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

PRESIDENT'S MALARIA INITIATIVE

Malaria Operational Plan — FY 12

MOZAMBIQUE

TABLE OF CONTENTS

ABBREVIATIONS AND ACRONYMS

ACT	Artemisinin-based combination therapy
AIDS	Acquired immune deficiency syndrome
AL	Artemether-lumefantrine
ANC	Antenatal clinic
APE	*Agentes Polivalentes Elementares da Saúde* (Community-based healthcare worker)
APHL	American Public Health Laboratories
ARV	Anti-retroviral therapy
AS–AQ	Artesunate-amodiaquine
BCC	Behavior change communications
BES	*Boletim Epidemiológico Semanal* (Weekly Epidemiologic Bulletin)
CDC	Centers for Disease Control and Prevention
CISM	*Centro de Investigação em Saúde Manhiça* (Maniça Research Center)
CMAM	*Central de Medicamentos e Artigos Médicos* (Central Medical Stores)
DDT	Dichloro-diphenyl-trichloroethane
DDS	*Departamento Distrital de Saúde* (Ditrict Health Department)
DEPROS	*Departamento de Promoção de Saúde* (Health Promotion Department)
DHS	Demographic and health survey
DfID	United Kingdom Department for International Development
DNAM	*Direcção Nacional de Assistencia Médica* (Nacional Directorate of Medical Assistance)
DPS	*Direcção Provincial de Saúde* (Provincial Health Department)
ELISA	Enzyme-linked immunosorbent assay
FBO	Faith-based organization
FHI	Family Health International
FP	Family planning
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
IMCI	Integrated management of childhood illnesses
INCAM	*Inqúerito sobre Causas de Mortalidade* (Cause of Death Survey)
IPTp	Intermittent preventive treatment of pregnant women
INS	*Instituto Nacional de Saúde* (National Institute of Health)
INSIDA	*Inquérito de Indicadores de SIDA* (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
LATH	Liverpool Associates for Tropical Health
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
MICOA	*Ministério de Coordenação de Acção Ambiental* (Ministry of Coordination of Environmental Affairs)
MICS	Multiple Indicator Cluster Survey
MMI	Model Maternity Initiative
MINAG	Ministério de Agricultura (Ministry of Agriculture)
MIP	Malaria in pregnancy
MIS	Malaria Indicator Survey
MISAU	'Ministério de Saúde' (Ministry of Health)
MOP	Malaria operational plan
NGO	Non-governmental organization
PCR	Polymerase chain reaction
PCV`s	Peace Corp Volunteers
PEPFAR	President's Emergency Plan for AIDS Relief
PIRCOM	*Programa Inter-Religioso contra a Malária* (Inter-Religious Campaign Against Malaria)
PMI	President's Malaria Initiative
PNCM	*Programa Nacional de Controlo da Malária* (National Malaria Control Program)
PSI	Population Services International
RH	Reproductive health
RBM	Roll Back Malaria
RDT	Rapid diagnostic test
SEA	Supplemental environmental assessment
SP	Sulfadoxine-pyrimethamine
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USG	U.S. Government
WHO	World Health Organization

EXECUTIVE SUMMARY

Launched by President George W. Bush, the President's Malaria Initiative (PMI) is a core component of the Global Health Initiative (GHI), a comprehensive US Government effort announced by President Barack Obama in 2009 to reduce the burden of disease and promote healthy communities and families around the world. Through the GHI, the USG will 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 PMI was launched in June 2005 as a five-year, $1.265 billion initiative to rapidly scale-up proven effective malaria prevention and treatment interventions and reduce malaria-related mortality by 50% in 15 high-burden countries in sub-Saharan Africa. Funding is extended now through Fiscal Year (FY) 2014 with the passage of the 2008 Lantos-Hyde United States Leadership against HIV/AIDS, Tuberculosis and Malaria Act. As with previous years' funding, programming of PMI activities follows the core principles identified in 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, as in all other PMI countries, is to 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).

Despite signs of decreasing malaria prevalence from the Mozambican Ministry of Health (MISAU) health information system, malaria remains a major cause of morbidity and mortality. The GOM considers malaria a priority for poverty reduction and its development agenda. Although the MISAU is committed to increasing access to health services and increasing the efficiency and quality of those services nationwide, a weak health infrastructure and a shortage of health workers are formidable obstacles. In a national survey conducted after the 2007 national census, which used verbal autopsy methodology, malaria was the most common cause of death (29%). Among children less than five years old, 42% of deaths were due to malaria, while HIV/AIDS accounted for 26% of deaths overall and 13% in children less than five years old. The PMI-supported Malaria Indicator Survey (MIS), conducted in June–July 2007, showed results consistent with the findings of this verbal autopsy with very high levels of malaria parasitemia among children at 50% by RDTs and 36% by microscopy.

This same MIS revealed that only 18% of households with a child less than five years and/or a pregnant woman owned at least one ITN, and only 7% of pregnant women and 7% of children less than five years old had slept under an ITN the previous night. Only 4% of children less than

five years old with fever had received an ACT within 24 hours of onset of symptoms. With support from partners, scaling up of malaria prevention and control interventions is well underway, and the 2008 Multiple Indicator Cluster Survey (MICS) demonstrated some improvement, 31% of households with a child less than five owned at least one ITN, and 23% of children under five had slept under an ITN the night before the survey.

Mozambique's Round 2 Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund) grant for $28 million has been fully disbursed although with some initial delays due to difficulties in the central basket funding. Mozambique was also awarded a two-year, $36 million Round 6 grant and although funds dispersal began in 2008, no disbursements actually occurred in 2009. In 2010 and 2011 the grant was fully disbursed in the form of commodities. The grant officially closed in December 2010 but commodities continued to arrive into 2011.

Mozambique's Round 9 proposal was accepted and signed in early 2011. Unfortunately, disbursement of phase one Round 9 funds is on hold due to Global Fund concerns regarding supply chain mismanagement, including the expiry of a large cache of commodities and irregularities found on the 2009 audit. As a result, there are several conditions precedent; funds are not expected to be released in calendar year 2011 given the complex and extensive solutions required to resolve the conditions. Continued delays could pose significant challenges in terms of reaching universal coverage targets and mandatory confirmatory testing should these issues go unresolved. In 2009, a five-year, $35 million World Bank health sector credit, which includes approximately $12 million for malaria control, was approved. This credit will primarily focus on system strengthening at the national and provincial levels, with a particular emphasis on three northern provinces. To date, however, the implementation of this project has not started but commodities from this credit are scheduled to arrive in early 2012.

The FY12 PMI Malaria Operational Plan for Mozambique was based on the progress and experiences of the first five years of PMI support and was developed during a planning visit in April and May of 2011 by representatives from the United States Agency for International Development (USAID), the Centers for Disease Control and Prevention (CDC), the USAID Integrated Health Office and PMI Interagency staffs in Mozambique. Activities of the FY12 plan were developed in consultation with the National Malaria Control Program (PNCM) and national and international partners involved in malaria prevention and control in the country. With the relatively recent appointment of a new PNCM director, it is hoped there can be a revised enthusiasm for elevating malaria as a continued public health concern, enabling Mozambique to achieve significant gains in malaria control.

The total amount of PMI funding requested for Mozambique is $29.9 million for FY12 and the following activities will be supported with FY12 PMI funding:

Insecticide-Treated Bed Nets (ITNS): Since 2007, five million LLINs have been distributed in Mozambique with PMI contributing approximately three million. PMI has supported free LLIN distribution through both antenatal clinics (ANC) as well as two subnational-level campaigns. With FY12 funding PMI will continue to support net distribution primarily through ANCs and is expecting to procure about 1.5 million LLINs to cover all routine ANC needs, including a buffer

stock. In addition, PMI can support the PNCM's universal coverage distribution in districts not covered in the Global Fund Round 9 proposal, as well as post-campaign surveys.

Indoor Residual Spraying (IRS): The draft 2010–2014 National Malaria Prevention and Control Plan has set the target for IRS coverage at 40% of the population, or about 8 million people. PMI has been supporting IRS in Zambézia Province since 2007. In 2010, PMI expanded its geographic coverage of IRS within Zambézia Province from six to eight districts (out of a total of 16). The addition of two districts translated into approximately three million residents protected in total. Entomology facilities at the National Institute of Health (INS) in Maputo and in Zambézia Province were refurbished with PMI support.

With efforts toward improving integrated vector management and a longer-term goal to graduate from blanket spraying to more focalized spraying, PMI will support spraying in only six districts in Zambézia Province with FY12 funding, covering just under three million residents. With the withdrawal of IRS from two districts, PMI will support universal coverage with LLINs as well as increased surveillance and entomologic monitoring in these districts. PMI will continue to provide technical assistance through an entomologist placed with the PNCM who supports entomology monitoring of IRS activities.

Malaria in Pregnancy (MIP): In 2010, the "Integrated Reproductive Health/Maternal-Neonatal-Child Services Package" was finalized, which addresses malaria prevention and treatment activities in pregnant woman. With FY12 funds, training focused on these ANC guidelines will be expanded nationally. PMI will support supervisory visits by MISAU personnel to ensure the guidelines are appropriately implemented and standards of care are maintained. As in previous years, PMI will continue to cover all needs for LLINs to be distributed free to pregnant women during their routine ANC visits.

Malaria Diagnosis: Since 2009, PMI supported the development of a malaria laboratory diagnostic manual, assisted with refurbishing of the National Reference Laboratory for Blood Parasites, procured microscopes, and conducted microscopy training. With FY12 funds, PMI plans to purchase approximately three million rapid diagnostic tests (RDTs), assist MISAU in improving the rational use of RDTs by health workers, support laboratory supervision, with emphasis on improving standards of care through quality control and assurance, and continue support for supplies for the National Reference Laboratory for Blood Parasites.

Malaria Treatment: In 2009, artemether-lumefantrine (AL) became the first-line treatment for uncomplicated malaria in Mozambique. Implementation of this new policy, which included a new diagnostic approach, was supported almost entirely by PMI, with more than 12,000 health care workers (HCW) trained during the new case management policy roll-out. A second national case management training, with introduction of new treatment for severe malaria, was conducted with PMI support in August through October 2011. Since 2007, PMI has been the primary source of AL in-country, having procured and distributed over eight million treatments. PMI has also strengthened MISAU's logistic capacity at the central level for quantifying, forecasting, warehousing, and transporting antimalarials although there are currently significant problems with the existing supply chain management system. With support of PEPFAR funds, provincial pharmaceutical advisors were put in place to support all commodities including malaria as they

funneled into the supply chain. Their overall effectiveness is unclear and is being addressed as part of the supply chain management system overhaul. National training on standard operating procedures for all staff who manage commodities along the supply chain is planned for September 2011. The provincial advisers will be involved in this activity. Since 2009, PMI has been supporting the kitting and parallel distribution of AL kits down to the provinces, which will continue to be supported for at least an additional year. With FY12 funds, PMI will continue to purchase and distribute approximately 6.25 million AL treatments, continue technical support and assistance to strengthen the supply chain management system, improve warehousing and management logistics at the regional and provincial levels, improve the monitoring of malaria commodities, and support refresher trainings for HCWs as needed.

Capacity Building and Health Systems Strengthening: Consistent with GHI principles, PMI is building capacity and supporting health system strengthening in Mozambique at various levels. PMI supported the refurbishment of the National Reference Laboratory for Blood Parasites aiming to revitalize its role as a reference center for training and quality assurance and quality control methods for malaria diagnosis. This effort will continue with support for refresher training, supervision, and the expansion of quality control for diagnostic testing procedures to the provincial level. PMI has contributed to the Field Epidemiology and Laboratory Training Program (FELTP) since 2009. PMI has also hired a monitoring and evaluation (M&E) specialist and an entomologist, both of whom are seconded to the PNCM as part of the staff. The in-country PMI team actively participates in PNCM technical working groups and in the development of national-level policy documents. PMI has integrated with other USAID health programs and PEPFAR projects to strengthen health services, as well as to avoid duplication. PMI has contributed to the development of an integrated antenatal care service package in which malaria in pregnancy training and services play an important role.

