

This Malaria Operational Plan has been approved by the U.S. Global Malaria Coordinator and reflects collaborative discussions with the national malaria control programs and partners in country. The final funding available to support the plan outlined here is pending final FY 2013 appropriation. If any further changes are made to this plan it will be reflected in a revised posting.



PRESIDENT'S MALARIA INITIATIVE



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Mozambique

Malaria Operational Plan FY 2013

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ABBREVIATIONS

ACT	Artemisinin-based combination therapy
AIDS	Acquired immune deficiency syndrome
AL	Artemether-lumefantrine
ANC	Antenatal clinic
APE	<i>Agentes Polivalentes Elementares da Saúde</i> (Community-based healthcare worker)
AS/AQ	Artesunate-amodiaquine
BCC	Behavior change communications
BES	<i>Boletim Epidemiológico Semanal</i> (Weekly Epidemiologic Bulletin)
CDC	Centers for Disease Control and Prevention
CMAM	<i>Central de Medicamentos e Artigos Médicos</i> (Central Medical Stores)
DDT	Dichloro-diphenyl-trichloroethane
DDS	<i>Departamento Distrital de Saúde</i> (District Health Department)
DEPROS	<i>Departamento de Promoção de Saúde</i> (Health Promotion Department)
DHS	Demographic and health survey
DfID	United Kingdom Department for International Development
DNAM	<i>Direcção Nacional de Assistência Médica</i> (National Directorate of Medical Assistance)
DNSP	<i>Direcção Nacional de Saúde Pública</i> (National Directorate of Public Health)
DPS	<i>Direcção Provincial de Saúde</i> (Provincial Health Department)
ELISA	Enzyme-linked immunosorbent assay
EUV	End-Use Verification tool
FELTP	Field Epidemiology & Laboratory Training Program
FY	Fiscal year
Global Fund	Global Fund to Fight AIDS, Tuberculosis, and Malaria
GHI	Global Health Initiative
GOM	Government of Mozambique
HCW	Healthcare worker
HIV	Human immunodeficiency virus
IEC	Information and education communication
IPTp	Intermittent preventive treatment of pregnant women
INS	<i>Instituto Nacional de Saúde</i> (National Institute of Health)
INSIDA	<i>Inquérito de Indicadores de SIDA</i> (AIDS Indicator Survey)
IRS	Indoor residual spraying
ITN	Insecticide-treated bed net
JHPIEGO	Johns Hopkins University affiliated non-governmental organization
LLIN	Long-lasting insecticide-treated bed net
LMIS	Logistics Management Information Systems
LSDI	Lubombo Spatial Development Initiative
MACEPA	Malaria Control and Evaluation Partnerships in Africa
M&E	Monitoring and evaluation
MCHIP	Maternal and Child Health Integrated Program
MICS	Multiple Indicator Cluster Survey

MMI	Model Maternity Initiative
MINAG	<i>Ministério de Agricultura</i> (Ministry of Agriculture)
MIP	Malaria in pregnancy
MIS	Malaria Indicator Survey
MISAU	<i>Ministério de Saúde</i> (Ministry of Health)
MNCH	Maternal-Neonatal-Child Health
MOP	Malaria operational plan
NGO	Non-governmental organization
NHS	National health service
PCR	Polymerase chain reaction
PCV`s	Peace Corps Volunteers
PEPFAR	President's Emergency Plan for AIDS Relief
PIRCOM	<i>Programa Inter-Religioso contra a Malária</i> (Inter-Religious Campaign Against Malaria)
PLMP	Pharmaceutical Logistics Master Plan
PMI	President's Malaria Initiative
PNCM	<i>Programa Nacional de Controlo da Malária</i> (National Malaria Control Program)
PSI	Population Services International
RBM	Roll Back Malaria
RDT	Rapid diagnostic test
SIMAM	(Medical Stores Information Systems)
SLICE	Supply and Logistics Inventory Control Evaluation
SP	Sulfadoxine-pyrimethamine
TB	Tuberculosis
UMA	<i>Unidade de Monitorio e Avaliacao</i> (DNSP M&E Unit)
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USG	U.S. Government
WHO	World Health Organization

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 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. PMI was launched in June 2005 as a five-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. 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.

One of four countries selected in the second year of PMI, the primary goal of PMI in Mozambique continues as in previous years: assist the Government of Mozambique (GOM), in collaboration with other partners, to reduce malaria mortality by 50% by rapidly scaling-up coverage of vulnerable groups with four highly effective interventions: artemisinin-based combination therapy (ACT), intermittent preventive treatment of pregnant women (IPTp), insecticide-treated bed nets (ITNs), and indoor residual spraying (IRS).

In 2011, Mozambique carried out a Demographic and Health Survey (DHS) and while the preliminary data show minor improvements in all indicators compared to the 2007 MIS, coverage rates are still disappointingly low. The proportion of children less than five years old with fever in the last two weeks who received treatment with an ACT within 24 hours of onset of fever increased from 4.5% in 2007 to 15.3% in 2011. Similarly, the proportion of pregnant women who slept under an ITN the previous night increased from 7.3% to 19.5% over the same time period. Unfortunately, the proportion of women who received two or more doses of IPTp during their last pregnancy within the last two years only increased from 16.2% to 18.6% from 2007 to 2011.

Mozambique has applied for several rounds of funding from the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund); successfully receiving \$28 million through a Round 2 grant and \$36 million through a Round 6 grant, both of which have been fully disbursed. Mozambique was most recently awarded a Global Fund Round 9 grant to scale-up universal access to malaria prevention and control services. The Ministry of Health (MISAU) and World Vision Mozambique were selected as the two Principal Recipients for this grant. This grant provides \$32 million to MISAU to strengthen National Malaria Control Program (PNCM) capacity at the national level in order to intensify prevention activities related to ITNs, IRS and IPTp, and treatment through appropriate malaria case management. The MISAU grant is

focused on commodity support and through this grant the Global Fund is procuring insecticides for the 2012 IRS campaign and 1.9 million long-lasting insecticide treated nets (LLINs), which are expected to arrive in country in 2013. The grant also allows for the procurement of other malaria commodities such as drugs and rapid diagnostic tests (RDTs). It also provides \$21 million to World Vision to conduct activities at the community level in seven out of Mozambique's ten provinces, including LLIN distribution, and the design and implementation of behavior change communication (BCC) activities to promote prevention and treatment seeking behaviors.

This FY 2013 PMI Malaria Operational Plan for Mozambique was developed during a planning visit carried out in May 2012 by representatives from the U.S. Agency for International Development (USAID), the Centers for Disease Control and Prevention (CDC), and the PNCM, with participation of other major partners working on malaria in Mozambique. The proposed FY 2013 PMI activities are based on progress and experiences during the last five years and the PNCM's 2012-2016 National Malaria Control Strategy. PMI activities are designed to complement activities supported by other partners.

The total amount of PMI funding requested for Mozambique is \$29 million for FY 2013 and the following activities will be supported with FY 2013 PMI funding:

Insecticide-treated nets (ITNs): Since its inception in Mozambique in 2007, PMI has supported free LLIN distribution, primarily through antenatal clinics (ANC). As in previous years, in 2012 PMI procured enough ITNs to cover all of the ITN needs for routine ANC distribution (~1.2 million nets). With FY 2013 funding, PMI will continue to support net distribution through ANCs and is expecting to procure approximately 1.2 million LLINs. PMI will continue to support distribution of ANC LLINs down to the district level in addition to efforts to strengthen the LLIN logistics system. PMI's coverage of ANC net needs will complement the mass universal coverage campaigns that are expected to be completed, nationwide, by the end of 2012 in all districts not targeted for IRS.

Indoor residual spraying (IRS): Indoor residual spraying remains a high priority vector control intervention for MISAU in Mozambique. PMI has been implementing IRS in Zambézia Province since 2007. In 2011, PMI achieved a 99% coverage rate with IRS operations; covering more than 660,000 structures and protecting approximately 2.8 million people in eight of the 17 districts in Zambézia. Due to funding constraints, the IRS campaign will support the spraying of six districts in Zambézia in 2012, targeting approximately 573,000 structures and 2.4 million people. In 2012, PMI will initiate enhanced epidemiologic surveillance, in addition to entomologic surveillance, in the two districts that are no longer going to have PMI support for IRS (Maganja da Costa and Mopeia), but where instead ITN universal coverage campaigns will take place. This epidemiologic and entomologic surveillance will also take place in the six districts where PMI is conducting IRS operations. With FY 2013 funding, PMI will initiate targeted IRS operations in six districts of Zambézia Province using data from entomologic and epidemiologic surveillance activities. In addition, PMI will continue enhanced entomologic and epidemiologic surveillance in the eight districts that were supported in 2012. In an effort to increase the sustainability of the IRS program, PMI will give funds directly to the Zambézia Provincial Health Department (DPS) for implementation of IRS-related social mobilization

activities. Other components of IRS such as procurement of insecticide and other IRS commodities, training, and environmental compliance will continue to be managed through the IRS central task order.

Intermittent preventive treatment of malaria in pregnancy (IPTp): Over the past 12 months, PMI has supported the procurement of 3.6 million treatments of SP and contributed to the training of health care workers (HCWs) on malaria case management, including support to the development of the training modules. According to preliminary data from the 2011 DHS, Mozambique has made relatively little progress on scaling up IPTp, with only 18.6% of women having received two or more doses of IPTp during their last pregnancy in 2011, compared to 16.2% in the 2007 MIS. While the exact reason for the low coverage is unknown; it is thought to be due to a combination of factors, including inadequate stocks of SP, poorly coordinated training of staff, and lack of supervision, together with poor reporting practices. PMI is actively working to strengthen Mozambique's IPTp activities through stronger collaboration with the Maternal & Child Health (MCH) Department at MISAU for training and supervision of MCH health care workers. With FY 2013 funding, PMI will continue to support the integrated supervision of ANC staff and HCWs in the provision of malaria in pregnancy-related activities, in addition to the procurement of LLINs for distribution at ANCs. PMI will also procure approximately four million doses of SP with FY 2013 funding to meet the national demand.

Malaria diagnosis: In 2007, RDTs were introduced in Mozambique and rolled-out nationally; however, there have been chronic shortages of RDTs over the past several years which have hampered efforts to scale-up malaria case management activities. In 2012, PMI will procure approximately three million RDTs, along with microscopes, microscopy kits and reagents as needed, in addition to supporting supervision of laboratory diagnosis. With FY 2013 funds, PMI will procure approximately six million RDTs to help fill the nationwide shortage. In addition, PMI will continue to provide supplies for the National Reference Laboratory for Blood Parasites, and will support training and integrated supervision of laboratory diagnosis, in coordination with efforts to improve laboratory diagnosis of other diseases (HIV/AIDS and tuberculosis).

Malaria treatment: Artemether-lumefantrine (AL) has been the first-line treatment for uncomplicated malaria in Mozambique since 2009. PMI has been the primary provider of Mozambique's national AL needs since the Initiative began and will procure approximately 6.25 million treatments in 2012. With FY 2013 funds, PMI will procure approximately 6.4 million AL treatments. PMI will also continue to strengthen the capacity of MISAU's supply chain management system (CMAM) to forecast and manage antimalarial drugs through improved logistics management capacity, with a focus on AL distribution through the kit system. PMI will also support ongoing continued assessments of warehousing inventory management, as well as strengthening storage and distribution capability at the central level.

Capacity building and health system strengthening: PMI is committed to implementing the core GHI principle of health system strengthening through support to capacity building efforts at various levels in Mozambique. Over the past 12 months, PMI has provided technical and programmatic support to the PNCM, has provided extensive support to build the entomological capacity nationally, and contributed to the Field Epidemiology and Laboratory Training Program (FELTP) and the hiring of a monitoring and evaluation (M&E) staff person who will mentor junior PNCM M&E staff. In addition, PMI Resident Advisors and implementing partners

continue to provide technical and implementation support to the PNCM on a range of issues including the recently finalized National Strategic Plan, the M&E Plan and other policy documents. With FY 2013 funding, PMI aims to decentralize its health systems strengthening support to lower levels to help improve the quality of activities implemented at the lowest levels and to achieve greater impact, particularly with respect to LLIN distribution to ANCs, IRS, case management supervision, BCC implementation, and M&E supervision. PMI will continue to contribute to the FELTP and will maintain the M&E staff member and data manager to ensure the health information system for malaria remains viable, in addition to an entomologist at the PNCM to coordinate all vector control activities.

Behavior change communication: The objective of the PNCM's BCC activities is to ensure that by 2016, 95% of the population is reached by key messages related to malaria prevention, diagnosis and treatment. PMI support for malaria BCC activities has largely been through the Inter-Religious Campaign Against Malaria (PIRCOM), a consortium of religious groups, which is working in Zambézia, Nampula, Sofala, and Inhambane Provinces. During the past year, PIRCOM trained more than 6,000 religious leaders on key malaria messages, who in turn have reached approximately 100,000 people in 35 districts. In addition, PMI has been working to strengthen PIRCOM's capacity through technical assistance, trainings and mentoring.

With FY 2013 funding, PMI will continue to provide technical assistance to the PNCM and the Health Promotion Department (DEPROS) and will support community-based, non-governmental organizations (NGOs) to disseminate malaria prevention and treatment messages. PMI's implementing partner for this activity is already working with DEPROS to develop an advocacy, communication and social mobilization strategy for TB and will expand its support to include the malaria communication strategy.

