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 — FY2011

ANGOLA

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ABBREVIATIONS

ACT	artemisinin-based combination therapy
AL	artemether-lumefantrine
ANC	antenatal clinic
CDC	Centers for Disease Control and Prevention
FBO	faith-based organization
Global Fund	Global Fund to Fight AIDS, Tuberculosis, and Malaria
GRA	Government of Republic of Angola
IEC	information, education, communication
IMCI	integrated management of childhood illnesses
IPTp	intermittent preventive treatment for pregnant women
IRS	indoor residual spraying
ITN	insecticide-treated net
LLIN	long-lasting insecticide-treated net
MICS	Multiple Indicator Cluster Survey
MIS	Malaria Indicator Survey
MOH	Ministry of Health
NEDP	National Essential Drug Program
NMCP	National Malaria Control Program
NGO	non-governmental organization
PMI	President's Malaria Initiative
PSI	Population Services International
RBM	Roll Back Malaria
RDT	rapid diagnostic test
RFA	request for application
RTI	Research Triangle Institute International
SP	sulfadoxine-pyrimethamine
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USG	United States Government
WHO	World Health Organization

EXECUTIVE SUMMARY

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

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

Angola was selected as one of the first three countries in the PMI in June 2005. Implementation of large-scale malaria control activities in Angola faces serious challenges. The country's health infrastructure was severely damaged during the civil war and it has been estimated that only about 40% of the population has access to government health facilities. Malaria is a major health problem, accounting for an estimated 35% of the overall mortality in children under five, 25% of maternal mortality, and 60% of hospital admissions for children under five. Malaria transmission is highest in northern Angola, while the southern provinces have highly seasonal or epidemic malaria.

In February 2009, Angola signed a five-year, $78 million Round Seven Global Fund malaria grant. The United Nation's Children's Fund (UNICEF) and the World Health Organization (WHO) have been major partners with the National Malaria Control Program (NMCP) in scaling up interventions. An effective partnership with ExxonMobil has resulted in donations of $3.5 million to the United States Agency for International Development (USAID) over the last three years to further PMI objectives in Angola.

The FY2011 PMI Malaria Operational Plan for Angola was developed during a planning visit carried out in April 2010 by representatives from USAID, the Centers for Disease Control and Prevention (CDC), and the Angolan NMCP with participation of other major partners working on malaria in country. The proposed FY2011 PMI activities are based on progress and experiences during the last five years and the NMCP's 2008-2012 National Malaria Control Strategy. Since Angola was successful with its Global Fund Round Seven grant proposal, the PMI activities are designed to complement activities supported under that grant.

With the proposed FY2011 PMI funding of $30,175,000, the following activities will be supported:

Insecticide-treated nets (ITNs): When the PMI began, only about 11% of households owned one or more ITNs. During the last six years, more than 6 million ITNs were procured and distributed by all partners. Over the past 12 months, PMI supported UNICEF to procure about 400,000 LLINs, while an additional 600,000 LLINs were procured for free distribution in nine of the country's 18 provinces through non-governmental organizations (NGOs). About 60% of these nets were distributed during municipal health days while the remaining 40% were reserved for distribution through antenatal and immunization clinics. None of the nets procured by the PMI were targeted to the capital, Luanda, where a PMI-supported study demonstrated very low malaria transmission. With PMI support, a study to assess the longevity and durability of LLINs under field conditions is underway to guide future net replacement strategies.

With many residents unable to afford the cost of an LLIN, PMI will continue to support the existing Ministry of Health (MOH) strategy of providing nets free of charge. With FY2011 funding, it is expected that about 800,000 LLINs will be procured and distributed free to pregnant women and children under five through routine clinic services and municipal health days together with behavior change communications (BCC) activities to increase demand for and correct use of nets.

Indoor residual spraying (IRS): Before PMI-supported IRS campaigns began in southern Angola in 2006, no large-scale IRS had been carried out in the country for more than 10 years. IRS activities supported by the PMI during the past 12 months include spraying of 103,000 houses, protecting a total population of more than 486,000 in the provinces of Huila and Huambo. Huambo Province is the second most malarious province in the country and Huila reports the most cases of malaria among the southern provinces. More than 96% of the houses targeted for spraying were sprayed. With FY2011 funding, the PMI will support a fifth annual round of spraying in Huambo and seventh round of spraying in Huila. In addition, at the request of the NMCP, PMI will also spray three large towns in Cunene Province on the border with Namibia, which is one of the Southern Africa Development Community countries attempting to eliminate malaria. A total of approximately 130,000 houses will be sprayed with FY2011 funding, benefiting more than 650,000 residents.

Health systems strengthening and integration: In line with GHI principles, PMI has reinforced its efforts to build capacity and integrate across programs. Because of the limited access of the population to government health facilities in the rural areas of most provinces, PMI has focused its efforts on the rollout of IPTp, correct diagnosis and prompt treatment of malaria, and distribution of LLINs through NGOs and FBOs that have a presence at the provincial level and work closely with provincial health authorities. These NGOs assist with training and supervision of health workers on malaria as part of Integrated Management of Childhood Illnesses, supply chain management at the provincial level and below, and BCC activities to ensure correct usage of LLINs, IPTp, and ACTs. National or international NGOs are currently being supported in nine of the country's 18 provinces with a combination of PMI funding and an annual donation to USAID/Angola from the ExxonMobil Foundation. This scale up has been accompanied by joint PMI and PEPFAR-supported technical assistance to the National Essential Drugs Program to strengthen the pharmaceutical management system at national, provincial, and health facility levels. During the past year, more than 400 health workers were trained in malaria case management and malaria in pregnancy, while nearly 600 were trained in IRS.

Intermittent preventive treatment of malaria in pregnancy (IPTp): About 80% of women in Angola attend antenatal clinics at least once during their pregnancy. Implementation of IPTp in Angola began in May 2006 together with the roll out of ACTs; at that time, it was estimated that fewer than 2% of pregnant women were receiving IPTp. The PMI has supported the Angolan NMCP scale up of IPTp through health worker training and BCC activities to promote early and regular attendance at ANCs, together with IPTp and ACT implementation in nine provinces through NGOs. As of June 2010, more than 257 health workers had already been trained in IPTp. Together with other partners, IPTp has now been implemented in all 164 municipalities nationwide and during the past 12 months, more than 280,000 pregnant women received the recommended two doses of IPTp.

With FY2011 funding, efforts will be continued to promote early antenatal clinic attendance and raise levels of IPTp coverage by distribution of free ITNs to pregnant women through these clinics. The PMI will continue its support for health worker training and supervision and ensuring a steady supply of commodities for the prevention and treatment of malaria in pregnancy. Support to NGOs will continue to promote IPTp and LLIN distribution through health facilities as well as effective case management of malaria in pregnant women.

Case management: For the past four years, PMI has been supporting improved parasitologic diagnosis of malaria with rapid diagnostic tests (RDTs) and microscopy through procurement of equipment and supplies and training and supervision of laboratory workers. Although artemether-lumefantrine (AL) was approved as the first-line treatment of uncomplicated malaria in Angola in October 2004, implementation of the new policy did not begin until May 2006 in MOH facilities. In collaboration with other partners and support from PMI, AL treatment of malaria has now been implemented in 92% of health facilities nationwide and more than 400 health workers have been trained. In the past year, PMI procured 5 million AL treatments. A PMI-supported pilot study of private sector distribution of highly subsidized ACT in Huambo Province has functioned well and 95 private pharmacies have been licensed to distribute an over-branded AL product at the cost equivalent to malaria monotherapies. Surveys have shown increasing demand for the new product and that pharmacists are adhering to NMCP guidelines when distributing the drug.

With FY2011 funding, PMI will procure about 900,000 RDTs, together with supplies for microscopy, and will continue to support the training and supervision of laboratory workers in the laboratory diagnosis of malaria. PMI will also procure approximately 4 million additional AL treatments to cover the remaining ACT gap after Global Fund procurements. The PMI will continue to assist with ACT implementation at the provincial level in 9 provinces through local and international NGOs, and will provide technical assistance to promote good supply chain management and commodities security through Central Medical Stores. With completion of the successful PMI-supported pilot study of private sector sales of ACTs in Huambo Province, PMI worked with the NMCP to include funding for an expansion of private sector sales of subsidized ACTs to two new provinces in the Round 10 Global Fund proposal. Together with the NMCP, European Union, and other partners, the PMI will continue to provide technical assistance to the NMCP and National Essential Drugs Program at the central, provincial, and district levels in pharmaceutical management. The PMI will facilitate provincial level supervision by NMCP through NGOs. For the capital, Luanda, where malaria transmission is non-existent or very low, PMI will promote correct use of laboratory diagnostic test results and rational administration of antimalarial drugs to patients with a positive test.

Monitoring and evaluation (M&E): With FY2010 funding, PMI is supporting a nationwide Malaria Indicator Survey (MIS) with an increased sample size to assess progress in scaling up malaria prevention and treatment interventions since the baseline MIS in 2006/2007. This survey to be conducted in late 2010 will assess coverage with ITNs, IPTp, and ACTs, together with measurements of all-cause under five mortality and anemia and parasitemia biomarkers. Monitoring and evaluation capacity within the NMCP have increased with recent staff hires. With FY2011 funds, PMI will support *in vivo* therapeutic efficacy studies of AL at three sites and will support strengthening of the national health management information system (HMIS) based on a new HMIS strategy under development. PMI will also support quarterly surveys of health facilities and provincial medical stores to monitor the availability of key malaria commodities (including PMI commodities).

INTRODUCTION

Global Health Initiative

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

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

President's Malaria Initiative

The President's Malaria Initiative (PMI) is a core component of the GHI, along with HIV/AIDS, and tuberculosis. The PMI was launched in June 2005 as a 5-year, $1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions and reduce malaria-related mortality by 50% in 15 high-burden countries in sub-Saharan Africa. With passage of the 2008 Lantos-Hyde Act, funding for PMI has now been extended through FY2014 and, as part of the GHI, the goal of the PMI has been adjusted to reduce malaria-related mortality by 70% in the original 15 countries by the end of 2015. This will be achieved by continuing to scale up coverage of the most vulnerable groups — children under five years of age and pregnant women — with proven preventive and therapeutic interventions, including artemisinin-based combination therapies (ACTs), insecticide-treated nets (ITNs), intermittent preventive treatment of pregnant women (IPTp), and indoor residual spraying (IRS).

Angola was one of the first three countries selected for PMI. Large-scale implementation of ACTs and IPTp began in Angola in mid-2006 and has progressed rapidly with support from PMI and other partners, in spite of the country's weak health infrastructure. Artemisinin-based combination therapies and IPTp are now available and being used in all public health facilities nationwide and more than 6 million long-lasting ITNs have been distributed to pregnant women and children under five in the last 6 years.

This FY2011 Malaria Operational Plan presents a detailed implementation plan for the sixth year of PMI in Angola, based on the PMI Multi-Year Strategy and Plan and the National Malaria Control Program's (NMCP's) 5-Year Strategy. It was developed in consultation with the Angolan NMCP, with participation of national and international partners involved with malaria

prevention and control in the country. The activities that PMI is proposing to support fit in well with the 2008-2012 Angolan 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 recently approved Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund) Round 7 malaria proposal. This document briefly reviews the current status of malaria control policies and interventions in Angola, describes progress to date, identifies challenges and unmet needs if the targets of the NMCP and PMI are to be achieved, and provides a description of planned FY2011 activities.

