology

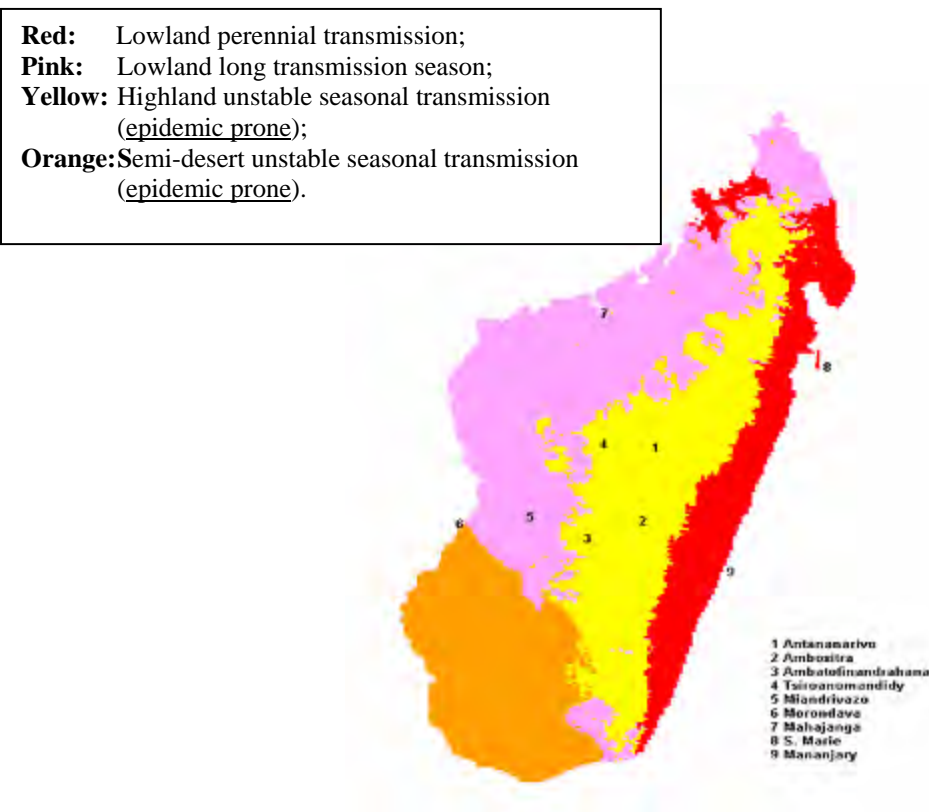
Malaria is endemic in 90% of Madagascar, however, the entire population is considered to be at risk for the disease. Reported malaria cases and deaths through the national HMIS system have shown decreasing trends in morbidity and mortality between 2003 and 2009. Overall, hospital deaths attributed to malaria decreased from 17% in 2003 to 6% in 2009 (SLP, April, 2010). In 2009, malaria was responsible for an estimated 4% of all reported outpatient visits and 14% of all children under five years of age admitted to a hospital were diagnosed with severe malaria (INSTAT, 2010). In spite of this, malaria remains 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 based on the length and intensity of malaria transmission: 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 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. The East Coast has perennial transmission and the West Coast has seasonal transmission (> 6 months) with decreased transmission in July and August. In both regions, immunity among adults is reported to be

high and most morbidity and mortality is among children under five and pregnant women. Almost one-third of the Central Highlands lies above 1,500 meters where malaria transmission tends not to occur or transmission is seasonal and unstable. In the semi-desert South, transmission is also seasonal but very unstable and in many years is almost absent. Immunity is limited in both the upper 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. The “fringe” districts of the Central Highlands are those areas between 800 m and 900 m of altitude that lie between the epidemic-prone areas of upper Central Highlands and the malaria endemic areas of the coasts.

Figure 2: Madagascar Malarionometric Stratification



All four species of human *Plasmodium* are endemic in Madagascar. While *Plasmodium falciparum* predominates in all areas, *P. vivax* and the 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 abundance 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 prefers to feed and rest indoors, it is quite sensitive to IRS. *Anopheles arabiensis* is also present in the highlands, but is more ecologically independent of humans and their domestic environment.

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). Since the beginning of the political crisis in 2009, several key partners have restrictions on working directly with the GoM resulting in major program cuts or significant changes in malaria specific support.

National Malaria Control Plan and Strategy

An International Conference entitled “Intensification of Malaria 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, and to accelerate the scale up of malaria prevention and case management activities. The NMCP subsequently revised its original 2007-2012 National Strategy to integrate recommendations from the conference and republished the revised strategy in early 2009 as the “National Malaria Strategy of Madagascar 2008-2012: from Control towards Elimination of Malaria.” This effort was led by the NMCP and local Roll Back Malaria in-country partners. PMI provided substantial technical support to those efforts.

Five key approaches of the revised 2008-2012 National Strategy include:

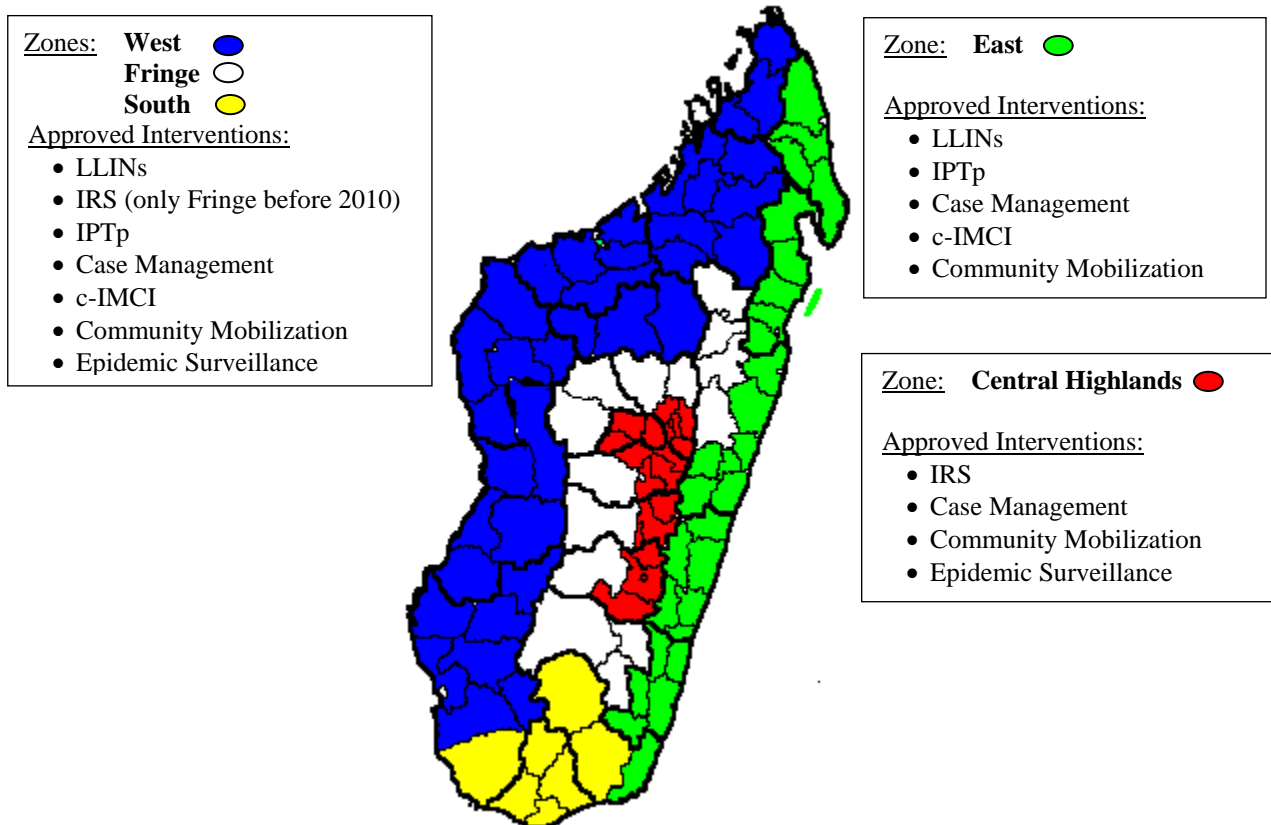
- Generalized IRS in the Central Highlands and surrounding districts, and fringe area, with extension to the South and West, for four consecutive years, followed by targeted IRS.
- Distribution of long-lasting insecticide-treated nets (LLINs) in all areas except the Central Highlands, employing the following strategies: “catch up” by free distribution of LLINs through mass campaigns to meet the national objective of two LLINs per household; “keep-up” through routine free distribution of LLINs to pregnant women as part of antenatal care (ANC) services and to infants during immunization visits; and social marketing of highly-subsidized LLINs to the population in general;
- IPTp in all areas except the 19 health districts of the Central Highlands.
- Improved case management in health facilities combined with increased use of rapid diagnostic tests (RDTs) nationally; and community-based treatment of fever with ACTs in areas of stable transmission
- Epidemic surveillance, detection and control in areas of low or unstable transmission

The strategy also emphasizes the need for comprehensive and effective information, education, communication and behavior change communication (IEC/BCC), monitoring and evaluation (M&E) and on-going drug resistance surveillance.

As shown in Figure 3, below, the revised national malaria control strategy divides the country into five operational zones: Central Highlands, Fringe, East Coast, West Coast and South. The interventions in the Central Highlands focus on IRS, case management, epidemic surveillance and community education. The interventions in the Fringe districts emphasize

IRS, LLIN distribution, IPTp, case management, home-based management of fever (HBMF), and community education. The interventions in the East and the West Coasts, with stable malaria transmission, focus primarily on LLIN distribution, case management, IPTp, HBMF, 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. To scale up prevention efforts towards pre-elimination in the highlands and Fringe districts as a medium-term goal, starting in 2010, IRS will be extended to the South and West coast districts bordering the Fringe. This will create a barrier around the central highlands and fringe districts, moving progressively from the lowest endemic to the highest endemic zones. As transmission drops, expansion of epidemic surveillance and response activities will follow accordingly.

Figure 3: National malaria control strategy interventions, by operational zone



Progress toward National Malaria Strategic targets

The *National Malaria Strategy of Madagascar 2008-2012: From Control toward Elimination of Malaria*, set ambitious targets for IRS and ITN coverage. With a population at risk of malaria of slightly over 20 million, the coverage targets for the control phase of Madagascar's strategic plan calls for reaching about 60% of the population at risk of malaria with both IRS and LLINs. Madagascar is on target to meet those goals in late 2010.

The mass LLIN distribution campaign scheduled for the fourth quarter of 2010 will reach the 72 targeted districts not covered in the November/December 2009 first phase and will achieve delivery of two LLINs to every household in endemic districts. Also in late 2010, generalized IRS will be carried out in the Central Highlands, the Fringe, adjacent districts in West and much of the South (see Figure 3), protecting approximately 10,250,000 with one annual spray round.

This level of IRS and LLIN coverage should produce dramatic reductions of malaria transmission in Madagascar. As the anticipated impact is achieved, the national strategic plan calls for moving from generalized to focalized IRS in 2012.

D. CURRENT STATUS OF MALARIA INDICATORS

The most recent DHS was carried out from November 2008 to August 2009 and provides baseline indicators for PMI in Madagascar. Child mortality was estimated at 72 per 1000 live births. Additional data, including routine malaria-specific HMIS data and malaria program data compiled by the NMCP, are reported and centrally stored in a national malaria database. Some national malaria indicators have been estimated based on these data and additional sources such as special studies and limited surveys.

Results of the 2008/2009 DHS showed that all bednet indicators have increased substantially since the 2003/2004 DHS. Nationally, ownership increased from 39% for one or more nets of any type in a household in 2003/2004 to 57% for ownership of at least one ITN per households in 2008/2009. Net use increased between these surveys from 36% of children under five sleeping under any bednet to 46% sleeping under an ITN the previous night, with a similar increase for pregnant women from 35% under any bednet to 46% under an ITN the previous night. Within the 91 districts that are targeted for ITNs, 72% of households had at least one ITN and 29% owned two or more ITNs. Use of an ITN the previous night in those districts was 58% of children under five and 57% of pregnant women.

The 2008/2009 DHS data showed that 90% of women who had a pregnancy in the two years had at least one ANC visit and 87% had two or more visits. Among the 92 targeted districts for IPTp, only 15% reported receiving at least one dose of SP during ANC visits and only 8.3% reported receiving two doses of SP. In contrast, facility-level data collected by the NMCP estimates that 68% of pregnant women attending at least one ANC visit received two doses of SP for IPTp during their pregnancy in 2009. However this data is based on partial reporting (district-level reporting completeness of 70%) and reflects information from health facilities regarding pregnant women who have access to ANC services.

ACTs were adopted as the first-line treatment for malaria in 2006. ACTs and RDTs were rolled out in public health facilities in 2006-2007, however, because of production and packaging delays, community-level ACTs for HBMF were only introduced in late 2008. The 2008/2009 DHS reports that only 0.4% of children with fever in the last two weeks received treatment with an ACT within 24 hours of fever onset.

Table 1: Madagascar malaria indicator estimates (2008/2009 DHS)

Indicator	National	Intervention Targeted Districts
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	0.4%	N/A
Proportion of households with at least one ITN	57%	72%
Proportion of children under 5 years old who slept under an ITN the previous night	46%	57%
Proportion of pregnant women who slept under an ITN the previous night	46%	57%
Proportion of women who received 2 or more doses of IPTp during their last pregnancy in the last 2 years ¹	6%	8%

E. EXPECTED RESULTS

The goal of the PMI is to reduce malaria-associated mortality by 70% compared to pre-initiative levels in the original PMI countries. By the end of 2012, 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.

Expected Results – FY 2011 (Year Four)**Prevention:**

1. PMI will have supported generalized IRS spraying in 13 districts, protecting a population of approximately 2.6 million people.

2. PMI will have procured and begun distribution of 1.7 million free LLINs to help maintain universal coverage in 19 districts on Madagascar's East Coast.
3. Using a simplified algorithm and clear, concise instructions for health facility staff involved with antenatal care, PMI and partners will retrain almost half of the staff at the *Centre de Santé de Base* (CSB) level in appropriate delivery of IPTp.

Case management:

1. With PMI support CSB staff in almost half of the 3,000 CSBs nationwide will have received refresher training and supervision for on diagnosis using RDTs and treatment with ACTs. ACTs needs will have been filled by Global Fund and other partners;
2. Home-based management of malaria will have been expanded to reach over 50% of all communes located more than five kilometers from a health facility nationwide, providing diagnosis with RDTs and treatment with an ACT to more than 35% of children under five with fever. This will be done as part of an integrated approach that will also provide treatment as needed for acute respiratory infections and diarrhea.