Monitoring and evaluation (M&E): Strengthening the capacity of the PNCM and MISAU to undertake M&E activities is a high priority for PMI. In early 2012, the PNCM finalized its 2012-2016 M&E Plan, which is aimed at integrating a variety of M&E needs of the priority health programs. In an effort to help strengthen Mozambique's M&E system, which includes the newly established temporary routine malaria data collection database from outpatient registers, PMI will provide funds for an M&E advisor for the PNCM in addition to a data manager who will assist with this malaria database, which is expected to be rolled out nationally by early 2013.

Other M&E activities to be continued with FY 2013 funds include support for the implementation of the end-use verification tool, support for M&E supervision from the provincial level to health facilities, and support for increased entomological and epidemiological monitoring in the districts where PMI-supported IRS was withdrawn as part of an overall strengthened integrated vector management strategy. The entomological support in the two non-IRS districts will complement PMI's entomological monitoring activities in the six IRS districts in Zambézia Province, as well as PMI's support to MISAU for entomological monitoring in sentinel sites in six additional provinces.

In addition, PMI will be using FY 2013 funding to complete an MIS in FY 2014.

INTRODUCTION

Global Health Initiative

Malaria prevention and control is a major foreign assistance objective of the USG. In May 2009, President Barack Obama announced the GHI, a comprehensive effort to reduce the burden of disease and promote healthy communities and families around the world. Through the GHI, the USG will invest 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 USG 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. The GHI will build on the USG's accomplishments in global health, accelerating progress in health delivery and investing in a more lasting and shared approach through the strengthening of health systems. Framed within the larger context of the GHI and consistent with the GHI's overall principles and planning processes, BEST (Best practices at scale in the home, community and facilities) is a USAID planning and review process that draws on our best experience in Family Planning, Mother and Child Health and Nutrition to base our programs on the best practices to achieve the best impact.

President's Malaria Initiative

The President's Malaria Initiative (PMI) is a core component of the GHI, along with HIV/AIDS, and tuberculosis. PMI was launched in June 2005 as a five-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 PMI has been adjusted to halve the burden in 70% of the at-risk population in the original 15 countries by the end of 2015. This will be achieved by continuing to scale up 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).

Mozambique was selected as a PMI country in fiscal year 2007, part of the second round of countries launching the initiative. Large-scale implementation of interventions supported by PMI began with the procurement of about five million ACT treatments and about one million ITNs. PMI also started supporting IRS in Year 1, with more than 400,000 households protected in Zambézia Province in the first of six IRS campaigns in this province. Artemisinin-based combination therapies and IPTp are now available and being used in all public health facilities

nationwide. Around eight million LLINs, more than five million of which were procured with PMI support, have been distributed to pregnant women via ANC and to children under five through a combined measles-malaria campaign in 2008 as well as to entire communities through universal coverage campaigns in 2010.

The Government of Mozambique (GOM) recognizes the importance of malaria for poverty reduction and development. Although MISAU is committed to increasing efficiency, quality, and access to health services nationwide, a weak health infrastructure, unstable funding from health donors to MISAU paired with unpredictable availability of funding from the Global Fund, and a shortage of health workers, are formidable obstacles.

This FY 2013 Malaria Operational Plan presents a detailed implementation plan for 2013 - 2014, based on the PMI Multi-Year Strategy and Plan and the PNCM's newly drafted 5-Year Strategy. It was developed in consultation with the PNCM, with the participation of national and international partners involved with malaria prevention and control in the country. This document also proposes new approaches for addressing the malaria situation in Mozambique, such as establishing local partnerships to support the implementation of supervisory and logistic activities. The activities that PMI is proposing to support fit in well with the newly finalized National Malaria Control Strategy and Plan and build on investments already made by PMI and other partners to improve and expand malaria-related services, including the Global Fund malaria grants. This document briefly reviews the current status of malaria control policies and interventions in Mozambique, describes progress to date, identifies challenges and unmet needs if the targets of the PNCM and PMI are to be achieved, and provides a description of planned activities with FY 2013 funding.

MALARIA SITUATION IN MOZAMBIQUE

Malaria is endemic throughout Mozambique and the entire estimated population of 23 million people is at risk. Most of the country has year-round malaria transmission with a seasonal peak during the rainy season, from December to April. In addition, Mozambique is prone to natural disasters such as drought, cyclones, and floods; these may have contributed to increases in malaria transmission in recent years, particularly in low-lying coastal areas and along major rivers.

Malaria is considered the most important public health problem in Mozambique and accounts for 29% of all deaths, followed closely by AIDS at 27%. Among children less than five years old, malaria accounts for 42% of the deaths, followed by AIDS at 13%. *Plasmodium falciparum* accounts for 90% of all malaria infections, with *P. malariae* and *P. ovale* responsible for about 9% and 1%, respectively. The major vectors in Mozambique are *Anopheles gambiae* s.s., *A. arabiensis*, *A. funestus* s.l., and *A. funestus* s.s. Of the major subspecies of the *A. gambiae* complex, *A. arabiensis* is more prevalent in the south and *A. gambiae* in the north.

Figure 1. Map of Mozambique by Province



In April 2009, PMI sponsored an assessment of malaria transmission in the administrative areas of Maputo City, due to assumed low transmission. This area includes urban, peri-urban and rural areas (where “rural” areas are considered those with more limited access to water, etc). Data from the assessment, however, suggested ongoing transmission at higher-than-expected levels, even in the most urbanized parts of the city. Using RDTs, the prevalence of malaria among febrile patients presenting for care to public health facilities was 10.8% in urban Maputo, 16.5% in peri-urban areas surrounding Maputo, and 24.2% in rural areas in Maputo City. Additionally, anecdotal reports suggest transmission has increased significantly since the assessment was done, apparently precipitated by the suspension of IRS, which had previously been supported through the trilateral collaborative spray efforts of the Lubombo Spatial Development Initiative (LSDI).

Mozambican Health System

In Mozambique, the public sector – the National Health Service (NHS) – dominates health service delivery. Although there is a growing private sector, it is limited to major cities. The NHS reaches an estimated 60% of the population.

The NHS consists of four levels. Level I includes both rural and urban health centers and health posts. These health facilities provide a package of primary health care services, have very limited laboratory capacity and usually have a maternity ward but do not provide inpatient services. According to a World Bank Report (2004), Level I facilities represent at least 40% of all health services and are typically the first (and often only) point of contact with the health system for a large portion of the population. Level II includes district and rural hospitals that offer diagnostic, surgical, and obstetric services, and include general medical doctors on their staff. Level III consists of provincial hospitals, which offer curative services, diagnostic services/equipment, and training centers. Finally, Level IV is made of the country's three referral hospitals in Maputo, Beira, and Nampula, serving the southern, central, and northern regions respectively.

Recognizing the limitations of the NHS and the lack of professionally trained HCWs, the country, with USG support, has recently begun revitalizing the community health care worker program, known as *Agentes Polivalente Elementar da Saúde* (APE). The APEs work at the community level to provide preventive and basic curative services, including malaria diagnosis (using RDTs) and treatment (with ACTs). A number of national and international NGOs also work within the NHS to assist in the provision of health services.

Malaria control in the public health system consists of three administrative levels: central, provincial and district. At the central level there is a structured National Malaria Control Program (PNCM), although it is under-staffed and some of the existing staff lacks the technical skills to adequately manage the program. Each province has a provincial malaria focal point who coordinates the implementation of malaria control activities at that level. Recently, MISAU approved the creation of a district malaria focal point as a way to improve data management and reporting for malaria at the district level.

National Malaria Control Program Strategy and Activities

The PNCM is responsible for developing policy, establishing norms, and planning, organizing, and coordinating all malaria control activities in the country. Additional responsibilities include periodic assessment of the impact of malaria control activities, development of training materials on malaria case management for HCWs at all levels, mobilization of domestic and external funds for malaria control activities, promotion of malaria awareness and advocacy, and leading operational research.

In 2012, the PNCM finalized the National Malaria Policy and the 2012 - 2016 National Malaria Prevention and Control Strategic Plan. The strategic plan focuses on continuing national-level scale-up of five objectives for malaria prevention and control:

1. Decentralization of malaria control activities, with 100% of districts in 2014 having malaria management capacity in place: this includes revising PNCM structure and increasing its personnel; acquiring appropriate infrastructure (including warehouses, vehicles, etc.); improving program management; strengthening national partnerships; improving emergency response to outbreaks; and support regional malaria elimination efforts led by the Southern African Development Council.
2. Access to at least one prevention method for 100% of the population by 2014: this includes having an Integrated Malaria Vector Control Strategy; mass ITN distribution through universal coverage; routine ITN distribution through ANCs; IRS in target areas; provide IPTp through the integrated package of MCH services; and conducting larviciding where it is appropriate.
3. Confirmatory laboratory testing on 100% of suspected cases of malaria throughout the entire health system, including community HCW (APEs) by 2014: this would be conducted through consolidation of RDT use in all health centers and among APEs; expanding malaria diagnosis through microscopy; prompt and appropriate treatment of all diagnosed cases of malaria; improve treatment of severe malaria; and promote the national guidelines in the private sector in coordination with the pharmaceutical department.
4. Malaria prevention messaging reaching 100% of the population by 2016: includes finalizing the National Communication Strategic Plan for Malaria; advocacy through all appropriate media; advocacy through leaders (community, religious and political); in coordination with the School Health Department, promote advocacy in schools; promote advocacy through APEs; social mobilization prior to universal coverage campaigns and acquire vehicles and equipment for BCC.
5. Strengthened M&E system so that by 2014 all districts are capable of reporting key malaria related indicators: this includes improving human resources for M&E activities at all levels; improving data collection tools and data quality; creation of and implementation of a malaria database; operational research; quality control of malaria-related commodities; and national surveys to assess impact.

CURRENT STATUS OF MALARIA INDICATORS

In 2011, Mozambique carried out a Demographic and Health Survey (DHS), which provides the most up-to-date information on key PMI indicators. Preliminary data from this survey is compared against results from PMI's 2007 baseline Malaria Indicator Survey (MIS), the 2008 Multiple Indicator Cluster Survey (MICS) and the 2009 AIDS Indicator Survey (INSIDA) in the table below. Overall, coverage rates improved only slightly between the 2007 and 2011 surveys, and for many indicators coverage decreased between the 2008 MICS and the 2011 DHS.

The 2011 DHS preliminary data shows minor improvements in all indicators compared with the 2007 MIS. The proportion of children less than five years old with fever in the last two weeks who received treatment with an ACT within 24 hours of onset of fever increased from 4.5% in 2007 to 15.3% in 2011. Similarly, the proportion of pregnant women who slept under an ITN the previous night increased from 7.3% to 19.5%. Despite these minor improvements, all indicators remain well below target levels, and many indicators have shown relatively little progress. For example, the proportion of women who received two or more doses of IPTp during their last pregnancy during the last two years increased from 16.2% to only 18.6%.

Table 1. Malaria Indicators in Mozambique

Malaria Indicators	2007 MIS (%)	2008 MICS (%)	2009 INSIDA (%)	2011 DHS (%)
Proportion of households with at least one ITN	15.8	30.7	NA	28.4
Proportion of children less than five years old who slept under an ITN the previous night	6.7	22.8	NA	17.5
Proportion of children less than five years old who slept under a bed net the previous night	15.7	42.1	48.7	39.1
Proportion of pregnant women who slept under an ITN the previous night	7.3	NA	NA	19.5
Proportion of pregnant women who slept under a bed net the previous night	19.3	NA	42.1	36.7
Proportion of women who received two or more doses of IPTp during their last pregnancy in the last two years	16.2	43.1	33.0	18.6
Proportion of children less than five years old with fever in the last two weeks who received treatment with an antimalarial within 24 hours of onset of fever	17.6	22.7	NA	22.2
Proportion of children less than five years old with fever in the last two weeks who received treatment with an ACT within 24 hours of onset of fever	4.5	NA	NA	15.3

GOALS AND TARGETS OF THE PRESIDENT’S MALARIA INITIATIVE

The goal of PMI is to reduce the burden of malaria by 70% compared to pre-Initiative levels in the 15 original PMI countries. By the end of 2014, PMI will assist Mozambique to achieve the following targets:

- >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 six months;
- 85% of women who have completed a pregnancy in the last two years will have received two or more doses of IPTp during that pregnancy; and
- 85% of government health facilities have ACTs available for treatment of uncomplicated malaria.

EXPECTED RESULTS – YEAR SEVEN

With FY 2013 funding, the following results are expected:

Prevention:

- Approximately 1,200,000 LLINs will be procured and distributed to pregnant women at ANCs. This amount is expected to cover the majority of ANC net distribution needs nationwide. PMI will continue to support the distribution of LLINs down to the district level.
- Coverage of at least 85% of houses targeted for IRS in the original six districts of Zambézia Province. The exact number of structures and population to be covered in the six districts for the 2013 IRS operations will be determined based on malaria transmission data to target areas where impact of IRS could be greatest.

Treatment:

- In support of MISAU’s efforts to strengthen malaria case management, PMI will procure approximately 6 million RDTs for distribution nationwide, as well as microscopy kits to increase confirmatory testing from 20% to 40% of suspected malaria cases.
- Procure approximately 6.4 million first-line ACT treatments so that, together with World Bank and Global Fund support, 100% of malaria episodes in children less than five years old will be treated with an ACT.
- With PMI and PEPFAR support for logistics management, at both the central and provincial levels, efforts will be made to strengthen warehousing and supply chain logistics so that at least 60% of health facilities will report no disruption of antimalarial drug stocks for more than one

week during the previous three months and at least 75% of provincial level warehouses routinely report consumption data.