Behavioral Change and Communication (BCC): Since 2007, PMI has supported malaria social mobilization through a consortium of religious groups, the Inter-Religious Campaign Against Malaria (PIRCOM). This consortium has trained more than 20,000 religious leaders in four provinces (Zambézia, Nampula, Sofala, and Inhambane) who have reached more than 1.5 million people with malaria prevention messages. In 2010, PMI shifted its capacity building support for BCC from the PNCM to the Health Promotion Department (DEPROS) of MISAU and FY12 funds will continue to maintain technical assistance to DEPROS, mainly to further develop the overall malaria communication strategy. With FY12 funds, PMI will continue to support BCC for malaria in pregnancy activities, ITNs and IRS.

Monitoring and Evaluation (M&E): PMI supported the 2007 MIS, which provided a baseline for malaria indicators as malaria prevention activities began scaling up. PMI seconded a technical advisor in the PNCM in 2009 and this assistance will continue with FY12 funds. This support is aimed at improving the capacity at PNCM and peripheral levels for M&E related activities. Specifically, improving the quality and amount of malaria data collected at the health facility level and improving routine data flow from the health facility level all the way to the central level. This will allow for improved overall management of LLINs, IRS, and commodities for case management. Other M&E activities to be continued in FY12 include support for the implementation of the end-use verification tool, support for the FELTP program and continued evaluation of LLIN durability after a campaign in 2008. PMI will also support

increased entomological monitoring in the districts where PMI-supported IRS may be scaled-down in the future as part of an overall strengthened integrated vector management strategy.

INTRODUCTION

Global Health Initiative

Malaria prevention and control is a major foreign assistance objective of the U.S. Government. In May 2009, President Barack Obama announced the Global Health Initiative (GHI), a 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 GHI is a global commitment to invest in healthy and productive lives, building upon and expanding the USG's successes in addressing specific diseases and issues.

The GHI aims to maximize the impact the United States achieves for every health dollar it invests, in a sustainable way. The GHI's business model is based on: implementing a woman- and girl-centered approach; increasing impact and efficiency through strategic coordination and programmatic integration; strengthening and leveraging key partnerships, multilateral organizations, and private contributions; encouraging country ownership and investing in country-led plans and health systems; improving metrics, monitoring and evaluation; and promoting research and innovation. 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. One key principle of the GHI approach is to achieve "smart" integration. BEST is an action plan to ensure that, under the Global Health Initiative, USAID applies state-of-the-art programming in family planning, maternal and child health, and nutrition (FP/MCH/N) programs that draw on evidence-based interventions. BEST facilitates and encourages FP/MCH/N integration with malaria, HIV/AIDS, other health elements and other sectors, where doing so is a pathway to reaching program goals and objectives.

President's Malaria Initiative

The PMI is a core component of the GHI, along with HIV/AIDS, and tuberculosis. Launched in June 2005 as a five-year plan, the PMI is a $1.265 billion initiative to rapidly scale-up malaria prevention and treatment interventions and reduce malaria-related deaths by 50% in 15 high-burden countries in sub-Saharan Africa. With passage of the 2008 Lantos-Hyde Act, funding for PMI has now been extended through FY 2014 and, as part of the GHI, the goal of the PMI has been adjusted to halving the burden of malaria in 70% of at-risk populations, or about 450 million residents, in the original 15 countries by the end of 2015. Toward this end, PMI has included jump start activities in parts of the Democratic Republic of Congo and in Nigeria, two recent PMI focus countries. 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 the provision of life-saving ACTs, ITNs, IPTp, and the use of IRS.

Mozambique was selected as a PMI country in FY 2007. Large-scale implementation of ACTs and IPTp began in Mozambique in 2007 and has progressed with support from PMI and other partners. Artemisinin-based combination therapies and IPTp are now available and being used in

all public health facilities nationwide and more than five million long-lasting ITNs (LLINs) have been distributed to pregnant women and children under five during just the last three years.

This FY12 Malaria Operational Plan presents a detailed implementation plan for Mozambique based on the PMI Multi-Year Strategy and Plan and the PNCM five-year strategy. It was developed in consultation with the PNCM and with participation of national and international partners involved in malaria prevention and control in the country. The activities that PMI is proposing to support align well with the National Malaria Control Strategy and Plan and build on investments made by PMI and other partners to improve and expand malaria-related services, including the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund), the World Bank and UNICEF. This document briefly reviews the current status of malaria control policies and interventions in Mozambique, describes progress to date, identifies challenges that need to be overcome to achieve PNCM and PMI targets, and provides a description of planned FY12 activities.

The total amount of PMI funding requested for Mozambique is $29.9 million for FY12.

Malaria Situation in Mozambique

Malaria is endemic throughout Mozambique and the entire population of 23 million people is at risk to malaria. 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; and 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. Confirmed malaria 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.

In April 2009, PMI sponsored an assessment of malaria 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 on-going 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 apparently precipitated by the recent suspension of IRS, which had previously been supported through the trilateral collaborative spray efforts of the Lubombo Spatial Development Initiative (LSDI).

Malaria Control Plan and Strategy

The National Malaria Prevention and Control Plan for 2010 to 2014 (still in draft form) focuses on continuing national-level scale-up of six key malaria prevention and control interventions. At the time of the MOP FY12 drafting the PNCM was in the process of updating this draft document using as a foundation the recent *Mozambique Malaria Program Performance Review 2010 Report*. This document was drafted by an external review team consisting of members of WHO and the Swaziland National Malaria Control Program Director. The draft 2010 – 2012 document covers the following areas (which may see some changes after the updated document is finalized):

1. Integrated vector management (IRS, ITNs, and environmental management): IRS has been a core malaria control strategy in Mozambique for a number of years, with national targets aiming for coverage of at least 40% of the population located mostly in the more densely populated areas in Mozambique. Free LLIN distribution focuses on people at risk of malaria outside the areas covered by IRS, principally in rural areas. The plan emphasizes universal coverage of LLINs, defined as one net per two people as defined in an early LLIN universal coverage draft guideline. To date, universal coverage campaigns are being conducted based on household membership and sleeping pattern data obtained from community-led census.

2. Prompt diagnosis and correct treatment: The PNCM rolled out a new case management policy in late 2009, which expands diagnostic testing to all persons suspected of having malaria. This policy applies to both healthcare workers (HCW) in health facilities and those in the community. The first-line treatment of uncomplicated malaria was also updated and artesunate/sulfadoxine-pyrimethamine (AS/SP) was replaced with artemether-lumefantrine (AL).

3. Malaria prevention in pregnancy: Use of IPTp with SP was scaled-up nationally beginning in early 2006; national surveys indicate significant improvement in uptake nationally. Because of the high prevalence of HIV infection in Mozambique, however, all pregnant women should receive three, instead of two, doses of IPTp during pregnancy, with the first dose given after quickening.

4. Health promotion and community participation and involvement: To improve the knowledge of rural communities, the PNCM promotes increased community participation in developing solutions to impact malaria mortality and morbidity. In addition, a cadre of community HCWs, known as *Agentes Polivalente Elementar da Saúde* or APEs, is being revitalized. APEs will play a key role for the largely rural population in Mozambique in both health promotion and malaria case management.

5. Emergency and epidemic preparedness and response: Coordination between MISAU and the National Disasters Management Institute is intended to facilitate forecasting and timely detection of malaria outbreaks using health information systems data and weather forecasts.

6. Program management, monitoring and evaluation, and health system strengthening, including operational research: Strengthened management and planning of malaria activities and

capacity at all levels will direct limited resources more effectively. Effective M&E systems (including data collection, processing, and use) and operational research will measure progress toward established milestones and help guide evidence-based decision making.

Current Status of Malaria Indicators

There is no current population-based data on malaria indicators. The PMI-supported DHS began data collection in May 2011 and results are expected in early 2012. Until that time, data collected through the 2008 MICS and the 2009 AIDS Indicator (INSIDA) survey remain the most up-to-date information available.

PMI's baseline Malaria Indicator Survey (MIS), carried out in June–July 2007 and at the end of the rainy season, demonstrated that 15.8% of households had at least one ITN but only 7.3% of pregnant women and 6.7% of children less than five years old had slept under an ITN the previous night (see table below). This represents no improvement in ITN use compared with the 2003 DHS (data not shown).

Data from the MIS also showed that only 16% of pregnant women had received two or more doses of IPTp and only 4.5% of children less than five years old with fever had received an ACT within 24 hours of onset of symptoms.

The 2008 MICS showed an improvement in ITN use and treatment with an antimalarial within 24 hours of onset of fever as compared to the 2007 MIS. Also, the proportion of women who received two or more doses of IPTp during their last pregnancy had increased from 16.2% to 43.1%.

The INSIDA carried out in July 2009 included some questions on bed net use, IPTp, and IRS. Results showed improvement in the use of bed nets compared to prior surveys for both pregnant women and children less than five years old.

Malaria Indicators in Mozambique: Data from 2007 MIS, 2008 MICS, & 2009 AIDS Indicator Survey

Malaria Indicators	2007 MIS (%)	2008 MICS (%)	2009 AIDS Indicator Survey (%)
Proportion of households with at least one ITN	15.8	30.7	NA
Proportion of children less than five years old who slept under an ITN the previous night	6.7	22.8	NA
Proportion of children less than five years old who slept under a bed net the previous night	15.7	42.1	48.7
Proportion of pregnant women who slept under an ITN the previous night	7.3	NA	NA
Proportion of pregnant women who slept under a bed net the previous night	19.3	NA	42.1
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

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
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

GOAL AND TARGETS OF THE PRESIDENT'S MALARIA INITIATIVE

The goal of PMI is to reduce malaria-associated mortality 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 in populations at risk for malaria:

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

EXPECTED RESULTS — YEAR FIVE

At the end of Year 6 of PMI in Mozambique, the following targets will have been achieved:

<u>Prevention:</u>

- Approximately five million LLINs will be procured and distributed free of charge. The bulk of PMI's LLIN contribution goes to pregnant women through ANCs but PMI will also contribute to universal coverage campaigns through assistance with the planning and distribution of LLINs, as well as post-campaign surveys. With these two approaches, national household ownership of at least one ITN is expected to rise to at least 70%.
- At least 90% of houses in six districts (roughly 650,000 households or almost three million residents) targeted for IRS in Zambézia Province will have been sprayed with support from PMI.
- PMI, with the President's Emergency Plan for AIDS Relief (PEPFAR) and other USAID health funding, will support quality ANC services, including IPTp in all 11 provinces with a target of 60% of all pregnant women receiving at least two doses during their pregnancies.

Diagnosis and Treatment:

- PMI will support MISAU in the procurement and distribution of approximately five million RDTs in FY12. Provided Global Fund support for diagnostic procurement continues, combined with PMI efforts, diagnostic testing for malaria will be available to at least 80% of health facility based HCWs.
- PMI will procure and distribute approximately six million AL treatments in FY12. Provided Global Fund Round 9 funds are released and antimalarials procured, at least 60% of malaria episodes in children less than five years old will be treated with an ACT.
- With the support from USG and other donors and partners, MISAU will recruit approximately 2,500 community-based HCWs by the end of 2012. These newly recruited APEs will be trained in case management and use of RDTs.
- With PMI and PEPFAR support for logistics management at both the central and provincial levels, at least 60% of health facilities will report no disruption of stock of antimalarial drugs for more than one week during the previous three months.

INTERVENTIONS — PREVENTION

Insecticide-Treated Bed Nets

Background

Since January 2006, the provision of free ITNs to at-risk populations through the public health service has been national policy. Children less than five years old and pregnant women were targeted for ITN distribution from 2006 until 2009. These populations were reached either through mass campaigns targeted to children less than five years old or delivered to pregnant women during ANC visits.

The draft 2010 – 2014 National Malaria Control Strategic Plan for 2010 to 2014 outlines a national ITN distribution policy, which focuses on universal coverage, using LLINs, (approximately one LLIN for every two persons) for the entire population at risk of malaria in areas not covered by IRS and nationwide distribution to pregnant women through ANCs. Both of these distribution methods will provide nets free of charge.