MALARIA SITUATION IN ANGOLA

Angola emerged in 2002 from almost three decades of civil war that left the country's health infrastructure severely damaged. Angola has a population of approximately 18 million people in 18 provinces and 164 municipalities (districts). It is estimated that 80% of the health facilities were damaged or destroyed during the war and that the existing health system covers only 30%-40% of the Angolan population. Although a major health facility building program is underway, the remaining health infrastructure is limited by a lack of qualified and motivated health staff outside the capital, weak drug and medical supply and management systems, poor data quality and analysis, and a weak primary health care network. The mortality rate for children under five is one of the highest in the world at 250 deaths per 1,000 live births, and maternal mortality is estimated to be 1,280 per 100,000 live births.

Malaria is hyperendemic in northeastern Angola and Cabinda Province. The central and coastal areas are largely mesoendemic with stable transmission. The four southern provinces bordering Namibia have highly seasonal transmission and are prone to epidemics. In the north, the peak malaria transmission season extends from March to May, with a secondary peak in October-November. *Plasmodium falciparum* is responsible for more 90% of all infections. The primary vectors in the high transmission areas are *Anopheles gambiae ss* and *An. funestus*, which prefer to bite humans and feed and rest indoors. *Anopheles melas*, which favors a brackish water habitat, can be an important vector in coastal areas. *Anopheles pharoensis* can be a secondary vector where present. The behavior of *An. arabiensis*, which prefers to feed on animals and outdoors, limits its role in malaria transmission. Until recently, the extent of malaria transmission in Luanda City has been unclear, but a PMI-supported study carried out in 2007 has now shown that malaria transmission in Luanda City is very low, except in the outlying areas of Cachuaco, Viana, and Samba.

Malaria Transmission in Angola

Although the prevalence of malaria in Angola is believed to be falling as a result of control efforts, malaria is still reported by the Ministry of Health (MOH) to account for about one-third of the overall mortality in children under five and one-quarter of overall maternal mortality. It is also reported to be the cause for 60% of hospital admissions among children under five and 10% among pregnant women. As part of its decentralization plan, the MOH has increased funding to each district and now districts are expected to play a greater role in managing disease prevention and control activities within their borders.

Funding of malaria control activities

In 2007, Angola was awarded a $78 million Round 7 malaria grant. The MOH is the Principal Recipient, with World Health Organization (WHO), United Nations Children's Fund (UNICEF), and Population Services International (PSI) as sub-recipients. A Program Management Unit for the Global Fund grant has been established within the MOH. This grant includes approximately $36 million for ITNs, $17 million for ACTs and case management, $19 million for general health systems strengthening, and $6 million for IEC, all over five years. The total funding for Year 1 is $17.9 million and for Year 2 is $14.5 million. The grant was signed in February 2009 and funding is flowing.

CURRENT STATUS OF MALARIA INDICATORS

When PMI began work in Angola in December 2005, no accurate, up-to-date information on nationwide coverage of key malaria prevention and control measures was available. To provide

the NMCP with information on the status of their control efforts and to establish a baseline for the PMI in Angola, a nationwide Malaria Indicator Survey (MIS) was conducted between November 2006 and April 2007 with PMI and Global Fund support. This was the first nationwide health survey in more than 20 years in Angola.

Although the MIS was carried out approximately nine months after PMI-supported IRS began in southern Angola and three to four months after the large-scale measles-ITN campaign, this survey represents the only available information on baseline coverage for the four major areas of intervention as of early 2006. At the time the survey was conducted, ACT and IPTp implementation had only just begun, so the figures reported for proportion of children under five receiving an ACT and proportion of pregnant women receiving two doses of IPTp can be considered accurate baselines for PMI. In the case of ITNs, where a large-scale campaign in seven provinces had occurred several months prior to the survey, families interviewed were asked specifically when they had received their bednets and an adjustment was made in the calculations to take campaign nets into account in estimating the baseline ownership of ITNs.

The National Institute of Statistics carried out a third Multiple Indicator Cluster Survey (MICS) in May 2008 as part of a much larger World Bank Household Income and Expenditure Survey. PMI supported inclusion of a malaria module in the MICS to provide updated information on ITN, IPTp, and ACT coverage. Since the sample size was 12,000, the 2008 MICS was also intended to provide an estimation of all-cause mortality rates for the five year period from 2003-2007. The final results of this survey were expected to be known by the end of 2009 but problems with the analysis became apparent earlier this year. In spite of several attempts, PMI was unable to obtain access to the dataset from the National Bureau of Statistics, and final survey results are expected to be released in September 2010. Based on PMI review of the earlier preliminary results, it appears that there may have been serious flaws in either the collection and/or analysis of the data, raising questions about their validity. Fortunately, PMI had already planned to carry out a nationwide Malaria Indicator Survey with an expanded sample size at the end of 2010, and this is expected to provide the most up-to-date information on progress in malaria prevention and treatment activities in Angola since 2005/2006.

The following table shows the baseline figures for the major indicators being used by PMI:

PMI Baseline Information	
Indicator	**2006–2007 MIS**
Households with at least one ITN	28%*
Children under five years old who slept under an ITN the previous night	18%
Pregnant women who slept under an ITN the previous night	20%
Women who received two or more doses of IPTp during their last pregnancy in the last two years	2.5%
Children under five years old with fever in the last two weeks who received treatment with an ACT within 24 hours of onset of fever	1.5%

*The estimated PMI baseline before the 2006 measles-ITN mass campaign was 11%

GOAL AND TARGETS OF THE PRESIDENT'S MALARIA INITIATIVE

Although it is historically accepted that 100% of Angola's population is at risk of malaria, transmission has been shown to be very low in the most heavily urbanized areas of the capital, Luanda, where 20-25% of the country's population resides. Thus, it is reasonable to assume that only about 85% of the population of approximately 16 million (or around 13.6 million people) are at risk of malaria.

The PMI **goal** is to reduce the burden of malaria (illnesses and deaths) by 70% compared with pre-PMI levels by the end of 2015.

The PMI will assist the GRA to achieve the following **targets** in populations at risk of malaria:

1. More than 90% of households with a pregnant woman and/or child under five will own one or more ITNs;
2. 85% of children under five will have slept under an ITN the previous night;
3. 85% of pregnant women will have slept under an ITN the previous night;
4. 85% of houses in geographic areas targeted for IRS will have been sprayed;
5. 85% of pregnant women and children under five will have slept under an ITN the previous night or in a house that has been protected by IRS[1];
6. 85% of women (in areas determined to be appropriate for IPTp use) who have completed a pregnancy in the last two years will have received two or more doses of sulfadoxine-pyrimethamine (SP) for IPTp during that pregnancy;
7. 85% of government health facilities will have ACTs available for the treatment of uncomplicated malaria; and
8. 85% of children under five with suspected malaria will have received treatment with an ACT within 24 hours of the onset of their symptoms.

EXPECTED RESULTS — YEAR SIX

By the end of Year 6 of PMI in Angola (31 March, 2012), the following targets will have been met:

Prevention:

- A total of 2.1 million additional free LLINs will have been procured and/or distributed by different NMCP partners (with 860,000 to be contributed by PMI) to children under five and pregnant women through antenatal and child health clinics and municipal- and province-wide campaigns. This is expected to bring household ownership of one or more ITNs to 60% nationwide;
- At least 85% of houses targeted for IRS in Huambo, Huila, and Cunene Provinces will be covered in a fourth annual round of spraying. A total of approximately 130,000 houses will be sprayed, benefiting more than 650,000 residents; and
- Intermittent preventive treatment of pregnant women with SP will have been implemented in all government hospitals and health centers nationwide. This is expected

[1] Since transmission in southern Angola is highly seasonal, spraying will be done within three months before the malaria transmission season.

to increase IPTp coverage with two doses of sulfadoxine-pyrimethamine (SP) to 60% of all pregnant women nationwide.

Treatment:

- A total of 900,000 RDTs will have been procured together with diagnostic reagents and supplies to improve the proportion of patients with suspected malaria who receive a laboratory diagnostic test; and
- A total of 4.6 million treatments with artemether-lumefantrine will have been procured by PMI. This will contribute to the scale up of ACTs to all government hospitals and health centers in all 18 provinces and is expected to increase ACT coverage to 70% of all children under five nationwide.

PREVENTION ACTIVITIES

Insecticide-Treated Nets

The use of LLINs is a major part of the NMCP's strategy to control malaria in Angola and several different approaches have been used for net distribution. Recently, the NMCP adopted a policy of universal coverage with one ITN for every two residents although this policy has not been officially disseminated. LLINs are sold at full-cost in the capital Luanda, where malaria transmission is very low, and at a subsidized price in other urban areas where residents can afford them. These commercial sales account for roughly 20% of the total nets brought into the country. Most nets are distributed free-of-charge through antenatal and child health clinics targeting pregnant women and children less than five years old. Free net distribution also occurs as a part of Municipal Health Days. No large-scale campaigns have been carried out since 2006 at the request of the GRA, which is concerned that such campaigns may disrupt routine health activities. In nine of the 18 provinces, where PMI supports NGOs, those groups have taken the lead in ITN distribution.

The costs of ITN distribution in Angola are very high compared with most other African countries. Based on UNICEF costs from previous LLIN procurements and distribution, the total cost for purchase and delivery of a net to the household level is about $10.42. This consists of $5.29 for a LLIN delivered to Luanda; the cost of port clearance, warehousing, and transportation to the district level is about $2.31; and training, IEC/BCC, and monitoring and evaluation add another $2.82. No information is available on the relative costs of LLIN distribution through national campaigns and municipal health days.

Progress to Date:

A nationwide MIS conducted with PMI assistance in 2006 – 2007 showed that 28% of households owned at least one ITN, but in the seven hyperendemic provinces where a 2006 measles-ITN campaign had occurred, the coverage of households with at least one ITN was 51%. More than 1.4 million LLINs were distributed in 2008 in Angola of which 734,198 were procured by PMI. The vast majority of these nets (700,300) were distributed free of charge through antenatal and child health clinics. In 2009, UNICEF distributed 850,000 LLINs from UNITAID and 1.2 million LLINs from Global Fund and PMI. One hundred nets were stored in each health center for later distribution to pregnant women through antenatal clinics. In addition,

ExxonMobil made a donation of 12,100 LLINs to help the internally displaced population in Cunene Province during the flooding in 2009. AFRICARE, an NGO funded through PMI, supported LLIN distribution of 32,700 ITNs in Huila Province, which is expected to help bring the province to 73% coverage. A national NGO, Consaude, also helped the provincial health authority in Malange to distribute 50,000 nets during their 2009 municipal health day in 2009.

In PMI's FY2010 budget, $11,905,000 was allocated for LLIN procurement, distribution, and IEC/BCC to promote net ownership and correct use. With this funding, PMI supported UNICEF to procure 384,000 LLINs for free distribution to pregnant women and children while 706,000 LLINs were procured for free distribution in the nine provinces where PMI support NGOs working in malaria control activities. In 2010 the GRA will procure 600,000 nets.