PREVENTION ACTIVITIES

Insecticide-treated nets

Background

Mozambique introduced free distribution of ITNs to children less than five years old and pregnant women as a national policy in 2006. Children less than five years old are reached through mass campaigns, while ITNs are delivered free of charge during ANC visits to pregnant women. In 2009, the country adopted the policy of universal coverage, defined as one LLIN for every two persons.

The recently approved 2012-2016 National Malaria Control Strategic Plan set the ambitious target of covering 90% of the population with at least one malaria prevention method (LLINs, IRS, IPTp or larviciding). The plan outlines a national ITN distribution policy of targeting areas not covered by IRS with mass coverage of LLINs, combined with nationwide routine distribution to pregnant women through ANCs. Both distribution methods will provide nets free of charge and contribute towards achieving and maintaining the universal coverage goal. The PNCM has been intensely focused on planning for universal coverage campaigns and there has been less focus on formalizing the ANC distribution system. Despite the lack of a national vector control policy, the 2009 technical working group which assembled for the Global Fund Round 9 proposal agreed that the Global Fund, the World Bank, World Vision and UNICEF, would support the procurement and distribution of LLINs through mass universal coverage campaigns, while PMI would be the source of funding for routine LLIN distributions through ANCs.

The implementation of mass universal coverage campaigns started in 2010 in 11 (out of a total of 144) districts; in 2011 universal coverage campaigns were carried out in 45 districts with LLINs procured by Global Fund Round 6. During 2012 MISAU will carry out Global Fund and World Bank-supported mass universal coverage campaigns in 31 districts in the following provinces: Zambézia (11 districts), Nampula (12 districts), Manica (four districts), Inhambane (one district), Sofala (one district), Gaza (one district) and Niassa (one district). By the end of 2012, all districts targeted for mass universal coverage campaigns are expected to be covered. Some of the districts initially targeted for IRS will also be covered by mass universal coverage campaigns.

The Global Fund Round 9 proposal also includes 1.9 million LLINs (MISAU component) which are expected to arrive in country during calendar year 2013. These LLINs will be used to replace the LLINs distributed during the 2010 campaigns and to cover some of the districts that receive IRS. However, funds are needed to cover the distribution costs of these ITNs as these costs are not included in the Global Fund Round 9 proposal.

Since late 2009, PMI has supported the purchase of LLINs for ANCs and their distribution to provincial warehouses throughout Mozambique. Although routine distribution of LLINs to pregnant women at ANC visits has been national policy since 2006, the system to support this

activity has not been formalized; furthermore, PMI at present is the only donor providing funding for distribution of LLINs through routine systems. Thus, with no formal distribution system or provincial management guidelines for ANC distribution, many health facilities had LLIN stock outs in 2010 and 2011, and many pregnant women did not receive an LLIN. In 2011 a joint Global Fund/PMI supply chain analysis (SLICE) was performed to assess the weaknesses of the routine LLIN logistics system and provide specific recommendations for how to address them. The report called for the PNCM to work closely with PMI and other partners to develop a strategy and define a set of procedures for LLIN storage and distribution. Other recommendations included the need to improve the logistic information system and put in place measures to reduce commodity diversion. PMI is already working with the PNCM to implement these recommendations.

Progress during last 12 months

According to PNCM data, a total of 4,140,000 LLINs were distributed in 2011, with 961,380 of these being distributed to ANCs through the routine system, representing 92% of the needs of this group. However, because there is no consumption data for LLINs, we do not know the exact number of pregnant women who received an LLIN. In January 2012, MISAU introduced a new register at the prenatal consultation which will allow this data to be collected routinely going forward.

To assess the longevity and durability of LLINs under field conditions, PMI is supporting an evaluation in which a sample of bar-coded LLINs distributed in Nampula Province in October 2008 have been collected yearly for three years through 2011. The data on comparative durability of different LLIN products, which showed that polyethylene nets had significantly more holes of any size compared with polyester nets after three years, will be used to make procurement decisions on the basis of “price per year of protection” rather than unit price per net.

With PMI’s support to the PNCM and DPSs, all pregnant women in Mozambique are expected to have access to LLINs through ANCs in FY 2013. For this to happen, a supply chain system for LLINs, a commodity that is outside of the existing MOH supply chain management system (CMAM), should be fully functional. The LLIN supply chain should include planning and budgeting for transportation, warehousing, and managing LLINs from point of arrival in port to the province and district warehouses, and from there to health facilities across the country. As most of these functions are not carried out either centrally within MISAU or provincially within the DPSs, there is a need for more clearly defined roles and responsibilities, as well as standard operating procedures. The uncovering of irregularities in the Sofala LLIN warehouse during a March 2011 investigation, in which it was determined that about 50,000 LLINs had been diverted from the public system, prompted the PNCM to accelerate the formalization of the LLIN distribution system for routine distribution through ANCs. With PMI support, logisticians dedicated to providing technical assistance to DPSs nationwide were hired. These logisticians will continue to assist and build LLIN distribution management capacity at the provincial level to guarantee that all pregnant women presenting for their first ANC visit receive an LLIN. PMI will also partner with UNICEF to provide financial and technical support to provinces and districts to strengthen their logistic management capacity to distribute LLINs.

By the end of 2012 all districts not targeted for IRS will have implemented a mass universal coverage campaign with LLINs. The PNCM is now devising a plan to ensure high coverage of LLINs in these districts. Besides routine delivery to pregnant women through antenatal services, a number of other strategies are being considered, including routine delivery to infants at immunization clinics and repeated campaigns, including in districts receiving IRS. PMI will support the introduction of a social marketing program for LLINs by extending the current PSI social marketing program, which includes several health products. By offering a low price LLIN, we expect to reduce the diversion of LLINs from the public sector to the illegal market. If successful, the LLIN social marketing program can serve as the basis for a future voucher scheme for LLINs destined to pregnant women. This would free the public health sector from the difficult task of managing LLINs.

Table 2: ITN Gap Analysis

Need	2011	2012	2013	2014
Estimated population	23,049,621	23,700,715	24,366,112	25,041,922
Campaign target population	7,683,207	7,900,238	8,122,037	8,347,307
Campaign replacement	4,268,448	4,389,021	4,512,243	4,637,393
Routine ANC	1,267,729	1,303,539	1,340,136	1,377,306
Total need	5,536,177	5,692,561	5,852,379	6,014,699
Already committed/distributed				
PMI (for ANC needs)	1,500,000	1,200,000	1,200,000	1,200,000
World Bank	190,000	1,400,000	560,000	
GF	2,450,000	1,500,000	1,900,000	
Others		70,000		
Total nets distributed or committed	4,140,000	4,170,000	3,660,000	1,200,000
Annual ITN gap	1,396,177	1,522,561	2,192,379	4,814,699

Proposed activities with FY 2013 funding: (\$5,450,000)

PMI will continue to make a significant contribution towards increasing LLIN ownership and use in Mozambique. The proposed activities with FY 2013 funding are as follows:

1. LLIN procurement: Approximately 1,200,000 LLINs will be procured for routine distribution through ANCs, assuming a cost per net of approximately \$3.80 (\$4,400,000);
2. Support ANC LLIN distribution to provincial level: Continue to support distribution of LLINs from port of entry to the provinces (\$300,000);
3. Support ANC LLIN distribution from provincial level to district level: In coordination with UNICEF, increase support to distribution of LLINs from the provincial level to the districts and health facilities and strengthen the logistics management of LLINs at provincial and district levels (\$250,000); and
4. ITN Social marketing: In collaboration with other partners, start the process to establish and implement a national ITN social marketing program (\$500,000).

Indoor Residual Spraying

Background

IRS remains a priority vector control intervention for MISAU in Mozambique. Historically, IRS was focused on urban and peri-urban areas, which represent approximately 35% of the entire population. However, the recently finalized National Strategic Plan no longer specifies the areas targeted for IRS, nor what proportion of the population will be covered by this intervention. MISAU has historically selected the areas to receive IRS based on population density in each of the districts, and during the universal coverage campaigns for ITNs in the past three years has elected to distribute nets to the districts where no IRS takes place. With the current drafting of a Vector Control Strategy it is expected that epidemiologic data will guide where IRS and ITN mass distribution will take place in the future.

Currently, there are three major supporters of IRS in Mozambique: PMI, Global Fund and MISAU. PMI focuses on parts of Zambézia Province, and MISAU sprays between 50 and 60 of the 122 remaining districts in the remaining provinces. In 2012, Global Fund will support the procurement of insecticides in support of the government's national spray campaign. LSDI support of IRS in Maputo and Gaza provinces ended earlier than expected in September 2010 when the Global Fund withdrew support. Although the plan was to hand over IRS activities to the provincial authorities, the early termination of LSDI, prevented this from taking place. In 2010, as a result of LSDI's early termination, MISAU was only able to spray two of the eight districts in Maputo Province, and achieved low overall IRS coverage in Gaza Province. In addition to losing LSDI's support in 2010, funding from bilateral donors to the Common Fund, which is the source of MISAU's IRS funding, was interrupted due to unresolved audit issues, negatively impacting MISAU's ability to conduct national IRS activities.

PMI-supported IRS in Zambézia began in 2007. Historically, IRS insecticides have been procured by MISAU for all spray operations in the country, with the southern provinces using DDT and carbamates, and the central and northern provinces using pyrethroids. The exception has been Zambézia Province which up until 2009 also used DDT. The insecticide selection and the timing of the spray cycle have been dictated by MISAU, though PMI has raised questions

about the use of short-acting pyrethroids, quality of the insecticide procured, and the timing of the spray operation (beginning well before the transmission season). For the 2011 campaign PMI for the first time procured pyrethroid insecticides to be used in Zambézia Province.

The PMI-supported upgrade of the central reference entomology laboratory and insectary at the INS in Maputo was completed in 2010. These facilities allow for in-country processing of mosquito material, such as PCR species identification of mosquito complexes, ELISA testing for malaria-infected mosquitoes, ELISA- and PCR-based monitoring for insecticide resistance and its mechanisms, and insecticide efficacy monitoring for IRS and LLINs nationwide. Previously, field collected material had to be sent outside the country for such laboratory assays. PMI supported the construction of an entomology laboratory in the city of Quelimane in Zambézia Province, to serve as a regional center for entomologic monitoring and surveillance for IRS and LLIN activities in the central provinces of Mozambique. In a collaborative effort between PMI and the DPS, the Quelimane entomology laboratory has been staffed by four DPS personnel trained in basic entomologic field techniques, as well as insectary maintenance. PMI provided funding for an entomology technician to assist, with short-term technical assistance from entomologists from Kenya, the DPS personnel in entomologic monitoring. Similarly, the PMI-supported entomology laboratory in the city of Pemba in Cabo Delgado Province is operational. It is currently staffed by a DPS biologist trained in a WHO/PMI supported workshop in 2008, and by three technicians from the DPS. Due to the lack of entomologists at the central level, PMI in 2009 also hired an entomologist to provide two years of entomology technical assistance for the PNCM to support the national entomology surveys and assist with IRS surveillance in Zambézia.

Progress during last 12 months

In 2010 the PMI IRS campaign in Zambézia Province increased from six to eight districts (Nicoadala, Namacurra, Quelimane, Milange, Morrumbala, Mocuba, Maganja da Costa and Mopeia), covering 70% of the population of those districts. In 2011, PMI continued to support IRS activities in the same eight districts. The 2011 spray campaign, carried out from September 12th – December 9th, used *Fendona 5% WP*, a pyrethroid. A total of 2,519 men and women were hired and trained as spray operators, team leaders, locality and district supervisors, coordinators, and warehouse keepers. Of the 664,544 structures found in the targeted districts, 660,064 were sprayed, representing 99% coverage. The total number of persons protected is estimated at 2,825,648, including 194,345 pregnant women and 540,600 children under five years of age.

WHO wall bioassays conducted in 2011 in Mocuba District one and two months post-IRS showed 97% and 86% mortality, respectively, after 24 hours. In Mopeia, testing carried out one and two months post-IRS showed mortality levels of only 67% and 53%, respectively. In Morrumbala, bioassays conducted three and four months post-IRS had 96% and 84% mortality respectively. In Maganja da Costa testing carried out three and four months after IRS showed 58% and 50% mortality, respectively. The apparent short acting residual effects of *Fendona 5% WP* on sprayed walls in some districts are of concern.

In August 2011, Abt Associates was awarded a three-year Africa-wide IRS project for 14 PMI countries. In January 2012, a four-person team was deployed to Mozambique to initiate the

transition of the IRS program to Abt Associates. To provide more consistent support for the entomology personnel and activities in Zambézia, an entomologist has been hired by Abt and based in Quelimane. Because of the lack of entomological capacity at the central level, PMI continues to support the PNCM with an entomologist, hired in 2009, to support the national entomology surveys and assist with IRS surveillance in Zambézia. In addition, PMI is supporting entomologic strengthening at the central and provincial levels with training, supervision and standardization of entomology techniques. The 2012 spray campaign will begin in September and will target approximately 573,000 structures in only the six original districts, covering approximately 2.4 million people.

Proposed activities with FY 2013 funding

Because funding limitations are likely to continue, PMI will support the seventh round of IRS in Zambezia, as funding permits, within the six original districts for a second year. It is expected that improved epidemiologic data collected during 2012 and 2013 will guide targeted spraying for the 2013 campaign to maximize the limited funding to achieve greatest impact.