Despite the lack of a formal national policy for vector control, the technical working group responsible for drafting the quantification and gap analysis for the Global Fund Round 9 proposal in 2009 agreed that PMI would be the source of funding for LLINs to be distributed routinely to pregnant women at their first ANC visit. The Global Fund, along with World Bank, World Vision and UNICEF, would therefore support the procurement and distribution of LLINs through mass universal coverage campaigns. Since then, most of the LLINs procured by PMI have been distributed to the provinces where the Provincial Directorate of Health (DPS) assumes responsibility for distribution to the district warehouses and from there to the health facilities.

In the Global Fund Round 9 proposal, MISAU requested support for the procurement and distribution of 10 million LLINs for universal coverage campaigns over the five year duration of the grant. The proposal also includes warehousing provisions, as well as personnel costs, to

manage LLIN distribution at a provincial level. The nationwide scale-up of universal coverage campaigns started in July 2011 with LLINs procured by Global Fund Round 6, as the Round 9 grant disbursement is on hold.

Although routine distribution of LLINs at every pregnant woman's first ANC visit has been national policy since 2006, the system to support this activity has not been formalized. Since late 2009, PMI has supported the purchase of LLINs and their distribution to provincial warehouses throughout Mozambique. The distribution from there to the districts and then to health facilities has been supported in different provinces by the NGOs PSI (with PMI funding in Maputo City, Maputo Province, and Zambézia Province) and Malaria Consortium (with DfID funding in Inhambane, Cabo Delgado, Nampula, Manica, and Sofala Provinces) and by UNICEF (Niassa, Tete, and Gaza Provinces). In May 2009, DfID funding ended, as did Malaria Consortium's ability to continue supporting their provinces to distribute LLINs through ANCs. Moreover, UNICEF's funding is through general budget support. Thus, with no formal LLIN distribution system or provincial management guidelines for LLIN distribution through ANCs, many health facilities had LLIN stock outs and many pregnant women did not receive an LLIN during their pregnancies in 2010 and 2011.

LLINs are considered a key component of the ANC package of services, as highlighted in a newly approved *Integrated Reproductive Health/Maternal-Neonatal-Child Services Package* document drafted by Maternal-Neonatal-Child Health Directorate (MNCH) at MISAU with USAID's support. This document describes the different maternal-neonatal-child health services at the various levels of health facilities throughout Mozambique. At all levels of health care, the distribution of LLINs along with IPTp are important interventions with potential for great impact on morbidity and mortality.

The focus of Mozambique's current approach to LLIN distribution is on building capacity at central, provincial and district level for distribution both through universal coverage mass campaigns and routinely through ANC visits. The NCMP has been intensely focused on planning for universal coverage campaigns as 2.2 million LLINs from Global Fund Round 6 arrived in country in the first semester of 2011 and are scheduled to be distributed through mass campaigns in four provinces by the end of 2011. There has been less focus on formalizing the ANC distribution system although through support from Malaria Consortium a consultant was hired to draft guidelines for this approach.

Progress during last 12 months

LLIN Distribution to Provincial Warehouses by Province, 2006–2010 (including LLINs for distribution through universal coverage campaigns and routine distribution)				
Province	**2007**	**2008**	**2009**	**2010**
Cabo Delgado	294,051	131,075	197,657	143,596
Gaza	66,195	39,237	171,672	28,159
Inhambane	191,157	159,861	107,611	134,182
Manica	20,386	106,755	248,324	137,422
Maputo Province	132,346	64,350	116,520	15,325
Maputo City	-	-	60,000	15,381
Nampula	228,578	1,045,901	94,018	120,433
Niassa	161,121	38,811	254,577	192,184
Sofala	47,923	76,150	38,029	194,873
Tete	82,675	231,604	273,752	105,183
Zambézia	282,043	192,624	66923	98,081
Total	**1,506,475**	**2,086,368**	**1,629,083**	**1,184,819**

** Source: UNICEF, Population Services International, MISAU*

According to the PNCM 2010 Annual Report, a total of 892,305 LLINs were distributed directly to beneficiaries in 2010; 588,752 of these were to pregnant women, representing 54% coverage in this target group.

Other sources of LLINs are UNICEF, World Bank, World Vision and MISAU for LLINs destined for universal coverage; PMI is now seen as the sole source of LLINs for ANC distribution. However, the last Global Fund Round 2 LLIN procurement of 142,000 LLIN which arrived in Maputo in early 2011 were used for ANC distribution. In 2011, UNICEF procured 6,000 (in response to emergency need in Gaza), World Vision 190,000 and Global Fund Round 6 2.2 million. These are scheduled to be distributed by universal coverage campaigns.

In order to assist PNCM in developing a standardized universal coverage distribution methodology PMI supported an LLIN universal coverage pilot campaign in four districts in Sofala Province in early 2010. This pilot campaign was the first large-scale universal coverage campaign: 140,000 LLINs were distributed to approximately 60,000 households. PMI is supporting an evaluation of this pilot, as MISAU is using this experience to develop standard guidelines for the rest of the LLIN universal coverage campaigns to distribute the 2.2 million LLINs from Global Fund Round 6. Trainings conducted by PNCM staff for provincial DPS staff have taken place in 2 provinces in mid-2011 and 2 additional provinces expect to receive training and conduct campaigns by the end of 2011. In addition, World Vision, the lead NGO of the Civil Society Principal Recipient of Global Fund Round 9, has also conducted universal coverage campaigns in Nampula, using the guidelines, in early 2011. World Vision procured LLINs with their funds and is expecting to receive and distribute additional LLINs from Global Fund Round 9.

To assess the true durability of LLINs in field conditions, PMI is supporting an evaluation in which a sample of bar-coded LLINs distributed in the Nampula campaign in October 2008 have

been collected yearly for three years (2011 will be the last year to collect samples of the LLINs distributed in 2008) to determine LLIN longevity and durability.

Proposed Activities

With PMI's support to the PNCM and DPSs, all pregnant women in Mozambique in 2012 should have access to LLINs through ANCs. 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. As with all supply chains, the LLIN chain should include planning and budgeting for transportation, warehousing and managing LLINs from point of arrival in port, to the provinces, to district warehouses and from there to health facilities across the country. As most of these functions were not being conducted centrally within MISAU nor provincially within the DPSs, roles and responsibilities as well as standard operating procedures are needed. Irregularities in the Sofala Province LLIN warehouse management were uncovered in March 2011 as the result of an investigation, when it was determined that about 50,000 LLINs were diverted from the public system. The poor distribution management of LLINs from the provincial level down to the health facility was highlighted during this investigation, which has been closed. This prompted 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 assist and build DPS LLIN distribution management capacity to guarantee that all pregnant women presenting for their first ANC visit receive an LLIN.

The PNCM laid out a plan in the Global Fund Round 9 proposal to start universal coverage campaigns in provinces that have not had mass campaign distributions since 2007 and in districts where IRS activities are not present. As described in the IRS section, as part of integrated vector control, two previously sprayed districts in Zambézia will transition from IRS to universal coverage with LLINs. The calculation for Global Fund proposal Round 9 for LLIN universal coverage was based on the population in areas with no IRS (which at the time of the calculation included these two districts) as well as having most of the campaigns across Mozambique taking place every three years. Thus, LLINs from the Global Fund should be sufficient to meet this transition plan. PMI would support the distribution of the LLINs consistent with the universal coverage guidelines. In addition, PMI will continue to give technical support to PNCM on the LLIN universal coverage distribution strategy. Maintenance ANC distribution would be continuous and is approximately 1.5 million LLINs a year on top of the universal coverage LLIN needs.

Proposed activities with FY 2012 funding: ($9,500,000)

PMI will make a significant contribution towards increasing LLIN ownership and use in Mozambique. The proposed activities for PMI Year 6 are as follows:

1. LLIN procurement: Approximately 1,500,000 LLINs will be procured and delivered, assuming a cost per net of approximately $5 each ($7,250,000);

2. LLIN distribution through ANCs: Increase support to provincial and district health teams for management, logistics, and promotional activities related to the LLIN delivery through ANCs through the hiring of logisticians, and district warehouse improvements ($1,500,000); and

3. LLIN distribution universal coverage campaigns: Continue technical and logistic support for universal coverage campaigns where needed. This activity will also include funds for the evaluation of the pilot universal coverage campaign conducted in Sofala in 2010. The LLINs needed for the transition from IRS to LLIN universal coverage in Zambézia were already included in the initial Global Fund Round 9 proposal and therefore no additional funding for procurement of these nets is needed ($750,000).

Indoor Residual Spraying

Background

IRS remains a priority vector control intervention for MISAU in Mozambique. Historically MISAU considered IRS to be the backbone of their malaria control strategy with a focus on urban and peri-urban areas, which represent approximately 40% of the entire population. Currently, there are two major players in the IRS program – PMI and the MOH. PMI focuses on Zambézia Province, and MOH sprays in the remaining provinces. In previous years, LSDI supported IRS in Maputo and Gaza provinces; this project ended in late 2010 when the Global Fund withdrew support due to mismanagement of the grant. The grant was scheduled to end in September 2011with a hand over of activities to the Maputo Province DPS. This did not take place. PMI has always focused on Zambézia Province, and MOH sprays some districts in the remaining provinces. All approaches are similar with training of supervisors, local spray operators, supervision of the warehouses, and the spray operation itself.

Historically, the insecticides have been procured by the MOH for all spray operations in the country with the southern provinces using DDT and carbamates and the central and Northern provinces using pyrethroids, with the exception of Zambézia Province which, up until 2009, also used DDT. In 2010 Maputo Province did not conduct IRS activities; some districts sprayed in 2009 in the rest of the country were not sprayed in 2010. All spraying conducted in 2010 used pyrethroids including in Zambézia Province. For the campaign 2011 PMI procured, for the first time, insecticide to be used in Zambézia Province, which was a long acting pyrethroid. The insecticide selection and the timing of the spray cycle are dictated by the MOH although PMI has raised questions about the use of a short acting (lambda-cyhalothrin WP) pyrethroid and the timing of the spray operation (beginning well before the transmission season).

In late 2010, the MISAU procured 130 metric tons (MT) of DDT which was originally destined for Maputo Province; 50 MT of this was to be allocated for the PMI spraying in Zambézia Province. A preliminary inventory of the DDT in Maputo and Gaza provinces revealed 102 MT of DDT in stock representing 44 different lot numbers. Because of concerns about the quality of the DDT, PMI sent a random sample of the entire inventory to a WHO approved laboratory in Belgium for quality testing. The results of the testing revealed that the product was below WHO standards.

In 2009 PMI supported the establishment of an entomology laboratory in Quelimane in Zambézia Province that allowed the initiation of entomologic surveillance activities under the previous RTI/Liverpool Associates for Health subcontract, with two technicians from the DPS. After the Liverpool Associates for Health subcontract ended in May 2010, longitudinal entomologic monitoring for vector species and density was halted as there was no biologist to staff the entomology laboratory and mosquito production at the insectary declined. Activities restarted in mid-2011.

The PMI supported upgrade of the central reference entomology laboratory and insectary at the INS, Maputo were completed in 2010. This will allow for in-country processing of mosquito material, such as PCR species identification of mosquito complexes, ELISA testing for malaria-infected mosquitoes and ELISA- and PCR-based monitoring for insecticide resistance and for insecticide efficacy monitoring for IRS and LLINs nationwide. Previously, field collected material had to be sent outside the country for such laboratory assays. PMI provided additional support for an entomology laboratory in Pemba, Cabo Delgado Province. The laboratory was constructed from two insulated containers mounted on a concrete base and protected by a roof. One container functions as an insectary and the other as an entomology laboratory. With the lack of entomologist at the central level, PMI also supported a two-year entomology technical assistance by hiring an entomologist in 2009 for the PNCM to support the national entomology surveys and to assist with the IRS surveillance in Zambézia.