F. PREVENTION ACTIVITIES

Insecticide-treated nets (ITNs)

Background:

In May 2008, during an international conference to realign national malaria control strategies towards elimination, Madagascar's national strategy and goals for malaria control through 2012 were revised. The major strategic change regarding LLIN distribution was to scale up to universal coverage, defined currently in the National Strategy as two nets per household in all areas, except 20 (out of 111) health districts of the Central Highlands (leaving 91 of the 111 health districts targeted for universal ITN coverage). Madagascar has prioritized free LLIN distribution through mass campaigns as a key strategy in scaling up to universal coverage. In addition, three "keep up" strategies are supported, including routine distribution of free LLINs through ANC and EPI clinics targeting pregnant women and children under five, free targeted distribution to communities most affected by natural disasters, such as cyclones, and the sale of highly subsidized LLINs in urban and rural communities.

There is a culture of net use in Madagascar, high community awareness, and a high demand for ITNs. With approximately 30% of the Malagasy population living more than ten kilometers from a health facility, community and commercial distribution of highly-subsidized ITNs offers an alternative network for routine distribution. Madagascar's multi-pronged approach for ITN distribution is summarized below.

Table 2: Madagascar national ITN distribution strategies, by distribution method

Approach	Target Pop	Target Areas	Method	Current Donors
Mass distribution	Two LLINs/household in whole country except 20 districts in the Central Highlands (i.e., 91 of the 111 health districts)	Districts selected at time of campaign; goal is universal coverage in 91 health districts	Free of charge	Multiple, including PMI
Distribution in response to natural disasters and emergencies	People living in communities most affected by natural disasters, such as cyclones	Communities most affected by natural disasters such as cyclones	Free of charge	UNICEF
ANC and EPI clinic distribution	Pregnant women and children under five	Whole country except 20 districts in the Central Highlands (i.e., 91 of the 111 health districts)	Free of charge	Global Fund
Social marketing: communities	Pregnant women and children under five who can afford subsidized nets	Whole country except 20 districts of the Central Highlands (i.e., 91 of the 111 health districts)	Sold for about \$1.50 by community health workers	PMI and Global Fund
Social marketing: commercial	Those who can afford subsidized nets	Urban centers	Sold for about ~\$1.50 in shops and markets	PMI and Global Fund

To fund its ambitious LLIN distribution goals, the GoM, with assistance from PSI and RBM, successfully submitted a \$64 million Rolling Continuation Channel (RCC) Grant proposal for Global Fund Round 4. The grant includes two large universal “catch up” LLIN campaigns, one each in 2009 and 2012, with support for free routine and subsidized sales of LLINs for “keep up” activities between the two mass campaigns. The grant’s original gap analysis was calculated based on LLIN needs for a “fill-in” campaign to achieve two LLINs per household assuming a 10% loss per year. After expert consultation with the Alliance for Malaria prevention, it soon became apparent that a “fill-in” campaign was technically not feasible or cost-effective from a distribution standpoint. In addition, experts concluded that LLINs distributed in 2007 would likely no longer be effective by 2010 because of limited physical durability and low or undetectable levels of active insecticide.¹ RBM recalculated the gap analysis based on a universal coverage distribution to all households in the 91 targeted districts and sought additional funding from other donors, including PMI to fill the identified gap.

The GoM’s LLIN distribution strategy is moving forward and significant numbers of LLINs are reaching priority communities throughout the country. Between 2008 and the end of

¹ Of note, Madagascar participated in a recent multi-country WHOPES evaluation of LLINs to assess efficacy, longevity and fabric integrity. Results from polyester nets collected from four sites in Madagascar under normal use conditions showed high insecticide decay, poor insecticide performance and were in poor physical condition (poor fabric integrity, very dirty despite > 15 washes reported by users) after three years. As a result, a maximum of three years is used as an estimate for net longevity modeling to establish the net gap.

2010, an estimated 9.1 million LLINs will have been distributed to communities throughout the priority 91 health districts in the country, as outlined in Table 3, below.

Table 3: Annual ITN Distribution in Madagascar, by year and method

Method	2008	2009	2010 ¹	Total
Mass Distribution	0	1,738,469 (1,000,000 PMI)	5,659,739 (2,605,000 PMI)	7,398,208
Routine and Emergencies	474,291	0	130,000	604,291
Social marketing	429,332	291,636	468,000	1,188,968
Total	903,623	2,030,105	6,257,739	9,191,467

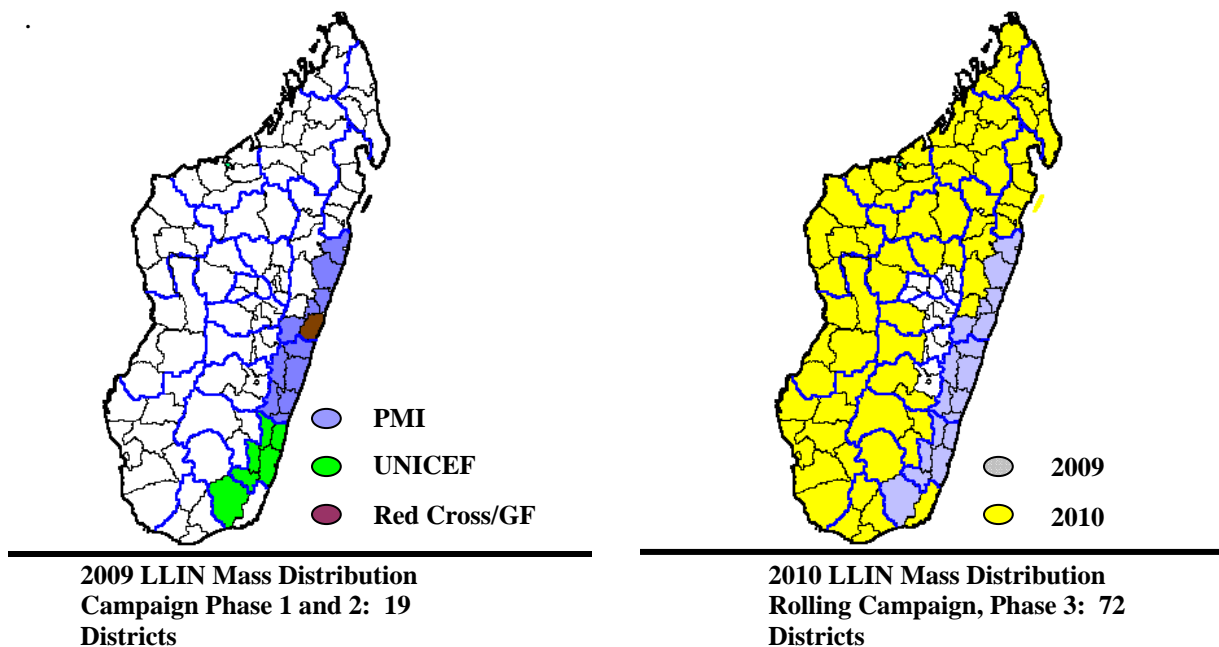
Notes:
1. Reflects the expected total distribution achieved by December 31, 2010, based on current estimates and plans.

Progress in the past 12 months:

Free distribution in “catch up” campaigns

As a result of the re-quantification of LLINs needed to reach universal coverage, in conjunction with the estimated lead times required to secure additional funding from other donors and to procure the number of nets needed, the first mass distribution campaign was planned and implemented in a phased roll out from November 2009 through the end of 2010. The first two phases of the campaign were implemented in November and December 2009, in 19 priority districts on the East coast that were not covered in the 2007 campaign. Over 1.7 million LLINs were distributed before the beginning of the 2010 rainy season. A separate LLIN distribution in the district island of Ile St. Marie occurred in March 2010 through a special project with financing from Monaco and a supplemental contribution of nets from the Global Fund RCC4 grant to scale up to universal coverage. A large third and final phase of the universal campaign for the remaining 71 districts is planned for September-October 2010. By the end of 2010, Madagascar aims to achieve universal ITN coverage of households in targeted districts, with ownership at two LLINs per targeted household. Figure 4, below, graphically presents the rolling distribution campaigns conducted in 2009 and planned in 2010.

Figure 4: Distribution of districts targeted for rolling ITN distribution campaigns, by year



To assist Madagascar to successfully scale up to universal coverage, PMI procured approximately 1 million LLINs to support the first two phases of the rolling mass distribution campaign in 2009. In addition, in 2010 PMI has procured a total of 2,585,000 to support the third and final phase of the rolling universal coverage mass campaign; these nets will be distributed in the campaign currently scheduled for September-October, 2010. PMI has provided substantial training, logistics and IEC/BCC support for this campaign, which is the largest free mass distribution of LLINs ever organized in Madagascar. To understand the outcomes of the universal coverage distribution strategy and goal, a post-campaign evaluation was conducted among the 19 districts that received LLINs in 2009 during the first two phases of the campaign. This survey analyzed the results of the campaign on ownership and use during the rainy season, post-distribution. Preliminary results show high levels of ownership and use: 74.2% of households reported owning at least two LLINs and 84.2% of all persons reported sleeping under a net the night before the survey.

In addition to the post-campaign survey, the national coordination committee, through quality supervision, monitoring, and evaluation, identified several campaign problems encountered when rolling out Phase 1 and 2, while also identifying practical and critical solutions. These lessons learned have been used to revise the methodology for the Phase 3 campaign.

The overall results of the LLIN campaign will be evaluated as part of the Malaria Indicator Survey (MIS) 2011 which is planned during the high transmission season, with data collection from mid-March through mid-May 2011.

Information, education, communication/behavior change communication:

PMI, through a partnership with PSI, aired radio spots, displayed mobile cinema shows at the community level and disseminated posters to CSBs and CHWs promoting use of LLINs with educational and promotional messages. PMI also educated CHWs through SanteNet2 community-based activities to promote LLIN use among pregnant women and children under five years old.

Proposed FY 2011 activities: (\$11,593,874)

In analyzing the 2011 and 2012 ITN needs, it is clear that most of the available donor funding is focused on supporting the 2013 campaign to replace the nets being distributed in 2010. The ITN gap analysis, outlined in Table 4 below, documents that there remains a significant need to support the 2012 replacement campaign for the Phase 1 nets distributed in 2009. The gap is estimated based on the distribution of 1 ITN per 1.8 persons in the 19 replacement districts and an annual population growth of 2.8% per year. Note that previously documented gap analyses were based on two ITNs per household (as per the National Strategy).

Table 4: 2012 Universal ITN Coverage Gap Analysis

A. Total ITN replacement nets needed in 2012 to maintain universal coverage	2,752,904
B. Total ITNs distributed through free mass distribution UC campaigns in 2009 estimated to be functional at the end of 2012	0
C. Total ITNs needed to replace nets distributed in 2009	2,752,904
D. Estimated number of ITNs pledged for 2012 replacement campaign from other partners	100,000
E. PMI contribution for ITNs for 2012 replacement campaign	1,723,579
F. Total ITNs pledged for mass distribution in 2012 (D+E)	1,823,579
G. Remaining ITN gap to maintain universal coverage in 2012 (A-F)	929,325
Assumptions	
1. Universal coverage target will be revised to adopt the goal of 1 ITN per 2 persons (gap calculated based on an average distribution of 1 ITN per 1.8 persons)	
2. Total population: 21,444,187 in 2012	
3. 2012 population at risk of malaria who are targeted for receipt of LLIN intervention is 16,917,644 in 2012	

PMI continues to promote correct and consistent use of ITNs within priority populations and targeted communities. In 2009, PMI supported the development and airing of radio spots, displayed mobile cinema shows at the community level and disseminated posters to CSBs and CHWs promoting use of LLINs with educational and promotional messages. PMI also trained CHWs through USAID’s community-based projects to promote LLIN use among pregnant women and children under five years old.

PMI will continue its strong commitment and support for increased LLIN ownership and use in Madagascar. This approach ensures that universal coverage will be maintained and that continuous access to LLINs is provided to new cohorts of pregnant women and infants. The

FY 2011 strategy of support is based on the following assumptions and information from in-country partners:

- The 1.7 million LLINs distributed in 2009 to the first 19 districts covered in the first universal coverage campaign will be three years old and should be replaced by the end of 2012.
- The consensus of the NMCP and its partners that free mass distribution campaigns are successful in equitably boosting ITN ownership and use across the wealth quintiles.

Based on these assumptions and identified needs, the specific activities supported by PMI in FY 2011 include:

1. *Procure LLINs for the 2012 universal coverage campaign to maintain the universal coverage goal:* PMI will procure approximately 1.7 million LLINs in Year 4 to replace the nets distributed in the 19 Phase 1 and 2 districts. Other partners (Global Fund, UNICEF, Canadian Red Cross, etc.) will be sought to fund the remaining net gap to maintain universal coverage goals in the 2012 replacement campaign. (\$10,681,874)
2. *Support logistics, distribution, social mobilization, IEC/BCC and hang-up activities as part of the LLIN rolling campaign:* PMI will support the logistics, distribution, social mobilization, IEC/BCC and active hang-up activity needs associated with the 2012 mass distribution campaign. (\$850,000)
3. *Continuous monitoring of tagged LLINs distributed during the 2009 campaign:* Implement WHO recommendations to regularly monitor net life under field conditions by monitoring tagged nets that were distributed in the 2009 mass campaign. (\$50,000)
4. *Technical assistance to LLIN activities:* PMI will provide technical assistance for the supervision and monitoring and evaluation of the rolling campaign and to build local management and process evaluation capacity. One CDC TDY will be supported for this effort. (\$12,000)
5. *Provide support for implementation of national and targeted mass media and community focused IEC/BCC campaigns:* This activity will promote correct use of ITNs, communicate the risks and danger signs of malaria in children less than five years, and educate pregnant women about the benefits of prenatal care, including iron/folate, IPTp, and ITNs. (Costs covered in IEC/BCC section)
6. *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 the IEC/BCC section)

Indoor Residual Spraying

Background:

The National Malaria Strategy calls for implementation of insecticide-based control measures—universal coverage with either IRS and/or LLINs—in different geographic regions: IRS in the Highlands, the Fringe districts, with an extension to the Western ‘transition’ zone, and the epidemic prone South. Universal coverage of LLINs, as discussed in the previous section, will overlap with the districts slated to receive IRS as critical prevention interventions in all regions, except for the Highlands.

Beginning in 2008, Madagascar conducted the first year of a generalized IRS program (defined as spraying at least 80% of all targeted structures once per year) in 32 health districts, reaching a total of 7 million inhabitants in the Central Highlands and the Margin/Fringe zones. In line with the National Malaria Strategy of 2008-2012, generalized IRS will be implemented for four consecutive years in the Central Highlands, the Fringe, with extension to the South and West, to be followed by targeted IRS. As summarized in Table 5, generalized IRS coverage will transition by 2012 to focalized (targeted) IRS in the Central Highlands and Fringe. The NMCP will use focalized spraying in areas where: a) LLIN coverage is low; b) there is evidence of high vector - pyrethroid resistance (a threat to LLIN efficacy that can be managed by IRS); and c) epidemics of malaria may occur so that IRS can be used to establish thresholds under the targeted approach.

In 2010, Madagascar added an additional 21 additional districts to its generalized IRS program (reaching an additional 3.25 million inhabitants in the South and West zones). These new districts will receive generalized spraying for the four years before they also transition to focalized spraying in 2014.