The two previous IRS districts of Mopeia and Maganja de Costa transitioned to universal LLIN coverage in 2012, and will undertake epidemiologic and entomologic surveillance to monitor the impact of the vector control transition. Epidemiologic and entomologic surveillance will also be undertaken in the six districts in which PMI is currently implementing IRS as well. Enhanced epidemiologic monitoring will be based on health facility surveillance, using MISAU's newly implemented malaria data reporting for laboratory confirmed cases of malaria. PMI will provide support to ensure the availability of tools to conduct the surveillance (reporting tools as well as consistent supply of RDTs from existing national stocks) and the oversight to ensure the flow of quality data from health facilities to the district level and from there to the provincial level, where the data will be entered into a malaria database (see Monitoring and Evaluation Section for more details).

In addition, as entomologic monitoring of the insecticide alpha-cypermethrin used in 2011 IRS operations indicated only a three-month or shorter residual efficacy of the insecticide on walls, PMI will purchase a longer-acting insecticide for the 2013 IRS operations in Zambézia Province. The selection of insecticide for 2013 spraying will be based on residual efficacy data from the 2012 spray operations and on insecticide resistance data, which will likely take place early in 2013. With the possibility of emerging insecticide resistance in Zambézia Province, entomologic monitoring in IRS districts will be intensified. PMI will also work closely with the PNCM on a revised national malaria vector control strategy, which should address, among other issues, insecticide selection and the timing of the start of the spraying as it relates to the transmission season. Currently, there are no PMI plans to support the National Strategic Malaria Plan on larviciding or environmental management.

To promote long term sustainability of the IRS program in Zambézia and strengthen provincial capacity, PMI proposes to begin transitioning certain operational components of the IRS program from IRS 2 TO 4 to the DPS. Fiscal year 2013 funds will be given directly to the Zambézia DPS for implementation of IRS social mobilization activities. Other components of IRS such as procurement of insecticide and other IRS commodities, training, and environmental

assessments will continue to be managed by IRS 2 TO 4. This proposal also suggests corresponding significant oversight by both Abt and when necessary, the PMI team.

Proposed activities with FY 2013 funding: (\$5,195,000)

1. IRS implementation in Zambézia Province: Continue to support epidemiologically guided IRS operations (targeted IRS) in Quelimane, Namacurra, Nicoadala, Morrumbala, Mocuba and Milange districts of Zambezia Province. The number of structures and population to be covered in the six districts for the 2013 IRS operations will be determined based on malaria transmission data to target areas where impact of IRS could be greatest. The PMI supported activities for 2013 IRS operations will include training, supervision and environmental monitoring of IRS (\$2,870,000);
2. Direct support to the Zambézia Province DPS for the implementation of social mobilization activities (\$100,000);
3. Purchase equipment and supplies for the IRS operations in six districts: Procure adequate quantities of a longer-acting pyrethroid insecticide, personal protective equipment, and spare parts for spray pumps (\$1,625,000); and
4. Forward funding for 2014 IRS operations: Support for activities for 2014 IRS operations that take place prior to availability of 2014 funds (\$600,000)

Intermittent Preventive Treatment of Pregnant Women

Background

The MISAU Maternal & Child Health Program (MCH) underwent an internal re-organization with changes to personnel in 2012 and appears open to improving coordination of activities with the PNCM. During the yearly MISAU performance assessment (*Avaliação Conjunta Annual*), the malaria indicators, specifically IPTp and ITN coverage for pregnant women, which fall in the arena of MCH implementation, were determined to be below target. The low coverage for these indicators has re-invigorated the sense of urgency at MISAU for better coordination between the two programs.

The annual MISAU performance assessment relies in part on different MISAU programs submitting data collected through the routine health information system, which is known to be weak. MCH has been updating the outpatient registers used in maternal and child health wards to include HIV and malaria-related fields (coverage of IPTp and ITNs) previously not collected; these were rolled-out early in 2012. The information collected in these new MCH registers flows into the *Modulo Basico*, which is also being updated. Some partner-supported registers did collect this data in the past, but not in a nationally standardized manner.

The priority for the MISAU MCH program is the implementation of an “Integrated Reproductive Health/Maternal-Neonatal-Child Services Package” described in the FY 2012 MOP. This priority was noted during the development of the GHI Mozambique country strategy and is in

line with GHI's goal of aligning with national priorities. PMI has contributed to this effort, along with other USAID funding sources, since FY 2009. The USG has supported the development of national policies, norms, and guidelines; conducted training on the integrated in-service training package; provided support for the improvement of the quality of care; and coordinated MCH partners under the leadership of MISAU.

The MISAU has promoted malaria prevention interventions for pregnant woman, including the use of SP for IPTp and ITNs, since 2006. Three monthly doses of SP after quickening are recommended in Mozambique due to the high HIV prevalence. However, clearly articulated guidelines on IPTp administration are lacking for MCH health care workers. The newly drafted "Mozambique Malaria Treatment Guidelines" (*Normas de Tratamento da Malária em Moçambique*) address IPTp, but these guidelines do not go into as much detail for IPTp as they do for the treatment regimens for malaria. While the use of IPTp has been national policy since 2006, its scale up has gone slowly. In the 2008 MICS, 43% of pregnant women received at least two doses of SP, however in the 2009 HIV/AIDS survey, IPTp2 coverage was 33%. The preliminary results of the DHS conducted in 2011 show the national coverage to be only 18% for IPTp2. The reason for the low coverage is not known; it is thought to be due to a combination of factors, including inconsistent stocks of SP, poorly coordinated training of staff, and lack of supervision, together with poor reporting practices. A national stock out of SP occurred in mid-2010 through early 2011 due to expiry of all SP in country. Although SP normally has been procured by MISAU, currently there is a gap in financing. PMI, therefore, supported SP procurement in 2011 and 2012.

Assuming pregnant women make up approximately 5.5% of the population, an estimated 1.37 million women will be pregnant in 2014 in Mozambique. Using this figure a total of 4.1 million treatments of SP (comprised of three tablets each) are required to maintain an adequate SP pipeline if each woman is to receive the requisite three doses of IPTp during her pregnancy. However, many pregnant women are also HIV-positive and first learn of their serologic status when they present for ANC services. HIV-positive women are referred for CD4 testing and enrollment in antiretroviral therapy, as appropriate. Cotrimoxazole for opportunistic infection prophylaxis in HIV-infected women is also national policy, which precludes the use of SP for IPTp in these women.

The LLINs, another component of the ANC service package, are managed centrally by the PNCM as far as forecasting needs, specification of LLIN types, and distribution from port of entry to province. In contrast to SP, LLINs for ANC distribution are not part of CMAM's domain for supply chain management and, therefore, have required external support through donors and other partners for their distribution. PMI is working, along with UNICEF, to improve distribution from port level to district level by decentralizing support to facilitate the transportation from the provincial level down (See Capacity Building Section).

Progress during last 12 months

New registers for the MISAU MCH Program were rolled out in early 2012 with PMI support. Although there will be challenges consistent with the implementation of a new reporting system, this new register will be a major improvement for the collection of data for these interventions.

PMI has contributed to the training of 416 MCH nurses and 29 trainers on integrated Maternal, Neonatal and Child Health (MNCH) care, including malaria prevention. In addition, 39 health care workers were trained on malaria case management. These national case management trainings, which were initiated in mid-2011, are expected to continue until the end of 2012. PMI supported the development of the training modules and participates in the training sessions themselves to ensure quality of training. It is expected that through the supervision of these staff, the deficiencies in point of service delivery can be addressed that relate to the health care worker. The number of supervisions conducted, where they were conducted, improving the supervision itself by selecting appropriate staff to conduct it with appropriate guidelines and reporting tools to document outcome are all part of the efforts to improve the coverage of this intervention. In addition, PMI has supported the development of a matrix of priorities for improving the quality and humanization of care specifically for malaria.

The USG provided funding for about 3.6 million treatments of SP for 2010 – 2011 and, due to continued funding limitations at CMAM, will procure SP for 2012-2013.

Table 3: SP Gap Analysis

	2012	2013	2014	2015
SP national needs	6,000,000	0	3,980,375	6,411,032
PMI	6,000,000	0	4,000,000	0
Annual SP gap	0	0	(19,625)	6,411,032

Proposed activities with FY 2013 funding are as follows: (\$600,000)

PMI will continue to support the provision of antenatal care services to pregnant women through training and supervision. Improving the quality of the supervision itself from the provincial level down (through appropriate personnel selection, training and guidelines), as well as improving the reporting of the supervision outcomes, are important components of the PMI plan to improve IPTp coverage. Through the ongoing national case management training, topics such as IPTp, as well as reporting on malaria case management (specifically ACT and RDT consumption) and logistics are emphasized. It is expected that the programmatic leadership for this will come from the PNCM at the central level and that there will be a decentralization that moves the supervision of the implementation to the provinces and the districts. Support from PMI partners will also include the facilitation of such supervision. In addition, support to the PNCM will be continued for supervision from the central level to the provinces. PMI will also support the procurement of SP to meet the national gap for 2014 of approximately 4,000,000 treatments.

1. Support supervision of ANC staff in malaria in pregnancy (MIP): Support integrated supervision of ANC and HCWs in prevention of malaria in pregnancy (\$500,000).
2. Procurement of SP: Procurement of approximately 4,000,000 doses of SP to fully meet the nationwide SP needs for 2014 (\$100,000).

CASE MANAGEMENT

Malaria Diagnosis

Background

The PNCM continues to prioritize confirmatory testing for the diagnosis of malaria. This applies to all levels of health care, including APEs. An updated policy for diagnostic testing was launched in 2009. Initially aligned with the revised WHO diagnostic guidelines, the policy was revised in 2011 to recommend that persons of all ages, and from all parts of the country, suspected of having malaria receive a confirmatory diagnostic test before treatment with an ACT. Among the roughly five million cases of malaria reported annually, only about 20% are diagnosed by microscopy. Given the challenges around ensuring the availability of high-quality microscopy, RDTs are the preferred test for primary diagnosis of malaria in Mozambique, while microscopy, according to national guidelines, is reserved for suspected treatment failures, severe febrile illness, and cases referred from lower levels of care. While refresher training of microscopists has recently taken place, poor supervision and lack of quality assurance measures has resulted in the overall poor quality of microscopic diagnosis of malaria in Mozambique. In addition, of the 1,249 health facilities in the country, only 254, or about 20%, are equipped with laboratories. Moreover, stock-outs of microscopy reagents such as Giemsa stain, methanol, and immersion oil are common.

There have been many challenges to the roll-out of laboratory diagnostic testing both centrally and peripherally since 2007. At the central level the lack of consumption-based distribution plans for RDTs, poor warehousing and storage practices and poor logistics management have resulted in relatively widespread RDT stock-outs at peripheral levels. These intermittent stock-outs lead to an inability for HCWs to comply with guidelines for diagnosis and thus contribute to the overall poor case management.

Progress during last 12 months

The PMI-supported refurbishment of the National Reference Laboratory for Blood Parasites in Maputo is complete and the plans for the activities that will take place in the laboratory have been finalized. This Reference Laboratory is responsible for malaria diagnosis quality assurance and training, along with limited reference services. Malaria diagnosis supervision guidelines have been completed, though they are not yet being used for decentralized supervisory purposes at the provincial level. PMI will continue to support laboratory supervision collaboratively with PNCM, the laboratory section of DNAM (the National Directorate of Medical Assistance), but will also focus more on the DPSs. PMI has also supported completion of the procedures manual for training of laboratory technicians and is in the process of developing quality assurance of laboratory testing procedures for malaria. The development of this quality assurance manual, led by the INS, is a comprehensive effort to improve not only the quality of malaria diagnosis but also HIV and tuberculosis diagnosis.

Three regional training of trainers workshops in malaria microscopy were recently carried out in Tete, Maputo and Beira Provinces with support from PMI and the INS. A total of 65 laboratory

technicians attended the three training workshops. Using a cascade approach, these trainers then trained 1,072 laboratory technicians in malaria microscopy, representing 95% of the 1,200 laboratory staff existing in the country.

A study to assess the forecasting, allocation, distribution, and stock management plan for RDTs has been finalized but is awaiting award. The information collected through this study will be used to improve the allocation and distribution of RDTs, as well as to highlight current challenges of RDT use and interpretation by HCWs so that these can be adequately addressed during laboratory supervisory visits. In addition to this assessment on RDT use, another study is underway by PMI implementing partners in Cabo Delgado Province. The study will estimate the stock shortages of RDTs for HIV, malaria, and syphilis; identify factors associated with stock shortages and predictors of the percentage of overall need; identify the distribution system characteristics affecting stock shortages; and finally identify and quantify data quality and collection challenges at the health center level for RDTs for HIV, malaria, and syphilis. PMI expects to use these data to help identify and address similar challenges in other provinces to improve the availability of malaria RDTs and inform future supply chain strengthening activities.

Table 4: RDT Gap Analysis

	2012	2013	2014	2015
RDT national needs	18,748,300	24,715,138	24,643,410	26,795,076
Global Fund	10,268,300	10,368,322	0	0
World Bank	4,080,000	4,520,000	0	0
PMI	4,400,000	3,000,000	6,000,000	0
Annual RDT gap	0	6,826,816	18,643,410	26,795,076

Proposed activities with FY 2013 funding: (\$4,297,100)

PMI will support the continued strengthening of diagnostic laboratories at all levels through procurement of necessary commodities, refresher training, supervision, and quality control of diagnostic testing. The proposed activities are as follows:

1. Procure RDTs and laboratory supplies: Support will be provided to procure approximately 6 million single species RDTs plus additional microscopy kits (slides, lancets, cotton, and alcohol) (\$4,000,000);
2. Support to National Reference Laboratory: Continue support to the INS National Reference Laboratory with procurement of supplies including microscopes, microscopy kits and reagents for routine reference activities and repair parts for malaria-related diagnostic equipment (\$30,000);
3. Support training and supervision of laboratory diagnosis: Provide support for in-service training and integrated supervision of laboratory staff in malaria microscopy and use of RDTs by HCWs, including quality assurance. This activity will be coordinated with efforts to improve laboratory diagnosis of other diseases, e.g., HIV/AIDS and tuberculosis (\$250,000); and

4. Technical assistance from CDC: CDC staff to provide technical support and supplies needed to conduct training to PNCM and INS laboratory strengthening activities (\$17,100).