Progress during last 12 months

The 2010 PMI IRS campaign in Zambézia Province increased from six to eight districts (Nicoadala, Namacurra, Quelimane, Milange, Morrumbala, Mocuba, Maganja da Costa and Mopeia) and now covers 70% of the population of those districts. WHO wall bioassays indicate the high quality of the spray program with 100% mortality during the first 3 months of IRS. However the lambda-cyhalothrin WP was short acting as the residual efficacy was reduced to 57.5% during the fourth month post-IRS. The timing of the initiation of the spray operation and the use of a short acting pyrethroid (lambda-cyhalothrin WP), which lasts between 3 to 4 months on sprayed walls, are of concern to PMI and these concerns have been raised with MISAU.

A total of 1,996 men and women were hired and trained as spray operators, team leaders, locality and district supervisors, coordinators, and warehouse keepers. Of the 625,700 structures visited in the targeted districts 618,290 were sprayed, representing 99% coverage. A total of 2,945,721 persons were protected. The definition of 'target structures' (for spraying) should be clarified, as "structures visited" does not necessarily translate into a complete denominator of all structures in a community. Entire community structures will be counted in the spray campaign for 2011, thus giving a more robust denominator for coverage calculation.

The DPS, Ministry of Coordination of Environmental Affairs, and Ministry of Agriculture remained involved in the IRS campaign in Zambézia Province to monitor environmental compliance and spray quality standards. In 2010, in order to adhere to stringent USG environmental mitigation measures described in the supplemental environmental assessment, PMI converted the previously constructed evaporation tanks into soak pits to limit contamination of the water table.

After the termination of the RTI/LATH subcontract, entomologic monitoring in Zambézia Province has been carried out using short-term technical assistance provided by RTI and CDC. With support of the Quelimane DPS, improvements to the entomology laboratory and insectary continue and the space for the insectary was expanded to include an adult mosquito room. In April 2011, two additional Zambézia DPS technicians joined the entomology team, bringing the total staff to four technicians. The DPS has also nominated a Quelimane DPS staff member as entomology manager responsible for the insectary and coordinating entomologic monitoring activities.

With the INS central laboratory refurbishment completed, the entomologic material collected for PCR and ELISA from Zambézia Province and from the national entomology surveillance program in other provinces, such as Cabo Delgado, samples are now being processed in Maputo. PCR data is used for composition of vector species, monitoring insecticide resistance in the species as well as within the *An. gambiae* and *An. funestus* species complex, and mechanisms of insecticide resistance. The ELISA is used determine sporozoite rates and metabolic resistance mechanisms. PMI continues to support entomologic strengthening at the central and provincial levels with training, supervision and standardization of entomology techniques. In August 2010, three INS and one NMCP personnel were trained in PCR techniques for *An. gambiae* and *An. funestus* species complex identification. Between March and May 2011, training was provided to the INS entomology team to improve the central insectary and to serve as standard national reference for provincial insectaries.

The entomology laboratory and insectary in Pemba was completed and became functional in April 2011. It is currently supported by a biologist, trained in a WHO/PMI supported workshop in 2008, and by three technicians from the DPS. This team participated in basic field entomology training in Quelimane in April 2011.

Proposed activities with FY 2012 funding

At the request of the MISAU, IRS operations in 2010 and 2011 was expanded to two more districts, Mopeia and Maganja de Costa, in addition to the six districts covered during the previous spray campaigns. With the scale-up of LLIN universal coverage in Mozambique in 2011-2012, PMI will support the sixth round of focal IRS in six districts of Zambézia Province in 2012. The PMI is considering the feasibility of transitioning some areas of current IRS spraying to universal LLIN coverage as a way to manage long-term vector control. Current plans for the transition from one intervention to the other are centered on transition of activities from two entire districts. It is possible that as the 2012 campaign plans are developed, more focused IRS combined with LLIN universal coverage distribution in the same district will be agreed upon. In order to establish a base line malaria prevalence to measure the effect of the vector control transition, the PMI team will likely conduct a facility-based study (school children, e.g.). Increased surveillance is also planned to monitor the impact of the vector control transition.

In addition, as the entomologic monitoring of the insecticide lambda-cyhalothrin WP used in the FY10 IRS indicated only a three-month residual efficacy of the insecticide on walls, PMI will purchase a longer-acting pyrethroid for the FY11 IRS operations in Zambézia Province. With

the new leadership at PNCM, PMI will work closely with PNCM on a revised national integrated vector control strategy which should address, among other issues, insecticide selection and the timing of the start of the spray season as it relates to the transmission season. The FY12 funding will cover the IRS activities to September 2013.

Planned activities with FY 2012 funding are as follows: ($6,125,000)

1. Spraying in Zambézia Province: Continue to support IRS operations in Quelimane, Namacurra, Nicoadala, Morrumbala, Mocuba and Milange Districts, covering approximately 398,000 households and two million residents. This will include operations, hiring of personnel, training, and supervision over a three-month period ($4,500,000); and

2. 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).

Malaria in Pregnancy

Background

The MISAU MNCH Program, in close collaboration with partners developed an "Integrated Reproductive Health/Maternal-Neonatal-Child Services Package" document. This document, which was finalized in late 2010, addresses key MIP components: IPTP, and ITN distribution through ANC. The document has three main parameters: continuous services through the different life stages and different health service levels; the health care provider category at each health service level and availability of health commodities at each level; the health services organization at each level. Based on these factors, the interventions and services were grouped into four sub-packages and in each of these sub-packages, use of ITNs, IPTp and malaria case management for pregnant women, newborns, infants and children are addressed.

The MISAU has promoted the use of IPTp since May 2006, using sulfadoxine-pyrimethamine (SP). The PNCM and MISAU MNCH Program have collaborated in developing the IPTp policy. Three monthly doses of SP after quickening are recommended in Mozambique due to the high HIV prevalence. While the use of IPTp has been the national policy since 2006, its scale up has gone slowly. In the 2008 MICS IPTp coverage of at least two doses of SP was 43%; in the 2009 HIV/AIDS survey, it was found to be 33%. Although these figures represent improvement relative to the 2007 MIS (16.2%), uptake continues to be low in contrast to 92% of women receiving prenatal care during their pregnancy (MICS 2008). This is probably 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. The MOH had not budgeted for replacing these stocks and PMI assisted with SP procurement on this occasion. Although SP normally has been procured by the MOH, current gap analyses show a gap in financing, suggesting that the Ministry has not budgeted for its procurement for 2012. USG and donors are in ongoing discussions with the Ministry on financing for health commodities.

The LLINs, a key ANC service package component, are still managed centrally by the PNCM but in 2011 the MNCH became more actively engaged to assist in development of a distribution plan. In contrast, SP for IPTp, LLINs are not part of CMAMs domain for supply chain management and therefore have required external support through donors and other partners. With the loss of support from some of the partners for this activity, ITN stock outs at ANCs have been common during 2010 and 2011.

Assuming pregnant women make up about 5% of the population, an estimated 1.5 million women will be pregnant in 2013 in Mozambique. Using this figure a total of 4.5 million treatments at SP (comprised of three tablets each) are required 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.

Progress during last 12 months

In early 2011, USAID awarded a new contract with an intended scope to continue the Model Maternities initiative work, guideline and training curricula development, quality of care and other MNCH services, including MIP. This award also includes funds from PMI for training and supervision of case management of malaria in pregnant women and children. The newly updated malaria treatment guidelines, finalized and approved in 2011, also include the MIP component. PNCM will be conducting a national-level training and supervision for these newly updated malaria case management guidelines starting August 2011 with PMI support to the PNCM.

USG provided funding to support SP needs (about 3.6 million treatments) for 2010 – 2011 due to CMAM budget constraints, which ultimately resulted in national-level stock outs of SP. However, as mentioned above, the current gap analysis submitted to Global Fund shows a gap of more than 200,000 USD in SP needs for 2012. USG and other donors will discuss with the Ministry available resources and financing for this and other commodity needs in light of Global Fund delays.

Proposed activities with FY 2012 funding

PMI will continue to support provision of comprehensive antenatal care services to pregnant women with a strong focus on system strengthening for service provision and M&E. The FELTP malaria candidate is currently developing a protocol to assess IPTp uptake with the aim of understanding the barriers to this intervention and the low uptake. PMI will continue to support distribution of ITNs to pregnant women through ANCs.

Planned activities with FY 2012 funding are as follows: ($200,000)

1. Support supervision of ANC staff in MIP: Support integrated supervision of ANC and HCWs in prevention of malaria in pregnancy ($200,000).

INTERVENTIONS — CASE MANAGEMENT

Malaria Diagnosis

Background

A diagnosis of malaria is based on clinical criteria (clinical suspicion) and detection of parasites in blood (parasitological or confirmatory diagnosis). Prompt, accurate diagnosis of malaria is part of effective disease management. High sensitivity in diagnosis is important in all settings, particularly for the most vulnerable groups, such as young children, as the infection can progress rapidly to severe cases and even death. However, only about 20% of all malaria cases in Mozambique are diagnosed by microscopic examination of a blood slide; the remainder of cases is diagnosed clinically. Refresher training and supervision of microscopists occur irregularly, and the overall quality of microscopic diagnosis of malaria in Mozambique is thought to be poor. In addition, of the 1,249 health facilities in the country, only 254, or about 20%, are equipped with laboratories. Availability of adequate laboratory consumables also remains a challenge and stock-outs of Giemsa reagent, methanol and immersion oil are common.

In 2007, RDTs were introduced in Mozambique and rolled-out nationally, supported by new MISAU guidelines, "Criteria for Rapid Diagnostic Test Use in Mozambique." These guidelines recommended that laboratory testing be guided by local malaria epidemiology as far as which age group should be tested. Overall poor logistic management resulted in adequate RDT stocks in central warehouses while stock-outs occurred at peripheral levels. In the absence of either readily available microscopic capacity or RDTs, HCWs are often forced to rely solely on clinical criteria to diagnose and treat malaria.

A new malaria case management policy was launched in 2009, including an updated policy for diagnostic testing. The policy was revised in 2011 and recommends that persons of all ages and from all parts of the country who are suspected of having malaria receive a confirmatory diagnostic test for malaria before treatment is administered. This policy is to be applied at all levels of care, including care provided by APEs. RDTs are the preferred test for primary diagnosis of malaria in Mozambique. Microscopy is reserved for suspected treatment failures, severe febrile illness, and cases referred from lower levels of care.

Progress during last 12 months

The PMI-supported refurbishment of the National Reference Laboratory for Blood Parasites in Maputo is complete. The terms of reference for the activities that will take place in the laboratory have yet to be finalized.

PMI has supported the development of malaria diagnosis supervision guidelines and will continue to support laboratory supervision collaboratively with PNCM, the Laboratory section of DNAM, and DPS'. PMI, working closely with diagnostics experts from CDC, is also supporting the finalization of the manual for procedures for training of laboratory technicians, quality

control of malaria microscopy and RDTs, and quality assurance of laboratory testing procedures. This quality assurance manual development is led by the INS and is a comprehensive effort to improve not only the quality of malaria diagnosis but also HIV, and tuberculosis.

Three regional training of trainers workshops in malaria microscopy were completed (one in Tete, Maputo and Beira). These trainings were carried out with support from CDC/Atlanta and the INS. A total of 65 laboratory technicians attended the three training workshops (18 in Tete, 29 in Maputo and 20 in Beira) and have achieved the following results: average percentage of microscopic fields correctly identified from the analysis of 20 distinct microscopic fields, 54% in pre-test and post-test 84% in Tete, 53.7% in pre-test and 83.5% in the post-test in Maputo, and 44.1% in pre-test and 75.2% in post-test in Beira. PMI will support technical assistance from CDC/Atlanta in September 2011 to assist in the development of the QC guidelines for malaria diagnosis, also part of the National Malaria Reference Laboratory scope of work.

The contracting mechanism for the assessment of the status of RDT use, including the forecasting, allocation, distribution, and stock management plan, is finalized. This information will be used to improve the allocation and distribution of RDTs, as well as highlight the current challenges of RDT use and interpretation by HCW so that these can be adequately addressed during future laboratory supervisory visits.