Resources for IRS in all districts are coming from a combination of partners, including: the Government of Madagascar, the Global Fund Round 7 grant, the Global Fund National Strategy Application grant, and the PMI. IRS program decisions (e.g., number of spray rounds, choice of insecticide and IRS impact) are made based on entomology indicators such as: duration of insecticidal effect, vector-insecticide resistance, vector density and mosquito taxonomy. The indicators and their measurements are described in the Madagascar Entomology Monitoring and Evaluation Plan, which is updated annually.

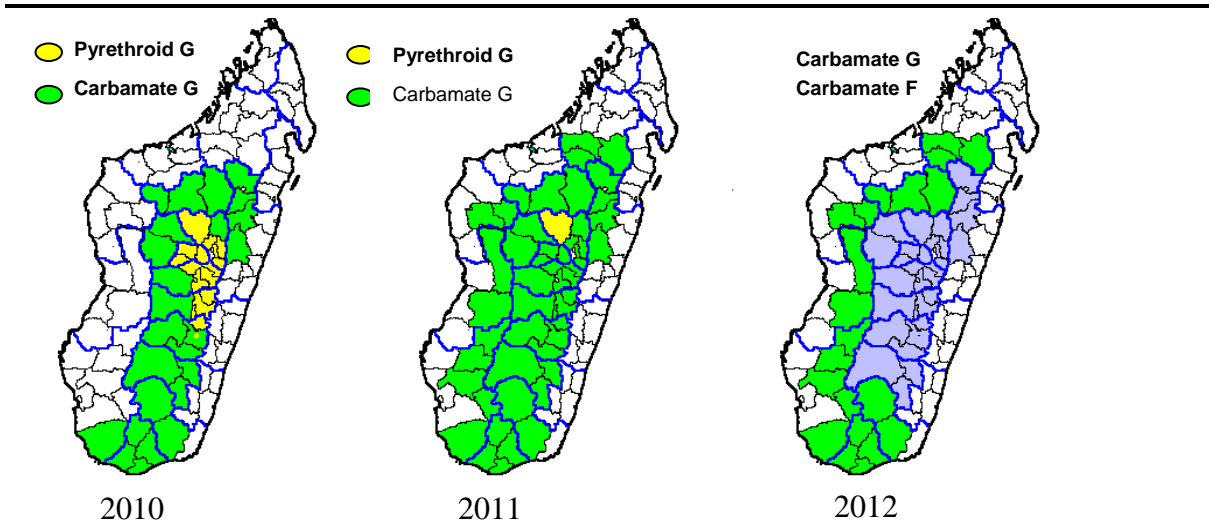
Table 5: Madagascar Strategic Plan for IRS Coverage, by year

Area/year	2008	2009	2010	2011¹	2012
Central Highlands	Generalized	Generalized	Generalized	Generalized	Focalized (targeted)
Margin/fringe areas	Generalized	Generalized	Generalized	Generalized	Focalized (targeted)
South/West	No IRS	No IRS	Generalized	Generalized	Generalized
Notes:					
1. If adequate M&E and entomologic monitoring suggest a fourth year of generalized spraying is not needed, the GoM will begin focalized spraying in 2011.					

Insecticide Resistance Management

As shown in Figure 5, below, the national IRS choice of insecticide strategy calls for a rotation of insecticides to effectively manage the threat of emerging vector resistance. Pyrethroids have been used for IRS in Madagascar over the past five years; this same class of insecticide is also used to treat the ITNs distributed in districts targeted to receive both interventions. Given the duration of use in IRS and the wide distribution of pyrethroids throughout the country, the national anti-vector sub-committee advised a change of insecticides for IRS starting in 2010. Therefore, the insecticide will be switched to carbamate insecticides for all IRS districts for the 2011 spray season, with two exceptions. Two districts, one in the Central Highlands and one in the Fringe, where there has been limited evidence of possible carbamate resistance, pyrethroid-based IRS will continue to be the primary anti-vector intervention. The NMCP will conduct on-going insecticide resistance monitoring to monitor levels of resistance for all districts receiving the IRS intervention.

Figure 5: IRS insecticide transition plans, by year and type of spraying (G=generalized; F=focalized)



PMI provides IRS technical, managerial, and operational support to the NMCP. The program creates an opportunity to promote IRS as part of a malaria vector control strategy in partnership with the NMCP and the Global Fund. Activities related to procurement, logistics, storage, training, and supervision, short-term technical assistance, IEC, M&E and environmental impact are envisioned to meet current and strategic objectives.

Since Madagascar includes extensive areas classified as ecologically sensitive, a Supplemental Environmental Assessment (SEA) for alpha-cypermethrin, the current IRS insecticide, was completed in 2007. An updated (SEA) for all approved pyrethroid insecticides was approved in 2009. Similar documentation for bendiocarb and the new IRS intervention areas was submitted and approved in 2010. The mitigation measures and conditions described in the SEA are supported by PMI, including insecticide chain-of-custody, disposal of used insecticide sachets, and post-IRS environmental assessments.

Epidemiological Monitoring

The NMCP's National Strategic Plan recognizes that as malaria interventions scale up, existing epidemiological patterns change and areas of perennial transmission may, over time, become more like epidemic-prone areas. Tracking the epidemiological patterns in priority areas receiving intensive prevention (IRS and LLIN) interventions is critical to ensuring an appropriate mixture of interventions suited for specific transmission patterns.

Sporozoite rate is used to estimate the entomological inoculation rate (EIR) which is the complement of the parasite prevalence from malaria surveys. EIRs provide important independent confirmation that changes in transmission are related to anti-vector interventions. Sporozoite rate assessment involves collection and testing of vectors with the ELISA (circum sporozoite--enzyme-linked immune sorbent assay) test. The second indicator, vector survival in response to IRS and LLINs, is assessed using traditional mosquito dissection methods to identify the proportion of older (epidemiologically important) females in a population. In addition to this assessment, technology to assess vector survival following entry into a house, protected by and ITN(s) or IRS, the hut trap, will be deployed to assess changes in vector resting and indoor biting behavior that occur in response to selection associated with IRS and LLINs. The hypothesis is that changes in transmission, indicated by estimated clinical cases (diagnostic data), should be reflected in entomology data (EIRs and proportion of 'older' females).

Progress in the past 12 months:

The 2010 IRS spray round, supported by all partners, is projected to protect approximately 10.25 million people in 53 districts. The program will be implemented from October-December 2010 with PMI supporting a total of 16 districts reaching approximately 3 million people. Table 6, below, summarizes the IRS activities for 2010 and 2011 by funding partner.

In 2009, PMI trained approximately 9,120 non-government personnel (administrative, operational, clinical, environmental staff and community health workers) in IRS operations. The investment in these individuals will contribute significantly to future rounds of spraying further reducing costs while increasing impact.

PMI, in accordance with the national strategy, supported IEC and social mobilization programs to sensitize communities before, during and after house spraying. PMI also supported the environmental mitigation measures as recommended in the SEA. Key activities included: establishing insecticide chain-of-custody and using adequate facilities for insecticide storage, preparation and use of soak pits, progressive rinsing of spraying equipment, adequate insecticide sachet disposal and a post IRS environmental assessment.

PMI has also supported entomologic monitoring and evaluation including a work plan and budget to cover collection of data to guide IRS decision making, for example insecticide resistance monitoring to inform insecticide selection and entomologic measures of IRS impact.

Table 6: Summary of Recent IRS activities, by year and funding partner

Year	No. of districts	Number of individuals targeted	Actual or (projected) percentage of districts covered, by funding partner		Actual coverage achieved in PMI spray areas
			PMI	GF Rd 7 or NSA	
2008/9	32	7,000,000	20%	80%	1,222,000 houses sprayed; 6.7 million people protected (>95% coverage) PMI supported generalized spraying in 6 health districts (1.4 million population) among the highlands and fringe districts.
2009	32	7,000,000	20%	80%	1,222,000 houses sprayed; 6.7 million people protected (>95% coverage); PMI supported generalized spraying in 6 health districts (1.4 million population) in the highlands and fringe districts.
2010	53	10,250,000	(30%)	(70%)	Not yet available
2011	53	10,250,000	(25%)	(75%)	Not yet available

Proposed FY 2011 activities: (\$7,437,126)

Within NMCP's strategy for IRS, and in partnership with the Global Fund (to achieve full coverage of the IRS targeted areas), in the 2011 spray round (October-November 2011), PMI will support generalized spraying in 13 health districts (six in the Central Highlands and Fringe districts, plus seven extension districts in the South) and will be available to support the purchase, transport, delivery and safe storage of insecticide, spray pumps, spare parts, and personal protective equipment, and to rent vehicles and storage facilities. Specific activities supported by the PMI in FY 2011 include:

1. *Support IRS in 13 districts as part of the national IRS campaign and strategy towards elimination:* PMI will partner with the NMCP and the Global Fund to support IRS in 2011. Costs include all components of IRS including procurement of insecticides, spray pumps and other logistics required for spray operation, necessary environmental assessments, monitoring, and IEC/BCC activities specific to IRS in 13 districts. To develop Madagascar's capacity to expand and sustain IRS operations, PMI will invest in capacity development of the public sector to provide appropriate supervision and oversight of IRS activities. GF will provide support for IRS in the remaining 40 targeted districts. (\$7,120,126)
2. *Entomological surveillance and monitoring:* PMI will continue building local entomological capacity by assisting the NMCP at the central level. The IRS implementing partner will be supported to conduct comprehensive IRS-related vector surveillance, assess resistance and other indicators of IRS impact: vector taxonomy and density, and insecticide decay rates. Indicators will be estimated on a monthly

- basis at four locations targeted for IRS/ITN campaigns in the FY11 plan; costs include training, field costs, procurement of equipment and sample analysis. (\$200,000)
3. *Routine programmatic monitoring of change in vector behavior following malaria program interventions:* Additional entomological monitoring in four sites including sporozoite rates, vector survival and hut trap assessments to identify a change in vector behavior following exposure to IRS and LLINs. PMI proposes two additional entomological monitoring activities at four sites (1 per epidemiological setting) to detect and effectively respond to such changes: sporozoite rates and vector survival. An implementing partner with existing capacity to do ELISA, vector control assessment and deploy the hut traps technology will carry out both activities. (\$80,000)
 4. *Environmental monitoring oversight:* An independent environmental monitoring oversight is key for monitoring and evaluation of safe use of insecticide used for the IRS program. (\$25,000)
 5. *Technical assistance to implement PMI IRS activities:* One CDC technical assistance visit will support IRS implementation and entomological monitoring especially for assistance with the added activity of sporozoite rate detection and vector survival. (\$12,000)
 6. One USAID technical assistance visit to support the IRS program will be conducted.. (Core funding)

Intermittent Preventive Treatment of Pregnant Women

Background:

As part of the national strategy to prevent and limit morbidity associated with malaria during pregnancy, IPTp has been implemented since 2004 in 92 lowland and coastal districts where malaria transmission is stable or seasonal. The remaining 20 districts in the Central Highlands, which are epidemic prone, are not targeted for this policy. The strategy includes the provision and promotion of LLIN usage during pregnancy, and early, effective IPTp, which are delivered as a package at the ANCs. The IPTp policy calls for two doses of SP taken at least one month apart; the first dose after quickening and the second dose one month later and both should be directly observed and free of charge. Starting in 2004, the MoH has trained health workers at the CSBs on the provision of IPTp and plans to extend the training to the private sector with the support of GFATM NSA funds. 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. All focused antenatal care activities (FANC), 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 malaria in pregnancy activities, including IPTp. The

NMCP has also revised the reporting form for the HMIS in order to monitor and capture the number of women who receive SP for IPTp.

The 2003/2004 DHS reported that 80% of women made one or more antenatal clinic visits, while in the latest 2008/2009 DHS, this percentage increased to 90%, with 86% making two or more visits. In addition, according to the latest DHS, the average month during pregnancy at which the women reported presenting to ANC for the first time was 4.8 months. Despite this very high rate of ANC attendance, and relatively early attendance during the course of the pregnancy, the percentage of women in zones targeted for IPTp (92 out of 111 health districts) who reported receiving at least one dose of SP during an ANC clinic visit was only 14.5%, and only 8.3% reported receiving two or more doses. It is unclear what obstacles are responsible for the poor uptake of IPTp, but lack of opportunity for delivery at ANC is not an issue. Because of the political constraints related to working with GoM since March 2009, PMI and other donors have not been able to support ANC services at the CSBs. As a result, inadequate supervision, lack of refresher training, staffing shortages, and stock-outs have been reported and these may be factors in limiting progress in IPTp implementation. In response to the reported low uptake of SP for IPTp, the NMCP is currently exploring ways to incorporate ANC outreach services in remote areas with poor access to health services.

In 2011, an estimated 1 million SP tablets are needed to treat approximately 549,000 pregnant women expected to attend ANC clinics in the 92 malaria endemic health districts. Global Fund will provide the entire SP need for IPTp from 2010-2012 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. Additionally, the GFATM NSA grant provides funding to introduce SP among private and NGO providers and purchase SP for this sector, though distribution strategies have not yet been identified.

It is national policy to treat malaria infections during pregnancy with quinine during the first trimester and with ACTs during the second and third trimesters; however, in reality, adherence to this national policy is highly variable.

The recurrent 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 LLINs and SP are continuously available at ANC clinics. Though health care providers at CSBs have been trained in IPTp, there is an urgent need for supervision and reinforcement of training both in IPTp and in treatment of malaria during pregnancy as part of FANC, especially as support to the CSB based activities has been limited over the past year. Furthermore, the pre-service training for medical and para-medical personnel is reportedly outdated and inaccurately caution against using SP during pregnancy. Lastly, continued support and training of CHWs is needed to promote demand for and utilization of prenatal services to maintain the high ANC attendance rates.

Progress in the past 12 months:

In Year 1 PMI supported activities to strengthen the implementation of IPTp as part of ANC services. This included: a desk review of existing reports, program data and program evaluations to identify barriers to IPTp uptake. The desk review was only partially completed and identified several early program implementation challenges based on an evaluation conducted in 2006: insufficient training of health care workers in malaria in pregnancy (MIP) (poor knowledge of the consequences of malaria during pregnancy and inadequate compliance with correct and complete administration of SP during ANC visits); stock-outs of SP in some health facilities, especially urban health facilities and overall inadequate SP uptake among women attending ANC visits (an estimated 42% for the first dose of IPTp and 35% for the second dose). The completion of the desk review, implementation of a workshop and training activities originally scheduled for mid-2009 were cancelled because of the USG suspension of support for all non-lifesaving assistance and direct support to the GoM. During Years 2 and 3, the scope of PMI activities shifted from implementation at the CSBs to specific IEC/BCC messaging in the communities to encourage adoption of MIP strategies and promote regular ANC attendance.

Proposed FY 2011 activities: (\$800,000)

The MoH has trained CSB staff and implemented IPTp delivery through ANC clinics in 92 districts (excluding the Central Highlands). Revision of reporting requirements and clinic registers to capture the number of women receiving two doses of SP has also been done. However, revised ANC registers and HMIS monthly reporting forms have not yet been widely distributed or used, and implementation of reporting requirements is incomplete. The CHWs, through a network of NGOs, play an important role in delivering key IEC/BCC messages. Other PMI countries have shown significant success in increasing uptake of IPTp and in some cases these have relied on simple, innovative approaches to improve health worker acceptance and buy-in for delivery of SP during ANC clinics. For example, PMI will work with the NMCP to adopt and adapt approaches that seem promising for the Madagascar setting.