Malaria Treatment

Background

Since 2007, there has been significant confusion at all levels of the health care system regarding standards of care for malaria treatment, as national malaria treatment guidelines have changed three times. The first-line treatment in Mozambique is AL, which was rolled out nationally in 2009, and the second-line treatment is AS/AQ. Efforts by the GOM to provide an uninterrupted supply of either the first or second-line treatments have been hampered by a combination of a weak supply chain and unreliable forecasting due to poor quality data. Ongoing challenges with Global Fund grants also hamper procurement and supply chain planning as well as donor coordination for ACTs and other malaria-related commodity needs (e.g. RDTs and severe malaria drugs).

Significant delays in donor- and locally-financed AL have resulted in national-level stock-outs of AL during the early part of 2012. As a result the second-line treatment, AS/AQ, was widely distributed for approximately six months as a substitute for AL. Also contributing to the general confusion regarding standard treatment of care was the lack of finalized case management guidelines that until 2011 were available only in draft form.

In response to the April 2011 WHO malaria treatment guidelines, MISAU now recommends the use of parenteral artesunate over parenteral quinine for both adults and children for the treatment of severe malaria. According to treatment guidelines approved in Mozambique, rectal artesunate suppositories are recommended for pre-referral treatment of severe malaria. Quinine remains the recommended treatment for pregnant women during their first trimester and for suspected failures to AL.

An interest in revitalizing the APE network arose several years ago and since then, policies and an operational plan have been developed. APEs provide 80% preventive care and 20% curative care at the community level for illnesses such as upper respiratory tract infections, diarrheal diseases and malaria. With the policy and training materials finalized, the first group of APEs was trained on a rolling basis starting in mid-2011 through January 2012. The APEs are intended to serve as the “first-line of defense” against malaria so that people in very rural areas will have access to a trained individual capable of using an RDT and if positive, an ACT, in line with the newly revised case management guidelines.

From 2008 through 2010, Global Fund grant funds went through the sector wide approach framework (SWAP). A recent audit by the Global Fund, however, found some financial discrepancies and requested the MOH to investigate these findings. As a temporary measure, all non-commodity funding through Round 9 to the principal recipient was placed on hold. At the time of drafting this MOP, findings from the MOH-led investigation were unavailable. If these issues are not resolved, Phase 2 of Round 8 will not be released. PMI will continue to support

the procurement of antimalarials with FY 2012 funds but given the World Bank grant is coming to an end this year and the precarious nature of Global Fund funding, PMI may be the major donor to fund ACTs and RDTs after 2012. This will pose significant challenges in terms of meeting commodity needs for pending gaps.

Quantification of malaria treatment needs

Estimates of ACT needs for 2012 and beyond were provided by the Malaria Quantification Group based on a quantification exercise done in May 2012 using software developed by the Clinton Foundation. This software was also used to develop a country-wide supply plan for all partners including PMI, the Global Fund, the World Bank and the GOM.

Assumptions made for antimalarial drug forecasting and quantification again included an expected drop in number of malaria cases; this is expected to transpire due to the implementation of preventive measures such as ITNs, IRS as well as the increased use of RDTs, and an overall improvement in malaria case management. This quantification assumed an annual population growth rate of 2.4%, a 5.5% pregnancy rate and a 50% (i.e., six-months of the year) high-risk of malaria rate. It also took into account differences in malaria prevalence by province and age group, accessibility to health services, and expected impact of IRS and ITNs on malaria transmission. The positivity rate of laboratory testing was not considered a variable and remained constant for purposes of the quantification calculations.

Table 5: ACT Gap Analysis

	2012	2013	2014	2015
AL national needs	14,612,891	10,783,193	8,686,560	8,919,360
Global Fund	0	933,888	0	0
World Bank	3,583,891	1,299,840	0	0
PMI	11,029,000	6,084,185	6,400,000	0
Annual AL gap	0	2,465,280	2,286,560	8,919,360

Progress during last 12 months

Challenges remain in Mozambique to scale-up malaria case management activities. However, there has been significant improvement in the ability of in-country partners to coordinate and harmonize activities, due in part to the routine meetings of the *Grupo Tecnico do Medicamentos*, (GTM). The GTM serves as a coordinating body for the overall implementation of MISAU priorities, including the management of donor and State financial resources intended for the procurement of medicines and medical supplies and activities related to the management of these products.

Efforts to strengthen supervision have been made through implementing partners at the provincial level by working with the DPSs. Beyond the provincial level, there is a continued interest by the PNCM to work with APEs and PIRCOM, both of which have extensive reach. Formalizing these networks continues to pose challenges given the geographic parameters (i.e.,

Mozambique is a large country and reaching distant provinces beyond the immediate areas is difficult for the PNCM), as well as the limited staff within the PNCM.

In 2011, 339 APEs were trained with support from NGO partners across three provinces. Their data suggest that, during this time period, about 105,000 cases of malaria were treated and about 2,400 supervisory visits (covering ARI, diarrheal disease management, and malaria) were conducted. The potential for better integrating APEs into the national health system should be further explored. Originally, the strategy was to place 25 APEs in each of the 144 districts nationwide where they would be a reliable resource for malaria case management (under coordination from the DPS's on a quarterly basis). Additionally, routine monitoring through the collection of malaria-specific indicators by the APEs will be done on a monthly basis. If successful, this network will consist of 2,800 fully-trained APEs by 2014.

Refresher training of clinical staff from all levels of the public sector on the new treatment guidelines has been conducted in three provinces; 757 clinicians were trained in Maputo, Gaza and Cabo Delgado Provinces.

Proposed activities with FY 2013 funding:

See activities listed below under the Pharmaceutical Management section.

Pharmaceutical Management

Background

Structure of the pharmaceutical management system

CMAM falls under the management of DNAM. It is the national entity with the primary responsibility within MISAU for all central-level supply chain functions, bearing responsibility for the procurement of all pharmaceuticals and related health supplies for use in the public health system. The CMAM, in collaboration with the PNCM, continues to manage the forecasting needs and supervises the procurement, storage, and distribution of essential medicines and related medical supplies from the central level to the provincial warehouses. CMAM takes legal responsibility for procurement-related activities. Twice a year, CMAM will issue a public tender open to national and international bidders who must offer competitive prices and lead times for ARVs, antimalarials, and antimycobacterial drugs that are WHO-prequalified.

With support from different USG funds, CMAM operates under newly revised standard operating procedures, directly derived from the 2010 updated procurement legislation. Other areas of technical assistance from the USG, including PMI, focus on quantification, logistics management information systems and warehousing and supply chain management. The Supply Chain Management System (SCMS) Project has been a continued source of funding and technical assistance around warehousing both in Maputo and Beira.

Distribution

About 1,300 health facilities, ten provincial warehouses, and three central hospitals are serviced by the dual logistics system set up in Mozambique. One of the distribution systems targets only the health centers and APEs, each with a distinct kit of essential medicines, which are financed by pooled MISAU resources and other donor funds. There is also a separate AL-only kitting system initially developed in response to the bulky Coartem packaging. Currently, the DELIVER project supports this system, which is handled at the central Zimpeto warehouse. These malaria kits are distributed in parallel with the essential medicine kits.

The second logistics system, the *Via Classica*, is a pull system that distributes medicines and commodities on a quarterly basis down to the provincial depots. Distribution from the depots is taken place on a monthly basis (unless an emergency request is made), either by provincial vehicles or if available, district trucks. The breakdown of malaria drugs between these two systems is divided almost equally. Through the *Via Classica*, commodities are delivered to one of the two central warehouses in Maputo and a warehouse in Beira, which in turn supply the three central hospitals and ten provincial warehouses. Each of the ten provincial warehouses supply the district warehouses, rural hospitals, general hospitals, and provincial hospitals.

Malaria drugs are also managed through the *Via Classica* requiring health facilities to request commodities based on consumption. In 2010, a national-level Pharmaceutical Logistics Master Plan (PLMP) was developed, in an attempt to address across the board, the multiple issues plaguing the pharmaceutical and supply chain in Mozambique. Changes in CMAM management, however, necessitated a temporary stop to all PLMP-related activities.

Logistics and warehousing

To date, there have been significant donor contributions toward supply chain strengthening and pharmaceutical management in efforts to ensure access to high quality commodities. Refurbishment of the main central warehouse, Zimpeto, located on the outskirts of Maputo, and refurbishment of the Beira regional warehouse in Sofala Province is near completion. Refurbishment of the Nampula regional warehouse is scheduled to start soon. From the provincial level warehouses, distribution of commodities moves to the 128 district-level warehouses. Ideally, the regional warehouses should be harmonized to form a centrally managed, national system with accurate information on stock status for all essential commodities. Given the focus on improving collection of consumption data, PMI will likely focus more efforts at the provincial warehousing level.

Historically, multiple factors have contributed to the dysfunctional supply chain and logistics system in Mozambique, including the continued reactionary response to pending large-scale stock-outs, high turnover rates of personnel at both the PNCM and CMAM, and a disconnect between various programs within MISAU. The frequent changes to national level diagnostic and treatment guidelines have also had a confounding effect as the time lag between implementing large-scale changes to having new commodities added (and non-essential commodities removed) has not been sufficient. Operationally, this has translated into expiry and mismanagement of life-saving commodities.

During the first half of 2011, a large cache of expired drugs, primarily antiretrovirals and opportunistic infection medicines, and some ACTs, mostly funded with Global Fund grant support, was identified during routine supervision. The Global Fund halted the disbursement of phase 1 of the Round 9 grant until certain conditions precedent had been met by MISAU. These findings speak to an obvious deficit in terms of not only absorptive capacity of the supply chain but also how donor funds and technical assistance are used in Mozambique toward supply chain strengthening. Emergency procurements of some commodities from within the \$32 million phase 1 of Round 9 Grant has occurred and a Procurement and Supply Management plan has been developed and submitted.

Developed in collaboration with USG implementing partners, the Medicines Technical Working Group expanded upon an existing database tool to develop an electronic LMIS in 2010. By October 2010, the integrated LMIS had been rolled out to the last of the ten provinces. By mid-2011, consumption data was flowing from many of the provinces and there was dedicated staff within CMAM to analyze incoming consumption data.

Progress during last 12 months

Recently, a decision to include RDTs into the PMI-supported ACT kits was made. The impetus behind this decision stems primarily from one of the conditions precedent set by the Global Fund in response to last year's discovery of commodity diversion. This is being addressed in two ways: working with the DELIVER task order, a paper-based "tick" mark sheet will be inserted into every kit prepared by DELIVER (containing both ACTs and RDTs). Visually based (in the event APEs or HCWs have low levels of literacy), the sheets will be aggregated back at the district level and then the provincial, finally fed up to CMAM. In addition to the new consumption sheets, as mentioned above, the MOH wants to push the computer-based LMIS out to the district level. As of yet, there is no clear strategy to implement the LMIS at the district level.

This past year has also seen the implementation of two rounds of the End-Use Verification (EUV) tool as well as the SLICE Tool. The EUV highlighted the poor storage and warehousing conditions at the district and health facility level, but showed that ACTs were available with no significant stockouts. For further information, please see the Monitoring & Evaluation section. Working in collaboration with CMAM, PMI partners piloted the SLICE tool in September 2011 with support from Global Fund and UNICEF. The SLICE tool looks at areas of greatest vulnerability along the supply chain. The assessment visited 45 sites located in eight provinces and 26 districts across the country and included each level of the distribution point: point of entry (port, airport, land crossing), central warehouses, provincial warehouses, district warehouses and sub-district points of distribution to the end-user at the health facility level. Results from the pilot showed that the further you go down the supply chain toward the sub-district level, the greater the likelihood that commodities will be mismanaged. Further details of this assessment are included in the ITN section.

Proposed activities with FY 2013 funding: (\$9,250,000)

1. Procure AL: PMI will procure approximately 6.4 million AL treatments to fill gaps in the first-line treatment (\$7,900,000);
2. Provide technical assistance to strengthen the antimalarial supply chain and overall pharmaceutical management system of MISAU: Continue to support strengthening CMAM's capacity to forecast and manage antimalarial drugs through improved logistics management capacity, with particular support for AL distribution through the kit system. PMI will also support ongoing assessments of warehousing inventory management, as well as strengthening storage and distribution capability at the central level (\$500,000);
3. Support warehousing and drug management: Building on achievements already made at the central level warehousing facilities, PMI, along with PEPFAR, will support regional or provincial technical support from implementing partners to improve warehouse management, supervision of the LMIS system, and transportation of medicines to strengthen peripheral-level capacity in selected provinces (\$200,000);
4. Central supervision support: Facilitate and assist with planning for supervisory visits of central level staff to provinces as well as technical support for malaria case management (\$50,000); and
5. Decentralized support of case management supervision: PMI will focus efforts to improve supervisory capacity for malaria case management across all 10 provinces (excluding Maputo City) through facilitation of the logistics aspects of supervision and assistance in supervisory planning (\$600,000).