Proposed activities with FY 2012 funding

In Year 6, 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:

Planned activities with FY 2012 funding are as follows ($2,817,100)

1. Procure RDTs and laboratory supplies: Support will be provided to procure approximately 3 million RDTs plus additional microscopy kits (slides, lancets, cotton, and alcohol) ($2,250,000);

2. Support to National Reference Laboratory for Blood Parasites: Continue support to the INS National Reference Laboratory with procurement of supplies and repair parts for malaria-related diagnostic equipment ($50,000);

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 ($500,000); and

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

Malaria Treatment

Background

During the past five years, the national malaria treatment guidelines have changed three times. In compliance with the 2006 WHO recommendation for the use of an ACT for uncomplicated falciparum malaria and in part to concerns about resistance to SP, the GOM switched from AS-SP in 2007 to AL as first-line. Finally rolled out nationally only in 2009, efforts by the GOM to provide an uninterrupted supply of both the first- and second-line/alternative treatments have, however, been hampered by a combination of a weak supply chain, unreliable forecasting, severely delayed Global Fund shipments resulting from ongoing challenges with the Global Fund grants, and poor donor-Ministry coordination for ACT commodity needs. Although the new first-line drug was rolled out in late 2009, this was prior to the approval and wide dissemination of national case management guidelines. Anecdotally, there is significant confusion at the health facility level given the multiple changes in the first-line therapy and as a result of the national stock out of AL in 2010, the second-line treatment, artesunate-amodiaquine, was widely distributed for about six months in late 2010 as a substitute for AL. Also contributing to this confusion was the lack of finalized case management guidelines (in draft form for several years, but only approved and made available in early 2011), and the interrupted supply of rapid diagnostic tests, all of which add to weaken malaria case management at all levels of health care. The capacity to adapt to changing treatment policies, as well as to confirm all diagnoses before administering an ACT is weak. Moreover, GOM quality control/quality assurance systems that focus on improving supervision to help strengthen these areas are not yet functional.

In April 2011, WHO released a modified section of the 2010 second edition malaria treatment guidelines focusing on the treatment of severe falciparum malaria in children. The new newly MISAU-approved guidelines now recommend the use of parenteral artesunate over parenteral quinine for both adults and children. In addition, rectal artesunate suppositories are recommended for pre-referral treatment of severe malaria. Quinine will remain as the recommended treatment for pregnant women during the first trimester and for suspected failures to AL. Of note, the new approach recommends that patients of all ages undergo confirmatory diagnostic testing, either microscopy or RDT, and only those with a positive result will receive treatment. If sufficient RDTs are not procured due to delays in Global Fund disbursements clinicians will continue to rely on clinical diagnosis and consumption of antimalarials will remain higher than true malaria cases.

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 necessary, an ACT, in line with the newly revised case management guidelines. Given the delays in Global Fund

disbursements, the first cadre of newly recruited and trained APEs have yet to receive RDTs as part of their medical supply kits.

Structure of the pharmaceutical management system

CMAM falls under the management of DNAM and has primary responsibility within MISAU for all central-level supply chain functions, including providing the public health system with medicines and supplies. The CMAM, in collaboration with PNCM, continues to manage the forecasting needs and supervising the procurement, storage, and distribution of essential medicines and related medical supplies from the central level to the provincial warehouses. The exceptions to this are the ITNs, for which CMAM does not have any input on the ITN supply chain management. This is a key factor in the lack of system and oversight for this commodity.

Distribution

Currently, there are two separate logistics systems for essential medicines. The first is a push system, with two types of kits that deliver essential medicines to either health centers or APEs. These kits are prepared overseas after the issuance of a biannual tender financed by pooled MISAU resources and other donor funds. As the AL packaging is bulky, however, PMI has been supporting the purchase of boxes and the packaging of AL into separate boxes ("malaria kits") at the central Zimpeto warehouse. These malaria kits are distributed in parallel with the essential medicine kits. The essential medicine kits arrive via ships to the different ports in Mozambique and are delivered to provincial warehouses. The second logistics system is the *Via Classica* and is a pull system. 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. Ideally, the third regional-level warehouse located in Nampula would be incorporated into this supply chain, but the warehousing and distribution system in Mozambique remains weak and it is unclear at this point when the Nampula facility will become functional. Each of the ten provincial warehouses supply the district warehouses, rural hospitals, general hospitals, and provincial hospitals. MISAU-financed medicines and supplies distributed through the *Via Classica* system come from CMAM annual tenders and in-kind donations (such as the USG, and Global Fund voluntary pooled procurement shipments).

Malaria drugs are also managed through the *Via Classica* requiring health facilities to request commodities based on consumption. Given the supply chain and logistics challenges inherent in the antimalarials supply chain – throughout the supply chain and especially distal to Maputo – reports of stock outs continue. In 2010, a national-level Pharmaceutical Logistics Master Plan was developed, in an attempt to address across the board, the myriad issues plaguing the pharmaceutical and supply chain in Mozambique. Due in part to a change in leadership at CMAM, the organization within the MOH with oversight for PLMP implementation, the finalization of the PLMP remains on hold; significant changes in the management of the *Via Classica* system were part of this PLMP but their exact status is unknown.

Quantification of malaria treatment needs

Estimates of needs for 2012 were provided by the Malaria Quantification Group based on a data quantification exercise done September 2010. As customary, assumptions made for antimalarial drug forecasting and quantification considered several variables, including an expected drop in number of malaria cases due to the implementation of preventive measures and introduction of malaria laboratory testing for all suspected cases of malaria. Although it is reasonable to expect a decrease in number of treatment needs, these assumptions may have overestimated the likely drop in malaria cases in Mozambique. In 2011, AL needs were estimated as 5.04 million treatments, while in 2012, these needs increased to approximately 11.1 million (see table below), a considerable increase of first-line antimalarial treatment.

Estimated Antimalarial Drug Needs and Costs				
Treatment	**2012 estimated needs** (treatments)	**Cost (US$)***	**2013 estimated needs** (treatments)	**Cost (US$)***
Artemether-lumefantrine				
6x1 tablet blister	2,712,000	1,003,440	1,812,960	670,795
6x2 tablet blister	2,332,800	1,726,272	2,372,640	1,814,257
6x3 tablet blister	2,027,520	2,250,547	2,091,840	2,321,942
6x4 tablet blister	4,060,320	5,684,448	4,149,600	5,809,440
Total	**11,132,640**	**10,664,707**		**10,664,707**
Artesunate 60 mg injection *(with solvent)*	2,001,804	2,121,912	2,077,939	2,202,615
Artesunate suppository 200 mg	102,092	60,060	103,260	60,748
Artesunate suppository 50 mg	255,230	99,973	258,150	101,117
Sulfadoxine-pyrimethamine 500 mg +25 mg tablet	11,279,862	260,565	11,279,862	260,565
RDTs	13,494,492	7,017,135	17,740,286	9,224,949

** Freight and distribution costs not included*

A number of parameters were also considered when developing the quantification for AL, including the maximum and minimum buffer stock levels required at different levels, the time needed to transport drugs through the system, and the relatively shorter shelf-life of AL compared to other non–artemisinin-based malaria treatments. This quantification 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.

Parenteral quinine is not included in this quantification because of high stock levels in the country and also because in the new standard malaria treatment guidelines, quinine was replaced by injectable artesunate for severe disease and by artesunate suppositories for pre-referral treatment. Artesunate rectal suppositories are to be included in the malaria kits but this has not

happened to date. Using the 2007 census data, it also was estimated that 5.6% of the population would be pregnant next year and 85% of those would receive SP.

PMI has supported the procurement of antimalarials with FY08, FY09, and FY10 funds. CMAM received an additional seven million treatments in 2009 and the beginning of 2010 (3.5 million treatments supported by PMI and 3.5 million treatments supported by the Global Fund through UNITAID). Approximately 5.9 million treatments of AL are available at central level as stock on hand as of May 2011.

The requirement for confirmatory testing of all patients with suspected malaria poses two additional challenges. First, it will eventually result in a significant decrease in the requirements for AL, although the magnitude of that decrease will be difficult to predict prior to implementation and it is likely to change over time. However, this assumes correct interpretation and use of RDT results in decision making on malaria treatment by the HCW. Second, the logistics system for distributing RDT kits is not entirely clear: MISAU plans on putting RDTs into the essential drug kits but the implementation of this is complex and has yet to be developed completely.

Logistics & warehousing

Fiscal Year 2012 will be the sixth year of implementation for PMI in Mozambique. To date, PMI, along with other donors, has contributed significant financial and technical support both directly and indirectly toward supply chain strengthening and pharmaceutical management in efforts to simultaneously ensure access to good quality commodities, but also, to engage in true capacity building. The refurbishment of the main central warehouse, Zimpeto, located in the outskirts of Maputo, is complete and warehousing software has been implemented. While some staff has been trained on the use of warehouse stock management software, MACS, the Zimpeto facility continues to experience significant issues and stock management is problematic. Refurbishment of the Beira regional warehouse in Sofala Province is in progress. Ideally, the Maputo-based Adil warehousing complex and Zimpeto warehouses should be harmonized with Beira and Nacala warehouses to form a centrally managed, national system with accurate information on stock status for all essential commodities. Viable plans for this network have yet to materialize but given the completion of Zimpeto and the progress at Beira, it is hoped CMAM can work toward finalizing these plans. Warehouses are also being rented with PMI, PEFAR and family planning funds to supplement Zimpeto's storage capacity. Specifically, family planning funds are supporting the ADIL central storage facility at about $250,000, and PEPFAR is contributing about $54,000 per year. This will continue to be necessary until the new extension to Zimpeto is built by USAID.

There remain significant challenges in the supply chain regarding the harmonization of donor coordination; accurate forecasting of needed commodities; quantification of diagnostic needs in conjunction with life-saving treatments; perpetual draft national policies – leading to confusion and potentially mis-treatment at service delivery point; multiple changes in leadership at all levels; paucity of qualified human resources including the absence of a finalized national-level organogram with clearly defined roles and responsibilities; weak communication between MISAU departments – specifically CMAM, DNAM and PNCM; and a failure to create a robust

linkage between the PNCM at the central level with the provincial-level coordinators. When evaluated in its entirety, the malaria logistics and supply chain has too long responded on an 'emergency' basis with warehousing and distribution capacity of essential medicines and malaria commodities suffering overtly as evidenced by stock outs and large-scale expiry. Frequently, changes in diagnostic and treatment guidelines have failed to translate into operational and programmatic changes, which have contributed to the sustained aforementioned problems. This has also created an unhealthy system that is more reactive than proactive, responding to the supply and demand dynamic in an ad hoc manner, based not on data, and unable to reach a steady-state for any one commodity. Another contributing factor is the lack of a functional logistics management information system (LMIS).

Additional challenges have surfaced as well. At the time of the MOP visit, a cache of expired drugs, primarily antiretrovirals and opportunistic infection medicines, and some ACTs, some funded with Global Fund grant support, was identified during routine supervision. The expired pharmaceuticals were accumulated over years but may also have included some more recently procured drugs. Set for a phase I, Global Fund Round 9 grant disbursement, the Minister requested that the disbursements be halted and MISAU agreed that several conditions precedent be applied for future disbursements. These included an immediate inventory of the expired cache of products as well as a plan for how products would subsequently flow down through the supply chain. These findings speak to an obvious deficit in terms of not only absorptive capacity of the supply chain writ large but as importantly, how donor funds and technical assistance are used in Mozambique toward supply chain strengthening.

Progress during last 12 months

Despite many challenges with the supply chain in Mozambique, the new Minister of Health and new Director of CMAM have shown transparency and willingness to work closely with the USG and other donors to improve a system that has been suffering from extreme mismanagement for the past six years. This new approach has allowed for these systemic problems to be uncovered. As a result of the discovery of years of accumulating expired drugs, the Minister established an emergency Task Force on commodities and called for a national inventory of existing, expired or about to expire drugs and a quantification and gap analysis (using this inventory as a base) of key commodities including antimalarials. All of these activities are being done in a very open and collaborative manner with all stakeholders, including the USG.