LLIN Distribution in Angola 2005 – 2010

	2006	**2007**	**2008**	**2009**	**2010** (projected)
PMI	540,949	294,2000	734,198	411,000	1,090,000
Global Fund and GRA, Partners	285,707	662,978	737,002	2,100,000	1,600,000
TOTAL	826,656	957,178	1,471,200	2,511,000	2,690,000

Based on a gap analysis conducted as part of the Round 10 Global Fund proposal, the following table shows the expected net contributions from each partner and the overall net gap for the next two years 2011-2015:

LLINs Gap Analysis

	2012	**2013**
Need (one LLIN for every 2 residents)	**10,675,870**	**10,996,147**
Government of Angola	1,000,000	1,000,000
PMI	900,000	1,000,000
Global Fund Round 7	892,040	734,808
Other Donors	400,000	400,000
LLIN Distributed in previous 3 years (minus those beyond useful net life)*	6,034,704	6,456,031
Total Contributions	**9,226,744**	**9,590,839**
Remaining Gap	1,449,126	1,405,308

***Note:** Useful LLIN net life calculated in line with RBM Harmonization Working Group guidelines – after 1 year 8% of LLIN wasted, after 2 years 20%, after 3 years 50% and beyond three years all LLINs must be replaced.

Most of the nets shown in the "Remaining Gap" are being requested through the Global Fund Round 10 proposal.

Planned activities with FY2011 funding are as follows: ($8,520,000)

1. PMI will procure 210,000 LLINs for distribution through antenatal and child health clinics as well as through outreach programs, countrywide, without PMI-supported NGOs ($2,125,000);

2. Procure 584,000 LLINs to be distributed in the nine provinces where PMI is supporting NGOs to deliver malaria prevention and treatment services. The NGOs will distribute these LLINs through municipal health days ($5,845,000);

3. Continue to support the procurement and distribution of subsidized LLINs through social marketing in the urban and peri-urban towns of all provinces except the province of Luanda where sales will be at full-cost ($500,000); and

4. Support the second year of a study to evaluate the longevity and durability of LLINs in field conditions in Angola ($50,000).

Indoor Residual Spraying

PMI and the Global Fund began supporting large-scale IRS operations in the three southern provinces of Huila, Cunene and Namibe in December 2005/January 2006. In 2007, with evidence of low levels of transmission in Cunene and Namibe Provinces, PMI-supported IRS activities were redirected to Huila and Huambo Provinces alone. In a more recent development, the Southern African Development Community (SADC) called for the elimination of malaria in the sub-region. To support Namibia's malaria pre-elimination efforts, the GRA has agreed to intensify malaria control activities in the southernmost areas of Namibe, Cunene, and Kuando Kubango Provinces that border Namibia. In 2009, the NMCP requested PMI to support the SADC initiative by assisting with IRS operations in these provinces. Given the very low population density in these border areas, the NMCP and PMI agreed to focus IRS in three border towns of Cunene Province, Odjiva, Namacunde, and Santa Clara, and cover approximately 20,000 houses, where the population mobility between the two countries is greatest. The focus of malaria control activities for the remainder of Cunene Province and the provinces of Namibe and Kwando Kubango will be on achieving high LLIN ownership and usage rates, strengthening malaria case detection, and improving malaria case management. As a separate activity, the NCMP plans to install durable wall linings impregnated with insecticides in houses in sparsely populated areas along the border as part of a pilot program; PMI funding will not be used for this activity

In April 2009, the GRA initiated a two-year malaria vector control program in collaboration with the Cuban Government. The Angolan-Cuban program consists of larviciding in all provinces together with support for IRS and thermal fogging. The program also includes entomologic and epidemiologic monitoring of vector control interventions. An estimated 300 Cuban technical personnel are involved, with one technical person stationed in each municipality. With Cuban technical assistance, eight trained Angolan personnel in each municipality carry out larviciding and entomological monitoring. In addition to larviciding in Luanda Province, the program has also implemented thermal fogging with deltamethrin in the city of Luanda and IRS with cypermethrin in the peri-urban communities of Viana and Cacuaco.

Although the NMCP has trained entomology staff, they have limited laboratory and insectary facilities in Luanda and no facilities at the provincial level. To strengthen entomologic capacity in the NMCP, PMI agreed to refurbish and equip an insectary and train entomologists in vector control and monitoring. These activities have been delayed for several years due to successive changes in the proposed site for the insectary/laboratory. Initially, the insectary was to be located at the National Institute of Public Health in Luanda. However, in 2009, due to malaria

vector control thermal fogging activities in Luanda, the NMCP and INSP requested re-locating the insectary in the neighboring province of Bengo. The insectary/laboratory was to be part of a new health research center being established there, adjacent to the local medical school, with support from KalousheGolbeink, a Portuguese foundation.

Between February 2007 and February 2008 a longitudinal PMI-supported entomologic survey was carried out in Luanda, Huila, and Namibe Provinces. Due to the lack of in-country capability, the *Anopheles* mosquitoes were sent to CDC for species identification and to determine their infectious status using the *P. falciparum* malaria sporozoite enzyme-linked immunosorbent assay. Of the 166 specimens tested, 3% were infected with *P. falciparum*. All of the *P. falciparum* infected specimens were from Namibe Province and 4 of the 5 specimens were *An. gambiae s.s.*; one of the specimens could not be identified.

Progress to Date:

Between October and December 2009, a fifth annual round of IRS was carried out in Lubango and Chiba municipalities of Huila Province. The third round of spraying was carried out in the urban and peri-urban areas of Huambo municipality, capital of Huambo Province. After the remaining stocks of ICON® Wettable Powder from the previous rounds were utilized in Huila, ICON® CS was used to complete the spraying. The longer-lasting formulation of lambda-cyhalothrin insecticide, ICON® CS, was used in Huambo. Although the FY2009 PMI plans targeted 140,000 structures for IRS (60,000 in Huambo and 80,000 in Huila), only 107,377 structures were found and sprayed during the 2009 spray operations. The reason for the difference in the reported number of houses/structures and those found when the spraying is carried out is unknown. Of the 107,377 structures in the targeted municipalities, a total of 102,731 structures were sprayed, representing nearly 96% coverage. A total of 485,974 persons were protected.

As in the past, provincial health department staff participated actively in the 2009 IRS campaign. A total of 585 men and women were hired and trained as spray operators, supervisors and IEC mobilizers. Two environmental inspections were conducted before and during this spray campaign to assess ensure compliance and address issues raised during the previous spray campaign. At the end of the IRS operations, the implementing partner met with the provincial health department staff in both Huambo and Huila to review the activities/results and to prepare the report. Equipment remaining from the IRS operations was securely stored in warehouses at the provincial capitals of Huila and Huambo Provinces. In December 2008, a company in Luanda with an incinerator suitable for the disposal of empty insecticide sachets and protective gears from previous campaigns was identified. All solid waste from the previous IRS operations was transported by truck from Huila and Huambo Provinces and incinerated in November 2009. The waste from the October 2009 spraying operations which have been stored at the warehouses in Huila and Huambo were incinerated during the month of August 2010.

An entomology team consisting of a consultant from Kenya and eight biologists from the Huambo Provincial Directorate of Health, trained in basic entomology monitoring techniques, conducted a baseline entomologic survey in Huambo Province in November 2009. Pyrethrum spray collections were conducted in eight villages (five in non-sprayed areas and the remainder in sprayed areas) to assess indoor resting densities. The results showed relatively low numbers of *Anopheles* mosquitoes but >94% were highly susceptible to lambda-cyhalothrin, which was

being sprayed. Following spraying, WHO wall assays showed nearly 90% mortality, confirming the high quality of the spraying.

In February 2010, a three-week "Entomology Technicians Course - Basic level" training course was held in Bengo Province in collaboration with the NMCP, Corporate Alliance for Malaria in Africa, the Global Business Coalition for HIV/AIDS, Tuberculosis and Malaria, and PMI. The course was aimed at supporting the NMCP to build a critical mass of trained staff to support entomology monitoring and surveillance in the provinces for a scale-up of malaria vector control. Forty students from all18 provinces, all technicians either from the NMCP or the Angolan-Cuban National Larval Control Project, participated in the course.

The MOH is considering an integrated vector control strategy for trypanosomiasis and malaria. As part of this integrated strategy, the NMCP requested relocation of the proposed PMI-supported insectary to the Instituto de Combate e Control de Trypanosomiasis Hospital in Viana, about 25 km outside of Luanda. The hospital currently has an operational research laboratory with parasitological, immunological, and capability to perform molecular biologic studies. A site at the Viana hospital has been identified and the insectary design modified to incorporate operational and biosafety requirements. Construction is expected to begin later this year. Documents necessary to begin construction are being prepared.

Planned activities with FY2011 funding are as follows: ($5,037,500)

1. PMI will continue to assist the NMCP with IRS in Huila and Huambo Provinces using a synthetic pyrethroid, with a lifetime of six months or more on sprayed surfaces. The spray operations will take place between August and December 2011. An estimated 110,000 houses will be sprayed, 60,000 in Huila and 50,000 in Huambo Province. In addition PMI will support the NMCP in the SADC malaria pre-elimination initiative in Cunene Province on the border of Namibia with the spraying of approximately 20,000 houses in the towns of Odjiva, Namacunde, and Santa Clara, near the Cunene-Namibia border. PMI will also continue to assist the NMCP to increase LLIN coverage and use, strengthen malaria case detection and treatment and establish a malaria early warning and epidemic response system in the four border provinces of Huila, Namibe, Cunene and Kuando Kubango ($5,000,000); and

2. PMI will work with the NMCP to establish the insectary and laboratory in Viana and strengthen capacity within the NMCP and at the provincial level for monitoring vector populations and insecticide resistance in areas where LLINs and/or IRS are used. In addition, training for resistance and monitoring of IRS and LLINs will be provided by CDC after the insectary and laboratory are completed and a susceptible mosquito colony established ($37,500, including two TDY visits by CDC).

Intermittent Preventive Therapy of Pregnant Women

The NMCP's policy related to malaria in pregnancy and conforms with the WHO recommendations and consists of a three-pronged approach made up of prompt and effective case management of malaria; promoting use of an LLIN; and IPTp with at least two doses of SP during pregnancy. This policy is applied countrywide including in areas of low malaria transmission. Training materials and guidelines are in use since May 2006.

According to the 2006-2007 MIS, only 5% of pregnant women received IPTp1 and 2% had IPTp2. Although Angola has specialized health centers which provide comprehensive antenatal services, including IPTp, pregnant women who attend other health facilities can also receive SP. Collaboration between the Reproductive Health Division and the NMCP in implementing measures to control malaria in pregnancy remains limited.

Progress to Date:

PMI continues to support NGOs and faith-based organizations (FBOs) in nine of the eighteen provinces nationwide to improve access to health care delivery and help to scale up malaria prevention and treatment activities in pregnant women. With PMI/FY2009 funding, 257 health workers were trained in IPTp and an extra 122 nurses received IPTp training with Global Fund Round 7 support. In the remaining nine provinces, funds from the Global Fund Round 7 grant are used to support similar scale up activities. Given that IPTp is now available in all ANCs nationwide, the increasing number of pregnant women receiving IPTp, and the substantial amount of resources toward implementation of IPTp, it is expected that the 2010 MIS will demonstrate a significant increase in IPTp coverage.

Year	No. of Pregnant Women Treated with IPTp1	No. of Pregnant Women Treated with IPTp2*
2006	29,148	27,569
2007	196,160	164,469
2008	300,549	228,426
2009	387,389	281,394

** NMCP database*

In general, IPTp uptake is increasing in Angola, but malaria in pregnancy interventions need to be better linked with the antenatal care service delivery system, thereby better enabling pregnant women to benefit from a complete package of antenatal interventions, as opposed to an isolated strategy, thereby resulting in overall improvements of birth outcomes. PMI continues to advocate for closer collaboration between the NMCP and the Reproductive Health Division.