For FY 2011 and 2012, all SP needs are met through funding from Global Fund. Specific activities to be supported by the PMI in FY2011 include:

1. *Strengthen implementation of IPTp at the central and district levels as part of Focused Antenatal Care:* PMI will support targeted technical assistance to the NMCP/MoH to implement best practices of increased IPTp uptake. This will include an assessment of current bottlenecks impeding the implementation of IPTp, especially the second dose, and review and revision of the pre-service curriculum at training institutions as needed. Lessons learned from other countries should be taken into consideration while developing innovative approaches to increase IPTp uptake in Madagascar. (\$300,000)
2. *Continue to strengthen implementation of IPTp and treatment of MIP as part of FANC at the CSB level:* PMI will support refresher trainings, integrated, supportive

supervision of ANC services, job aids, and quality monitoring and evaluation of IPTp and appropriate treatment or referral of MIP primarily focusing on public sector health facilities. In addition, PMI will support the implementation of the directly observed therapy (DOT) strategy for SP at health facilities. Training will be expanded to include private and civil society service providers to ensure that all health service providers are trained according to the national malaria control strategy for MIP. (\$500,000)

3. *Provide support for implementation of national and targeted mass media and community focused IEC/BCC campaigns:* PMI will support IEC/BCC activities focusing on early and frequent ANC attendance by pregnant women in order to prevent malaria in pregnancy. Messages will focus on nightly ITN use, IPTp and prevention of anemia. (*Costs covered in the IEC/BCC section*).

G. INTERVENTIONS — CASE MANAGEMENT

Malaria Diagnosis

Background:

The national policy on malaria diagnosis states that malaria cases should be confirmed by microscopy at hospitals, if possible, and by RDTs at CSBs and, recently, at the level of the community. Where this cannot be done, diagnosis should be based on clinical evaluation after all other causes of fever have been eliminated. Community-based treatment of malaria is currently being rolled-out nationwide as part of the integrated c-IMCI guidelines. As per the National Malaria Control Strategy, the use of RDTs by CHWs is being introduced as part of c-IMCI training. The PMI-supported diagnostic activities at the community level were able to continue during the political crisis, unlike the activities at the CSBs and hospitals.

Over the last five years, the NMCP has made a concerted effort to improve the availability and quality of malaria diagnostics. In 2007/08, 24 regional laboratory supervisors were hired to provide training and to perform quality control of the malaria slides in all 22 regions. Nationwide training of trainers and refresher trainings for laboratory technicians on microscopy were conducted in 2009. Financial support for the trainings was provided by Global Fund Round 7 and the African Development Bank. However, despite these efforts to improve microscopy at the district and referral hospitals, utilization of microscopy for the confirmation of malaria remains low.

Based on the results from a pilot study assessing the feasibility of the use of RDTs by CHWs, the NMCP decided to incorporate RDTs into the national strategy for CCM rollout in 2009. The NMCP began training and reinforcing supervision for RDTs at CSBs since 2005. At present, RDTs have been implemented in all public primary health care facilities with the supply of RDTs for the public sector financed by Global Fund Round 7. RDTs recently introduced for use at the community level by CHWs during the first quarter of 2010 and training and expansion of this activity is planned through the next year. RDT needs for the

NGO and faith-based clinics and community case management, however, have not been completely met.

A \$1 fee is currently charged for malaria microscopy at the hospitals to support its operations. Although this presents an obstacle to test utilization and many partners have advocated for the removal of this charge (and this may happen in the near future), it remains a source of financing for the health facility. The situation is different for RDTs which are free of charge to the patient. The NMCP began collecting average monthly consumption data in 2008 to more accurately estimate the number of RDTs needed for procurement and distribution. Consumption of RDTs was far below anticipated levels in 2008 and 2009. In 2009, there were less than 300,000 confirmed malaria cases reported by the NMCP and the number is expected to decrease as malaria prevention interventions are scaled up in 2010 and 2011. The table below shows that Global Fund Round 7 funding for RDTs from 2009 to 2012 will be more than adequate to cover expected health facility demands based on current consumption data. Estimated RDT needs shown in the table are conservative, assuming increased uptake and use of RDTs by health care workers (over double the current RDT consumption levels); these estimates do not include the needs at the community level or for NGO/faith-based providers.

Table 7: Estimated RDT supply for 2010 to 2012 at health facilities

	Year		
	2010	2011	2012
RDTs available Global Fun Round 7	1,723,950	1,455,890	1,436,202
Estimated RDT needs ¹	1,539,627	1,537,848	1,436,202
RDT Surplus/(GAP)	184,323	(81,958)	0
1. Conservative RDT needs estimated with RBM locally in April 2009; assumes increased uptake and use of RDTs with improved implementation of the national policy to test all suspect malaria cases			

RDT use by CHWs began scale-up in 2010. Based on early and limited consumption data, we estimate that each CHW trained in RDT use will require a starter pack of 40 RDTs and will use on average 12 RDTs per month for suspect malaria cases in children under 5 in their communities. We anticipate over 5800 CHWs in USAID supported programs will be regularly using RDTs to diagnose malaria by the end of 2011. Program data will be used to quantify monthly demand and to predict regular consumption and inform stock management. A quality assurance/quality control (QA/QC) system for microscopy has yet to be developed; however, regional supervisors do report on a quarterly basis on their quality control of slides at the District Hospital. Some financial support for microscopy supplies at the 63 *Centres Hospitaliers de District I* (District Hospitals – Level 1) has been included in Global Fund Round 7 grant.

Rolling out RDT use by CHWs in hard to access areas of the country poses several challenges, especially in ensuring that the large number of trained CHWs are providing quality services to the population they serve. PMI and its partners are addressing this in several ways. SanteNet2 (a USAID primary health care bilateral) manages this activity through a series of local partner NGOs. Each commune in which trained CHWs are active

organizes a monthly review meeting where achievement and challenges (mainly related to community based services) are discussed and data aggregated. These meetings with the CHW are organized by partner NGOs and community leaders with the head of the health facility acting as the technical supervisor; the partner NGO field worker aggregates the information. Quarterly supervision of the CHWs is carried out by local SanteNet2 recruited and trained independent supervisors in collaboration with primary care health facility staff. Through this mechanism, CHWs are subject to comprehensive supervision on a regular basis to improve and maintain quality. Finally, with FY10 funds, a quality control system will be developed and implemented (see below) to ensure correct and consistent use of RDTs by CHWs. This system will be further expanded in 2011.

Currently there is no system for ensuring the quality of RDT kits post-deployment. The *Institut Pasteur de Madagascar* (IPM) has developed a pilot system based on a repeat test during a supervisory visit using an RDT kit that has been stored under ideal conditions at IPM. A blood slide is made and examined for microscopic confirmation. The performance of CHWs using RDTs is also observed by the supervisor but because diagnosis and treatment of malaria by CHWs is only done in fokontany more than five kilometers from the nearest CSB, supervision presents a major challenge. PMI and partners are still working on innovative QA/QC methods at the community level. A routine QA/QC system for implementation of RDTs at the CSB level is also needed to ensure the accuracy of diagnostic test results when performed by the health care workers.

Progress in the past 12 months:

In 2008, PMI support to reinforce Madagascar's national strategy on malaria diagnostics began with a rapid laboratory assessment of a convenience sample of nine health facilities with microscopy capacity representing the Central Highlands and both coasts. The goal of the rapid assessment was to inform future training needs and to guide the development of a QA/QC system (including an external QA system). Findings indicated that health care workers were not following standard guidelines for the use of diagnostic tests, including not testing all suspect cases, treating patients with antimalarials despite negative test results and charging patients up to \$1 each for blood smear examination. In addition, no system exists for maintenance of laboratory equipment, available laboratory services are under-utilized, and data reporting is inconsistent and incomplete. To date, no evaluation of the use of RDTs in public health facilities or by community health workers has been conducted. An evaluation designed to assess the use and accuracy of RDT results at the level of the CSB was suspended following the USG prohibition on direct assistance to the GoM. PMI has been able to support the introduction of RDTs at the level of the community as part of the integrated c-IMCI. By the end of 2010, SanteNet2 will have trained approximately 2200 CHWs in 366 communes in the use of RDTs for malaria diagnosis as a part of c-IMCI. Almost all other FY 2008 to 2010 PMI activities to support and strengthen diagnostics at the health facilities have been suspended.

Proposed FY 2011 activities: (\$2,312,000)

In FY 2011, PMI will assist the NMCP in scaling up its strategy to increase malaria laboratory diagnostic capacity, ensure accuracy of test results, increase supervisory support to the districts through a decentralized structure, and support increased utilization of microscopy and RDTs. In particular, RDT needs for the NGO and faith-based sector (through a public-private collaboration with clinics that provide subsidized services) and for CCM, which are not yet covered by other donors, will be supported by PMI. PMI will support integrated training and supportive supervision at health facility and community levels to ensure both an accurate diagnosis of malaria and appropriate treatment based on the diagnostic results performed by health workers and CHWs. The plan for FY2011 will also include support for the development and implementation of the QA/QC system for microscopy and RDTs. Specific activities supported by PMI in FY 2011 include:

1. *Technical support for the continued development and implementation of the QA/QC policies and guidelines for microscopy and RDTs nationally:* Technical assistance and training will be provided at the central ministry level to improve availability and usage of diagnostic testing, strengthening the link between laboratory services and case management (improve ease of ordering a diagnostic test and using results to guide clinical management of suspect malaria cases), and addressing the practice/policy of charging for microscopy. Implementation of the previously planned RDT evaluation, including a probability sample of health facilities, will be used to assess use of RDTs by health workers under routine program conditions and will inform the development of the QA/QC system. (\$150,000)
2. *Implementation of the QA/QC system for microscopy and RDTs in hospitals and clinics:* This activity will include the translation of national policies and guidelines into a set of standards, procedures, supervisory tools, and will include training of supervisors or trainers, extension of lot quality testing for RDTs at the community level and district pharmaceutical depots, and reinforcement of logistics and human resources for these activities. Decentralize QA/QC to the district level. This activity will build upon and continue the activities conducted with FY08 funds before the interruption of the program during the political crisis. (\$425,000)
3. *Support for NMCP supervision of diagnostic activities:* Provide resources to the NMCP to oversee QA/QC activities for both microscopy and RDTs, conduct supervision visits and trainings, provide feedback, and collaborate with implementing partners. (\$75,000)
4. *Expand community-based case management using RDTs:* Expand to additional districts according to the national strategy, develop a streamlined M&E system to report confirmed cases to the local CSBs, to the district level and centrally to the NMCP. This activity includes subgrants to NGOs/FBOs. (\$500,000)
5. *Procure RDTs for community based case management of malaria in roll-out districts:* These funds will support the roll-out of integrated CCM in up to 800 communes with

- the provision of approximately 800,000 RDTs. This activity supplements support from GF Round 7 which provides RDTs for a portion of the districts targeted. The roll out of the CCM training and the uptake of RDTs by trained CHWs will be closely monitored to ensure that there are not excess RDTs entering the country. The delivery schedule of RDTs will be adjusted to reflect actual usage. (\$800,000)
6. *Procure RDTs to trained private sector/NGO providers:* With Global Fund NSA and Affordable Medicines Facility for malaria (AMFm) support, the NMCP will train private sector providers in the use of RDTs according to national policy. Funding from PMI will support provision of RDTs to the trained, qualified clinical providers who will provide the service (testing) free of charge. This activity will include strategies to improve case reporting from the private sector; the private sector/NGO providers will be incorporated into the QA/QC activities carried out at the district level. (\$350,000)
 7. *Provide technical assistance for QA/QC activities:* One CDC TDY to support implementation of national QA/QC system for microscopy and RDTs. (\$12,000)

Pharmaceutical and Commodity Management

Background:

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 districts. SALAMA is an autonomous, non-profit organization established in 1997 with the support of various donors. SALAMA finances all its activities from the resources generated by sales.

At the district 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 and sell to the health facility pharmacies. All medicines dispensed at public health facilities are sold with a mark-up of 35% of the SALAMA price.

The introduction of the free distribution of some malaria commodities through the public sector has resulted in alternative procurement and distribution channels to the district level for these products. There are also multiple channels for distributing antimalarial medicines and products within districts. 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 cases, CSBs are responsible for the 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 primarily 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, *Programme d'Action pour l'Intégration des Intrants de Santé* (PAIS), for which planning was completed

in 2008. However, since the political crisis began, little progress has been made in implementing this project.

An assessment of the national pharmaceutical management capacity in 2008 highlighted the following constraints: (1) lack of trained pharmacists in public pharmacies; (2) weak institutional capacity; (3) insufficient pharmaceutical policies and guidelines; (4) low capacity and inadequate human resources for pharmaceutical management in the health care system; (5) multiple vertical programs challenging integration and coordination; and (6) logistics and distribution challenges at the peripheral level.

PMI interventions have been aimed at addressing point (1) by supporting the *Institut National de Santé Publique et Communautaire* (INSPC) in pre-service training on pharmaceutical management; points (2), (3), (5) and (6) by strengthening the *Direction des Pharmacies, des Laboratoires et de la Médecine Traditionnelle* (DPLMT) pharmaceutical management capacity; and (4) through training and supervision of personnel. However, implementation of these activities was stopped in March 2009, as part of the USG suspension of support to the GoM.

Private sector: Highly-subsidized ACTIpal[®] (the socially-marketed ACT for under fives; ~\$0.5 per treatment) are distributed to CHWs through various NGOs, private sector pharmacies, pharmacy depots, and private doctors through PSI-contracted pharmaceutical wholesalers. 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 with at least three local manufacturers who import finished products for repackaging and sales, in addition to approximately 20-30 wholesalers, 200 private pharmacies and 2,000 pharmacy depots.

Quality Assurance: The *Direction de l'Agence de Medicament de Madagascar* (DAMM) which includes the national medicines quality control laboratory, is responsible for testing most pharmaceutical products destined for use in the country and products already on the market. The medicines quality monitoring program is designed to help the national drug authority, DAMM, to detect substandard and counterfeit medicines and take immediate action to remove such medicines from the market. The DAMM has established seven peripheral sentinel sites where samples of antimalarials are regularly collected and tested using minilab kits.

Pharmacovigilance: In early 2006, Madagascar's national pharmacovigilance center and system were established. 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 antimalarial treatment policy. Although ACTs are generally considered safe, routine surveillance should still be undertaken as some adverse effects may be very rare and only detected through long term surveillance. As fake antimalarials, and locally produced antimalarials are also common, pharmacovigilance and drug quality assurance are complementary and ensure a safe product. Since its inception, 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 the NMCP. Post marketing surveillance in addition to drug quality monitoring of pharmaceuticals remains an important activity in ensuring rational and safe drug use. Since its establishment, the national pharmacovigilance center has collected and analyzed adverse events reports from various health centers across Madagascar.