Rebuilding the commodity system in Mozambique requires long-term investment. However, the USG, along with other donors, has a responsibility to ensure that USG and donor-procured commodities reach the Mozambican population. The health donor partners and USG are currently engaged in developing interim, alternative options to ensure the security of donor procured goods. The objective of this effort is to establishing enough confidence among donors that commodities brought into the country will reach the end user. For this, we anticipate that funding from USG will be necessary to support this alternative measure and that USG partners will be involved in any option agreed upon.

The new director of CMAM is working with the USG, the Global Fund and other health partners to implement the Supply and Logistics Internal Control Evaluation tool (starting August 2011).

Specifically, the tool is designed to assess public sector pharmaceutical supply chain controls, as well as help verify the effectiveness of internal controls that ensure commodities reach the people in need. Ideally, specific weaknesses along the supply chain are identified; this will allow for the identification of specific interventions to repair the system.

PMI procured approximately 10 million treatments of AL between 2007 and additional December 2010 and six million treatments are expected to be procured in 2011. Although currently on hold, the Global Fund Round 9 grant only covered about a million ACT treatments. If the problem with the Global Fund is not resolved during 2011, PMI will engage in discussions to with the PNCM to determine if an emergency procurement is warranted.

By October 2010, the integrated LMIS had been rolled out to the last of the ten provinces and by the time of the FY 12 MOP planning visit, some consumption data had begun trickling up from a few provinces. While having the LMIS established in all provinces is a major step forward, problems remain. The lack of *routine* information reporting from the provincial level is compounded by the concurrent lack of understanding of how to use this data to inform procurement decisions, as well as a failure to communicate this data to the PNCM for use in better understanding where and how to implement supervision and strengthen training. PMI funds have contributed to the training of staff at the peripheral level on LMIS and these activities will continue over the next 12 months.

Malaria treatment will continue to be available, free-of-charge through the APEs and all public health facilities. MISAU, with support from USG and 10 other partners, has contributed to the development of the APE program, which ideally would place 25 APEs in each of the 144 districts nationwide. In addition to malaria case management, APEs will also engage in supervisory activities; coordinated by DDS staff and done on a quarterly basis. While MISAU is moving toward integrated clinical supervision, the necessary tools for this type of supervision remain undeveloped. 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.

While not formally recognized as a third arm of distribution, there is a parallel kitting system established by CMAM in collaboration with PMI implementing partners, based on results from a 2008 PMI-financed pilot to assess the delivery preference of the first-line ACT, AL. Supported by PMI and operational since October 2009, the ACT kitting system is maintained at the Zimpeto central-level warehouse facility outside of Maputo. To date, a total of about 31,000 kits for the APEs and 46,500 kits for health facilities have been pushed out (on a quarterly basis) down to the provincial level. Currently, all other antimalarials continue delivery through the Via Classica to health centers and health posts.

Proposed activities with FY 2012 funding

Challenges to ensuring prompt, effective, and safe ACT treatment to 85% of patients with laboratory-confirmed malaria in Mozambique continues to represent a major challenge for PMI and PNCM. With continued disruptions in procurements, a very weak pharmaceutical management system, changes in PNCM and ministry leadership, and changes in responsibility

from one department to another, and a supply chain unable to successfully absorb the commodities funneled into it, PMI will focus on the most significant problems to overcome immediate bottlenecks.

Planned activities with FY 2012 funding are as follows: ($7,262,100)

1. Procure AL: PMI with FY2012 funding will procure approximately 6.25 million AL treatments to fill gaps in the first-line treatment ($6,500,000);

2. Provide technical assistance to strengthen antimalarial supply chain and overall pharmaceutical management system: 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 continued assessments of warehousing inventory management, as well as strengthening storage and distribution capability at the central level ($300,000);

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, where needed, transportation of medicines to strengthen peripheral-level capacity in selected provinces ($200,000);

4. Support refresher training and supervision of clinical staff: PMI is supporting a national training of HCWs at all levels of the public sector to ensure that HCWs are managing patients in line with the new guidelines in 2011. PMI will also support supervisory visits focused on increasing standards of care; these activities will be carried out in close coordination with the PNCM, provincial and district health teams, and partners. This is a new USG strategy of improving standards of care across the various clinical areas in coordination with PEPFAR-supported partners ($250,000); and

5. TDY from CDC Atlanta: CDC staff to provide technical support to malaria case management in Mozambique ($12,100).

INTEGRATION OF HEALTH ACTIVITIES, HIV/AIDS, AND MALARIA

Background

Both USG and the GOM are committed to integration of health programs. Under the GHI, USG funding follows a model that strongly emphasizes strategic coordination, host country ownership, and programmatic integration. The GOM, in its Integrated Plan to Reach the Millennium Development Challenge, Goals 4 and 5 (2009–2012), has clearly outlined MCH services as a key component of this plan. Improving quality of MCH care and services, as well as strengthening the health system in general, are top priorities for the GOM.

The USAID Mozambique Health Team, in response to the interest in integration, recently merged into one Integrated Health Office, maximizing the programmatic synergies among our PEPFAR, PMI and other health programs. This change is anticipated to increase administrative and technical efficiencies and avoid duplication of efforts. It will also 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 will strengthen antenatal care services across the country and improve quality of care.

Another USAID PEPFAR–funded project aimed at strengthening HIV-related services, linkages, and systems also has a broader mandate, which includes strengthening services for malaria. Although PMI does not contribute funding to this project, the project is expected to impact government and community capacity to deliver and manage all clinical services, including malaria, at the district level.

Progress during last 12 months

In the areas of integrated antenatal care services, performance measurement standards have been developed to assess and guide selected facilities in a variety of aspects of maternal and newborn care, including IPTp. These standards are to be expanded nationally. Also, antenatal care norms, which include MIP elements, have been revised and HCWs were trained in promotion of quality maternal and newborn care using performance standards as reference. The training includes appropriate prevention of MIP. Similar performance standards are being developed for malaria case management as well. FY11 funds were allocated for laboratory support, including support for laboratory infrastructure, finalizing diagnostic guidelines, and supervision activities, which are, for the most part, complementary to supervision activities for already on-going tuberculosis and HIV.

Proposed activities with FY 2012 funding (all costs for these activities are covered under Malaria in Pregnancy, Case Management: Diagnosis and Treatment, Communication and Behavior Changes, and Monitoring and Evaluation sections)

CAPACITY BUILDING AND HEALTH SYSTEM STRENGTHENING

Background

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 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. In August 2010 and then again in December 2010, the PNCM had changes in directorship. These changes in leadership in the PNCM had an important impact on the program. and currently the staff consists of a newly appointed director, a physician and physician in charge

of malaria case management, a national IRS supervisor, a biologist for ITN-related activities, a biologist dedicated to entomology, two entomology assistants, an information technology technician, a health communications officer, and an administrative assistant. Overall, the capacity, in terms of number and quality of personnel at the PNCM, is weak. PNCM's implementation planning continues to be weak, and has caused delays in the implementation of PMI activities in Mozambique. In addition, several policy and strategic documents have remained in draft form for extended periods of time prior to formal approval. These include the National Malaria Prevention and Control Plan 2010–2014, National Malaria M&E Plan 2010–2014, as well as malaria case management policies and guidelines. In November 2010, PMI supported the Malaria Program Review, which is to be used as the foundation for the updated drafts of the national policy documents. These documents are not only relevant for guiding the program but also are conditions precedent for Global Fund disbursements. They are on track, through PMI support, to be finalized in September 2011.

At the provincial level, the implementation and coordination of the health services are the responsibility of the DPS, specifically the Provincial Medical Chief. In 2008, the PNCM increased its regional capacity with the training of 14 biologists in a WHO/PMI–supported workshop, which included basic introductory modules on entomology, epidemiology, and malaria control planning. These biologists have been seconded to the provinces with the DPS to support malaria control activities at the provincial level. They report directly to the Provincial Medical Chief and oversee all malaria control activities in the province, with a focus on vector control and M&E activities. The PNCM is planning on revising the scopes of work of these biologists to include activities such as LLIN distribution oversight, AL stock information, and IRS management. Beyond the training the biologist received in 2008, they have no other malaria control management experience and receive little supervision from the central level. The quality of the biologist in terms of management capacity is variable. In addition to these biologists, the DPSs may have other personnel within their staff who also oversee malaria activities, however there is roles and responsibilities of these other personnel are not clearly outlined. District level malaria officers are among the key human resources requirements missing; the PNCM is planning on prioritizing this request of MISAU.

Given the lack of professionally trained HCWs, USG is contributing, along with other partners, to revitalize the APEs system. The APE system consists of community HCWs who have been selected by their communities to receive intensive four-month training on the prevention and treatment of common diseases, including malaria. In 2011 the MOH launched the new APE program and has trained 179 APEs. The existing cadre of APEs received a two separate kits with essential medications and medical supplies in one, and the malaria kit with treatment only for now; in the future, based on availability these malaria kits should also have RDTs. A revitalization of this system will be supported by the Global Fund Round 9 grant, World Bank Health Project, PEPFAR, and USAID health funding. A total of 2,340 new APEs are expected to undergo a four-month training program over the next five years at a cost ranging from $9 million to $32 million per year. The policy document was approved in March, 2010 by MISAU and training tools for trainers and trainees are being tested with the first APEs training program in expanded in 42 districts in 2011-12. The Capacity Plus Project has provided technical assistance to the Central MOH coordination unit for program planning, budgeting and curriculum development. Training of APEs will include the new malaria case management

guidelines, including the use of RDTs. This expansion, if successful, will greatly improve access to malaria case management at the community level.

Progress during last 12 months

PMI is building capacity for malaria control at a number of levels. Within the PNCM, PMI resident advisors and implementing partners have provided technical and implementation support to the PNCM on a range of issues including development of policies on malaria case management, strategies for ITN scale-up and M&E, and curricula for training of HCWs. PMI also assisted the PNCM with forecasting of malaria treatments and commodities and planning of ITN distribution campaigns. In addition, PMI has funded the hiring an M&E advisor to support key functions of the PNCM; this advisor is part of a broad USG effort to build M&E capacity within the National Directorate of Public Health (the MoH department which houses the PNCM) and works with the newly appointment PNCM M&E personnel. The M&E advisor is tasked with building the technical capacity of this PNCM staff member with the aim of this capacity being sustained. The National Reference Laboratory for Blood Parasites, the entomology laboratory and an insectary at INS were refurbished and re-equipped with support from PMI. Moreover, PMI has placed an entomologist at the PNCM to coordinate all vector control activities, including insecticide resistance surveys, provincial entomologic monitoring and IRS activities.

At the provincial level, PMI has been strengthening capacity at the DPS in Zambézia Province to implement IRS activities and conduct entomologic monitoring, including the establishment of a provincial entomology laboratory and insectary. The PNCM is also expanding its regional entomology capacity and decentralization of entomologic monitoring/surveillance, which otherwise would be too costly and logistically difficult to support on a routine basis from the central laboratory in Maputo. To that end, PMI agreed to support, with PMI Year 3 funding, the refurbishment of a regional entomology laboratory in Cabo Delgado Province for expansion of entomologic capability in the northern provinces of Mozambique. This will provide an opportunity for the biologists in the northern region to perform basic entomologic monitoring, such as vector identification, seasonal variations, and insecticide resistance bioassays as part of the ITN and IRS programs.

PMI has contributed FY09 - FY11 funding to the CDC-led Field Epidemiology and Laboratory Training Program (FELTP) activities in Mozambique. A two-year Master's level program in FELTP started in August of 2010 with a cohort of five epidemiologists and six laboratorians. The CDC PMI Resident Advisor directly supervises one of the existing candidates who is working within the PNCM. It is expected that candidates for the Master's degree in FELTP will come from the PNCM and that projects for the candidates will be include malaria evaluations.

Proposed activities with FY 2012 funding (Costs covered in other sections)

Strong and effective leadership by the PNCM will be critical to the success of the Mozambique's malaria control efforts. In addition, malaria as the number one killer of Mozambicans should be elevated within the MOH to a higher status and this requires strong leadership at the highest MOH levels. To reach the PNCM targets, continued support will be need to strengthen its

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.