Planned activities with FY2011 funding are as follows: (These costs are covered under the case management section)

1. Continue to support capacity building and standardization of implementation strategies related to control of malaria in pregnancy; PMI funded NGOs will provide initial and refresher training to nurses providing ANC services;

2. Continue to support NGOs/FBOs in IPTp implementation and routine LLIN distribution through ANCs, as well as effective case management of malaria in pregnant women; and

3. Monitor the use of traditional birth attendants in IPTp administration in Uige Province by Episcopal Relief and Development, as this is not WHO recommended practice.

CASE MANAGEMENT

Malaria Diagnosis

Background:

The treatment of malaria in MOH facilities in Angola is still based largely on clinical diagnosis. Malaria microscopy is only available in hospitals and larger health centers and the quality of those diagnoses varies considerably from one facility to the next, although recent efforts to improve laboratory diagnosis are showing results. The Angolan Instituto Nacional de Saúde Pública has responsibility for training in laboratory diagnosis and has an experienced team of trainers in the capital, Luanda, with adequate space and training facilities.

With the recent change in WHO guidance related to malaria laboratory diagnosis, Angola is in the process of updating its policy in line with international standards which recommends that all suspected cases of malaria be diagnosed parasitologically, using either microscopy or rapid diagnostic tests (RDTs). The NMCP Strategic Plan (2008-2012) recommends use of RDTs for malaria diagnosis in health facilities where microscopic diagnosis is not available. The new policy has not been widely implemented and problems still exist in terms of scaling up high quality laboratory diagnosis of malaria. These include shortages of RDTs, limited training and supervision of laboratory staff, inadequate quality control procedures, and perhaps the greatest challenge – failure of health workers to follow the results of laboratory testing when prescribing treatment. It is also unclear how RDTs will be incorporated into the Integrated Management of Childhood Illnesses algorithm.

A recent NMCP-led parasitological survey in Angola comparing the Parachek® brand RDT, a single species test that only identifies *P. falciparum*, and the Bioline® RDT, a multi-species test, showed a much lower sensitivity with the Parachek® test. With molecular studies now showing that about 10% of all malaria infections in Angola are caused by non-falciparum species, the NMCP is planning to recommend a change to a multi-species RDT. The findings from the NMCP-supported survey regarding the lowered sensitivity of Parachek® are corroborated by results from the WHO/CDC/FIND evaluation and suggest an alternative RDT is needed, although this may result in an increase in costs. However, given the Global Fund has already procured multispecies RDTs, PMI has decided to support the NMCP in this decision as well, in an attempt to avoid confusion with having two different nationally-supported diagnostic tests available throughout the supply chain.

Progress to Date:

For the past 2-3 years, CDC and the Improving Malaria Diagnosis Project have been working with the Instituto Nacional de Saude Publica to organize training workshops for senior provincial-level malaria laboratory technicians. Standardized laboratory training materials and laboratory aids have been adapted to the Angolan context by CDC and translated into Portuguese. Nearly all 18 provinces now have at least one or two experienced microscopists, who have been gradually conducting cascade training to other technicians in the provinces. In the nine provinces where PMI is supporting NGOs to scale up malaria service delivery, Huambo, Kwanza-Sul, Kwanza-Norte, Benguela, Huila, Uige, Lunda Norte, Malange, and Zaire, those NGOs coordinate and facilitate the training and regular supervision of the laboratory workers.

With FY2009 PMI funding, 450,000 RDTs, 30 microscopes, and 30 microscopy kits (each kit sufficient to test approximately 1,000 patients) have been procured and are being distributed to all 18 provinces. With FY2010 funds, PMI plans to procure another 600,000 RDTs, together with 50 additional microscopes, and 148 microscopy kits. The brand of RDTs will be determined after further review of the WHO/CDC RDT test results and detailed discussions with the NMCP. This is in addition to the 750,000 RDTs being procured with the Global Fund, Round 7 grant in 2009 and again in 2010. Most of the remaining gap in RDTs will be covered with the Global Fund Round 10 grant proposal, if successful.

Planned activities with FY2011 funding are as follows: ($1,150,000)

The PMI views malaria laboratory diagnosis as a key component of good case management and will continue to support the strengthening of malaria diagnosis (both microscopy and RDTs) in MOH facilities. As prevention measures begin to take effect and malaria cases fall, high quality laboratory diagnosis of malaria will become even more important, including efforts to improve the rational use of ACTs.

1. Procurement of microscopy kits (each one sufficient to diagnose 1,000 patients) for those laboratories strengthened with PMI support over the past several years ($200,000);

2. Procure approximately 900,000 multispecies RDTs ($700,000);

3. Continued support to laboratory supervision and quality control of malaria laboratory diagnosis including facilitation of provincial-level training workshops and regular supervision of provincial- and municipal-level laboratory staff on the correct use of RDTs and microscopy for malaria diagnosis in collaboration with the Instituto Nacional de Saude Pública (and a limited set of provincial health institutes). In particular, emphasis will be placed on training of clinical workers to adhere to the results of laboratory tests when/if administering subsequent treatment ($200,000); and

4. Four TDY trips from a CDC technical expert in malaria laboratory diagnosis to provide technical assistance to the MOH and in-country partners in the performance and quality control of malaria laboratory diagnostic tests ($50,000).

Pharmaceutical management

To date, a significant amount of PMI funding for Angola has been devoted to pharmaceutical and supply chain strengthening activities, with some notable successes but many gaps remain. Pharmaceutical management encompasses a broad and often highly technical range of activities, all of which are necessary for a well-functioning system and all predicated on robust national-level policies grounded in approved regulations ratified by law.
Angolan health care policy remains in flux, but efforts to improve weak or develop new guidelines are ongoing not only by the GRA but also by donors. Still lacking an approved national health care policy and a formalized policy on essential medicines, progress has been made in more focused areas. Specifically, a system for registration of medicines has been approved and plans are underway to establish that system by early 2011. However, routine supervision of health workers remains weak and verification of the availability of antimalarial

drugs is primarily dependent on donor-supported implementing partners. To help address this and as part of on-going pharmaceutical management strengthening efforts, PMI, through its implementing partners, continues to support a pharmaceutical management training program implemented jointly by the MOH and National Directorate of Medicines and Equipment. The focus of these trainings is to improve overall health care worker capacity in areas such as rational use of antimalarials, basic stock keeping practices, management information systems for malaria, and good warehousing practices. In the area of pharmacy registration in the public sector, the National Directorate of Medicines and Equipment bears responsibility for the licensing and registration of facilities that sell or dispense malaria medicines and works in conjunction with provincial level pharmacy units.

Responsibility for the selection and forecasting of malaria commodities continues to remain with the NMCP. While lacking a national essential medicines list, national malaria treatment guidelines were finally approved and a malaria-specific procurement plan developed, which is regularly reviewed. Although forecasting and supervision are included in the essential medicines management training described above, capacity at the national program level to quantify and forecast antimalarial commodities continues to require external technical support. Specific quantification and supervision trainings need to be conducted next year as part of the on-going pharmaceutical management trainings.

As mandated by the Department of National Medicines and Equipment, the National Essential Drugs Program (NEDP) bears responsibility for procurement, and distribution of malaria commodities (in addition to all other non-HIV/AIDS essential medicines and equipment). Lists are submitted to the NEDP and the requisite commodities are procured. For the NMCP, the NEDP procures only WHO-prequalified products, but occasional, small donations from international donors are accepted by the GRA, some of which include antimalarials that may not have been approved through the prequalification program.

The first-line treatment for uncomplicated malaria in Angola remains AL with the alternative first-line therapy of artesunate-amodiaquine (AS/AQ). In April 2010, the NMCP procured about 400,000 treatments of the fixed-dose combination AS/AQ that will be distributed only to hospitals and will not be part of the regular kits pushed down to the lower health facility level. The newly approved malaria treatment guidelines state that parenteral quinine is the approved treatment for severe malaria with parenteral artemether or artesunate as the alternative therapies. For the treatment of uncomplicated malaria in pregnant women, oral quinine is recommended during the first trimester and AL or quinine during the second and third trimesters.

Progress to Date:

There have been four known incidences of theft of PMI-financed ACTs since mid-2008, one from the Angolan national airport, one from a provincial airport (Huila Province) and two from the central storage facility Angomedica in Luanda. In total, about 535,000 treatments worth almost $650,000 have gone missing. The costs of these losses do not include the several hundred thousands of dollars spent on formal police investigations, follow-up and technical assistance by PMI implemennting partners, in-country Mission counterparts and PMI staff at headquarters in Washington, DC, as well as a formal Inspector General audit of PMI commodities in Angola

Following discovery of the largest theft of ACTs in December 2008 (as well as Global Fund and MOH commodities) from the central medical stores facility, Angomedica, significant changes to security and staffing were implemented. Regardless of the additional efforts to strengthen commodities security, another theft of PMI-funded AL from Angomedica occurred in May 2009. Initial arrests of some Angomedica and NEDP staff were made and even the Minister of Health vocalized interests in these thefts, expressing disappointment. Unfortunately, the investigation did not result in identification of the responsible parties. Given the financial and human resources invested to date, and the persistent losses of these high-value commodities, PMI opted to bypass the Angomedica warehouse, taking responsibility for the transportation of AL to the provincial level at which point commodities enter back into the public supply chain for subsequent distribution down to the facility level. To date, there have been several consignments of various commodities all delivered successfully into Angola and transported down through to the provincial level without any loss.

Although currently working through an alternate supply chain distribution system that circumvents all central level involvement, PMI has continued to support warehousing capacity at the provincial level, building on inventory management best practices training previously provided by the SPS Project. Ongoing drug management trainings have been provided for staff from all 18 provinces including a training of trainers for a core group of staff specifically for drug management at the lower health unit. Basic logistics management mechanisms, such as conducting multiple distribution records reviews at the central level and then corroborating with information collected at the provincial and municipal levels with subsequent follow-up corrective actions are relatively quick and simple ways to strengthen basic ACT management. The management trainings incorporate these basic components of pharmaceutical management to provide a relevant set of guidelines to lower level health facilities. The training materials and the revised standard operating procedures have been finalized in preparation for country-wide dissemination at the lower level health units. These standard operating procedures are in place in most NEDP drug stores and their application is monitored through periodic review of stock cards, stock levels and audits of delivery/receipt procedures by PMI implementing partners. These materials have been validated and approved by the GRA.

Standardized, national supervision checklists for both ACTs and essential medicines have been developed as well as a database to track and incorporate feedback from on-going implementation in the field. PMI pharmaceutical management implementing partners continue to work with the PMI-funded NGOs in nine provinces to assist in ongoing implementation and scale-up of AL, incorporating these checklists and training materials. Although the new GRA procurements of AS/AQ are intended only for distribution to hospitals, it is unclear at this point how much will be procured and the implications on the already overburdened supply chain. The impact of large-scale procurements of another first-line antimalarial drug on forecasting, quantification and overall supply chain management will have to be monitored.

Building upon previous experiences in Angola supply chain logistics, PMI implementing partners involved in pharmaceutical management have devoted considerable time to obtaining special permissions from the Ministries of Transportation, Health, and Finance as well as the National Airport Authorities to facilitate immediate release of PMI commodities from customs, where two of the four thefts occurred. Using private warehouses, a sizeable consignment of AL has been successfully delivered, cleared and transported to each of the 18 provinces, either by road or because of distance and poor roads, by air freight. Arrival of a second consignment of

ACTs will be combined with a sizable shipment of RDTs and microscopy kits, again requiring a significant level of technical assistance from PMI partners on the ground and short-term consultants from the US. The costs in technical assistance, storage and transportation of these three commodity consignments will total about $600,000.