CAPACITY BUILDING AND HEALTH SYSTEM STRENGTHENING

Background

The PNCM is responsible for developing policy, establishing norms, and the planning, organizing, and coordination of all malaria control activities in the country. Additional responsibilities include periodic assessment of the impact of malaria control, development of training materials on malaria case management for HCWs at all levels, mobilization of domestic and external funds for malaria control activities, promotion of malaria awareness and advocacy, and leading operational research.

The PNCM staff has grown slightly and currently consists of a director appointed in November 2010; two physicians in charge of malaria case management; an advisor for M&E; a biologist working on M&E; a national IRS supervisor; a biologist for ITN-related activities; two biologists dedicated to entomology; an entomology assistant; a health communications officer; a data manager, and an administrative assistant. The M&E advisor, one of the entomology biologists, and the data manager are supported by either PMI or MACEPA. PNCM's implementation planning has improved as key documents have been finalized and approved: the National

Malaria Policy, the National Strategic document 2012 – 2016, and the National M&E Plan. In addition, a yearly implementation plan is being drafted with wide participation from partners. This document gives guidance on the timing for implementation for specific activities, on who will support their implementation, and how much funding is available for it.

At the provincial level, the implementation and coordination of health services are the responsibility of the DPS, specifically the Provincial Medical Chief. The Provincial Malaria Chiefs, who were selected among a cadre of biologists trained by PNCM in 2008 and seconded to the provinces, are scheduled to come to Maputo for a meeting, the “*Balanço Annual*” (Annual Balance) in August 2012. The objective of this meeting is for the provinces to present a summary of the malaria activities implemented in the past year. The PNCM will take advantage of this meeting to review their terms of reference, update them on the new guidelines for ITN distribution (both through ANC and by universal coverage) and harmonize other activities. Beyond the training the biologists received in 2008, they have no other malaria control management experience and receive little supervision from the central level. In addition to these biologists, the DPSs may have other personnel within their staff who also oversee malaria activities, though their responsibilities are not clearly outlined. The PNCM is currently identifying focal points among existing personnel at the district level to be responsible for malaria activities, mainly in the area of reporting of malaria indicator data. This is an important step for improving the oversight of malaria-related activities as this identifies a person to be accountable for malaria-related activities. As mentioned before, because malaria is not a “vertical” program, there is little accountability at the lower levels for malaria activities.

Given the lack of professionally trained HCWs, USG is contributing, along with other partners, to the “revitalization” of the APEs system. The new APE system consists of community HCWs who have been selected by their communities to undergo intensive four-month training on the prevention and treatment of common diseases, including malaria. Support for the APE revitalization comes from many partners: UNICEF, USAID, World Bank, Irish Embassy, Malaria Consortium, Save the Children, and World Vision. The rollout of the APE trainings was divided into several rounds. In Round 1, eight districts in eight provinces were selected: 179 APEs were trained and started their work in November 2011. In Round 2, 42 districts in ten provinces will receive support to train 1,050 APEs. At the end of Round 3, it is expected that a total of 2,179 APEs will have been trained. The trainings, although initially scheduled to start in 2010, began in August 2011 and are expected to continue into 2013. PMI’s support to this effort has been through the procurement and kitting of ACTs for APEs and in FY 2012 for technical assistance at the central level. Now that the amount of RDTs in country is sufficient, these are also planned to be included in the kits.

The National Directorate of Public Health (the MISAU department which houses the PNCM, DNSP) requested support years ago from the USG to establish an M&E unit within the DNSP that would be separate from, although supportive of, each of the programs within the DNSP. The USG support being requested is for M&E capacity building through technical assistance. This concept, although generally well received, has met with internal and partner challenges and to date is still not a functioning unit.

Progress during last 12 months

PMI is building capacity for malaria control at a number of levels. PMI Resident Advisors and implementing partners have provided technical and implementation support to the PNCM on a range of issues including the recently finalized National Strategic Plan, the M&E Plan and other policy documents. PMI supports an entomologist at the PNCM to coordinate all vector control activities that are outside of Zambézia Province (where PMI provides direct support for IRS activities). In Zambézia Province, PMI has been strengthening capacity at the DPS to implement IRS activities and conduct entomologic monitoring through the establishment of a provincial entomology laboratory and insectary, which is staffed by DPS personnel who work with the PMI partner on these activities. The regional entomology capacity to do entomologic monitoring/surveillance has been supported through PMI by the establishment of an entomology lab in Pemba, Cabo Delgado. This lab is managed by the Provincial Malaria Chief from Cabo Delgado Province through support from the DPS, although more training and support for the maintenance of the laboratory are needed. The training is scheduled to happen in FY 2013 through the entomology support provided by a CDC entomologist and will include insecticide resistance bioassays.

The National Reference Laboratory, the entomology laboratory, and an insectary at INS were refurbished and re-equipped with support from PMI. Three regional “training of trainers” for malaria microscopic diagnosis were held in 2011 to establish a cadre of highly qualified master trainers. These trainings were led by CDC reference laboratorians and were very successful. Several technicians were chosen from among these master trainers to lead the national refresher training on malaria microscopic diagnosis. National training took place during 2011 and was finalized in November 2011; a total of 1,082 laboratory technicians throughout Mozambique were trained. Moreover, PMI supported a needs assessment for the establishment of a quality control system for diagnostics in Mozambique; a draft guideline for such a system is awaiting approval. To complement this, two of the technicians working in the Reference Laboratory traveled to Atlanta to spend six weeks training in molecular biology and other techniques that are seen as part of the activities of a diagnostic reference laboratory.

To date, 1,229 “revitalized” APEs have been trained. Kitting for ACTs and now for RDTs will continue; however, the technical assistance at central level will no longer be necessary.

The CDC-led FELTP activities in Mozambique are continuing with success. The two-year Master’s level program in field and laboratory epidemiology started in August of 2010 with a cohort of five epidemiologists and six laboratorians, one of whom was mentored by the CDC PMI Resident Advisor and is expected to graduate in August of 2012. One of the newly accepted candidates for the second cohort is also being mentored by the CDC PMI Resident Advisor and will be assigned for her long-term project to the PNCM.

PMI is assisting with the hiring of M&E personnel (advisor) for the DNSP M&E unit; it is expected that a person will be hired in 2012 to support the malaria-related M&E tasks for the DNSP M&E unit. This person would work along with other M&E personnel on tasks from the MCH, PMTCT, and TB programs. These other M&E personnel are also in the process of being hired by other USG partners.

Proposed activities with FY 2013 funding (costs covered in other sections):

Strong and effective leadership by the PNCM will be critical to the success of Mozambique's malaria control efforts. As the number one killer of Mozambicans, malaria should be elevated within MISAU to a higher status. This will require strong leadership at the highest MISAU levels. To reach the PNCM targets, continued support, along with close coordination with other partners and donors, will be needed to strengthen the PNCM's capacity and that of other collaborating departments at the central, provincial, and district levels to plan, conduct, supervise, monitor, and evaluate malaria prevention and control activities.

To this effect, PMI plans on decentralizing support to the provincial and district level. The objective of this approach is to improve implementation of malaria-related activities through the facilitation of supervision, distribution of commodities, and M&E. Exclusively supporting the central level limits the ability to ensure that the activities implemented at the lowest level (health centers) are done with any level of quality. Therefore, PMI plans to shift support more toward the lower levels of the health system. This will be done through partners, especially local partners where they exist, and if possible directly to the provincial MISAU. In provinces where the USG has existing partners efforts will be made to use these existing mechanisms thereby following the GHI mandate and avoiding duplication of efforts. The activities that will fall under this effort to decentralize PMI support are the following: LLIN distribution to ANCs, IRS, case management supervision, BCC implementation, and M&E supervision. In addition, PMI will continue to support the kitting for APE commodities, entomology, data management and M&E activities for the PNCM and DNSP, laboratory capacity building, as well as contribute to the FELTP program.

COMMUNICATION AND COORDINATION WITH OTHER PARTNERS

Background

Within the USG, the USAID Mozambique Health Team has merged into one Integrated Health Office, maximizing the programmatic synergies among our PEPFAR, PMI, and other health programs. This change was seen as an opportunity to enhance administrative and technical efficiencies and avoid duplication of efforts as well as to facilitate a broader health systems approach across all USG programs, including maternal and child health, reproductive health/family planning, tuberculosis, HIV, malaria, and nutrition. An example of integration of USAID health's projects include a project PMI is supporting jointly with funds from MCH, RH/FP and PEPFAR: integrated MCH services. This project, in line with Mozambique's GHI strategy, aims at strengthening antenatal care services across the country through support at the central level for guideline and training material development and quality of care improvement through "Model Maternities" and supervision. The merger has not been without challenges (time management for meetings, expectations of roles and responsibilities and clear communication channels), but overall the merger has been successful in breaking down some of the vertical barriers, in line with GHI guidance.

The Global Fund Round 9 proposal was written with direct input from PMI; activities and funding were tailored so that an activity not funded by one donor was supported by the other. An example of this distribution of activities is the ITN coverage: PMI supports the procurement and distribution of ITNs through ANCs for pregnant women and Global Fund supports the procurement and distribution of the ITNs for universal coverage. In addition, PMI has scheduled the arrival of shipments of ACTs and RDTs based on the expected arrival of Global Fund commodities, and, more recently, World Bank-supported commodities. Of these three major donors, PMI has been more reliably able to count on the timing of their funding and, therefore, to a certain degree, has been able to schedule commodity procurements around the other two donors. The most important factor in this ability to respond has been communication and coordination through the PNCM among the donors. This communication is not always optimal but has improved significantly in the past year.

Within the private sector, with the relatively recent advent of a significant private sector boom in Mozambique – primarily in the extractive sector – USAID has engaged with several companies to facilitate support from the private sector for health-related issues.

BEHAVIOR CHANGE COMMUNICATION

Background

The objective of the PNCM's BCC activities is to ensure that by 2016 95% of the population is covered by key messages related to malaria prevention, diagnosis, and treatment. To support this objective, PMI is building the capacity of a local organization to train religious leaders in BCC and community mobilization to reduce malaria prevalence in at least four provinces. PMI is also supporting DEPROS to strengthen its capacity to develop, implement, and coordinate malaria BCC strategies and approaches.

In areas where IRS is conducted, the PNCM Communications Officer and other PNCM staff visit the area to be sprayed to sensitize the community prior to the initiation of spray activities. This usually involves discussions with local community leaders, community gatherings and accompanying sprayers to homes to interact directly with community members. In Zambézia Province where PMI conducts IRS, it uses the same messages approved by PNCM. Similarly, in areas where LLIN universal coverage campaigns are taking place, community sensitization activities are carried out following guidance developed in Universal Coverage Campaign Guidelines with the support from partners involved in these mass distribution campaigns. The community sensitization activities include the involvement of local leaders in all steps of the campaign and the training of these leaders to mobilize their communities. There is also dissemination of key messages related to malaria and LLINs through radio spots, leaflets and pamphlets before, during, and after the campaign. At the distribution points there are demonstrations of how to hang a net.

Where available, APEs are involved in malaria IEC/BCC activities within their communities; however, the number of APEs is still very low and only a few communities are covered. Communications activities carried out by PNCM have focused on radio spots and materials distributed at health facilities. Each year, the PNCM organizes World Malaria Day activities,

and at the provincial level, DPSs organize celebrations. Partners usually support these activities, but more planning and coordination is needed to make these events more effective.

Progress during last 12 months

Although there was progress in some areas, BCC related to malaria prevention and control continues to be a significant gap in Mozambique. The PNCM does not have a comprehensive strategic plan for malaria BCC, as the plan remains in draft format. In addition, there is weak technical capacity for BCC at the PNCM, and the coordination between the malaria program and DEPROS is weak.

PMI provides support to BCC through a centrally funded partner, although the late start of the project among other issues has limited PMI's ability to improve MISAU's capacity in this area. Due to the challenges faced by our partner in providing effective support to DEPROS and to PNCM to finalize the malaria BCC strategy, PMI has partnered with WHO to complete this task. A consultant has been identified and is already working with PNCM and DEPROS to finalize the malaria BCC strategy. Considerable progress has been achieved in the past weeks, and we now expect a final draft to be produced by the end of the year. With FY 2012 funds, PMI will support the finalization and dissemination of the malaria BCC strategy.

PMI support for BCC activities has largely been through an inter-religious group, PIRCOM, which is working in Zambézia, Nampula, Sofala, and Inhambane Provinces. During the past year, PMI trained 6,008 religious leaders on key malaria messages, who in turn have reached approximately 100,000 people in 35 districts: nine in Zambézia, ten in Nampula, 11 in Sofala, and five in Inhambane. PMI continued to strengthen PIRCOM's capacity by supporting several board member trainings, ongoing mentoring of staff, and finalization of policies, procedures, work plans, budgets, and other tools to guide the organization and its work. PMI also provided technical assistance to PIRCOM towards strengthening their capacity in BCC, including the second and final training of 12 provincial members in BCC for malaria prevention and treatment. Other PMI supported BCC achievements to date include regular support for the malaria communication group, including advising on the universal net coverage campaign and World Malaria Day 2012 commemoration with MISAU and PMI partners.

Proposed activities with FY 2013 funding: (\$870,000)

In order to support MISAU efforts in BCC, PMI will continue to provide technical assistance to PNCM and DEPROS and will support community-based NGOs to disseminate malaria prevention and treatment messages. PMI will also continue to strengthen DEPROS's capacity in development, implementation, and coordination of BCC strategies and approaches and will foster better collaboration and coordination between DEPROS and PNCM.