In 2008, PMI supported the DAMM and the University Hospital of Antananarivo (*Hôpital Joseph Ravohangy Andrianavalona*), to establish a drug information centre (*Centre d'Information sur les Médicaments et les Intoxications* or CIMINTOX). PMI supported the training of center staff by the Moroccan center of pharmacovigilance. The role of the drug information center is to provide information to health professionals and the public on the safety of pharmaceuticals and any other health care or household products which could cause side effects and/or poisoning and to disseminate such information frequently. However, implementation of these activities was stopped in March 2009, as part of the USG suspension of non-lifesaving assistance and support to the GoM. The AMFm project will also support pharmacovigilance training for over 1250 private and NGO sector health providers as part of integrated case management training through 2012.

Madagascar became the 94th full member of WHO's international pharmacovigilance program. As a member, Madagascar has access to valuable resources that will help the country to strengthen its pharmacovigilance system.

Progress in the past 12 months:

All of the envisioned activities designed to support the public sector pharmaceutical and commodity management were stopped in March 2009, as part of the USG suspension of non-lifesaving assistance and support to the GoM. As of June 2010, USG sanctions have not been lifted and PMI support for these activities has not yet resumed. The FY 2010 funding for these activities was reprogrammed into other activities.

Proposed FY 2011 activities: (\$550,000)

1. *Strengthening pharmaceutical and commodity management system:* PMI will resume support to SALAMA, Health Product Integration Project (PAIS), and the NMCP to strengthen the national pharmaceutical management system which includes forecasting, management and distribution of pharmaceuticals, LLINs and RDTs. The main objective is to prevent and eliminate stock-outs of malaria commodities and to ensure that expired drugs are disposed of properly. (\$350,000)
2. *End-use verification of malaria commodities:* PMI will conduct an end-use verification of the availability of key antimalarial commodities at the facility level. This will entail quarterly supervisory monitoring visits to a sample 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. (\$100,000)

3. *Support and improve drug quality control and pharmacovigilance:* PMI will provide targeted technical assistance to strengthen and expand the quality control and pharmacovigilance of publicly and privately sold antimalarials throughout Madagascar. (\$100,000)

Treatment

Background:

In 2005, artesunate/amodiaquine (AS/AQ) combination therapy was adopted as the first-line and artemether/lumefantrine (AL) as the second-line treatment for uncomplicated malaria in Madagascar. The national rollout of training for health facility workers on the new policies for malaria diagnostics and treatment with ACTs, as outlined in the 2005 *Politique Nationale de Lutte Contre le Paludisme a Madagascar* was completed in 2007. The policy calls for diagnostic testing in public health facilities for all suspected cases of malaria. In 2009, the MoH adopted the new National Community Health Policy (*Politique Nationale de Santé Communautaire*) which provides a framework for all community health workers and calls for the introduction and scale up of RDTs at community level. Both policies state that where biological diagnosis is not possible, patients at clinics and at community level should be treated based on clinical signs. In Madagascar, ACTs require a prescription for purchase, except where delivered by a CHW. However, regulation and enforcement of prescriptions for antimalarials are weak.

PSI and *Unité de gestion du projet* (Global Fund Round 7 Principal Recipient for public sector activity) have been the key distributors of antimalarials to community level with support from the Global Fund Round 3 and 7 grants and PMI. ACTs in the form of prepackaged blister packs of AS/AQ (ACTIpal[®]) were rolled out in October 2008 to replace chloroquine for treatment of children under five at the community level. The preference in Madagascar is to use the co-formulated AS/AQ in place of blister packs and this formulation will be procured and rolled out in 2010 once the current stock of blister packs are exhausted. Treatment with ACTs is free of charge in the public health facilities and ACTIpal[®] (furnished through UNITAID) is available through pharmacies, CHWs, and private facilities at the price of 100 Ariary (~ \$0.05) per treatment.

The 2008/2009 DHS ², which was conducted over a period of eight months and included both the low and high malaria transmission season, reported that 9% of children under five nationwide had a fever in the previous two weeks. Twenty percent of those reported being treated with an antimalarial for the fever but only 8% received an antimalarial the same day or the day following fever onset. Eleven percent received chloroquine, 6% quinine and only 1% received an ACT. The low reported use of ACTs has been attributed to the delayed introduction of ACTs used by CHWs at the community level, which coincided with the DHS

² Demographic Health Survey Madagascar 2008-2009

data collection. The use of ACT by children under five is undoubtedly significantly higher now.

Another household survey conducted in late 2008, sponsored by ACT Watch, showed that 90% of caregivers of children with fever sought treatment for the child's fever, with the first sources of treatment being pharmacies or drug shops (27%), public health facilities (20%), and grocery stores (17%)³. A complementary ACTwatch facility study⁴ found that 86% of public health facilities stock AS/AQ, but other antimalarials remain extremely common and non-artemisinin therapies, such as chloroquine and SP, were far more commonly stocked than AS/AQ across all types of public and private facilities.

ACT needs for the public sector in Madagascar, including distribution through CHWs at community level through 2012 have been covered under the Global Fund Round 3 and 7 grants, a large contribution from UNITAID and the Global Fund National Strategy Application grant. In the private sector, Madagascar is one of eleven countries selected as part of a pilot for the AMFm project. AMFm is designed to make ACTs more affordable primarily in the private sector by applying a subsidy at the level of purchase from the manufacturers that is available to vetted wholesalers in participating countries. To date, five wholesalers in Madagascar have signed agreements with AMFm. Through these wholesaler networks it is expected that subsidized ACTs will be available as early as September 2010 in pharmacies, private clinics and *dépositaires* or depots, officially sanctioned community pharmacies for delivery of essential drugs. The price for an adult treatment of the subsidized AS/AQ is expected to range between 500-900 Ariary (~\$0.25-\$0.45) per treatment. The AMFm project also includes training for private and NGO providers on the national policy for case management, including encouraging parantologic confirmation for all suspect malaria cases.

Because an estimated 30% of the population lives more than ten kilometers from the nearest health facility, the GoM adopted an integrated approach to community case management of malaria, pneumonia, and diarrheal diseases through CHWs. In January 2009 national guidelines on the implementation of Community Integrated Management of Childhood Illnesses (c-IMCI) was completed in an effort to standardize and guide activities. The national guidelines identify remote community sites for c-IMCI based on their distance from the nearest health facility (>5km) or isolation due to natural barriers (for example, an island or a river). The staff of the closest CSB is responsible for participating in the selection, training, and supervision of the CHWs. The c-IMCI guidelines were updated in late 2009 to include diagnosis of malaria suspect cases with RDTs.

Global Fund Round 3 and Round 7 grants provided initial support for the fever/malaria component of c-IMCI, implementing the activity through local and international NGOs. In 2008, with support from PMI, SanteNet2 (a USAID primary health care bilateral) began a scale up of c-IMCI to reach all fokontany that meet the MOH criteria in 800 communes.

³ ACT watch Evidence for Malaria Medicines Policy, Household Survey Report (Baseline) Madagascar 12/08 – 01/09

⁴ ACT watch Evidence for Malaria Medicines Policy, Outlet Survey Report (Baseline) Republic of Madagascar 11/08 – 01/09

This represents about half of all communes nationwide and will include 5,015 fokontany. Training for CHWs in all 5,015 targeted fokontany should be completed by mid-2011. The c-IMCI component is part of the broader *Champion Commune* approach used by SanteNet2, which builds on work by earlier USAID supported projects and has been an innovative and effective community mobilization approach. Using local NGOs, *Champion Communes* empowers the community to improve the overall health and well being of the population. In addition to training and equipping CHWs with therapy for malaria, pneumonia and diarrheal diseases, SanteNet2 will train and equip CHWs for malaria diagnosis using RDTs.

The Global Fund National Strategy Application agreement also includes plans for significant scale up of c-IMCI, as does a new USAID bilateral project. Coordination among these will be a key priority for the NMCP and PMI. Other major challenges for c-IMCI include: 1) ensuring a continuous supply of commodities, that is ACTs, RDTs, cotrimoxizol, and oral rehydration salts with zinc (cotrimoxizol and ORS are provided through other USAID MCH funds); 2) providing oversight and supervision of CHWs; and 3) establishing continuous information systems to inform managers, manage stock, and provide feedback to CHWs.

Severe malaria: Quinine is the treatment of choice for severe malaria. NMCP policies do not include a recommendation for pre-referral treatment. There have been several discussions at the national level of needed policy changes to ensure that diagnosis and treatment of severe malaria is free. The Global Fund National Strategy Application grant includes funds to support free treatment of severe malaria in health facilities. Implementation will depend on high-level approval from the GoM for the policy change to provide free services in hospitals. However, no significant progress has been made on the policy side to date. Confirmed cases of malaria in pregnant women are treated as severe malaria.

Progress in the past 12 months:

PMI has not engaged the public sector in the past year, but indications from earlier studies and discussions with NMCP staff suggest that, in spite of availability of ACTs in health facilities, there continue to be serious issues around the delivery of ACT in primary health care facilities. Possible causes include poor stock management, an unreliable supply chain, especially in remote areas, and a reluctance to treat with an ACT in situations where RDTs are not available.

The rollout of c-IMCI was slowed as a result of the *coup d'état* in March 2009 and subsequent suspension of USG support to the government of Madagascar. Key USAID and implementing partner staff were evacuated for four months and the community-based programs were obliged to devise alternate approaches for training, supervision and commodity supply to CHWs that do not rely on government workers or primary health care facilities. Essentially, it was necessary to create a parallel system but one that has been coordinated with the CSB staff, who remain the main point of oversight for the CHWs. Perhaps the most difficult issue has been establishing commodity resupply points for CHWs outside of the CSB. PMI and USAID implementing partner, PSI, established a system using wholesalers based at the commune level. To date about 15 of an eventual total of 250 community wholesalers have been trained and are deemed functional.

In spite of these difficulties, a total of slightly more than 600,000 doses of socially marketed ACTIpal[®] were distributed between December 2008 and November 2009. Of those, 137,280 went to CHWs and the balance to private pharmacies. By the end of 2010, SanteNet2 will have trained approximately 2200 CHWs in 366 communes in the use of RDTs for malaria diagnosis as a part of c-IMCI.

Proposed FY 2011 Activities: (\$1,837,000)

PMI will provide support in two critical areas: expanding and improving malaria case management at community level and in primary health care facilities. This will be done in an integrated fashion to also ensure appropriate treatment for two other major causes of childhood mortality, pneumonia and diarrheal diseases. Fortunately, there are other donors proposing significant support in these areas, particularly the Global Fund NSA. PMI will work closely with the NMCP to coordinate these activities to maximize effective use of funds.

Based on the ACT gap analysis summarized in Table 8, below, there is no projected gap for ACTs. PMI is therefore not proposing to support procuring ACTs with FY2011 funding.

Table 8: Madagascar ACT gap analysis, 2010-2012

	2010	2011	2012
Total ACT treatment doses needed at public health facilities ¹	419,912	247,113	210,046
Total ACT treatment doses needed for children under 5 at the community level	527,884	492,309	418,463
Total ACT treatment doses needed for the private and NGO sector ²	100,000	150,000	127,500
Total Annual ACT Treatment Need	1,047,796	889,422	756,009
Total projected procurement for all donors	1322000	1,395,923	916648
Annual ACT Treatment Gap	-274,204	-506,501	-160,639

Notes:

1. Estimated with RBM locally in April 2009

2. Reflects AMFm start-up in late 2010

Specific activities to be supported by PMI in FY2011 include:

1. *Implementation and supervision of case management with ACTs at the CSB/health facility level:* Provide support for training/refresher training and routine supervision of health workers at CSB level for appropriate use of RDTs and ACTs. (\$500,000)
2. *Implementation and on-going supervision of community case management of malaria with ACTs:* Provide support for training/refresher training and routine supervision of community health workers in current intervention areas. Support ACT supply chain and reporting of cases from the community level. Includes sub-grants to NGOs/FBOs. (\$500,000)
3. *Implementation and on-going supervision of community case management of malaria with ACTs:* Expand the community-based program into new intervention areas into approximately 200 hard-to-reach communes in the West and North of the country and provide support for training and routine supervision of community health workers. Support ACT supply chain and reporting of cases from the community level. Includes sub-grants to NGOs/FBOs. (\$750,000)
4. *Facilitative supervision by NMCP working in collaboration with SanteNet2:* Supervision by central, regional and district level NMCP staff to ensure rational use of ACTs. (\$75,000)
5. *Implementation of mass media and community focused IEC/BCC activities:* PMI will support IEC/BCC to promote prompt treatment seeking by caregivers for fever in children under five years of age. This will be a part of an integrated IEC/BCC program to address all PMI malaria activities. (Costs covered in IEC/BCC section)
6. *TA to support community case management of malaria:* One USAID TDY to provide technical support for community case management of malaria. (No additional cost to program)
7. *TA to support community case management of malaria:* One CDC TDY to provide technical support for community case management of malaria. (\$12,000)

H. ADVOCACY, COMMUNICATION AND SOCIAL MOBILIZATION

Background:

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 early and regular antenatal clinic attendance to ensure uptake of IPTp.

In 2009, the MoH adopted the new National Community Health Policy (*Politique Nationale de Santé Communautaire*) which provides a framework for working in community health. This document also validates the use of the *Champion Commune* approach for working with communities. 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 *Champion Commune* approach is reinforced by a comprehensive behavior and community norm change strategy that makes full use of a variety of IEC channels. Partners 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. The 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. Community health workers 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.

As described in more detail in the earlier sections of this operational plan, community health workers 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 of age. The CHWs that distribute socially-marketed products are also responsible for educating local residents on ITNs and their use, on the necessity of prompt, correct treatment with ACT for children under five at the household level, and to recognize the danger signs of severe malaria that require immediate treatment at the clinic.

The *Plan Stratégique National* for malaria cites the adoption of the *Politique Nationale de Santé Communautaire* as a key element in mobilizing communities but decries the lack of any mention of a sustainable motivational strategy to encourage retention of community health workers (community health workers are not paid).

The overall goals of PMI-supported communication activities are ultimately those of PMI as a whole: increased use of ITNs, prompt diagnosis and correct treatment of malaria in children under five, and increased uptake of IPTp. Attainment of these goals is measured using various tools including the DHS, MIS, and the TRaC surveys, as well as more targeted evaluations, such as the ITN post-campaign evaluation.

Progress during the last 12 months:

PMI's support for community based interventions was intensified in the aftermath of the March 2009 USG suspension of non-lifesaving assistance and support to the GoM. Consequently, SantéNet2 continued its expansion of the *Champion Commune* approach. As

part of the *Champion Commune* approach, SantéNet 2 and its partners are implementing a new monitoring and supervision system for CHWs that will utilize local-level *Comités de Développement Social*, whose objectives are to identify communities' health services needs and to monitor and supervise CHWs service provision. As discussed in earlier sections, the SantéNet2 project continues to train CHWs to provide and promote malaria prevention and treatment services in priority communities including c-IMCI, malaria case management and the use of RDTs for malaria diagnosis.