The alternative warehousing and distribution plans take into consideration PMI's requirement to maintain commodity visibility throughout the supply chain. In doing so, PMI implementing partners will monitor the ability of contacted service providers to document the secure transfer of responsibility from the time of arrival of shipments through storage and transport. This will include verifying the use of effective and appropriate methods for stock keeping, transportation management and other logistics tools.

As part of the Inspector General's audit recommendations, the US Ambassador to Angola has already sent a written correspondence to the Minister of Health requesting reimbursement of the estimated losses of ACTs from the Angomedica warehouse. The USAID Mission in Angola has also drafted a formal written agreement with the GRA to better define the responsibilities related to PMI-funded commodities, identifying accountable parties among USG and GRA staff. This letter was officially sent to the GRA earlier this year.

Planned FY2011 PMI Activities: (Costs covered under "Malaria Treatment" section)

PMI will continue to provide supply chain security, including technical assistance when necessary to ensure the successful delivery of PMI commodities. At the same time, PMI will support efforts to build capacity at the provincial level by strengthening warehousing and pharmaceutical management activities, in collaboration with PMI-supported NGOs in those provinces where the NGOs are active. Increased efforts will also be made to monitor the antimalarial drug supply chain, through the end-use verification tool in the periphery and the pharmaceutical management tool at the warehouse level. PMI will also continue supporting implementation of a joint national supervision plan, using the national supervision tool, through relevant local partners and in collaboration with the National Directorate of Medicines and Equipment, PNCM, PMI-supported NGOs, and other relevant stakeholders. Technical assistance will also focus on issues related to pharmaceutical policy development/strengthening, drug selection, and quantification.

Planned activities for FY2011 are outlined below, under the "Malaria Treatment" section.

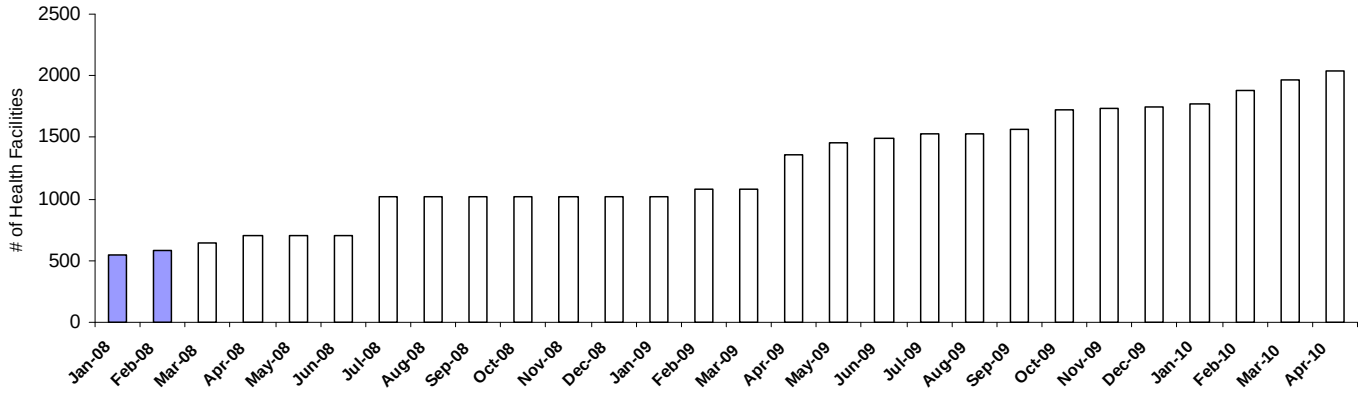
Malaria treatment

Artemether-lumefantrine and AS/AQ were approved by the NMCP as alternative first-line drugs for the treatment of uncomplicated malaria in October 2004 and roll out of the new policy began in MOH facilities in May 2006. In January 2007, the NMCP made a change in its policy and extended treatment with ACTs to all age groups. Implementation of ACTs has proved to be one of the greatest challenges in scaling up malaria control in Angola. The initial roll out of ACTs was complicated by the fact that not all provinces were using the same first-line drug for the treatment of uncomplicated malaria; however, during the last quarter of 2008, the NMCP made the decision to move to AL as the only first-line drug for the treatment of malaria. In spite of this, the NMCP in April 2010 held a launch for Arsucam®, a co-formulated AS-AQ, produced by Sanofi-Aventis. Another problem with the scale up of ACTs has been that many foreign

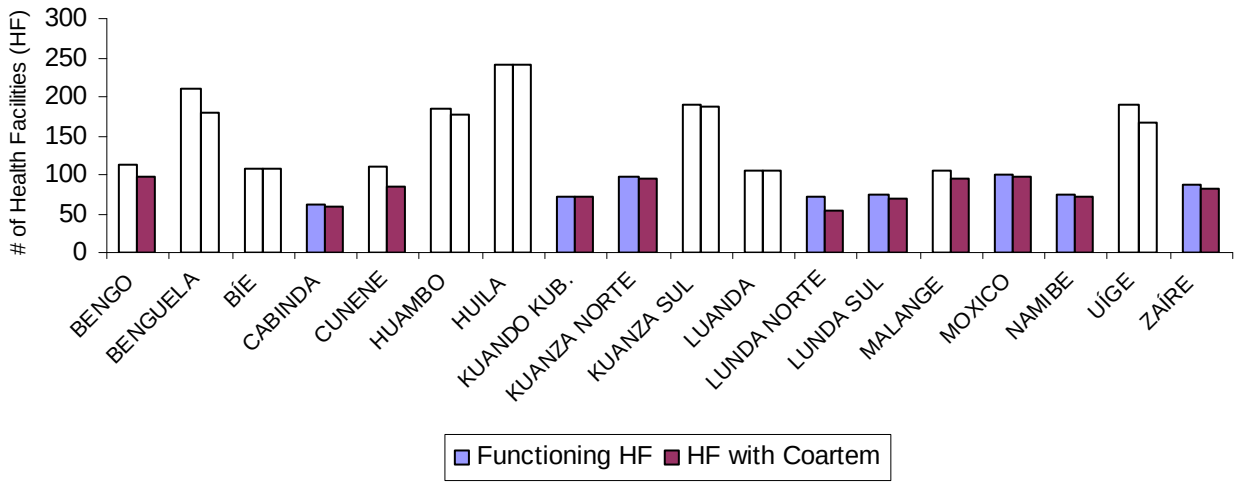
physicians serving in rural areas of Angola have little or no first-hand experience with malaria or its treatment. Although the former Vice Minister has required that all physicians receive training in the new policy, this is not being systematically implemented.

The system for monitoring the roll out of ACTs and IPTp has been greatly strengthened during the past several years and NMCP officers at the provincial level are reporting on a monthly basis to the NMCP the number of patients receiving ACTs and IPTp. This is being reinforced through M&E officers in each municipality who are government employees and receive a monthly financial incentive through the Round 7 Global Fund malaria grant. As of April 2010, all of Angola's 164 municipalities in the country had implemented ACTs through a network of 2,034 health facilities, which represents more than 92% of the Angola's functioning health facilities. The following graphs show the dramatic increase in the number of health facilities in Angola where ACTs are now regularly used:

Number of Health Facilities distributing artemether-lumefantrine (2008-2010)



Use of artemether-lumefantrine in MOH health facilities (HF) by province as of April 2010



The MOH has also been increasing its contribution to malaria treatment. While PMI only purchases the Coartem® brand of AL, the GRA has been purchasing generic formulations of this drug. In 2009, the MOH procured a total of 144,000 treatments with a generic AL, as well as at least 2 million SP tablets that were distributed through the essential drugs kit system. The MOH has stated that it will meet 10% of the country's need for ACTs and will continue to meet all

national needs in terms of intravenous quinine and intravenous artesunate for the treatment of severe malaria in public health facilities. Nevertheless, due to problems with procurement of health commodities by the MOH, the country has been facing frequent stock outs of both intravenous quinine and intravenous artesunate. New NMCP treatment guidelines include pre-referral treatment with rectal artesunate, and it is now expected that this drug will be included in the next order of essential drug kits.

As part of the National Malaria Strategic Plan for 2008–2012, the NMCP made the decision to support ACT use at the community level, although it is not clear how this will be accomplished, since no official decision has been made about paying community health workers.

In 2009, the GRA requested that future PMI procurements of Coartem® include the newly-approved dispersible formulation of the drug for lower age groups, while the standard oral tablet form will continue to be used for adults. The GRA is also considering purchasing of this new dispersible formulation of Coartem.® Recently, the National Directorate of Medicines and Equipment initiated contact with Novartis for the acquisition of the private sector packaged Coartem® with the aim of making it available at a subsidized price in private drug shops, which treat more than 50% of all suspected malaria cases. According to the National Director of Medicines and Equipment, this private sector packaged Coartem®, is now available in five provinces and will soon be expanded to other provinces. Furthermore, Novartis has now placed a representative in the country to oversee this process. A variety of antimalarial drugs, including chloroquine, artemisinin monotherapies, and generic formulations of ACTs, continue to circulate in the private sector in Angola.

Progress to Date:

Because access to health facilities is still poor in many rural areas of Angola, PMI has supported the provision of health services related to malaria through local and international NGOs which have a base of operations in those areas. In January 2007, MENTOR, a British NGO with considerable experience in Angola, was awarded a grant to help train staff to expedite and expand implementation of AL and IPTp in Huambo Province, the second most populous province in Angola after Luanda. Since 2008, MENTOR, has been working in all 11 municipalities and all 176 MOH health facilities in the province. MENTOR coordinates closely with the provincial staff, including the provincial NMCP officer as well as Malaria Supervisor. Training has been provided to health workers on malaria diagnosis (including use of RDTs), malaria case management with ACTs, malaria in pregnancy and IPTp, and pharmaceutical management. MENTOR has also helped local authorities to monitor stocks of antimalarial drugs and to distribute drugs within the province. Malaria coordination meetings are now held every other month between MENTOR, the provincial NPO, the Malaria Supervisor, and provincial health staff. A supervisory check list with a corresponding database, have been developed with assistance from SPS, to oversee health worker performance and service delivery in MOH facilities, and the frequency of supervisory visits has increased.

The same model has been followed in other provinces, and PMI-supported NGOs are now facilitating training in ACT management and use, IPTp, and IEC/BCC related to ITNs in seven additional provinces: Kwanza Sul and Huila (Africare), Kwanza Norte and Uige (World Vision), Malange (Consaude), Zaire (MENTOR), and Benguela (Catholic Relief Services). This was made possible by combining PMI funding and the ExxonMobil Foundation donation to PMI.

Another province, Luanda Norte, was added as part of the ongoing ExxonMobil Foundation donation to PMI, bringing the total number of provinces where PMI is supporting NGOs/FBOs to nine. Additionally, as part of the Malaria Communities Program (MCP) launched in December 2006, awards were made to two NGOs: Episcopal Relief and Development for Uige Province and Ajuda de Desenvolvimento de Povo para Povo (ADPP) for Zaire Province. With FY2009 funding, more than 2,784 health-workers were trained in case management with AL across these nine provinces.

A 2008 PMI-supported study of malaria risk in Luanda showed low to non-existent malaria transmission in most parts of the capital. In spite of this, malaria continues to be one of the most common "diagnoses" in health facilities in the capital and large quantities of ACTs continue to be used for the treatment of fever cases. Because of this, PMI has supported improved training of health workers in Luanda Province focusing on rationale use of ACTs based on laboratory test results.