PMI has identified another partner, which has an established relationship with both PNCM and DEPROS, to provide support to the central level, using FY 2012 funds. This partner is already working with DEPROS to develop an advocacy, communication and social mobilization strategy for TB and will expand its support to include the malaria communication strategy.

In order to expand support beyond the provinces supported by PIRCOM, PMI will identify local or international NGOs based at the provincial level to implement community mobilization activities. This will include establishing sub-agreements with NGOs through the existing partners and launching a Request for Applications (RFA) to identify additional partners to work at the community level. The RFA will cover several technical areas, including BCC.

Finally, PMI will work in collaboration with USAID strategic information and health promotion colleagues to devise an M&E plan of the malaria BCC activities to help guide implementation and maximize impact of the BCC interventions. This will include an assessment of the effectiveness of BCC interventions using a combination of quantitative and qualitative measures.

Proposed activities with FY 2013 funding: (\$870,000)

1. Support community mobilization activities: PMI will continue to support religious leaders to mobilize communities in four target provinces of Zambézia, Nampula, Sofala and Inhambane (\$400,000);
2. Support provincial BCC activities: PMI will support at least five community-based organizations which will work through existing community networks and in close collaboration with the provincial health directorates to disseminate messages related to malaria prevention and treatment in at least five provinces (\$350,000);
3. Support MISAU's malaria BCC activities: PMI will continue to support coordination of malaria BCC activities, disseminate the malaria communication strategy (to be finalized with FY 2012 funding) and strengthen the DEPROS in the development, implementation and coordination of BCC strategies and approaches (\$100,000); and
4. Peace Corps collaboration: Continue to provide support to at least one Peace Corps volunteer to assist with nets logistics and to develop and disseminate radio spots with key malaria messages (\$20,000).

MONITORING AND EVALUATION OF MALARIA CONTROL ACTIVITIES

Background

Strengthening malaria M&E capabilities within the context of other M&E systems in MISAU is a priority for MISAU, PNCM, and its partners. PNCM finalized the 2012–2016 PNCM M&E Plan in early 2012. This plan is in line with the MISAU M&E unified system, which is aimed at integrating a variety of M&E needs of the priority health programs, and should result in more efficient use of data and resources and ensure that indicators are comparable over time and duplication of effort is reduced.

For its part, the DNSP has been working to establish an M&E unit as a separate unit among the other programs that fall under its direction. At this time it is unclear if this effort will move

forward. The plans and terms of reference for DNSP's "*Unidade de Monitorio e Avaliacao*" (UMA) were developed in close collaboration with the USG and were approved in September 2011. To date the unit has yet to be fully staffed or functional due to internal USG challenges in hiring appropriate staff for the UMA and limited human resources at MISAU to guide this process. A key factor in the delays in hiring staff for this position was related to the lack of clarity within the DNSP of the roles and responsibilities of the personnel within the unit and how they would relate to the programs within the DNSP, in addition to difficulties in finding qualified personnel to fill this position.

The MISAU MCH Program also had an important achievement, which was the roll-out of the new MCH outpatient registers. This roll-out has proven to be challenging because of the lack of coordination for the different elements that compose the reporting chain, specifically updating the electronic format of the *Módulo Básico*. However, despite the initial challenges of the roll-out, the new registers contain fields for key malaria interventions (IPTp and ITNs for pregnant women).

Clinical and laboratory-confirmed malaria cases have historically been included in the reporting system of notifiable diseases (*Boletim Epidemiologico Semanal* [BES]), which is managed by the *Departamento de Epidemiologia*. All public health facilities are expected to report on the number of "confirmed" malaria cases on a weekly basis. To date, confirmed and clinical cases are not routinely differentiated, limiting the quality of these data. These data are supposed to be transmitted to the provincial and then national level, although this does not always occur regularly. This reporting system should not be considered the routine out-patient reporting system as it is limited to "notifiable" diseases. The data is collected weekly so that, in a functioning system, an increase in cases of one of these diseases would trigger a rapid response. It has been recommended that data on malaria morbidity not rely on this system at this point given the high malaria prevalence and that it be reported through a "routine" out-patient health information system. This system would be an updated version of the *Módulo Básico*, which is a routine health information system that flows directly to the *Departamento da Informacao da Saúde* (Department of Health Information) via the *Sistema de Informacao da Saúde* (Health Information System). Currently, *Modulo Básico* data are sent to the district level where they are collated and transmitted to the provincial and national level; the data are not relied upon as appropriate out-patient data is not being collected, and the quality of the data that is collected and transmitted is deemed to be low.

The *Módulo Básico* is in the process of being updated; the MCH department is the furthest along in this updating process. The PNCM is also introducing elements to update the system; the pilot started in August of 2012 and national roll-out is expected to happen by 2013. The *Módulo Básico* updating process requires the programs in MISAU (TB, HIV, MCH, malaria, etc.) to identify which data fields are necessary to be included in the health facility out-patient registers. Therefore, new updated out-patient registers are not expected to become available for several years. Given the enormous pressure the PNCM is under to respond to donors on basic malaria indicators that should be collected through the routine health information system, the PNCM is piloting and planning on implementing national data collection which temporarily relies on existing registers and then compiling this data into newly designed malaria data reporting forms. These forms are to be completed by HCWs at the health facility level and sent to the newly

appointed “focal point” at the district level (see Capacity Building Section). The district level focal point will compile the data and send them to the provincial level where all district level data will be entered into a newly created malaria database. National training is taking place to instruct HCWs to collect new data elements in the existing data fields of the out-patient register. An example of a data element needed is “suspect cases.” A consultant hired through support by the Southern African Development Community (SADC)/Southern Africa Roll Back Malaria Network (SARN) visited Mozambique in mid-2012 and created the malaria database, which will be populated with new data elements collected from the existing out-patient registers, as well as from other sources, specifically from new MCH registers, the pharmacy and laboratory.

Moreover, PMI is seeking to facilitate the ability of the ten provincial DPSs to conduct supervision of the malaria data reporting system that is currently being rolled out. As with supervision of others areas, limitations at all levels in availability of vehicles and fuel to travel to health facilities are one of the main obstacles regarding supervision. PMI plans on decentralizing support for M&E supervision to focus more on the provincial level down to health facility levels. PMI will engage local partners where these exist, or establish new local partnerships in each of the ten provinces (excluding Maputo City). These local partners will facilitate the logistics of the supervision (for example, ensure availability of cars and fuel to reach all health facilities), as well as assist the DPSs in their M&E supervision planning.

In early 2011, MACEPA placed an M&E advisor in Mozambique to assist the PNCM and partners to better coordinate M&E activities, focusing mostly on the strategic and policy level activities (such as finalizing the draft M&E strategic plan as well as defining indicators). MACEPA has been working closely with PMI to ensure that efforts are not duplicated. The M&E advisor has played a central role in guiding the process of finalizing the M&E strategic document as well as the National Malaria Policy and National Strategic Plan. The ongoing M&E coordination between various stakeholders is critically important for PNCM to have appropriate information to manage the program. The support from MACEPA is scheduled to end by 2012 but PMI will ensure continuity of the M&E support provided through MACEPA.

Progress during last 12 months

Entomologic monitoring: The entomology laboratory and insectary in Zambézia Province is a collaborative effort between the DPS, PMI and the PNCM, to serve as a regional center for entomologic monitoring surveillance activities for IRS and LLINs for the central provinces of Mozambique. It is currently staffed by four DPS personnel with the support of two entomology personnel from the IRS implementing partner. In addition, PMI has supported entomologic activities with short-term technical assistance from entomologists from Kenya and the CDC.

Insecticide resistance testing from 2007-2011 has shown variation in the levels of susceptibility of *An. gambiae s.l.* and *An. funestus s.l.* to the four classes of IRS insecticides, including the possibility of resistance to DDT, and confirmed resistance to deltamethrin and lambda-cyhalothrin in certain areas. Insecticide resistance testing done in 2011 in Mocuba and Maganja da Costa, both IRS districts, indicated 100% susceptibility of *An. gambiae s.l.* to lambda-cyhalothrin, bendiocarb, DDT, deltamethrin and fenitrothion. The differences in susceptibility seen over the years may reflect species differences in insecticide resistance development, the

focal nature of insecticide resistance and may indicate emerging insecticide resistance in some areas. With continuing IRS and the increase of LLINs through universal coverage, it is crucial that insecticide resistance testing continues. Resistance monitoring will take place in 2012 in three to five provinces outside of Zambézia and cone wall bioassays for insecticide efficacy in Cabo Delgado Province will also be conducted. In addition to Zambézia Province, PMI is supporting the PNCM in its national entomology surveillance plan, consisting of monitoring mosquito species, density, infection rates, and insecticide resistance.

Antimalarials availability monitoring: PMI-supported EUV assessments have been taking place since late 2011. These assessments consist of PNCM and CMAM central and provincial level staff jointly visiting sites, including warehouses and health facilities, with PMI. These sites were selected randomly at the provincial level (the PNCM has requested that all provinces be visited) to assess the malaria-related commodities supply chain and availability of these commodities at the health facility level. Given the lack of representativeness, these assessments are seen as a way of identifying bottlenecks in the supply chain and addressing them in a timely manner rather than as a tool to assess national distribution performance.

At the request of the PNCM, these surveys have been broadened to include a range of malaria activities and now include laboratory, pharmacy and case management components, where a sample of medical records from previous months are pulled and data extracted to calculate various indicators on case management. Between the two assessments, the provinces of Gaza, Zambézia, Niassa, Inhambane and Manica have had visits. Three more provinces have already had site visits; however, the report from these last three visits is not yet available. In general, during the survey the provincial warehouses, the district warehouses, urban and rural health centers and an APE are visited. Based on available reports to date, five provincial warehouses, 13 warehouses, 13 urban health centers, 12 rural health centers and 10 APEs have been visited in 13 districts in the five provinces mentioned. Overall, stocks of AL from at least one of the four presentations were always found at the health facility level during the assessment, but stock-outs of all products, including AL, in the three months prior to the assessment were common at the health facility level (especially for RDTs and LLINs). Examples of some of the case management parameters observed include the fact that clinical diagnosis of malaria is still common (30 to 58%) and AL is being used for treatment of cases (94 to 100%).

Miscellaneous M&E activities:

The field work for two LLIN evaluations has been completed; one assess the durability of LLINs will the other assess the effectiveness of Mozambique's LLIN universal coverage distribution model. For the net durability evaluation, the last survey and LLIN collection took place in November 2011 and processing of the LLINs in-country is to be completed by mid-2012. Preliminary results from this evaluation show that polyester nets last longer than polyethylene nets. Two years after distribution, 98% of polyethylene nets and 93% of polyester nets had at least one hole, however, polyethylene nets had significantly more holes of any hole category (based on size) than polyester nets overall. Factors associated with the holes are still being analyzed. The second evaluation to assess the effectiveness of Mozambique's LLIN universal coverage distribution model is ongoing; both planned surveys have been completed and data analysis is ongoing. Both of these evaluations are important to PNCM and PMI for policy and programmatic decision making, and the data will also be presented at conferences and published.

PMI provided support to a malaria module in the DHS 2011 to collect relevant data to monitor the status and impact of PMI interventions. Data collections started in May/June 2011. Preliminary results became available (with the exception of biological markers) in early 2012 and the finalized report is expected towards the end of 2012. The Global Fund has requested that MISAU plan for another MIS in 2013 and partial funding for this is included in the Global Fund Round 8 Health System Strengthening grant, which is in the process of approval. Planning with the National Institute of Statistics will need to be coordinated to reduce the burden of national surveys. Based on the likelihood of available funding for the MIS, this is expected to take place in early 2014.

The evaluation of the performance of HCWs use and interpretation of RDTs as well as logistic factors related to RDTs, an activity supported with FY 2010 funds, is still pending. Until now, limited information was available on the quality of RDT use at the health facility level or community level. The nationwide distribution of RDTs for malaria diagnosis, with little or no pre-service training, raises questions about the quality of their use and what impact this will have on case management. PMI is planning on having a local partner conduct this assessment in 2012 – 2013 in up to ten sites in the country using a standard protocol of data collection tools and observation of practices.

Enhanced surveillance in Zambézia: PMI conducted IRS operations in eight districts in 2010 and 2011, but two of these eight districts will not be receiving IRS in 2012. The transition from IRS to universal coverage with LLINs requires monitoring. PMI will be conducting enhanced surveillance in the two “transition” districts (Mopeia and Maganja da Costa), as well as in the six districts that will continue IRS operations in 2012. PMI will take advantage of the MISAU led roll-out taking place in mid-2012 of a new malaria data reporting system: this system includes national training of HCWs to fill out the existing out-patient registers with new data elements, new data summary tools to compile health facility level data, and a new malaria database at the provincial level. PMI will ensure through existing PMI staff at the district level in Zambézia that the health facilities in the enhanced surveillance districts have all the necessary tools (data collection tools as well as RDTs and ACTs) to conduct the surveillance. PMI will also ensure the flow of the data from the health facilities to the district focal points, as well as assist the focal point in overseeing data quality. The results of the enhanced surveillance will assist both PMI and DPS to target future IRS activities, as well as provide important data on the outcome of switching from one vector control intervention to another.

Proposed activities with FY 2013 funding: (\$2,336,600)

Well-functioning malaria surveillance and health information systems are crucial for monitoring trends, particularly as malaria interventions scale-up and data is needed to guide the PNCM on the implementation of control measures. The existing surveillance system continues to be weak and does not meet all the needs of the MISAU, PNCM or the donors. USG and partners are putting great effort to improve surveillance and M&E in Mozambique for malaria, HIV/AIDS, and tuberculosis by strengthening the MISAU routine health information system. To this effect the new MCH register is a positive step for both MCH and PNCM as is the roll-out of the temporary malaria data reporting system.