Between July 2009 and June 2010, PSI aired over 50,465 malaria radio spots and presented 347 mobile video unit shows. Most of these radio spots were to promote correct use of LLINs and to seek prompt and effective care for fever. Posters were developed and displayed in CSBs, at the house of community-based health agents and in villages to announce the upcoming visit of the mobile video unit team.

Proposed FY2011 Activities: (\$1,030,000)

PMI support to community mobilization activities will continue and expand to cover more of the country. The channels of communication will be focused on rural areas and will include community-based interpersonal communications, mobile video unit activities, and radio spots. In addition, PMI will support national level mass media and community IEC/BCC for increasing knowledge and enabling behaviors related to malaria prevention and treatment. PMI will continue support for the NMCP's goal to implement community case management of malaria, pneumonia and diarrheal diseases in all 91 districts outside the Central Highlands.

Specific activities to be funded by PMI in FY11 include:

1. *Strengthening the IEC/BCC capacity within the GoM and NMCP including campaign development and the production of materials for malaria prevention and case management:* PMI will strengthen the communications capacity within the MOH as a whole (in collaboration with other MCH funds) and at the NMCP specifically. PMI will contribute to the development of an integrated, cross-cutting campaign aimed at reducing child morbidity and mortality through greater awareness of IMCI services at the clinic and community levels. The activity will include the development and/or revision (as needed) of IEC/BCC support materials as well as job aids. PMI will support directly the NCMP in the development of targeted IEC/BCC campaigns and messages specifically related to malaria control activities (for example, bednet recycling and IRS campaigns). PMI will also continue to support an evaluation of the effectiveness of IEC/BCC activities in terms of knowledge and behavior change. (\$400,000)
2. *Implementation of national and targeted mass media and community focused IEC/BCC campaigns:* Production and placement of IEC/BCC materials for national mass media campaigns (including, for example, television and radio spots, billboards, point of sale material) and distribution of materials for use at the community level. These campaigns will be based on the national strategy and complementary to campaigns focused on government institutions and will target community case

- management in general as well as specific malaria activities including LLINs promoting ownership and use, uptake of IPTp, case management with RDTs and ACTs, and promotion of IRS. (\$400,000)
3. *Support implementation of community-based malaria activities through integrated CCM interventions with NGOs/FBOs:* Support for NGO/FBO grants to expand the implementation of community-based IEC/BCC interventions. (\$75,000)
 4. *Support expansion of implementation of community-based malaria activities to the West and North of the country through integrated CCM interventions with NGOs/FBOs:* Support for NGO/FBO grants to expand the implementation of community-based IEC/BCC interventions. (\$125,000)
 5. *Support to Peace Corps Volunteers:* Provide support for volunteers to promote malaria prevention and treatment seeking behaviors in their communities. Past experience shows that Peace Corps volunteer projects range from about \$500 to a maximum allowable amount of \$5,000. (\$30,000)

I. CAPACITY BUILDING AND HEALTH SYSTEM STRENGTHENING

Background:

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 for basic medical services and commodities are often 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. Much remains to be done at central and regional levels to ensure sustainable health financing.

The National Malaria Strategic Plan identifies the ineffective implementation of the “Three Ones” principles (one national strategy, one coordinating body and one M&E plan), as a major weakness of the NMCP in Madagascar. The plan recognizes that reaching the goal of elimination of malaria will require strengthening the NMCP, both in quantity and quality of human resources, at all levels of the health system. The plan further states that, as the coordinating body for malaria control interventions, the NMCP needs to “increase its capacity to plan, coordinate and monitor implementation of malaria control activities.”

Progress during last 12 months:

In Year 3, the planned direct activities to strengthen the capacity within the NMCP were suspended. Another major mechanism of capacity building at NMCP, continuous direct technical assistance from the in-country PMI team, was also limited because of the USG sanctions. In spite of this, the PMI team was able to strengthen the capacity of the overall malaria program within the country through its collaboration and coordination with all

partners through the RBM mechanism, especially related to planning of the IRS and LLIN distribution campaigns, and monitoring and evaluation.

Proposed FY 2011 activities: (\$150,000)

The National Malaria Strategic Plan recognizes the complex issues of long-term sustainability and building national capacity over time. With malaria program resources expanding rapidly, especially with the approval of the most recent Global Fund grant in 2010, 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. PMI and its partners will help to develop and improve capacity in the NMCP and the broader MoH through the activities described above for prevention, case management, epidemic surveillance, monitoring and evaluation. In addition, PMI will engage the NMCP and MoH to strengthen capacity in key cross-cutting areas, including supply chain management, communication for behavior change, monitoring and evaluation and epidemic preparedness. PMI interventions in these areas are designed to maximize the role of the MoH, with PMI and partners providing guidance as needed and resources to implement programs where MoH budgets fall short. To further strengthen the role of the NMCP, PMI will provide a direct grant to the NMCP to engage in facilitative supervision at the district and community levels to improve case management.

In addition, to directly strengthen the NMCP capacity, specific activities to be funded by PMI in FY11 include:

1. *Contribute to equipping the new NMCP headquarters building* (covering needs not met by other sources of funding) by fully equipping the insectary (dissecting microscope and tools, pipettes, bins, shelves, cages, trapping devices, humidifier) and laboratory (2 teaching microscopes, several Olympus microscopes, slides, reagents and other consumables), purchasing office supplies and computer equipment (this includes furniture and supplies for the PMI office at the headquarters building). (\$150,000)
2. *Provide support to NMCP for direct supervision of service providers* at the district and community levels to ensure quality diagnostics and rational use of ACTs. (*costs covered in the case management section*)

J. EPIDEMIC PREPAREDNESS AND RESPONSE

Background:

The Central Highlands, the transition zones between the highlands and the coast, and the South are the areas where epidemics can occur as a result of meteorological factors favoring transmission. In preparation for epidemics, ACTs, insecticides, RDTs, and ITNs are pre-positioned at the regional level for deployment. The decision to respond with targeted IRS is based on several factors including the malaria transmission season, recent spray history,

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, an 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 AS/AQ treatments had been distributed over a 17-20 day period to all children under five in the affected communities and to all household members with fever. Indoor residual spraying was not conducted during this outbreak, because the community had already been sprayed in early December.

The current epidemic surveillance monitoring system (*Postes Sentinelles de Surveillance or PSS*) was established in 1997 for 36 districts at risk for epidemics in the Central Highlands and South. This system has been enhanced and expanded with support from Global Fund Round 3 and supported 12 dedicated staff working at the district level to report district level suspected and confirmed malaria cases weekly in 36 high epidemic risk districts. District-level and central-level data bases are established and functional, reporting both suspect and confirmed malaria cases. Although data reporting is of variable quality from individual reporting health facilities, weekly reports are generated and analyzed. It is of superior quality, completeness and timeliness when compared to data from districts outside of the 36 epidemic risk districts which do not distinguish between confirmed and presumed malaria cases and rely on the general HMIS reporting system. The Global Fund Round 3 grant ended in late 2008 and the 12 dedicated staff were not paid and did not work for a period of approximately one year due to the delayed original signing of the GF Round 7 grant. Coverage of these posts resumed in late 2009 as planned during Year 2, Phase I of GF Round 7.

As the data from the PSS districts are substantially better than from districts without the dedicated staff and a dedicated malaria reporting system, the national strategy was revised to expand PSS coverage and staffing prioritizing districts that were at risk of becoming epidemic prone as a result of large scale prevention efforts (universal coverage with LLINs and generalized IRS). The NMCP strategy calls for a total of 65 PSS staff covering 102 districts to be functional by the end of 2012, prioritizing the IRS districts. With GF Round 7 funds, an additional 16 staff members were recruited to work in 16 new districts increasing the number of districts reporting and analyzing malaria data weekly, to 52 districts (previous 36 districts plus 16 additional new districts). As part of the MOP FY 2008 plan, PMI was planning to support the expansion by also adding 16 PSS staff covering 16 additional districts in 2009 and 2010 (bringing the total number of districts covered to 68). This expansion would have included both epidemic surveillance and general malaria surveillance aimed at improving quality and timeliness of routine malaria indicators. Terms of reference for local staff were developed for PMI districts and training planned when all activities were suspended as part of the US government response to the *coup d'état* in March 2009. No additional support could be planned for FY 2009 or FY 2010 because of the USG suspension of technical assistance to the government.

The national strategic plan aims to expand the number of districts and improve both epidemic detection and timely response, and data reporting on the number of confirmed malaria cases. Districts in areas of the expanded generalized IRS (West and South) will be prioritized, as

transmission is likely to decrease substantially making these areas more epidemic-prone in the coming years.

Proposed FY 2011 activities: (\$750,000)

PMI will assist the NMCP and other partners to revise, update, strengthen, implement the national plan for epidemic prevention, preparedness and response, and monitor progress. Although the overall national response will be monitored at the national level, the actual on-the-ground response will be implemented through district level teams given the difficult access in many areas of Madagascar. PMI will provide support to the PSS sites to increase supervision and training to improve the quality of data and the analytical capacity at the district level to enable rapid detection and response to outbreaks in the at-risk districts. In addition, PMI will support distribution of LLINs, targeted IRS, 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 as appropriate.

Specific activities to be funded by PMI in FY11 include:

1. *Support for strengthening epidemic surveillance, Postes Sentinelles de Surveillance:* PMI in-country staff will work with the NMCP and other partners to revise, update, strengthen, implement the national plan for epidemic prevention, preparedness and response, and monitor progress. Surveillance and epidemic preparedness will be reinforced by decentralizing surveillance, program supervision and data collection (including training, equipment, active data collection, cleaning and analysis, identifying alerts, and providing regular transport for supervision visits to CSBs) for 24 out of 52 at-risk districts. (\$250,000)
2. *Reinforce regional and district level response to epidemic alerts, investigation and mitigation:* Support for staff training, travel costs, district level meetings, and equipment and maintenance, including computers and software, pre-positioned IRS equipment; prioritizing the IRS targeted districts in the Highlands, Fringe, and South. Provide about \$10,000 per district per year. (\$500,000)
3. *PMI is prepared to support targeted IRS in response to an outbreak:* Following the NMCP protocol, PMI will assist with a rapid IRS response complimenting the response by the malaria program with LLINs and ACTs. (*Equipment and insecticide costs covered in the IRS section as part of the annual spray campaigns*)

K. COMMUNICATION/COORDINATION WITH OTHER PARTNERS

Background:

Commitment to malaria elimination is evident at the highest levels of the GoM. The Health Donors Group, which includes USAID, meets on a monthly basis to discuss issues of mutual interest. The Global Fund Country Coordinating Mechanism also meets monthly (and more

often as necessary). Before the USG sanctions, USAID played an active role in this group. Once normal relations between the USG and the GoM resume, it is expected that USAID will resume its strong participation in meetings at all levels.

The RBM Partnership continues to be strong. Good examples of this effective partnership include both the 2009-2010 IRS campaign and the 2009-2010 LLIN mass distribution campaign. These campaigns were supported by PMI and other partners in a harmonious manner and with good results.

Progress during last 12 months:

Within the USG restrictions of working with the GoM, PMI staff remain closely engaged with partners on key activities, especially in the planning and monitoring of malaria activities, such as the IRS campaign and the LLIN mass distribution campaign, and monitoring and evaluation activities. In addition, PMI staff continued to be active in coordinating bodies such as the RBM and fever sentinel surveillance coordinating group.

The new NMCP headquarters building, funded by the Principality of Monaco, was completed by early 2010. Although under current restrictions PMI staff may not occupy office space within GoM institutions, the NMCP has promised an office for PMI once the restrictions are lifted. PMI funds will be used to furnish that office.

At the planning and implementation levels, PMI and other partners continued 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. This coordination was extremely important for the large number of integrated activities implemented by the two USAID-funded bilateral projects: SanteNet2 and Social Marketing of Health Products. The PMI FSN Public Health Specialist acts as the Agreement Officer's Technical Representative of the Social Marketing of Health Products cooperative agreement. The PMI FSN Program assistant acts as the Alternate Agreement Officer's Technical Representative for this agreement.

Proposed FY2011 Activities: (No additional costs to PMI)

PMI, led by the PMI in-country team, will continue to work closely with the three USAID bilateral projects and other health-related programs in Madagascar to provide integrated services at facility and community level. The focus will be malaria and childhood illnesses, but also include integration with 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.

The PMI in-country team will continue to work closely with the NMCP and partners. The team will also continue to participate in coordination bodies and meetings. The PMI advisors will spend a significant portion of their time working closely with the NMCP staff on program implementation, monitoring and evaluation.

L. INTEGRATION WITH OTHER GLOBAL HEALTH INITIATIVE PROGRAMS

Since its launch in 2008, PMI/Madagascar has actively sought opportunities to collaborate with complementary USG health investments so as to ensure maximum impact for every health dollar the United States Government invests in the country. Currently, there are limited investments in the health sector from other USG agencies in Madagascar; however, PMI is collaborating with the following programs:

HIV/AIDS and Malaria: The seroprevalence of HIV infections remains about 1% in Madagascar. Areas where integration has been pursued between the HIV/AIDS and NMCP program 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 Prevention of Mother-to-Child Transmission (PMTCT) clinics. As in the previous three years, PMI will continue to coordinate with the NMCP and other partners to maximize any potential areas for synergy between the two programs, such as supply chain management or laboratories.

Neglected Tropical Diseases and Malaria: Madagascar is endemic for six of the seven diseases targeted for mass drug administration under the Neglected Tropical Disease (NTD) Program and five of these are widely prevalent in the country: lymphatic filariasis, schistosomiasis, and soil transmitted helminths (Ascaris, Trichuris, and hookworms). Trachoma is present but rare in Madagascar. Currently there is no USG NTD program in Madagascar; however, other partners have implemented large-scale campaigns to treat filariasis and schistosomiasis. PMI will work with the MoH to identify how best to integrate future NTD and PMI activities. PMI will also encourage its NGO partner organizations and others to apply for future funding from the USG NTD program.

M. MONITORING AND EVALUATION

Background:

In the context of malaria elimination, M&E has become a critical component of the national strategy requiring the establishment of an M&E system that is 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. A comprehensive National Monitoring and Evaluation Plan, 2008-2012, has been recently revised. The current M&E system for malaria is comprised of: 1) the national Health Management Information System (HMIS) which reports malaria cases and deaths monthly; 2) a malaria specific district-level surveillance system for epidemic-prone districts reporting and monitoring weekly confirmed malaria cases and deaths (described above); 3) an integrated fever sentinel surveillance system which provides highly accurate and rapid reporting of data from individual sentinel health facilities; and 4) population-based surveys. These data can be triangulated to assess progress in malaria prevention and case management. Additional M&E data are available, including insecticide resistance monitoring and residual insecticide testing; antimalarial drug

resistance conducted approximately every 2 years (in 2006, in 2008-9 and the next round of *in vivo* studies are planned in 2010-11 among 8 sentinel sites); and pharmacovigilance monitoring.