In the process of updating the National Malaria Strategic Plan (2008–2012) and its accompanying gap analysis, a refined ACT quantification and budgeting was carried out using the following assumptions: total population of 16 million residents, a malaria prevalence of 50%, health system coverage of 60% for Luanda and 40% for other provinces, and an average number of malaria episodes per age group varying according to endemicity level. This exercise led to the calculation of a total annual need of approximately 6.3 million ACT treatments for the whole country (See Table below). With the ongoing scale-up of malaria prevention activities, it is expected that the annual ACT consumption will remain stable for the next several years, but will then gradually decline as the differential malaria diagnosis of fever improves and the number of malaria episodes falls.

Estimated artemether-lumefantrine needs per year:

Patient weight	**Age group**	**Blister type (tablets)**	**No. of blisters needed**	**Percent**
5 to 14 kg	Under 3 years	1 x 6 tablets (6)	1,748,882	28
15 to 24 kg	4 to 8 years	2 x 6 (12)	1,230,546	20
25 to 34 kg	9 to 14 years	3 x 6 (18)	1,940,300	31
Above 34 kg	More than 14 years	4 x 6 (24)	1,302,915	21
Total			**6,222,643**	**100**

With FY2009 funding, PMI procured 3.5 million AL treatments and with FY2010 funding another 3.7 million treatments will be procured. The Round 7 Global Fund grant has a total of $17 million programmed over five years for procurement of AL and scaling up ACTs nationwide. In 2009, Global Fund Round 7 procured 1.3 million AL treatments and is procuring the same quantity of AL treatments in 2010. The Global Fund Round 7 grant has no funding for training in case management and only very limited funds for supervision. Global Fund ACTs are being distributed through the MOH's distribution chain. A pharmacist has been hired for the MOH's Project Management Unit and a logistician placed at the NMCP to oversee the distribution of all NMCP's commodities. USAID/Angola supported the establishment of the

Project Management Unit through a series of consultancies in three major areas, financial management, monitoring and evaluation, and procurement and supply management.

As part of the Global Fund Round 7 grant, funds are available to re-establish sentinel sites for monitoring the efficacy of antimalarial drugs. Studies in a total of eight sites are planned, of which PMI will support two to three selected sites.

Private Sector ACTs

Throughout Africa, more than half of all patients with suspected malaria first seek treatment from the private sector. Since it is clear that the Angolan NMCP will be unable to achieve their RBM targets for treatment coverage with ACTs without involving the private drug shops, they requested that PMI fund a pilot field trial of AL delivery through the private sector. With FY2008 funding, PMI competitively awarded the pilot to the MENTOR Initiative in the municipalities of Huambo and Cáala of Huambo Province. The pilot is being conducted in close collaboration with the Provincial Health Directorate and the Private Sector Pharmaceutical Association. A total of 95 licensed private pharmacies have been trained and registered, by both the Provincial Health Department and an association of private pharmacists. These pharmacies are provided a competitively priced, over-branded AL product selling for about 75 Kwanza ($1) per treatment in conjunction with training on clinical assessment, accurate diagnosis (based on clinical history) and rational use of ACTs, and followed up with routine supervisory visits from MENTOR staff. All costs recovered by MENTOR from the over-branded AL is recycled back into the program to help manage overhead costs as well as support various related projects and other on-going activities, including the re-packaging of the AL.

Progress to date:

All preparatory work including a baseline survey, community awareness, training of pharmacy keepers, and production of an over brand known as "*Coartem é Fixe*" meaning "Coartem is Cool" were completed prior to the launch of the pilot in July 2009. Established in 2006, the Huambo Association for the Owners of Private Pharmacies and Health Posts helped qualify private pharmacies to meet established criteria determined by the GRA and DPS of Huambo. This licensing program ensures, among other things, a clean and secure working establishment with appropriate technical staff trained in various aspects of good pharmacy practice and only approved and licensed outlets are eligible to participate in the pilot. MENTOR staff have developed a training curriculum at the outlets, adapted from a national-level approved public sector health care worker curriculum, focusing on pharmaceutical management of ACTs, rational use of AL, basic understanding of malaria diagnosis and recognition of signs and symptoms of both uncomplicated and severe malaria.

MENTOR ensures that ACT distribution though these outlets is accompanied by adherence to NMCP protocols. Training by MENTOR also focuses on improving caretakers' knowledge and understanding of the symptoms of malaria and danger signs in children less than five years. Thus far, over 95 private pharmacies have been licensed and they have distributed more than 46,000 over-branded AL treatments. Preliminary results from the pilot demonstrate an uptake of a good quality but competitively priced AL (i.e., not 100% subsidized). Before the July 2009 launch, the average cost of one branded treatment of AL in the two municipalities was about $20 - $30 USD. Since having introduced the over-branded AL, demand has remained steady.

Technicians' ability to keep and maintain adequate stock status levels has improved significantly and delays or stock outs were due only to release of the product from the vendor, not due to poor stock keeping. In April of this year, MENTOR conducted a refresher training to reinforce appropriate pharmaceutical management and rational use of ACTs, and more than 350 pharmacy technicians received training. Stock status cards are collected monthly and supplies of the AL are replenished, based on consumption data as kept in the monthly report cards. Based on results from their initial survey, Mentor developed BCC/IEC materials used throughout the pilot, including radio spots, short films, theater events, and printed materials (in Portuguese and Umbundo, the local language in Huambo). Key messaging focused on malaria signs/symptoms, prompt treatment-seeking behavior, the importance of completing the treatment courses, and effective ways of preventing malaria, including the correct use of LLINs.

During the remaining months of fiscal year 2010, original pilot activities are focusing on improving adherence by already registered private pharmacies to DPS regulations as part of on-going quality control through supervisory visits. With fiscal year 2011 funds, the focus of the ACT pilot project will be modified. The geographic coverage of the pilot will be expanded beyond the current, more heavily populated municipalities in Huambo Province to include all municipalities in the province. In addition, the expanded pilot will target all age groups (rather than just children under five) and assess approaches to including RDTs to improve case management. Direct supervisory visits are complemented by 'mystery shopper' visits to help verify AL usage and adherence to sales guidelines (i.e., if the pharmacy is adhering to their contractual agreement with MENTOR and the NMCP to sell only AL to only children under five in the absence of confirmatory testing). Finally, a post-survey survey will be conducted to evaluate the impact of the pilot, feasibility in rolling out to other areas and will be compared to pre-pilot survey results.

Results obtained to date will be communicated to the NMCP, who will ultimately make the decision to expand the rollout to additional municipalities in Huambo and/or to other provinces. The Round 10 Global Fund grant application requests funding for expansion of this effort to two additional provinces and if successful, the lessons learned in Huambo Province would be applied to those new provinces.

Planned FY2011 PMI Activities: ($11,325,000)

Ensuring prompt, effective, and safe ACT treatment to a high percentage of patients with confirmed or suspected malaria in Angola represents the single greatest challenge for the NMCP and PMI, given the weaknesses in the country's pharmaceutical management system, continued poor access to health services by a large number of Angolans and the lack of accurate diagnostic capabilities. As the Global Fund and PMI remain the two primary sources of ACTs for Angola, a collaborative approach between the two organizations to work with the MOH/NEDP is critical. It is also important that weaknesses in the supply system be promptly addressed. Given the poor access to health care in Angola, PMI in collaboration with the Global Fund Round 7 grant is supporting NGOs/FBOs to facilitate ACT implementation in areas that are currently underserved by the MOH. This will be coordinated with efforts to improve case management and malaria prevention of pregnant women in ANCs within health facilities, and will include assistance with training and supportive supervision of health care workers, IEC, and monitoring and evaluation. In addition, the results of the private sector pilot of ACT distribution will help inform future expansion of that approach.

Planned activities with FY2011 funding are as follows:

1. Procure approximately 4.6 million AL treatments ($4,600,000);

2. Provide support to the MOH for import/clearance, distribution and management of ACTs in order to overcome the complex clearance process and initial distribution from port of entry through central medical stores and down to the municipal level ($450,000);

3. Together with the MOH and other partners, continue to provide technical assistance to the MOH and NEDP at the central, provincial, and municipal levels in pharmaceutical management and implementation of ACTs that will address:
    a. Importing, quality control, storage, and inventory management;
    b. Coordination with the MOH on quantification and distribution;
    c. Quality improvement in the context of a multi-donor and decentralized procurement system at all levels;
    d. Appropriate use;
    e. Training and supportive supervision of health workers at provincial, district, and lower levels to ensure good ACT prescribing and dispensing practices;
    f. IEC for patients;
    g. Surveillance for adverse drug reactions and rapid response to reports/rumors of severe reactions;
    h. Monitoring of implementation/evaluation of coverage; and
    i. Promotion of correct use of ACTs in the private sector through IEC efforts.

    This will be provided by experts in pharmaceutical management based in country, as well as through short-term technical assistance visits ($550,000);

4. Continue to support ACT implementation (together with IPTp and distribution of LLINs) through national and international NGO/FBOs working in areas that are currently underserved by the MOH. This will include continued support in up to eight provinces (Huambo, Kwanza Sul, Kwanza Norte, Malange, Benguela, Huila, Uige and Zaire) which together with Lunda Norte described below will cover 50% of the Angola's 18 provinces ($4,325,000);

5. Expand the private sector ACT program to include all municipalities in Huambo Province, all age groups, and the use of RDTs ($600,000); and

6. Facilitate malaria program implementation as it relates to health system strengthening and in collaboration with the NMCP. This will include focusing on monitoring the use and uptake of RDTs in conjunction with ACTs and case management. This will be done in up to three provinces ($800,000).

EPIDEMIC SURVEILLANCE AND RESPONSE

Background:

Angola's four southern provinces of Namibe, Cunene, Huila, and Kuando Kubango, have low levels of malaria transmission and are prone to malaria epidemics. One of the objectives of the NMCP 2008-2012 Strategy is the establishment of a system for early detection and containment of malaria epidemics in these provinces.

Progress to Date:

In late 2008, a PMI-supported consultant worked with provincial health teams in southern Angola to develop plans for epidemic detection and containment. Funding from WHO will be used to establish and operationalize a malaria detection system based on collection and analysis of routine health facility data. With Global Fund Round 7 support, the WHO provided training to 214 provincial and municipal supervisors on monitoring and evaluation. This includes 73 technicians from the four provinces at risk for malaria epidemics. Since IRS has been carried out in Huambo Province for the past five years, a cadre of trained spray personnel exists at the provincial level that could respond rapidly in the case of an upsurge in malaria. As an emergency stock for possible future epidemics, a supply of spray pumps, protective gear, and insecticide has been stored securely in a 40-foot container in Lubango, the capital of Huila Province. These materials could be used to conduct IRS in response to sudden increases in malaria cases. A rotating stock of ACTs is also kept at the provincial level. PMI is also working with WHO and the NMCP in the development of an early warning system for malaria epidemics.

Planned activities with FY2011 funding are as follows: ($400,000)

1. Support WHO to provide refresher training and supervision to provincial epidemic surveillance teams in Huambo, Cunene, Namibe, and Kuando Kubango in collaboration with the provincial health directorates. This will include the use of improved diagnostic testing, data collection, detection, preparedness and response to the epidemics ($400,000).

