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 — Year Five (FY2010)

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
MESST — Monitoring and Evaluation System Strengthening Tool
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
UNICEF — United Nations Children's Fund
USAID — United States Agency for International Development
USG — United States Government
WHO — World Health Organization

EXECUTIVE SUMMARY

In June 2005, Angola was selected as one of the first three countries in the President's Malaria Initiative (PMI). The goal of this initiative is to rapidly scale-up malaria prevention and treatment interventions in 15 high-burden sub-Saharan African countries and reduce malaria mortality by 50% by 2010. The initiative is now entering the fifth year in Angola.

Implementation of large-scale malaria control activities in Angola faces serious challenges. Angola's health infrastructure was severely damaged during the civil war and it is estimated that only about 30% 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, moderate in the central part of the country, while the southern provinces have highly seasonal or epidemic malaria.

The most up-to-date information about nationwide coverage of key malaria prevention and control measures comes from a nationwide Malaria Indicator Survey (MIS) conducted between November 2006 and April 2007 with support from PMI. According to this survey, 11% of households owned one or more insecticide-treated nets (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 fever treated with artemisinin-based combination therapy (ACT) within 24 hours of the onset of illness and the proportion of pregnant women receiving two doses of intermittent preventive treatment (IPTp) were just 1.5% and 2.5%; however, that these two interventions had not yet been implemented nationwide at the time of the survey. Before the 2006 PMI-supported indoor residual spraying (IRS) campaign in southern Angola, no large-scale IRS had been carried out in Angola for more than ten years. Updated information on the coverage of malaria interventions is expected from a 2008 nationwide Multiple Indicator Cluster Survey (MICS) later this year.

Angola recently completed Phase II of a five-year, $38 million malaria grant from the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund) and has started implementation of a new five-year, $78 million Round 7 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 a $1 million annual donation to the United States Agency for International Development (USAID) over the last three years to further the PMI objectives in Angola.

The FY2010 PMI Malaria Operational Plan for Angola was based on progress and experiences from Years One through Four, and was developed during a planning visit carried out in May 2009 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 activities proposed by PMI fit in well with the NMCP's National Malaria Control Strategy 2008-2012 and complement activities and needs covered by other partners' efforts, such as the Round 7 Global Fund grant.

The results of PMI-supported activities during the past three years and proposed activities with FY 2010 PMI funding are described below:

Indoor residual spraying (IRS): Before the PMI began working in Angola, no large-scale IRS had been conducted by the NMCP for more than ten years. During the past 12 months, PMI supported spraying of 135,000 houses, protecting a total population of more than 678,000 in two provinces, 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. Acceptance of IRS activities was high, and more than 85% of the houses targeted for spraying were sprayed. With FY 2010 funds, the PMI will support a sixth annual round of spraying, targeting approximately 140,000 houses in Huila and Huambo Provinces. At the request of the NMCP, PMI will also spray up to 20,000 houses in two large towns in Cunene Province on the border with Namibia, which is part of a consortium of southern African countries attempting to eliminate malaria. The spraying conducted with FY 2010 funding is expected to benefit more than 800,000 residents.

Insecticide-treated nets (ITNs): Insecticide-treated net ownership rates in Angola were estimated to be 11% when the PMI began. During the past year, more than 2.5 million long-lasting ITNs (LLINs) were procured by all partners, with 411,000 contributed by PMI. Approximately half of these nets were distributed free-of-charge during municipal health days, while the other half were reserved for routine free distribution through antenatal and immunization clinics. Because of extremely low malaria transmission levels in the capital, Luanda, where 25% of the country's population lives, PMI nets were not targeted to this area and could be focused more high-risk rural areas. An additional 120,000 LLINs were sold at subsidized prices in urban areas, of which the PMI contributed about 34,000.

With most residents in peri-urban and rural areas unable to afford the cost of an LLIN, the PMI will continue to support the existing Ministry of Health (MOH) strategy of providing most nets free-of-charge to vulnerable groups. During FY 2010, it is expected that PMI will procure and distribute 1,090,000 LLINs free-of-charge to pregnant women and children under five. In addition, PMI will procure and distribute approximately 50,000 LLINs at subsidized prices to those who can afford them through the commercial market in urban areas. PMI will also support behavior change communication (BCC) activities to increase demand for and correct use of ITNs.

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 which time, it was estimated that IPTp coverage was less than 2%. The PMI has supported the NMCP scale-up of IPTp through health worker training and BCC, together with ACT implementation in seven more underserved provinces through non-governmental organizations (NGOs). IPTp has now been implemented in all 164 municipalities nationwide. In FY09, 640 health workers were trained in IPTp. Data collected from provinces reporting on a regular basis to the NMCP showed that more than 470,376 pregnant women received two doses of IPTp between July 2006 and April 2009.

With FY 2010 funding, PMI will continue its support for building capacity and ensuring standardization of approaches related to the prevention and treatment of malaria in pregnancy. Efforts will also be made to increase antenatal clinic attendance at existing health facilities and raise levels of IPTp coverage by distribution of free ITNs to pregnant women through these clinics. Focused BCC efforts will encourage women to visit ANCs for their IPTp. In the provinces with PMI-supported NGOs, those groups will continue to promote IPTp and LLIN

distribution through health facilities, as well as appropriate management of acute malarial illnesses in pregnant women.