In FY2012, PMI will continue to provide long-term technical assistance in entomology until 2013 and monitoring and evaluation activities until 2014 in support of the PNCM.

BEHAVIOR CHANGE AND COMMUNICATIONS

Background

Although progress has been made in some areas, BCC related to malaria prevention and control continues to be a significant gap in the malaria control in Mozambique. To date, a comprehensive strategic plan for malaria BCC remains in draft format.

The PNCM has included a section on Health Promotion and Mobilization with Community Involvement in its draft National Malaria Prevention and Control Plan 2010–2014. The communications section of the PNCM remains weak, despite technical support and good partner cooperation.

At the provincial level, a health education and communication coordinator is responsible for educating communities about malaria interventions and other health-related topics but it is not clear what capacity for BCC activities the provincial coordinators have. In addition, funding for BCC activities and personnel is limited.

APEs, where available, are also involved in malaria IEC/BCC activities within their communities. However, the number of APEs is still very low with only a few communities covered. Even where they exist, supervision of their work and updating their skills is irregular. Communications activities carried out by PNCM have focused on radio spots and material to be distributed at health facilities. Each year, the PNCM organizes Malaria Day activities, and the provincial level DPSs also organize celebrations. Partners usually support these activities, but there is little planning or coordination.

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 also conducts the BCC related to the activity, although the content of the messages require approval from PNCM to ensure continuity. Similarly, in areas where 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. PMI has participated in the BCC planning for the universal coverage campaigns which was led by MISAU. Unfortunately the “PNCM brand” which was planned to be used for the MISAU-led universal coverage campaigns in 2011 was not finalized. The products of the branding exercise will be used for the next wave of MISAU-led universal coverage campaigns in 2012.

Since May 2010, C-Change has been implementing PMI's BCC activities with the following scope of work: (i) build the organizational and institutional capacity of the *Programa Inter-religioso Contra Maláría* (PIRCOM), an inter-faith community organization, to implement future donor-funded health programs in malaria prevention and water-borne disease and control; (ii) train PIRCOM's religious leaders in social and behavior change communication (SBCC) and community mobilization to reduce malaria and water-borne disease prevalence in at least four provinces; and, (iii) support capacity strengthening of the Mozambican DEPROS in the development, implementation, and coordination of SBCC strategies and approaches.

Progress during last 12 months

The PMI support for BCC activities has largely been through PIRCOM, which has now expanded its activities to Zambézia, Nampula, Sofala, and Inhambane provinces. Training on key malaria messages has been provided to almost 21,169 religious leaders, who in turn have reached 1,575,752 people in 35 districts: nine in Zambézia, ten in Nampula, 11 in Sofala, and five in Inhambane. The national PIRCOM is close to finalizing the necessary steps to register as an NGO in Mozambique. PIRCOM also has a small grants program to support activities carried out by the District PIRCOMs.

Other PMI supported BCC achievements to date include PIRCOM's NGO registration and recruitment of central and provincial staff; the development of PIRCOM's five-year strategic plan; implementation of a data collection system for BCC indicators to be deployed in areas where PIRCOM activities are taking place; regular support for the malaria communication group, including advising on the universal net coverage campaign and World Malaria Day 2011 commemoration with the Office of the First Lady of Mozambique, MISAU and PMI partners.

Peace Corps Initiative

The Mozambique program opened in 1998 when the American Embassy in Maputo signed a memorandum of understanding with the Mozambican Ministry of Education. Peace Corps Mozambique has currently 139 volunteers serving in all provinces in the areas of Education, Health, and Food Security. The Peace Corps Health Volunteers work in a variety of placements ranging from small community-based organizations to outreach programs of large international NGO's. All activities have the goal of strengthening the community response to HIV and AIDS.

Proposed activities with FY 2012 funding: ($1,035,000)

1. Support MISAU's malaria BCC activities: PMI will continue support coordination of malaria BCC activities, implement PNCM branding strategy, finalize the malaria communication strategy and strengthen the DEPROS in the development, implementation and coordination of BCC strategies and approaches ($250,000);

2. Community mobilization activities: PMI will continue to support PIRCOM to mobilize communities and continue PIRCOM institutional capacity building until 2013 as it is expected that by then the organization will be able to obtain funding independently ($350,000);

3. Disseminate malaria in pregnancy prevention messages : PMI will support dissemination of malaria in pregnancy prevention in coordination with MNCH on the Integrated Reproductive Health/Maternal-Neonatal-Child Services Package ($200,000);

4. Promote and disseminate ITN ownership and use messages: Promote ITN ownership and use via mass media and community-based approaches ($215,000); and

5. Peace Corps collaboration: Provide training to a third year volunteer to assist with nets logistics and as PIRCOM provincial coordinators ($20,000).

MONITORING AND EVALUATION OF MALARIA CONTROL ACTIVITIES

Background

Strengthening M&E capabilities, within the context of other M&E systems in MISAU, is a priority for MISAU, PNCM, and its partners. Weaknesses in M&E are due in part to high personnel turnover in the directorates responsible for M&E and poor coordination among MISAU M&E stakeholders from the various health programs. PNCM drafted the 2010–2014 PNCM M&E Plan, which is being modified based on the Malaria Program Review recommendations. This plan, expected to be finalized in September 2011, 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. This unified M&E system is being led by the Directorate of Planning and Cooperation who is working closely with the National Directorate of Public Health to establish a strong system for the HIV, tuberculosis and malaria programs which sit within this department. These efforts should result in more efficient use of data and resources, and ensure that indicators are comparable over time and duplication of effort reduced.

For routine surveillance, clinical and laboratory-confirmed malaria cases are included in the reporting system of notifiable diseases, which is managed by the *Departamento de Epidemiologia*. All public health facilities are expected to report on the number of malaria cases, clinical and laboratory-confirmed, on a weekly basis. To date the differentiation of confirmed or clinical cases is not routinely done. These data are transmitted to the provincial and then national level, although this does not always occur regularly. In addition, monthly and quarterly data on malaria morbidity and mortality are aggregated separately by each health facility. These data are transmitted to the district level, collated, and transmitted to the provincial and national level. While considered to be the best functioning health information system in the country, there are concerns about the accuracy, completeness, and timeliness of the data. The MISAU MNCH Program has finally approved an updated patient register which is scheduled for national implementation in January 2012. This new register will collect data on key malaria indicators but the data flow and central database for these newly collected indicators has yet to be established.

UNICEF has historically maintained maps with the coverage of malaria control interventions nationwide (particularly ITNs and IRS), that are based solely on input data (i.e., number of LLINs distributed, number of houses sprayed). The PNCM received training from UNICEF to

update these map. There is a need for this update to be done regularly, particularly with the rapid scale-up of malaria interventions in Mozambique.

In 2011, MACEPA placed an M&E specialist in Mozambique to assist the PNCM and partners to better coordinate M&E activities, focusing mostly on the strategic and policy level activities (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 on-going M&E coordination between various stakeholders is critically important for PNCM to have appropriate information to manage the program.

Progress during last 12 months

Entomologic monitoring: After the RTI/LATH subcontract, entomologic monitoring in Zambézia Province was performed using two short-term RTI technical assistance from Kenya. In August 2010, a baseline larval survey carried out in the two new IRS districts, Mopeia and Maganja da Costa and in Pebane, a non-IRS district, which showed 58% *Anopheles gambiaes.l.* and 42% *Anopheles funestus*. Using pyrethrum spray collections, 46% were shown to be *Anopheles gambiae* s.l. and 54% were *Anopheles funestus*. An entomologic study by a Master's student in Zambézia comparing vector species abundance in 2006-2007 during the start of the scale-up of IRS to 2009-2010, indicates a reduction in vector abundance and reduced transmission index. In March 2011, post-spray pyrethroid spray collections conducted in the IRS districts of Nicoadala, Quelimane, Mocuba and Namacurra did not collect any Anopheles mosquitoes resting indoors in sprayed or unsprayed houses. During the same period, larval collections indicated that *An. gambiae* s.l. was the predominant mosquito species in the districts of Nicodala (100%), Mocuba (98.3%) and Maganja da Costa (84.3%). In Morrumbara District, the predominant mosquito identified was *An. natalensis* (55.1%) and *An. gambiae* s.l (36.2%) was the second most abundant mosquito. *An. funestus* was collected in Mocuba (1.7%), Morrumbara (8.7%), and Maganja da Costa (15.7%).

In the August 2011 baseline insecticide resistance testing in the new IRS districts of Mopeia and Maganja de Costa and the non-IRS district of Pebane on *An. gambiae* s.l. using the WHO assay indicated that there was 100% susceptibility to lambda-cyhalothrin, bendiocarb and DDT in all three districts. The RTI/LATH 2009 monitoring in Mocuba District indicated a reduced mortality to lambda-cyhalothrin (82.9%) and bendiocarb 90.3(%) in *An. funestus*. Similarly in Milange, *An. funestus* showed a reduced mortality to lambda-cyhalothrin (85.1%) and bendiocarb (84.5%).

In March 2011, post-spray insecticide resistance testing in Mocuba, an IRS district, indicated 100% susceptibility of *An. gambiae* s.l to lambda-cyhalothrin, bendiocarb, DDT, deltamethrin and fenitrothion. The differences in resistance may reflect the focal nature of insecticide resistance even within a district and may indicate an emerging insecticide resistance in some areas. These assays should be repeated and the number of test sites increased. The data currently indicates that although pyrethroids can be used in the FY12 spray activities, an insecticide resistance management plan must be developed in the near future and implemented.

WHO cone wall bioassays conducted from December 2010 to March 2011 indicated that the residual efficacy of the short acting lambda-cyhalothrin was approximately three months, declining from 100% from December through February to 57.5% efficacy in March. Based on this, PMI will purchase a longer lasting insecticide for the FY11 IRS.

In addition to Zambézia Province, PMI is supporting the PNCM in its national entomology surveillance plan, consisting of pyrethrum spray catches for monitoring mosquito species, density, infection rates, and resistance. In 2009, insecticide susceptibility testing in three provinces where the NMCP is spraying (Tete, Cabo Delgado, and Inhambane) showed that *An. gambiae* was susceptible to DDT, lambda-cyhalothrin, bendiocarb, deltamethrin, and propoxur in all the provinces tested except in Ancuabe (Pemba, Cabo Delgado Province), where it was observed that there is a possibility of resistance of *An. gambiae* to DDT (93% mortality). In 2010, PMI also supported a three-month national entomology survey in four provinces: Gaza, Manica, Nampula and Tete, similar to those in 2009. A significant reduction in the numbers of Anopheles were collected in sprayed areas compared to unsprayed areas, *An. funestus* being the most abundant mosquito species complex collected in all provinces in areas sprayed and unsprayed. The mosquitoes collected will be processed by the PCMP with INS using PCR for species identification. In addition, cone wall bioassays for insecticide efficacy carried out in Gaza Province to monitor DDT susceptibility demonstrated 100% mortality to six months post-spray.

The results of the analyses of all of the samples were made available in February 2011. Crops were compared to the EU maximum residual level of 0.05 mg/kg, and soils were compared to residential soil screening levels of 1.7 mg/kg for humans, and eco-soil screen levels of 0.093 mg/kg (avian) and 0.021 mg/kg (mammalian). The data indicate that the amount of DDT contamination in a crop stored within a house is more influenced by when and how long crop is stored than by how many times a house is sprayed. Median DDT concentrations increased from 0.036 mg/kg in Sample Point 1 to 0.11 mg/kg in Sample Point 2; the increase was not statistically significant. However, median DDT concentrations in crops in Mocuba were significant higher in 2010 (at 0.2 mg/kg) than in 2009 (0.043 mg/kg). Therefore, there is variation when measuring whether significant increases occur after one round of spraying alone. Results from soil samples indicate that, as to be expected, higher concentrations of DDT are found in entranceway soil than in garden soil. The increase in DDT concentrations from Sample Point 1 to Sample Point 2 was statistically significant in entranceway soils. Neither mean nor median DDT concentrations for entranceway soil exceeded the human SSL of 1.7 mg/kg, yet both mean and median DDT concentrations exceeded avian and mammalian eco-SSLs. Results from soil sampling in gardens are difficult to interpret. The extreme range in data (from non-detected to 47 mg/kg) indicate the possibility that there may be application of DDT to agriculture crops in Mozambique.