CAPACITY BUILDING AND HEALTH SYSTEMS STRENGTHENING

Background:

With funds from Global Fund Round 3 and 7 grants, the NMCP has increased its capacity at the national level through the recruitment of five National Program Officers (NPOs), based in Luanda. These NPOs provide technical support in the areas of monitoring and evaluation, finance, logistics, data management, and IPTp/IMCI. To strengthen capacity at the provincial level, an additional 18 NPOs, one for each province, have been recruited with Global Fund support to enhance management and coordination of malaria control by working within the Provincial Health Directorates. Provincial NPOs provide technical support on planning, capacity building, implementation, supervision, and monitoring and evaluation of the malaria control activities in their provinces. In addition, in each of the 164 municipalities, an existing staff member has been designated as the malaria focal point and trained to collect and report routine malaria surveillance data, with a monthly incentive paid for by the Round 7 Global Fund grant.

Progress to Date:

The presence of the two PMI Malaria Advisors and the improving in-country partnership has helped to energize malaria control activities in Angola. The two PMI advisors spend about 50% of their time at the NMCP offices. Thanks to their daily interaction with the NMCP Director and his staff and to the efforts of major partners such as WHO, UNICEF, the UNDP/Global Fund, and several of the larger NGOs, major progress has been made in recent years, including finalization and publication of malaria case management guidelines, finalization and publication of IEC/BCC strategic plan, and finalization of a costed National Malaria Strategic Plan for 2008–2012 in coordination with the NMCP. This document was used to develop a gap analysis that formed the basis for preparation of the successful $78 million Global Fund Round 7 malaria proposal. In early 2008 the Angola PMI team worked with NMCP to respond to Global Fund Round 7 queries and helped develop the Procurement, Supply and Management as well as the Monitoring and Evaluation Plans. After approval of the Round 7 grant, where the MOH was proposed as the new Principal Recipient, PMI provided technical assistance to the MOH in setting up a new Global Fund grant management unit that could accept and manage the grant. The PMI Resident Advisors have also played major roles in the conduct of a malariometric survey in Luanda and a health facility survey in Huambo, field supervision of malaria prevention and control activities, and working with the NMCP on developing technical guidelines on monitoring and evaluation, RDTs, ACTs, LLINs and IPTp. The Resident Advisors have also participated in writing of the new Round 10 Global Fund grant which was submitted in August 2010.

Planned activities with FY2011 funding are as follows: ($200,000)

1. Facilitate provincial-level supervision by the NMCP in order to strengthen NMCP capacity to supervise malaria activities at provincial level. This activity will be carried out in the following way: i) the central level NMCP staff will visit each of the 18 provinces at least twice a year; and ii) the provincial malaria staff will provide supportive on-the-job supervisory quarterly visits, to all municipalities. The follow-up supervision visits will then focus on previously identified problems at each level ($200,000); and

2. The PMI resident advisors will continue to provide technical assistance to the NMCP in all areas of malaria prevention and treatment (no additional cost).

COMMUNICATION AND COORDINATION WITH OTHER PARTNERS

Communication and coordination among partners involved in malaria prevention and control in Angola continues to improve. This is due to multiple factors, including increasingly strong leadership from the NMCP with greater willingness to ask for and accept assistance and advice, a growing sense of partnership among the key international and national organizations and groups supporting the NMCP, greater transparency in terms of funding and activities by all partners, and the catalytic effects of placing the two highly experienced PMI Malaria Advisors in the NMCP offices together with the move of several Global Fund-supported National Malaria Program Officers to the NMCP offices.

Progress to Date:

While much still remains to be done, the successful Global Fund Round 7 proposal prepared by the NMCP and its partners is a prime example of what can be accomplished by a strong and effective NMCP supported by a coalition of partners. The Global Fund Country Coordinating Mechanism is not very active in Angola, but the Malaria Partners' Forum, made up of ten different partners, including UNICEF, WHO, NMCP, PMI, and various NGOs now holds regular meetings to discuss progress and problems related to the implementation of different malaria interventions. This Forum was designed as a coordinating mechanism for stakeholders involved in malaria prevention and control, with the aim of supporting the NMCP and MINSA to achieve the objectives as defined in the National Strategic Plan. A local NGO, Consaude, has the presidency and the six permanent seats are occupied by the PMI, WHO, UNICEF, the World Bank HIV/AIDS, Malaria, Sexually-Transmitted Diseases, and Tuberculosis (HAMSET) Project, and NMCP.

During the past year, the Forum and its elected leadership have continued to meet approximately every two months and three provincial Forum meetings have been held, one each in Benguela, Huambo, and Malange. The Forum now has a dedicated staff funded by PMI which coordinates all meetings.

As part of the progress made toward improving malaria communication activities, a national IEC strategy was developed under the coordination of Consaude and PSI. The strategy has now been approved by the NMCP and is being implemented. With PMI funding, two radio and two television spots have been developed and widely disseminated. In April 2010, the NMCP organized a two-day training for journalists from all 18 provinces on key message of prevention and treatment.

Planned activities with FY2011 funding are as follows: ($50,000)

1. In-country PMI staff will continue to provide administrative support to the NMCP in the monthly meetings of the Malaria Partners' Forum to strengthen communication and coordination among malaria partners (No additional cost to PMI); and

2. Support the Partners' Forum meetings and salary for the administrative assistant, facilitating improved communication between partners, dissemination of minutes, etc. ($50,000).

PUBLIC-PRIVATE PARTNERSHIPS

Public-private partnerships are a highly attractive means of leveraging additional support and expertise for priority health programs. ExxonMobil, through its Africa Health Initiative and the ExxonMobil Foundation, has been a major contributor to malaria control efforts in Angola.

Progress to Date:

From 2006 through 2008, ExxonMobil has contributed $1 million each year to support PMI objectives in Angola. ExxonMobil 2009 funds are being used, together with PMI funds, to support the scale up of ACTs and IPTp through subgrants under the World Learning Civil

Society Strengthening Project to five NGOs/FBOs that are working in Benguela, Huambo, Kwanza Sul, Kwanza Norte, Uige, Huila, Malange, and Zaire Provinces, as well as through a USAID bilateral working in Lunda Norte where the government health infrastructure is weak. The results of this effort have been very positive. The NGOs are coordinating closely with provincial authorities and provincial NPOs and Malaria Supervisors.

Planned activities with FY2011 funding are as follows: (No additional cost to PMI)

If ExxonMobil funding is available in 2010, it will be used as in 2009 to support NGOs/FBOs in the nine provinces. These activities will be planned and carried out in coordination with the NMCP, PMI, and other partners to ensure uniformity of approaches and avoid duplication and mixed messages. Additional technical support in pharmaceutical management, laboratory diagnosis, rational use of ACTs, malaria in pregnancy and IPTp, ITNs, and IEC related to malaria prevention and treatment will be provided by other PMI partners.

MONITORING AND EVALUATION

In Angola, rapid scale-up of malaria prevention and control interventions, and the achievement of high coverage rates with ACTs, ITNs, IPTp, and IRS are common goals of the NMCP, PMI, Global Fund, and other national and international partners working on malaria. The PMI evaluation framework is based on the goal of reducing malaria deaths by 70% and achieving 85% coverage targets with specific interventions over the course of the program (2009-2014. This framework is aligned with the standard methodology for malaria program evaluation that is being adopted and promoted by the Roll Back Malaria Partnership. Program evaluation will be based on coverage outcomes that will be measured at baseline, midpoint, and the end of the Initiative, and impact on mortality, which will be measured at baseline and the end of the Initiative. Information used to evaluate program outcomes and impact will be collected primarily through household surveys of a representative sample of the national population. All-cause mortality will be interpreted together with data on anemia, parasitemia, available information on malaria cases and external factors (e.g., rainfall), and coverage indicators to account for changes in mortality at the population level that can be attributed to reductions in malaria over the course of PMI.

The PMI monitoring framework aims to complement and support the existing NMCP monitoring and evaluation efforts. The collection of this information is done by PMI implementing partners to avoid an additional burden to NMCP staff. According to the PMI framework, specific activities are monitored on a regular basis to allow in-country program managers to assess progress and redirect resources as needed. Activities within the four main intervention areas, ITNs, IRS, IPTp, and case management with ACTs, are tracked through periodic reports from groups providing commodities, health facilities, and international and local partners. Types of activities that are monitored include procurement and distribution of commodities, availability of commodities for prevention, diagnosis and treatment of malaria, health worker performance, IEC efforts, and supervision and training for healthcare workers. To supplement this information, targeted operational evaluations and record reviews may be required to answer specific questions or identify problems with program implementation.

Progress to Date:

The first nationwide health survey in more than 25 years in Angola was the MIS conducted in late 2006–2007 with funding from the PMI and Global Fund. A total of 2,566 households were surveyed. According to this survey, 28% of households nationwide owned one or more ITNs and 18% of children under five and 20% of pregnant women had slept under an ITN the night before the survey. The proportion of children under five with a fever treated with an ACT within 24 hours of the onset of illness and the proportion of pregnant women receiving two doses of IPTp were 1.5% and 2.5%, respectively, but both of these interventions were only adopted in 2005 and had not yet been implemented nationwide. Information on the proportion of houses targeted for IRS that have been sprayed is collected and reported to the NMCP as part of routine IRS operations.

To complement the data on coverage of interventions from the MIS, malaria parasitemia and hemoglobin levels in children under five and pregnant women were measured concurrently. About 19% of children under five had malaria parasitemia and 3.6% had severe anemia (hemoglobin less than 8 g/dl). In Angola, the most up-to-date mortality data was from the 2001 MICS. For this reason, the MIS in 2006–2007 was supposed to provide malaria-related mortality in children under five for the period five years prior to the survey, but due to small sample size, the confidence intervals around the estimate of malaria-specific mortality are very large.

The National Institute of Statistics carried out a MICS survey in 2008/2009, supported by UNICEF and PMI. This survey was added onto a larger World Bank-supported household income and expenditure survey. This survey will provide updated information on coverage with ITNs, ACTs, and IPTp together with an estimate of all-cause mortality rates for the five year period from 2003-2007. The final results of this survey were expected to be made available by the end of 2009 but due to problems with the analysis have delayed release of results.

The data management capacity of the NMCP has recently improved. The NMCP now has a full time Monitoring and Evaluation officer and data manager hired with Global Fund support. A supervision and reporting system have been put in place by this Monitoring and Evaluation officer to gather data on malaria indicators on a monthly basis, including data on malaria commodity consumption as well as the number of malaria episodes. The Global Fund Round 7 proposal, which focuses on building capacity in monitoring and evaluation at the municipal and provincial levels, and in implementing regular data collection, is complementing PMI support in this area. To date, with Global Fund support and technical assistance of WHO, 214 provincial and municipal supervisors have been trained in monitoring and evaluation, including 73 technicians from the provinces at risk of malaria epidemics as Huila, Cunene, Namibe and Kuando Kubango.

Following a comprehensive evaluation, a decision was made to discontinue support to the sentinel sites in Angola by November 2010. In March 2010, a member of the PMI M&E team spent a week working with the Resident Advisors and to introduce the PMI impact evaluation to the NMCP and other partners and identify potential data sources.
Macro International has indentified a Lusophone consultant who will lead the Angola MIS 2010/2011 with an expanded sample size to allow estimation of all-cause under-five mortality. The data collection is planned to start in November 2010 and the report will be available in last trimester of 2011.