As a key component of the M&E strategy, the NMCP is expanding district-level epidemic surveillance known as the *Postes Sentinelles de Surveillance (PSS)*, that cover 36 high risk districts for from the Central Highlands and the semi-arid southern region, to the margins of the plateau and the West Coast, and then throughout the remainder of the country.⁵

A complementary fever surveillance system developed by the *Direction des Urgences et de la Lutte contre les Maladies Transmissibles*, the NMCP, and IPM is actively collecting data on fever cases from 26 sentinel CSB 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. In March 2007, thirteen sites were established in CSBs across four malaria epidemiological zones with support from World Bank. PMI began supporting these sites in Year 1 (FY08) and increased the number of sites to fifteen in April 2010 using Year 2 (FY09) funding. Aggregate data on the number of fever cases is transmitted daily to the central level from each site using short message service phone technology, including demographic information, clinical symptoms, RDT or thick blood smear results, and history of antimalarial treatment before clinical consultation. 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. Promptness of reporting and quality of data is very good, and the aggregate reports are received daily >95% of the time. On average, fewer than 5% of reports required correction of errors. In addition, reporting and analysis are comprehensive, timely and complete and provide trends of confirmed cases of malaria since 2007.

Several of the fever surveillance sites are also part of the network of IPM sites used in monitoring antimalarial resistance. First-line antimalarial drug (AS/AQ) efficacy monitoring is done every one to two years by IPM with funding provided by the Global Fund. The 2009 study conducted in Maevatanana showed 100% efficacy of AS/AQ with antimalarial drug efficacy monitoring continuing at two additional sites in 2010. In 2006, antimalarial drug efficacy monitoring was conducted for the last time on chloroquine (56% efficacy), sulphadoxine-pyrimethamine (96% efficacy) and amodiaquine monotherapy (98% efficacy).

Coverage data for malaria interventions and program indicators have been reported from several sources. Compilation of malaria data reported through the routine national health information system is completed with the assistance of a data manager financed by Global Fund Round 7. All submitted reports through 2008 have been entered into the central database and are available for use. The NMCP is developing a format for a periodic report of key indicators to be shared with all partners and has begun publishing regular periodic bulletins to share information. The creation of a central M&E unit in the NMCP, consisting of one epidemiologist, one computer expert and an assistant will be supported by the Global

⁵ For a full description of the PSS program, see page 47.

Fund Round 7 grant. 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, office equipment, and a motorcycle.

In 2010 Institut Pasteur de Madagascar established a demographic surveillance site to look at the impact of childhood diseases, specifically diarrhea, on under five mortality in four communes in the district of Moramanga with a population of approximately 124,131. This is also a geographic area where PMI and USAID, through SanteNet2, will be investing significant resources to fully scale up c-IMCI, including case management by community health workers (including use of RDTs and ACTs) by March 2011. PMI proposes investing in this system to monitor the health of this population longitudinally to provide essential information regarding the results of our community based health investments both in terms of access to correct and timely malaria treatment (our weakest indicator) over time and to provide a better estimate of child mortality.

Progress in the past 12 months:

As a result of suspension of activities with the GOM, most activities directly supporting M&E were reprogrammed to support other areas for FY 2009 and FY 2010. In spite of this, PMI continues to coordinate with the GOM to streamline investments in priority surveillance systems.

PMI continues to support the fever surveillance sites. In Year 1, PMI supported 13 fever sentinel sites and added two more sites in 2010 (using FY09 funds). These sites are managed by IPM, a non-governmental organization that has consistently and reliably conducted fever and malaria case reporting to PMI for 13 sentinel sites, and has begun to report treatment and IPTp indicators from 10 sites. IPM has funding from other donors and will expand their total number of functional sites to 33 by the end of 2012.

PSI also conducted its national 2008 TRaC survey which measured 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) and final results were disseminated in September 2009.

With the support of FY 2010 funds, PMI is currently planning the MIS scheduled for the rainy season (April-May 2011). The 2011 MIS will be co-funded by PMI and Global Fund RCC4 grant. PMI has organized planning meetings and preliminary survey design.

PMI also collaborated with WHO in the organization and data collection for the IMPACT evaluation and the evaluation mission reviewing the Global Malaria Program (GMP) country database.

PMI has built upon the experiences of IPM in Madagascar and those from other countries to introduce the use of RDTs at the community level and has developed a simplified M&E system of reporting confirmed malaria cases. To date, reports are incomplete – however, as

the system matures, this information will be available in a timely manner and used for forecasting both ACT and RDT needs at the community level.

Proposed FY 2011 activities: (\$842,000)

In Year 4, PMI will resume strengthening of central-level, as well as district-level, M&E activities by implementing several activities identified as recommendations in the MESST action plan that were not implemented largely because of the political crisis. This will include evaluating the actual status of the HMIS system for malaria data quality and completeness and revising HMIS data collection to include malaria diagnostic data and IPTp data. Although the HMIS is separate from the WHO/GMP database activity in Madagascar, a large part of the database is populated with data collected as a part of the HMIS. An evaluation of the GMP database in March 2010 recommended strengthening the HMIS to provide more timely, accurate and complete data to the GMP database. PMI will support both epidemic surveillance and sentinel surveillance through the PSS districts and fever sentinel surveillance, respectively, and both will provide data on malaria indicators and function as early warning sites for malaria epidemics. The extensive reach of the PSS surveillance sites will essentially provide a structure for decentralized M&E supervision at the district level as described above. This strategy will improve the quality and availability of the malaria-specific data collected at health facilities.

The rationale for supporting both “sentinel site” systems is that the PSS 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.

Specific M&E activities to be funded by PMI in FY11 include:

1. *Strengthen HMIS monitoring and evaluation system for malaria* by conducting a rapid evaluation of data quality, completeness, flexibility and operating characteristics concerning malaria specific data. Technical assistance to revise the HMIS data collection system to include malaria diagnostic and malaria in pregnancy indicators. (\$250,000)
2. *Continue support for 15 fever sentinel sites* to monitor impact of program interventions on severe malaria within the same catchment areas; indicators will be harmonized between the fever surveillance sites and the PSS. (\$350,000)

3. *Continue monitoring impact of CCM services:* support for the intensified ongoing monitoring of CCM within a DSS population (DSS), to measure impact of CCM activities, especially on under five mortality. (\$150,000)
4. *Strengthen epidemic surveillance and response* by actively supporting PSS in at least 25 districts to enhance supervision and ensure complete and accurate data collection, provide additional trainings or refresher training to reinforce the analytic capacity at the district level, equipment or supplies needed for data collection, and transportation support. Support the national scale up of epidemic response capacity with a focus on IRS districts (Central Highlands, Fringe, South and West). (*Cost covered in the Epidemic Surveillance and Response section*)
5. *Provide technical assistance to support national malaria M&E implementation, reporting and regular use of data:* including local technical assistance to support the maintenance of the national malaria GMP database, data quality monitoring, implementing regular reporting to RBM and more general audiences through M&E newsletters and other documents, and training to ensure that these capabilities are transferred to the PNLP. (\$80,000)
6. *Technical assistance* to support strengthening NMCP M&E capacity. One CDC TDYs will support the implementation of the 2011 MIS and sentinel site surveillance. (\$12,000)

N. STAFFING AND ADMINISTRATION

Background:

The PMI in-country team consists of the CDC and USAID PMI Advisors and two Malagasy staff, a Senior Public Health Specialist/Epidemiologist and a Program Management Assistant. The Senior Public Health Specialist is leaving Madagascar in September 2010 to become the PMI advisor in Liberia. His replacement is expected to be recruited by the end of FY 2010. The candidates for this position will be evaluated and interviewed jointly by USAID and CDC, and both agencies will be involved in hiring decisions; the final decision will be made by USAID.

All PMI staff members are part of a single inter-agency team led by the USAID HPN Officer who has been delegated that authority by the USAID Mission Director. The PMI team shares responsibility for development and implementation of PMI strategies and work plans, coordination with national authorities, management of collaborating agencies, and supervision of day-to-day activities. The two PMI Advisors work together and oversee all technical and administrative aspects of PMI in Madagascar, including finalizing details of project design, implementing malaria prevention and treatment activities, monitoring and evaluation of outcomes and impact, and reporting of results. Both advisors report to the USAID HPN Officer. The CDC advisor is supervised by CDC, both technically and administratively. All technical activities are undertaken in close coordination with the

MoH/NMCP and other national and international partners, including the WHO, UNICEF, the Global Fund, World Bank and the private sector.

Locally-hired staff to support PMI activities either in Ministries or in USAID are 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.

Proposed USG Component: (\$1,498,000)

1. In country PMI staff salaries, benefits, travel and other PMI administrative costs: Continued support for two PMI (CDC and USAID) Resident Advisors and FSN staff members to oversee activities supported by PMI in Madagascar. Additionally, these funds will support pooled USAID Madagascar Mission staff and mission-wide assistance from which PMI benefits. (\$1,498,000)

FY 2011 Planned Obligations Madagascar

Proposed Activity	Mechanism	Total Budget	Commodities	Geographic area	Description of Activity
ITNs					
Procure LLINs for the rolling campaign to reach the national goal of 2 LLINs per household	DELIVER	\$10,681,874	\$10,681,874	19 districts	To purchase nets for 2012 mass distribution campaign covering 19 districts (replacing nets which were distributed in 2009). Approximately 1.78 million nets at \$6 per net.
Campaign logistics pre-campaign	PSI	\$850,000	\$0	Targeted comparison districts	Logistics, distribution, social mobilization, IEC/BCC and active hang-up activity support associated with the 2012 mass distribution campaign. \$1.50 per net total. \$.50 programmed in FY11 MOP; remaining balance will be budgeted for in FY12 MOP.
Monitoring of longevity and durability of tagged nets distributed during 2009 mass campaign	PSI	\$50,000	\$0	19 districts from 2009 mass campaign	Implement WHO recommendations to assess net life under field conditions by monitoring tagged nets that were distributed in the 2009 mass campaign.
Technical assistance to PMI LLIN activities	USAID	\$0	\$0	Nationwide	Technical assistance for the 2010 rolling campaign (costs covered in core budget).
Technical assistance to PMI LLIN activities	CDC IAA	\$12,000	\$0	Nationwide	Technical assistance for supervision and monitoring of the LLIN campaign and build local capacity
Subtotal: ITNs		\$11,593,874	\$10,681,874		
IRS					
IRS in 13 health districts as part of the National IRS campaign and strategy towards elimination	IRS IQC	\$7,120,126	\$2,136,040	13 districts	Conduct IRS in 13 districts (procurement of insecticides, spray pumps and other logistics required for spray operation, necessary environmental assessments, monitoring, and IEC/BCC activities). PMI will also invest in capacity development of the public sector to provide appropriate supervision and oversight of IRS activities Two thirds of insecticide were covered in MOP10. GF will support IRS in the remaining targeted districts.
Entomological surveillance and monitoring	IRS IQC	\$200,000	\$0	4 sites within the 13 districts	Conduct comprehensive IRS-related vector surveillance, assess resistance and other indicators of IRS impact: vector taxonomy and density, and insecticide decay rates.
Entomological inoculation rate and vector survival rate indicators	CDC IAA with a subgrant to IPM	\$80,000	\$0	4 sites tied to fever sentinel surveillance sites	Additional entomological monitoring in 4 sites including sporozoite rates, vector survival and hut trap assessments to identify a change in vector behavior following exposure to IRS and LLINs.
Environmental assessment	EMCAB	\$25,000	\$0	13 districts	Conduct an independent evaluation of the environmental effect of the GOMs entire IRS program.

Technical assistance to PMI IRS activities	CDC IAA	\$12,000	\$0	53 IRS Target Districts	One CDC TDYs to provide support for IRS.
Technical assistance to PMI IRS activities	USAID	\$0	\$0	53 IRS Target Districts	One USAID TDY to provide support for IRS (costs covered in core budget).
Subtotal: IRS		\$7,437,126	\$2,136,040		
IPTp					
Strengthen implementation of IPTp at the central and district level as part of Focused Antenatal Care	MCHIP	\$300,000	\$0	92 Target Districts	Provide targeted technical assistance to the NMCP/MoH to implement best practices of increased IPTp uptake. This will include an assessment of current bottlenecks impeding the implementation of IPTp, especially the second dose, and review/revise pre-service curriculum at training institutions as needed. Lessons learned from other countries should be taken into consideration while developing innovative approaches to increase IPTp uptake in Madagascar.
Strengthen implementation of IPTp as part of Focused Antenatal Care at the CSB level	SantNet2	\$500,000	\$0	92 Target Districts	Conduct refresher training, support supervision, supply job aids, and promote implementation of DOT for SP at the health facility level. Training will be expanded to private and civil society providers.
Subtotal: IPTp		\$800,000	\$0		
Case Management					
<i>Diagnostics</i>					
Technical support for the continued development and implementation of the QA/QC policies and guidelines for microscopy and RDTs nationally	IMAD	\$150,000	\$0	Nationwide	Support for technical assistance and training at the central ministry level to improve availability and usage of diagnostic testing, strengthening the link between laboratory services and case management.
Implementation of the QA/QC system for microscopy and RDTs in hospitals and clinics	SanteNet2	\$425,000	\$0	Nationwide	Translation of national policies and guidelines into a set of standards, procedures, supervisory tools; include training of supervisors or trainers, extension of lot quality testing for RDTs at the community level and district pharmaceutical depots, and reinforcement of logistics and human resources for these activities. Decentralize QA/QC to the district level. This activity will build upon and continue the activities conducted with FY08 funds before the interruption of the program during the political crisis.
Supervision by NMCP of QA/QC activities	NMCP	\$75,000	\$0	Nationwide	Supervision by central and regional NMCP staff to ensure implementation of QA/QC activities at hospital, CSB, and community level.

Expand community-based case management using RDTs to the new districts covered by RFA	New RFA	\$500,000	\$0	In approx. 200 hard-to-reach communes in the west and north of Madagascar	Expand community-based case management in an RDT context, while also strengthening case reporting to the NMCP. Includes subgrants to NGOs/FBOs.
Procure RDTs for community based case management of malaria	DELIVER	\$800,000	\$800,000	TBD	Procure an estimated 800,000 RDTs for community based case management.
Provide RDTs to trained NGO and faith-based providers	DELIVER	\$350,000	\$350,000	Nationwide	Provide RDTs to trained NGO and faith-based providers to improve case management with RDTs. Improved reporting from NGO providers. Note that NMCP will train private sector providers in the use of RDTs according to national policy.
Provide technical assistance for QA/QC activities	CDC/IAA	\$12,000	\$0	Nationwide	One TDY for CDC to provide technical support for diagnostics.
<i>Subtotal</i>		<i>\$2,312,000</i>	<i>\$1,150,000</i>		
<i>Pharmaceutical and Commodity Management</i>					
Strengthen pharmaceutical and commodity management system	DELIVER	\$350,000	\$0	Nationwide	Work closely with SALAMA and PAIS to strengthen all aspects of the pharmaceutical management system in order to prevent stockouts of malaria commodities and ensure that expired drugs are disposed of properly.
Support for end-use verification of malaria commodities	DELIVER	\$100,000	\$0	Nationwide	Conduct the end-use verification and monitoring of the availability of key antimalarial commodities at the facility level.
Improve drug quality control and pharmacovigilance	USP	\$100,000	\$0	Nationwide	Targeted TA to strengthen and expand quality control and pharmacovigilance of publically and privately sold antimalarials in the country. In collaboration with NSA.
<i>Subtotal</i>		<i>\$550,000</i>	<i>\$0</i>		
<i>Treatment</i>					
Implementation and supervision of case management with ACTs at CSB level (facility-based)	SanteNet2	\$500,000	\$0	Nationwide	Provide support for training/refresher training and routine supervision of health workers at CSB level for appropriate use of RDTs and ACTs.