Antimalarials availability monitoring: The End-Use Verification survey was prioritized as part of the plan to improve the supply chain management system, and is planned for October 2011. This assessment will be used to ascertain this information from a sample of health facilities, as well as district- and provincial-level warehouses. Health facilities will be visited, together with the warehouses that supply them. The objectives of this exercise are to ensure that PMI-supported malaria medicines and other commodities are reaching the people for whom they are

intended and monitor supply chain management of PMI-supported malaria medicines and other commodities. This will contribute to the establishment of an effective supply chain monitoring system in Mozambique.

Antimalarial efficacy monitoring: Mozambique has not conducted efficacy monitoring since almost a decade and given the poor case management and changes in treatment regimens this activity was prioritized and is on-going at the time of the drafting of this document. It is expected to be completed successfully in September 2011. It is expected to be conducted every two to three years.

Miscellaneous M&E activities: The evaluation of the performance of HCWs use and interpretation of RDTs as well as logistic factors related to RDTs, planned with FY2010 is to be announced by September 2011 for submission of proposals. Until now, limited information is available on the quality of RDTs use at the health facility level or community level. The distribution of RDTs for malaria across the country, with little or no pre-service training, raises questions about the quality of their use and what impact this will have on case management.

Two LLIN evaluations are on-going in Mozambique, one to assess the durability of LLINs – for which the last survey and LLIN collection will take place in October 2011 and processing of these LLINs which should be completed by February 2012 – and another to assess the effectiveness of the LLIN universal coverage distribution model developed in Mozambique. This evaluation has completed the second of three surveys and will be completed in by mid-2012. Both of these evaluations are important to PNCM and PMI for policy and programmatic decision making.

PMI provided support to a comprehensive malaria module in the DHS 2011 to ensure a collection of relevant data to monitor the status and impact of PMI implementation. Data collections started in May/June 2011. Results are expected in 2012. A tentative date for the next MICS supported by UNICEF is in 2013.

Proposed activities with FY 2012 funding: ($980,800)

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 or the PNCM. USG is putting great effort to improve surveillance and M&E in Mozambique for malaria, HIV/AIDS, and tuberculosis by strengthening the MISAU notifiable disease system. To this effect a new MNCH register is set to be launched in early 2012 and will collect key PMI indicators. PMI will target its support and will work closely with PEPFAR-funded partners to implement the MNCH register as well as other routine information systems (which provides the malaria data to PNCM) to ensure that the needs of the PNCM are met.

1. Technical assistance for PNCM M&E: PMI will continue to support M&E capacity building within the PNCM by supporting an M&E technical assistance, which will assist the newly assigned PNCM M&E staff to coordinate PNCM M&E activities and supporting routine

system strengthening at the central level. In addition, other M&E staff will be hired regionally to coordinate with MISAU and partners at lower level activities focused mostly on quality data collection and the oversight of the newly implemented MNCH registers. The activities to strengthen routine system will be leveraging a large system strengthening investment from PEPFAR and MCH through focused efforts on malaria specific tools and activities ($300,000);

2. Support for entomologic activities:
   i. Support on-going entomological monitoring in Zambézia Province (8 districts) and enhanced entomological monitoring in two Zambézia districts transitioning from IRS to universal coverage with LLINs; in addition, support NMCP IRS entomologic monitoring in sentinel entomological sites in five additional provinces (one per province) ($275,000);
   ii. Entomology TDY (three) 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 ($58,700);

3. Support for End-Use Verification Tool implementation: PMI will support the routine implementation of the End-Use Verification Tool roughly twice a year, in a rotating sample of health facilities and medical stores. This will be integrated into routine MISAU supervisory visits which take place quarterly ($100,000);

4. Surveillance in districts where IRS is being withdrawn: Mozambique is embarking on a universal coverage campaign in districts without IRS coverage. In Zambézia Province, where IRS is being supported by PMI in 8 districts, two districts will replace IRS with universal bed net coverage. It will be important to monitor the burden of malaria in these two districts with enhanced surveillance system ($100,000)

5. 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 ($100,000);

6. LLIN longevity monitoring: Final data collection and processing of 3 year durability evaluation of LLINs from 2008 campaign in Nampula ($35,000); and

7. TDY from CDC Atlanta: CDC Atlanta staff to provide technical assistance to M & E strengthening activities (costs covered under other TDY activities).

IN-COUNTRY STAFFING AND MANAGEMENT

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 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 Clinical and Community Care Cluster Leader. As part of CDC' Global Health "one CDC" reorganization the CDC RA will be supervised by CDC Mozambique Country Director and will continue to receive technical support from CDC Atlanta. PMI RAs 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 USAID Mission Director. Additional locally hired staff are planned for 2012 to improve the program management of the PMI team. 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.

Planned activities with FY 2012 funding are as follows: ($1,950,000)

1. Management of PMI: Support two senior technical Resident PMI Advisor staff (one USAID and one CDC) based at the USAID Mission in Maputo, one senior malaria Foreign Service National, and one mid-level Foreign Service National project manager PMI staff, including all work-related expenses (e.g., travel, supplies, etc.), and mission-based expenditures, including USAID mission expenses incurred in the direct implementation of PMI activities ($1,950,000).

ANNEXES

Tables

Table 1
President's Malaria Initiative — Mozambique
Year 6 (FY12) Budget Breakdown by Partner ($)

Partner Organization	Geographic area	Activity	Budget*
IRS IQC Global Task Order 4	Zambézia Province	Procurement of IRS equipment; support to IRS activities; strengthen entomologic capabilities of PNCM	6,125,000
Social Marketing RFA	Nationwide	Distribution of LLINs through ANCs, support for universal coverage, post-campaign surveys and promote LLIN use and ownership	2,250,000
DELIVER	Nationwide	Strengthen pharmaceutical management system, procure antimalarial drugs, RDTs, end use verification, and LLINs	16,600,000
JHPIEGO	Nationwide	Training and supervision in MIP and in case management	200,000
TB CARE	Nationwide	Reference lab support, lab training/supervision, lab information system support, and M&E support	1,100,000
TBD	Zambezia	Support enhanced surveillance in IRS to ITN transition districts	100,000
TBD	New BCC Award	Support for broad BCC activities	1,065,000
RTI	Zambezia	Support for entomologic monitoring in IRS districts	275,000
CDC	Nationwide	M&E support, entomologic evaluations, FELTP implementation, monitoring, training and supplies	159,500
Total			27,874,500*

*Does not include budget for staffing/administration of $1,950,000 or $75,500 for five CDC technical assistance trips.

Table 2
President's Malaria Initiative — Mozambique
Planned Obligations for FY12 ($)

Proposed Activity	Mechanism	Budget	Commodities	Geographical area	Description
ITNs					
Procure LLINs	DELIVER	7,280,000	7,280,000	Nationwide	Procurement of 1.5 million LLINs @ $5 per net targeting pregnant women and distributing through ANCs
Support LLIN distribution through ANCs	TBD	1,500,000	-	Nationwide	Support for ANC LLIN distribution to provincial and district health teams for management, logistics and promotional activities @ approx. $1.25 per net
Support LLIN distribution through universal coverage campaigns	TBD	750,000	-	Nationwide	Support for technical and logistics for universal campaign efforts including funds for campaign evaluation
SUBTOTAL ITNs		**9,530,000**	**7,280,000**		
IRS					
Support IRS in six districts of Zambézia province	IRS IQC 2 Task Order 4	4,500,000	-	Zambézia	IRS campaign in six districts of Zambézia covering 398,000 houses (2 million residents)
Procure IRS commodities	IRS IQC 2 Task Order 4	1,625,000	1,625,000	Zambézia	Procurement of personal protective equipment, spare parts, and insecticide
SUBTOTAL IRS		**6,125,000**	**1,625,000**		
Malaria in Pregnancy					
Support training and supervision of ANC staff in MIP	JHPIEGO	200,000	-	Nationwide	Integrated supervision of ANC HCWs in prevention of malaria in pregnancy
SUBTOTAL MIP		**200,000**	**-**		

Proposed Activity	Mechanism	Budget	Commodities	Geographical area	Description
Case Management: Diagnosis					
Procure diagnostic supplies	DELIVER	2,250,000	2,250,000	Nationwide	Purchase approximately 3.0 million RDTs and additional microscopy kits, reagents, and microscopes if needed
Support for National Reference Laboratory for Blood Parasites	TB CARE	50,000	50,000	INS	Provide supplies for National Reference Laboratory for Blood Parasites
Support supervision of laboratory diagnosis of malaria	TB CARE	500,000	-	Nationwide	Provide supervision of laboratory staff in malaria laboratory diagnosis, use of RDTs and including quality assurance
Provide technical assistance for laboratory strengthening	CDC	17,100	-	Nationwide	TDY for support of laboratory strengthening activities and supplies to PNCM, & quality control system support.
SUBTOTAL Diagnosis		**2,817,100**	**2,300,000**		
Case Management: Treatment					
Procure AL	DELIVER	6,500,000	6,500,000	Nationwide	Procurement and shipment of about 6.25 million AL treatments, including distribution to Provinces
Strengthen MISAU antimalarial drug management system	DELIVER	300,000	-	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
Support supervision of clinical staff	TB CARE	250,000	-	Nationwide	Support supervision of HCW at all levels in malaria case management
Provide technical assistance for case management	CDC	12,100	-	Nationwide	TDY for support of case management
SUBTOTAL Case Mgmt		**7,262,100**	**6,500,000**		

Proposed Activity	Mechanism	Budget	Commodities	Geographical area	Description
Communications and Behavior Change					
Support MISAU's malaria BCC activities	TBD	250,000	-	MISAU	Coordination of malaria BCC activities, PNCM branding strategy and DEPROS capacity building activities
Support community mobilization activities	TBD	350,000	-	Nationwide	Support PIRCOM to mobilize communities, continue capacity building
Disseminate malaria case management messages & MIP prevention	TBD	200,000	-	Nationwide	Support dissemination of malaria prevention and treatment messages
Promote and disseminate ITN ownership and use messages	TBD	215,000	-	Nationwide	Promote ITN ownership and use via mass media and community-based 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		**1,035,000**	-		
Monitoring and Evaluation					
Provide long-term technical assistance for monitoring and evaluation	TB CARE	300,000	-	PNCM	Support full-time staff to supervise monitoring and evaluation activities at NMCP and regionally in coordination with investments from PEPFAR
Support for entomologic monitoring in PMI IRS districts	RTI	275,000	-	Zambezia	Support ongoing entomologic monitoring in PMI IRS districts &enhanced entomologic activities in two transitioning districts. Plus support five sentinel entomological sites

Support for entomologic activities	CDC	24,500	-	Nationwide	Support for entomologic monitoring and training activities to include specific reagents and laboratory diagnostic materials
Support enhanced surveillance in IRS to LLIN universal coverage transition districts	TBD	100,000	-	Zambézia	Support for baseline parasitemia surveys and enhanced morbidity monitoring as dos districts transition from IRS to LLIN universal coverage
LLIN longevity monitoring.	CDC	35,000	-	Nampula	Final data collection and processing of 3 year durability evaluation of LLINs from 2008 campaign
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 (FELTP)	CDC	100,000	-	Nationwide	Support FELTP program with the participation of one or more PNCM staff
Provide technical assistance on monitoring and evaluation and entomologic monitoring	CDC	58,700	-	MISAU	Three TDYs for support of monitoring and evaluation strengthening activities
SUBTOTAL M&E		**980,800**	-		
In-country Staffing and Administration					
Support in-country administrative expenses	CDC/USAID	1,950,000	-	Nationwide	Staffing and general administrative support for PMI
SUBTOTAL Staff & Admin		**1,950,000**	-		
TOTAL		**29,900,000**	**17,705,000**		