Although not intended to provide nationally representative data, the end-use verification tool was designed to provide timely data on a quarterly basis on malaria commodities availability and on case management at the health facility level, covering the entire country over the course of a year. This information yields a gross estimate of malaria commodities availability and of obvious strengths/weaknesses of that country's malaria supply chain system. Ideally, it will highlight those areas within the supply chain that warrant additional technical and financial resources, ultimately to prevent (or mitigate to the extent possible) stock outs.

The NMCP with the assistance of the PMI and its partners have invested much time and money into the training of health workers to perform good quality malaria case management in public health facilities in Angola since the beginning of the PMI in FY2006. A health facility survey was performed in Huambo Province in November 2007 to evaluate the quality of the case management of malaria shortly after health workers were trained on the new antimalarial policy (e.g. ACTs and use of RDTs). Consultations were observed, patients were interviewed and re-examined, and health workers were interviewed. The survey demonstrated much progress in malaria case management scale up, but also demonstrated some deficiencies in health care worker knowledge, proficiency of the new policy, and policy ambiguities. The survey report made some recommendations to address the deficiencies.

After a few years of follow up of health care workers in malaria case management through supportive training and supervision led by NMCP and PMI partners, it would be beneficial to evaluate the quality of this malaria case management again. A similar survey instrument would be used to collect the data in Huambo Province. The evaluation of malaria case management quality as well as preparedness of health facility to manage cases, and quality of laboratory diagnosis will be evaluated again. Comparisons of results will be looked at to determine progress and update the current level of proficiency. This information will provide the national and provincial government and other national governments with similar situations ideas of how to move forward with malaria case management scale up.

Planned activities with FY2011 funding are as follows: ($562,500)

1. End-use verification/monitoring of the availability of key antimalarial commodities at the facility level. This will entail regular supervisory/monitoring visits to a random sample of health facilities and regional warehouses to better identify overt malaria commodities supply chain weaknesses, focusing on malaria drugs availability, ACT use, and general stock management, including quantifications/consumption capability ($100,000);

2. Support the efforts of other donors to strengthen the HMIS. The activities to be supported will be defined based on the results of a WHO assessment of the Angola HMIS, soon to be released ($200,000);

3. Conduct i*n vivo* drug efficacy testing of AL and AS-AQ at three sites to be identified to provide updated information on the therapeutic efficacy of the first-line antimalarial drugs ($150,000);

4. Conduct a follow-up health facility survey in Huambo Province to assess improvements in health care delivery since the November 2007 survey ($100,000); and

5. Provide technical assistance for the 2011 MIS and for routine monitoring and evaluation with the objective of strengthening the capacity of the NMCP ($12,500).

STAFFING AND ADMINISTRATION

Planned Year 6 PMI Activities: ($2,930,000)

The USAID and CDC in-country Malaria Advisors assumed their posts in late 2006. They have been provided space within the NMCP offices and spend much of each work day there. This has greatly improved communication and coordination between PMI and NMCP, and they are now regarded as valued advisors to the NMCP. In the afternoons both advisors work out of the USAID Mission. Both PMI staff members are part of a single inter-agency team led by the USAID Health Team Lead. The PMI team shares responsibility for development and implementation of PMI strategies and work plans, coordination with national authorities, management of collaborating agencies, and supervision of day-to-day activities. Both staff members report to the USAID Mission Director or his designee. The CDC staff member is supervised by CDC, both technically and administratively. All technical activities are undertaken in close coordination with the MOH/NMCP and other national and international partners, including the WHO, UNICEF, Global Fund, World Bank, and the private sector.

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

ANNEXES

President's Malaria Initiative — Angola Planned Obligations for FY2011 ($)

Planned Activity	Mechanism	Budget (*commodities)*	Geographic Area	Description of Activity	Relation to Interventions
PREVENTIVE ACTIVITIES					
Procurement of LLINs	Grant to UNICEF	2,125,000 *(2,125,000)*	Nationwide	Purchase/distribution of x LLINs to pregnant women/children <5 through clinics, outreach programs, child health days, routine distribution, including BCC/IEC and tracking	ITNs
Procurement of LLINs	DELIVER Task Order 3/NGOs	5,845,000 *(5,845,000)*	Nationwide	Purchase/distribution of 584,000 LLINs for increased population coverage distributed through municipal campaigns	ITNs
Commercial sales for LLINs	TBD	500,000	Nationwide	Integrated IEC/BCC related to ITNs	Malaria prevention and control
LLINs durability study	CDC	50,000	Uige, Kwanza Sul & Malange Provinces	Assist in the implementation of three-province study to gather data on LLIN longevity and durability; also provide technical assistance for evaluation	ITNs
Indoor residual spraying	IRS2 IQC Global Task Order	5,000,000 *(550,000)*	Huila, Huambo, and Cunene provinces	Procurement of insecticide, spray equipment/supplies to spray 160,000 houses; pre- and post-campaign surveys including entomologic monitoring	IRS

Planned Activity	Mechanism	Budget (*commodities)*	Geographic Area	Description of Activity	Relation to Interventions
Entomologic monitoring and insecticide resistance testing	CDC	37,500	Huila, Huambo and Cunene provinces	Technical assistance visit for entomologic monitoring and resistance testing in NMCP; includes support for specific reagents and other laboratory diagnostic materials	IRS
SUBTOTAL: Preventive Activities		**13,557,500** ***(8,520,000)***			
CASE MANAGEMENT ACTIVITIES					
Procurement of laboratory supplies	DELIVER Task Order 3	200,000 *(200,000)*	Nationwide	Procurement of laboratory diagnostic reagents and supplies	Case management
Procurement of RDTs	DELIVER Task Order 3	700,000 *(700,000)*	Nationwide	Procurement of 900,000 RDTs	Case management
Facilitate training, supervision and quality control of malaria laboratory diagnosis	World Learning follow-on	200,000	Nationwide	Technical assistance on quality control of laboratory diagnosis (microscopy and RDTs)	Case management
Technical support for laboratory training	CDC	50,000 (CDC TYDs)	Nationwide	Four TDY visits to provide assistance to in-country partners in the correct use of laboratory diagnostic test results	Diagnosis and treatment
Procurement of artemether-lumefantrine	DELIVER Task Order 3	4,600,000 (4,600,000)	Nationwide	Purchase of artemether-lumefantrine and other antimalarial drugs as needed	ACTs

Planned Activity	Mechanism	Budget (*commodities)*	Geographic Area	Description of Activity	Relation to Interventions
Technical assistance and support for import, clearance, storage, distribution and management of RDT and ACT commodities	DELIVER Task Order 3	450,000	Nationwide	Provide assistance in the clearance, distribution from port, and storage through customs, and down through provincial level	Case management
Strengthen Ministry of Health antimalarial drug management system	SPS	550,000	Nationwide	Strengthen pharmaceutical mgmt. related to antimalarial drugs including regular supervision, provincial training of pharmacist, help with printing of management	ACTs
Support to NGOs/FBOs	World Learning follow-on	4,325,000	TBD	Implement ACT treatment of malaria in areas not currently served by the MoH and include IEC/BCC related to ACTs, ITNS, IPTp in the same areas	Diagnosis and treatment
Continue ACTs private sector pilot	Mentor	600,000	Huambo	This activity will include an expanded geographic focus, broader target age population and incorporate RDTs to better understand case management practices in the private sector	Case management
SUBTOTAL: Case Management		**11,675,000** ***(5,500,000)***			
OTHER ACTIVITIES					
Facilitate malaria program implementation and health systems strengthening in collaboration with NMCP	SES follow-on	800,000	TBD	Facilitate malaria program implementation through health systems strengthening.	Health system strengthening

Planned Activity	Mechanism	Budget (*commodities)*	Geographic Area	Description of Activity	Relation to Interventions
Epidemic preparedness and response	WHO	400,000	Huila, Cunene, Namibe, Cuando Cubango	Refresher training and supervision as part of continued support to WHO for an early warning system and resources mobilization to detect and respond to epidemics	Epidemic response
Strengthen NMCP capacity at the provincial level through support supervision	World Learning follow-on	200,000	Nationwide	Strengthen NMCP capacity to supervise malaria activities at provincial level	Case management
Support to Malaria Partners' Forum secretariat	PSI follow-on	50,000	Nationwide	Continued support to Malaria Partners' Forum	Coordination of malaria partners
SUBTOTAL: Other Activities		**1,450,000**			
MONITORING AND EVALUATION					
End-use verification	SPS	100,000	Nationwide	At least biannual monitoring of commodity availability and use at health facility level	M&E
Strengthening HMIS	WHO or Measure	200,000	Nationwide	Support to strengthening HMIS based on results of WHO assessment	M&E
In vivo drug efficacy testing of first- and second-line drugs	CDC	150,000	TBD	Monitoring antimalarial drug efficacy through *in vivo* drug efficacy testing	M&E

Planned Activity	Mechanism	Budget (*commodities)*	Geographic Area	Description of Activity	Relation to Interventions
Health facility survey	CDC	100,000	Huambo Province	Observe patient consults, interview and re-examine patients, and interview health workers to evaluate quality of malaria case management in public health facilities	M&E
Technical assistance for routine monitoring and evaluation	CDC	12,500	Nationwide	To strengthen NMCP capacity for monitoring and evaluation	M&E
SUBTOTAL: Monitoring and Evaluation		**562,500**			
STAFFING AND ADMINISTRATION					
Staffing and administration	USAID and CDC IAA	2,930,000	Nationwide	Support to salaries and benefits of Resident Advisors and support staff	
GRAND TOTAL		**30,175,000** ***(14,020,000)***			

Year 6 (FY2011) Budget Breakdown by Partner*

Partner Organization	Geographic Area	Activity	Budget ($)
UNICEF	Nationwide	Procurement and distribution of LLINs	2,125,000
DELIVER/NGOs	Nationwide	Procurement and distribution of LLINs through NGOs	5,845,000
DELIVER	Nationwide	Procurement of diagnostic equipment and supplies, RDTs, AL and LLINs, including LLINS distribution	5,950,000
TBD	Nationwide	Commercial sales related to integrated IEC/BCC for ITNs	500,000
CDC	Uige, Kwanza Sul, Malange, and Huambo (HFS only) Provinces	a) Assist in implementation and evaluation of study to gather data on LLIN longevity and durability; b) Assist with *in vivo* drug efficacy studies; and c) conduct repeat health facility survey	300,000
IRS2 IQC Global Task Order	Huila, Huambo & Cunene Provinces	Procurement of insecticide, spray equipment and related IRS commodities to spray 160,000 houses; conduct pre- and post-campaign surveys and entomologic monitoring	5,000,000
Strengthening Pharmaceutical Systems	Nationwide	a) Strengthening MOH drug management system and implement end-use verification; and b) end-use verification	650,000
World Learning follow-on	9 provinces, nationwide	a) ACT and IPTp implementation in underserved areas, including BCC/IEC; and b) also quality assurance for laboratory diagnostics	4,725,000
Mentor	Huambo	Implementation of ACT private sector pilot and expansion to other municipalities	600,000
SES follow-on	TBD	Facilitate malaria program implementation through health system strengthening	800,000
WHO	Huila, Cunene, Namibe, Cwando Cubango	Refresher training and supervision as part of continued support to WHO to help strengthen the epidemic preparedness and response through development	400,000
PSI follow-on	Nationwide	Oversight of Malaria Partners' Forum	50,000
WHO or Measure	TBD	Provide technical assistance to strengthen HMIS system development based on WHO assessment	200,000

*Does not include budget for staffing/administration of $2, 930,000 or $100,000 for CDC temporary duty (TDY)