1. PMI will support M&E technical assistance by hiring an M&E advisor who will ensure continuation of support given to PNCM by MACEPA over the past two years. A data manager has been hired to assist with the roll-out of the out-patient malaria data collection tools and database which started in August 2012. It is expected that with the roll-out and national implementation extensive central level travel to all the provinces will take place (\$300,000);
2. Support for M&E supervision from provincial level to health facilities: PMI is seeking to engage existing USG partnerships or establish a new project to facilitate the ability of the ten provincial DPSs to conduct supervision in a decentralized manner. This will be done mainly by facilitating the logistics, as well as assisting the ten DPSs with their provincial-wide supervision planning. The local partners supporting the DPS to conduct supervision will be requested to submit the provincial supervision plan as well as reports on the outcomes of the supervisions conducted (\$500,000);
3. Support MISAU entomologic monitoring in sentinel entomological sites in up to six provinces (one per province) until planned funding from Global Fund for IRS related monitoring activities is disbursed to MISAU to conduct these activities (\$275,000);
4. Continue to support ongoing entomological monitoring in six PMI IRS districts in Zambézia Province, in addition to two PMI districts where IRS was withdrawn (\$150,000);
5. Entomology TDY (one) for CDC staff and supplies from CDC Atlanta to provide technical support to entomologic training and monitoring activities, including support for a limited pool of specific reagents and other laboratory diagnostic materials (\$24,500);
6. Enhanced surveillance in Zambézia: It will be important to continue to monitor the burden of malaria in the two transition districts as well as the six ongoing IRS operation districts with enhanced surveillance system (\$100,000);
7. Support for End-Use Verification Tool implementation: PMI will support the routine implementation of the End-Use Verification Tool three times a year, in a rotating sample of health facilities and medical stores in an integrated manner with MISAU supervisory visits (\$100,000);
8. Support of the Field Epidemiology & Laboratory Training Program: Support the FELTP program and possibly the participation of one or more PNCM staff in the FELTP program (\$75,000);
9. Malaria Indicator Survey: Global Fund and PMI will collaborate with the National Institute of Statistics to implement this national survey in early 2014. PNCM, PMI, Global Fund and other donors will be able to assess progress with this follow up survey compared to 2011 DHS (\$800,000); and

10. TDY from CDC Atlanta: CDC Atlanta staff to provide technical assistance to M & E strengthening activities (\$12,100).

STAFFING AND ADMINISTRATION

PMI staff includes two senior technical Resident Advisors, one representing CDC and one representing USAID, and a USAID Foreign Service National program management assistant that supports the two advisors. The addition of new implementing partners and the need to improve program management require the recruitment of additional staff. USAID will recruit a locally hired project management specialist, who is expected to take on both technical and managerial responsibilities.

The PMI staff work collaboratively to oversee and manage all activities in Mozambique. All PMI team members are part of a single inter-agency team led by the USAID Mission Director and work with the USAID Mozambique Integrated Health Office to oversee all technical and managerial aspects of PMI in Mozambique. This includes finalizing details of the project design, implementing malaria prevention and treatment activities, M&E of outcomes and impact, and reporting of results. PMI staff members report to the USAID Malaria Division Leader. The CDC RA will be supervised by the CDC Mozambique Country Director and will continue to receive technical support from CDC Atlanta. PMI Resident Advisors collaborate closely with the PNCM to support policy development, planning, and coordination of activities. All technical activities are undertaken in close coordination with the MISAU/PNCM and other partners, including WHO, UNICEF, the Global Fund, World Bank, and the private sector.

Locally hired staff to support PMI activities is 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 activities with FY 2013 funding: (\$1,001,300)

1. Management of PMI: Support to four staff members, including two senior Resident Advisors (one USAID and one CDC) based at the USAID Mission in Maputo, one senior Foreign Service National (project management specialist), and one mid-level Foreign Service National (project management assistant). The support includes all work-related expenses (e.g., salaries, travel, supplies, etc.), and mission-based expenditures, including USAID mission expenses incurred in the direct implementation of PMI activities (\$1,001,300).

ANNEXES

Table 1

**President’s Malaria Initiative — Mozambique
Year 7 (FY 2013) Budget Breakdown by Partner (\$)**

Partner Organization	Geographic Area	Activity	Budget (\$)
DELIVER	Nationwide	Procurement of 1.2 million LLINs for pregnant women at ANCs; Procurement of 6 million RDTs and additional microscopy kits, reagents, and microscopes if needed; Procurement and shipment of about 6.4 million AL treatments, including distribution to Provinces; Strengthening of CMAM’s capacity to forecast and manage antimalarial drugs and support distribution of ACTs through the KIT system; Support warehousing and management logistics at regional/provincial/district levels; and Support the implementation of the End-Use Verification Tool	17,200,000
Integrated Health Social Marketing Program (PSI)	Nationwide	Support for ANC LLIN distribution to provincial level; Implement national social marketing strategy	800,000
IRS IQC 2 Task Order 4 (Abt)	Zambézia	IRS campaign in six districts of Zambézia including procurement of PPE, spare parts, and insecticide; Support entomologic monitoring in five sentinel entomological sites; Support entomologic monitoring in six IRS districts in Zambézia; and Support enhanced surveillance in IRS to LLIN universal coverage transition districts	5,620,000
FARA (with DPS Zambézia)	Zambézia	Direct support to the Zambézia DPS for implementation of social mobilization activities related to the IRS campaign in the six target	100,000

		districts.	
TBCARE I	Nationwide	Support for National Reference Laboratory for Blood Parasites; Support supervision of laboratory diagnosis of malaria; Support supervision of clinical staff; Provide long-term technical assistance for monitoring and evaluation	630,000
CDC	Nationwide	Provide technical assistance for laboratory strengthening; Support for entomologic activities; Support FELTP program; and Support for M&E activities, including MIS	128,700
PIRCOM	Nationwide	Support PIRCOM to mobilize communities, continue capacity building	400,000
TBD	Nationwide	Support for ANC LLIN distribution, from provincial level to health facility	250,000
TBD	Nationwide	Support for in-service training and supervision of ANC staff in MIP	500,000
TBD	Nationwide	Provincial level supervisory activities for malaria case management	600,000
TBD	Nationwide	Provincial level BCC activities for malaria messaging	350,000
TBD	Nationwide	Support MISAU's malaria BCC activities	100,000
TBD	Nationwide	Collaboration with the Peace Corps	20,000
TBD	Nationwide	Provincial support for M&E supervision	500,000
TBD	Nationwide	Support for MIS in collaboration with GF	800,000
Admin			1,001,300
Total			\$29,000,000

Table 2
President's Malaria Initiative — Mozambique
Planned Obligations for FY 2013 (\$29,000,000)

Proposed Activity	Mechanism	Budget	Commodities	Geographical area	Description
ITNs					
Procure LLINs	DELIVER	4,400,000	4,400,000	Nationwide	Procure approximately 1.2 million LLINs @ \$3.80 per net targeting pregnant women and distributing through ANCs
Support LLIN distribution to ANCs at provincial level	Integrated Health Social Marketing Program (PSI)	300,000	-	Nationwide	Support for ANC LLIN distribution to provincial level from port of entry
Support LLIN distribution from provincial to district level for ANCs	TBD	250,000	-	Nationwide	Support for ANC LLIN distribution, in coordination with UNICEF, from provincial level to health facility
ITN Social marketing	Integrated Health Social Marketing Program (PSI)	500,000	-	Nationwide	Implement net social marketing program nationwide
SUBTOTAL ITNs		5,450,000	4,400,000		
IRS					
Support IRS implementation in six districts of Zambézia province	IRS IQC 2 Task Order 4 (Abt)	2,870,000	-	Zambézia	IRS campaign in six districts of Zambézia covering approximately 573,000 structures (2.4 million residents)
Support to Zambézia Province to implement IRS social mobilization activities	FARA (with DPS Zambézia)	100,000	-	Zambézia	Support to Zambézia Province to implement IRS social mobilization activities in the six targeted districts.

Proposed Activity	Mechanism	Budget	Commodities	Geographical area	Description
Procure IRS commodities	IRS IQC 2 Task Order 4 (Abt)	1,625,000	1,625,000	Zambézia	Procurement of PPE, spare parts, and insecticide
Forward funding for IRS activities in 2014	IRS IQC 2 Task Order 4 (Abt)	600,000	-	Zambézia	Support for activities for 2014 IRS operations that take place prior to availability of 2014 funds
SUBTOTAL IRS		5,195,000	1,625,000		
Malaria in Pregnancy					
Support in service training and supervision of ANC staff in MIP	TBD	500,000	-	Nationwide	Integrated training and supervision of ANC HCWs in prevention of MIP
Procurement of SP	DELIVER	100,000	100,000	Nationwide	Procurement of approximately 4,000,000 doses of SP to meet nationwide needs.
SUBTOTAL MIP		600,000	100,000		
Case Management: Diagnosis					
Procure diagnostic supplies	DELIVER	4,000,000	4,000,000	Nationwide	Purchase approximately 6.0 million RDTs and additional microscopy kits, reagents, and microscopes if needed
Support for National Reference Laboratory for Blood Parasites	TB CARE I	30,000	30,000	INS	Provide supplies for National Reference Laboratory for Blood Parasites
Support training and supervision of laboratory diagnosis of malaria	TB CARE I	250,000	-	Nationwide	Provide training and supervision of laboratory staff in malaria laboratory diagnosis, use of RDTs and QA
Provide technical assistance for laboratory strengthening	CDC	17,100	-	Nationwide	TDY for support of laboratory strengthening activities and supplies to PNCM, & QC system support
SUBTOTAL Diagnosis		4,297,100	4,030,000		

Proposed Activity	Mechanism	Budget	Commodities	Geographical area	Description
Case Management: Treatment & Pharmaceutical Management					
Procure AL	DELIVER	7,900,000	7,900,000	Nationwide	Procurement and shipment of about 6.4 million AL treatments, including distribution to provinces
Strengthen MISAU antimalarial drug management system	DELIVER	500,000	-	Nationwide	Strengthen CMAM's capacity to forecast and manage antimalarial drugs and support distribution of ACTs through the kit system
Support warehousing and drug management at regional/provincial/district level	DELIVER	200,000	-	Nationwide	Support warehousing and management logistics at regional/provincial/district levels
Supportive supervision of clinical staff	TB CARE I	50,000	-	Nationwide	Central level support supervision in malaria case management
Case management provincial support (HF and community level)	TBD	600,000	-	Nationwide	Provincial level supervisory activities for malaria case management
SUBTOTAL Treatment		9,250,000	7,900,000		
Behavior Change Communication					
Support community mobilization activities	PIRCOM	400,000	-	4 target provinces	Support PIRCOM to mobilize communities, continue capacity building
BCC provincial support	TBD	350,000	-	Nationwide	Provincial level BCC activities for malaria messaging

Proposed Activity	Mechanism	Budget	Commodities	Geographical area	Description
Support MISAU's malaria BCC activities	TBD	100,000	-	Nationwide	Support coordination of malaria BCC activities, disseminate the malaria communication strategy and strengthen the DEPROS in BCC strategies and approaches
Collaboration with the Peace Corps	TBD	20,000	-	Nationwide	Utilize third year volunteers to assist with net logistics and PIRCOM provincial coordinators
SUBTOTAL BCC		870,000	-		
Monitoring & Evaluation					
Provide long-term technical assistance for monitoring and evaluation	TB CARE I	300,000	-	PNCM	Support two full-time staff to supervise monitoring and evaluation activities at PNCM
Support for M&E supervision at provincial level	TBD	500,000	-	Nationwide	Support for M&E supervision at provincial level
Support for entomologic monitoring in MISAU IRS districts	IRS IQC 2 Task Order 4 (Abt)	275,000	-	Ento monitoring focus provinces	Support ongoing entomologic monitoring in five sentinel entomological sites and personnel to process samples in reference lab

Proposed Activity	Mechanism	Budget	Commodities	Geographical area	Description
Support for entomologic monitoring in PMI IRS districts	IRS IQC 2 Task Order 4 (Abt)	150,000	-	Zambézia	Support entomologic monitoring in six IRS districts in Zambézia, in addition to two former IRS districts
Support for entomologic activities	CDC	24,500	-	Nationwide	Support for ento monitoring and training activities to include specific reagents and laboratory diagnostic materials
Support enhanced surveillance in Zambezia	IRS IQC 2 Task Order 4 (Abt)	100,000	-	Zambézia	Support enhanced morbidity monitoring to assess transitioning from IRS to LLIN universal coverage and overall IRS impact
End-use verification	DELIVER	100,000	-	Nationwide	Support the implementation of the End-Use Verification Tool in a sample of health facilities and medical stores
Field Epidemiology & Laboratory Training Program	CDC	75,000	-	Nationwide	Support FELTP program with the participation of one or more PNCM staff
MIS	TBD	800,000	-	Nationwide	Support for MIS in collaboration with Global Fund
M&E TA	CDC	12,100	-	Nationwide	Support for M&E activities, including MIS
SUBTOTAL M&E		2,336,600	-		
In Country Staffing & Administration					
Support in-country administrative expenses	CDC/USAID	1,001,300	-	Nationwide	Staffing and general administrative support for PMI
SUBTOTAL Staff & Ad.		1,001,300	-		
TOTAL		29,000,000	18,055,000		