Implementation and on-going supervision of community case management of malaria with ACTs	SanteNet2 (subgrants to NGOs/FBOs)	\$500,000	\$0	Within the 800 communes covered by SN2	Provide support for training/refresher training and routine supervision of community health workers. Support ACT supply chain and reporting of cases from the community level. Includes subgrants to NGOs/FBOs.
	New RFA (subgrants to NGOs/FBOs)	\$750,000	\$0	In approx. 200 hard-to-reach communes in the west and north of Madagascar	
Supervision by NMCP working in collaboration with SanteNet2 and new RFA	NMCP	\$75,000	\$0	SanteNet2 and new RFA districts	Supervision by central, regional and district level NMCP staff to ensure rational use of ACTs.
TA to support community case management of malaria	USAID	\$0	\$0	Nationwide	One USAID TDY to provide technical support for community case management of malaria.
TA to support community case management of malaria	CDC IAA	\$12,000	\$0	Nationwide	One CDC TDY to provide technical support for community case management of malaria.
<i>Subtotal</i>		<i>\$1,837,000</i>	<i>\$0</i>		
Subtotal: Case Management		\$4,699,000	\$1,150,000		
Advocacy, Communication and Social Mobilization					
Strengthen the IEC/BCC capacity within the GoM and NMCP including campaign development and production of materials for malaria prevention and case management	C-Change	\$400,000	\$0	Nationwide	Strengthen the communications capacity within the MOH as a whole (in collaboration with other MCH funds) and at the NMCP specifically. Contribute to the development of an integrated, cross-cutting campaign aimed at reducing child morbidity and mortality through greater awareness of IMCI services at the clinic and community levels. Activity will include the development and/or revision (as needed) of IEC/BCC support materials as well as job aids. PMI will support directly the NCMP in the development of targeted IEC/BCC campaigns and messages specifically related to malaria control activities (for example, bednet recycling and IRS campaigns).
Implementation of national and targeted mass media and community focused IEC/BCC campaigns	PSI	\$400,000	\$0	Nationwide	Production and placement of IEC/BCC materials for national mass media campaigns and distribution of materials for use at the community level. Based on the national strategy and complementary to campaigns focused on government institutions; target community case management in general as well as specific malaria activities including LLINs promoting ownership and use, uptake of IPTp, case management with RDTs and ACTs, and promotion of IRS.

Implementation of community-based malaria activities through integrated CCM interventions through NGOs/FBOs	SanteNet2 (subgrants to NGOs/FBOs)	\$75,000	\$0	Within the 800 communes covered by SN2	Support for NGO/FBO grants to expand the implementation of community-based IEC/BCC interventions.
	New RFA (subgrants to NGOs/FBOs)	\$125,000	\$0	In approx. 200 hard-to-reach communes in the west and north of Madagascar	
Support to Peace Corps Volunteers to promote malaria case management and control.	Peace Corps (SPA)	\$30,000	\$0	Nationwide	Support PCVs to promote malaria prevention and treatment seeking behaviors at the community level.
Subtotal: IEC/BCC		\$1,030,000	\$0		
Capacity Building					
Provide equipment for the NMCP program/ headquarters	NMCP	\$150,000	\$150,000	Nationwide	Equipment for the insectary (dissecting microscope and tools, pipettes, bins, shelves, cages, trapping devices, humidifier) and laboratory (2 teaching microscopes, several Olympus microscopes, slides, reagents and other consumables), purchasing office supplies and computer equipment (this includes furniture and supplies for the PMI office at the headquarters building).
Subtotal: Capacity Building		\$150,000	\$150,000		
Epidemic Support and Response					
Support for strengthening epidemic surveillance	SanteNet2	\$250,000	\$0	Nationwide	Revise, update, strengthen and implement the national plan for epidemic prevention, preparedness and response in up to 52 at-risk districts (beginning with 24 initial districts). Reinforce surveillance and epidemic preparedness by decentralizing surveillance, program supervision and data collection, which includes training, equipment, active data collection, cleaning, analysis, identifying alerts, regular transport for supervision visits to CSBs.
Reinforce regional and district level response to epidemic alerts, investigation and mitigation	SanteNet2	\$500,000	\$0	Priority districts	Enhance regional and district level capacity in epidemic preparedness and response through support for human resources, travel costs, district level meetings, training, equipment; prioritizing IRS targeted districts (highlands, fringe, south, starting in 2010; phase in first year).
Subtotal		\$750,000	\$0		

M&E					
Strengthen HMIS monitoring and evaluation for malaria	SanteNet2	\$250,000	\$0	Nationwide	Evaluate current HMIS system for malaria data quality and completeness. Revise HMIS data collection to include malaria diagnostic data and IPTp data.
Continue support for 15 fever sentinel sites of the fever surveillance system	CDC/IAA (subgrant to IPM)	\$350,000	\$0	Nationwide	Support 15 fever sites to monitor impact of program interventions on severe malaria.
Support the intensified ongoing monitoring of CCM within a DSS population	CDC/IAA (subgrant to IPM)	\$150,000	\$0	1 district	Conduct intensified ongoing monitoring of CCM activities within a DSS population (DSS), to measure impact of CCM activities, especially on under five mortality.
Technical assistance to support national malaria M&E and regular reporting	SanteNet2	\$80,000	\$0	Nationwide	Technical assistance to support maintenance of the national malaria GMP database, data quality monitoring, implementing regular reporting to RBM and more general audiences through M&E newsletters and other documents, and training to ensure that these capabilities are transferred to the PNL.
TA for M&E strengthening	CDC IAA	\$12,000	\$0	Nationwide	One CDC TDY to provide technical support for the MIS and sentinel sites.
<i>Subtotal</i>		<i>\$842,000</i>	<i>\$0</i>		
<i>Subtotal: M&E</i>		<i>\$1,592,000</i>	<i>\$0</i>		
Staffing and Administration					
In country staffing and administration costs	USAID/CDC	\$1,498,000	\$0	Nationwide	Support for USAID and CDC annual staffing and administration costs.
<i>Subtotal: Staffing and Administration</i>		<i>\$1,498,000</i>	<i>\$0</i>		
GRAND TOTAL		\$28,800,000	\$14,117,914		

Year 4 (FY 2011) Budget Breakdown by Partner

Partner Organization	Geographic Area	Activity	Activity Budget	Total Budget, by Partner
IRS2 IQC	13 districts	Conduct IRS in 13 districts (procurement of insecticides, spray pumps and other logistics required for spray operation, necessary environmental assessments, monitoring, and IEC/BCC activities). PMI will also invest in capacity development of the public sector to provide appropriate supervision and oversight of IRS activities. Two thirds of insecticide were covered in MOP10. GF will support IRS in the remaining targeted districts.	\$7,120,126	\$7,320,126
	4 sites within the 13 districts	Conduct comprehensive IRS-related vector surveillance, assess resistance and other indicators of IRS impact: vector taxonomy and density, and insecticide decay rates.	\$200,000	
DELIVER	19 districts	To purchase nets for 2012 mass distribution campaign covering 19 districts (replacing nets which were distributed in 2009). Approximately 1.78 million nets at \$6 per net	\$10,681,874	\$12,281,874
	TBD	Procure an estimated 800,000 RDTs for community based case management.	\$800,000	
	Nationwide	Provide RDTs to trained NGO and faith-based providers to improve case management with RDTs. Improved reporting from NGO providers. Note that NMCP will train private sector providers in the use of RDTs according to national policy.	\$350,000	
		Work closely with SALAMA and PAIS to strengthen all aspects of the pharmaceutical management system in order to prevent stockouts of malaria commodities and ensure that expired drugs are disposed of properly.	\$350,000	
		Conduct the end-use verification and monitoring of the availability of key antimalarial commodities at the facility level.	\$100,000	

PSI	Targeted comparison districts	Logistics, distribution, social mobilization, IEC/BCC and active hang-up activity support associated with the 2012 mass distribution campaign. \$1.50 per net total. \$.50 programmed in FY11 MOP; remaining balance will be budgeted for in FY12 MOP.	\$850,000	\$1,300,000
	19 districts from 2009 mass campaign	Logistics, distribution, social mobilization, IEC/BCC and active hang-up activity support associated with the 2012 mass distribution campaign. \$1.50 per net total. \$.50 programmed in FY11 MOP; remaining balance will be budgeted for in FY12 MOP.	\$50,000	
	Nationwide	Production and placement of IEC/BCC materials for national mass media campaigns and distribution of materials for use at the community level. Based on the national strategy and complementary to campaigns focused on government institutions; target community case management in general as well as specific malaria activities including LLINs promoting ownership and use, uptake of IPTp, case management with RDTs and ACTs, and promotion of IRS.	\$400,000	
MCHIP	92 Target Districts	Provide targeted technical assistance to the NMCP/MoH to implement best practices of increased IPTp uptake. This will include an assessment of current bottlenecks impeding the implementation of IPTp, especially the second dose, and review/revise pre-service curriculum at training institutions as needed. Lessons learned from other countries should be taken into consideration while developing innovative approaches to increase IPTp uptake in Madagascar.	\$300,000	\$300,000
SanteNet2	92 Target Districts	Conduct refresher training, support supervision, supply job aids, and promote implementation of DOT for SP at the health facility level. Training will be expanded to private and civil society providers.	\$500,000	\$3,080,000
	Nationwide	Translation of national policies and guidelines into a set of standards, procedures, supervisory tools; include training of supervisors or trainers, extension of lot quality testing for RDTs at the community level and district pharmaceutical depots, and reinforcement of logistics and human resources for these activities. Decentralize QA/QC to the district level. This activity will build upon and continue the activities conducted with FY08 funds before the interruption of the program during the political crisis.	\$425,000	
		Provide support for training/refresher training and routine supervision of health workers at CSB level for appropriate use of RDTs and ACTs.	\$500,000	

SanteNet2 (subgrants to NGOs/FBOs)		Revise, update, strengthen and implement the national plan for epidemic prevention, preparedness and response. Reinforce surveillance and epidemic preparedness by decentralizing surveillance, program supervision and data collection; (including training, equipment, active data collection, cleaning, analysis, identifying alerts, regular transport for supervision visits to CSBs) for 24 districts at risk/52 total at risk districts (phase in first year).	\$250,000	
	Priority districts	Enhance regional and district level capacity in epidemic preparedness and response through support for human resources, travel costs, district level meetings, training, equipment; prioritizing IRS targeted districts (highlands, fringe, south, starting in 2010; phase in first year).	\$500,000	
	Nationwide	Evaluate current HMIS system for malaria data quality and completeness. Revise HMIS data collection to include malaria diagnostic data and IPTp data.	\$250,000	
		Technical assistance to support maintenance of the national malaria GMP database, data quality monitoring, implementing regular reporting to RBM and more general audiences through M&E newsletters and other documents, and training to ensure that these capabilities are transferred to the PNLP.	\$80,000	
	Within the 800 communes covered by SN2	Provide support for training/refresher training and routine supervision of community health workers. Support ACT supply chain and reporting of cases from the community level. Includes subgrants to NGOs/FBOs.	\$500,000	
		Support for NGO/FBO grants to expand the implementation of community-based IEC/BCC interventions.	\$75,000	
IMAD	Nationwide	Support for technical assistance and training at the central ministry level to improve availability and usage of diagnostic testing, strengthening the link between laboratory services and case management.	\$150,000	\$150,000
NMCP	SanteNet2 and new RFA districts	Supervision by central, regional and district level NMCP staff to ensure rational use of ACTs.	\$75,000	
	Nationwide	Supervision by central and regional NMCP staff to ensure implementation of QA/QC activities at hospital, CSB, and community level.	\$75,000	
		Equipment for the insectary (dissecting microscope and tools, pipettes, bins, shelves, cages, trapping devices, humidifier) and laboratory (2 teaching microscopes, several Olympus microscopes, slides, reagents and other consumables), purchasing office supplies and computer equipment (this includes furniture and supplies for the PMI office at the headquarters building).	\$150,000	\$300,000

New RFA	In approx. 200 hard-to-reach communes in the west and north of Madagascar	Expand community-based case management in an RDT context, while also strengthening case reporting to the NMCP. Includes subgrants to NGOs/FBOs.	\$500,000	\$1,375,000
	In approx. 200 hard-to-reach communes in the west and north of Madagascar	Provide support for training/refresher training and routine supervision of community health workers. Support ACT supply chain and reporting of cases from the community level. Includes subgrants to NGOs/FBOs.	\$750,000	
		Support for NGO/FBO grants to expand the implementation of community-based IEC/BCC interventions.	\$125,000	
USP	Nationwide	Targeted TA to strengthen and expand quality control and pharmacovigilance of publically and privately sold antimalarials in the country. In collaboration with NSA.	\$100,000	\$100,000
C-Change	Nationwide	Strengthen the communications capacity within the MOH as a whole (in collaboration with other MCH funds) and at the NMCP specifically. Contribute to the development of an integrated, cross-cutting campaign aimed at reducing child morbidity and mortality through greater awareness of IMCI services at the clinic and community levels. Activity will include the development and/or revision (as needed) of IEC/BCC support materials as well as job aids. PMI will support directly the NCMP in the development of targeted IEC/BCC campaigns and messages specifically related to malaria control activities (for example, bednet recycling and IRS campaigns).	\$400,000	\$400,000
Peace Corps (SPA)	Nationwide	Support PCVs to promote malaria prevention and treatment seeking behaviors at the community level.	\$30,000	\$30,000
EMCAB	13 districts	Conduct an independent evaluation of the environmental effect of the GOMs entire IRS program.	\$25,000	\$25,000
CDC/IAA (subgrant to IPM)	Nationwide	Support 15 fever sites to monitor impact of program interventions on severe malaria.	\$350,000	
	4 sites tied to fever sentinel surveillance sites	Additional entomological monitoring in 4 sites including sporozoite rates, vector survival and hut trap assessments to identify a change in vector behavior following exposure to IRS and LLINs.	\$80,000	

	1 district	Conduct intensified ongoing monitoring of CCM activities within a DSS population (DSS), to measure impact of CCM activities, especially on under five mortality.	\$150,000	\$640,000
CDC IAA	53 IRS Target Districts	One CDC TDYs to provide support for IRS.	\$12,000	
	Nationwide	One CDC TDY to provide support for supervision and monitoring of the LLIN campaign and build local capacity.	\$12,000	
		One TDY for CDC to provide technical support for diagnostics.	\$12,000	
		One CDC TDY to provide technical support for community case management of malaria.	\$12,000	
		One CDC TDY to provide technical support for the MIS and sentinel sites.	\$12,000	
USAID/CDC	Nationwide	Support for USAID and CDC annual staffing and administration costs.	\$1,498,000	\$1,498,000
TOTAL				\$28,800,000