Case management: Although artemether-lumefantrine (AL) was approved as the first-line treatment of uncomplicated malaria in Angola in October 2004, implementation only began in MOH facilities in May 2006. 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 ACTs in underserved provinces through NGOs that have a local presence in those areas. The Exxon-Mobil donation to Angola has been used to extend approach this to additional provinces. In collaboration with other partners and with support from the PMI, AL treatment of malaria has now been implemented in all 18 provinces in the country and more than 870 health workers have been trained in the use of AL. This scale-up has been accompanied by PMI technical assistance to the National Essential Drugs Program and the NMCP to strengthen the pharmaceutical management system at the national, provincial, and health facility levels. In the last 12 months, PMI procured almost four million AL treatments.

In spite of this progress, thefts of PMI-procured AL have plagued the scale-up of ACTs. A total of 535,000 AL treatments have been stolen on four separate occasions, two times from local airports (in Luanda and Lubango in Huila Province) and two other times from Angomedica, the central government warehouse in Luanda. Although considerable efforts were made by the Government of Angola to improve security at the Angomedica warehouse during the first few months of 2009, this did not prevent the fourth and most recent theft of 130,560 treatments in May 2009.

With FY 2010 funding, PMI will procure approximately 4.5 million AL treatments and will continue to assist with ACT implementation through local and international NGOs in a total of nine of the country's 18 provinces. Because of the repeated thefts, it was decided that, for the foreseeable future, all PMI-funded drugs and rapid diagnostic tests will be stored and distributed using private sector alternatives, avoiding both the National Essential Drugs Program and the Angomedica warehouse in Luanda. In Huambo Province, the PMI will continue to support a pilot study of private sector sales of ACTs to improve access to effective treatment of malaria. Together with other partners, the PMI will provide technical assistance to the NMCP and the National Essential Drugs Program at the central, provincial, and district levels to improve pharmaceutical management. For the capital, Luanda, where malaria transmission is very low, PMI will focus on improved laboratory testing of suspected malaria cases and rational use of antimalarial drugs.

Monitoring and evaluation (M&E): During the past year, sentinel sites for surveillance of malaria morbidity and mortality were established in health facilities in four provinces. A MICS with a full malaria module was also conducted with PMI support, with final results expected by December 2009. The NMCP monitoring and evaluation capacity has increased with recent staff hires through Global Fund support. With FY 2010 funding, the PMI will contribute to either a Demographic and Health Survey (DHS) with verbal autopsies, which will provide information on both all-cause mortality and malaria-related mortality for children under five, or to a Malaria Indicator Survey in 2010/2011 with an expanded sample size. The PMI will also implement quarterly surveys to verify the availability and correct use of malaria commodities at a random selection of health facilities nationwide.

The proposed FY2010 PMI budget for Angola is $35.5 million. Of this amount, 27% will support malaria diagnosis, procurement of ACTs, and improved case management; 34% insecticide-treated nets; 14% IRS; 9% monitoring and evaluation; 6% staffing and administrative costs; 5% other activities (including epidemic surveillance and NMCP capacity building); and 5% malaria in pregnancy activities. Approximately 47% of the total budget will be spent on commodities.

PRESIDENT'S MALARIA INITIATIVE

The goal of the President's Malaria Initiative (PMI) is to reduce malaria-related mortality by 50% by the end of 2010. This will be achieved by reaching 85% coverage of the most vulnerable groups — children under five years of age and pregnant women — with proven preventive and therapeutic interventions, including artemisinin-based combination therapies (ACTs), insecticide-treated nets (ITNs), intermittent preventive treatment of pregnant women (IPTp), and indoor residual spraying (IRS).

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 (FY07-FY09 funding) and other partners, in spite of the weak health infrastructure outside of the capital and major cities.

This FY2010 Malaria Operational Plan presents a detailed implementation plan for the fifth year of PMI in Angola, based on the PMI 5-Year Strategy and Plan and the 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 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 Round 7 Global Fund grant for malaria, which implementation started in late 2008. 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 PMI are to be achieved, and provides a description of planned Year 5 activities.

MALARIA SITUATION IN ANGOLA

In 2002, Angola emerged from almost three decades of civil war that severely damaged its development, particularly the health sector. The country has an approximate population of 17.5[1] 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 about 30% 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 than 90% of all infections. The

[1] Basilio and Luis Vinyals of the Office of Study, Planning and Statistics of the Ministry of health. Angola: public expenditure of the health sector, March 2007.

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 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; while anophelines are abundant in some peripheral areas, only small numbers have been collected in surveys carried out during the rainy season in central areas of the city. A PMI-supported study conducted in 2008 has now shown that malaria transmission in Luanda City is very low, except in the outlying areas of Cachuaco, Viana, and Sambizanga.

Malaria Transmission in Angola

Malaria is reported by the Ministry of Health (MOH) to account for 35% of the overall mortality in children under five, 25% of overall maternal mortality, and is the cause of 60% of hospital admissions for children under five and 10% for pregnant women. As part of its decentralization plan, the MOH has proposed to increase funding to each district and to allow districts 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

$35 million for ITNs, $17 million for ACTs and case management, $19 million for general health systems strengthening, and $6 million for IEC, disbursed over five years. The total funding for Year 1 is $17.9 million and for Year 2 will be $14.5 million. Implementation started in late 2008.

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 bednets. 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% (or around 14.9 million people) of the population of approximately 17.5 million is at risk of malaria.

The PMI **goal,** established in 2005, was to reduce malaria-associated mortality by 50% compared with pre-PMI levels by the end of 2010.

The PMI is assisting the Government of the Republic of Angola (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[2];
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 FIVE

By the end of Year 5 of PMI in Angola (31 March, 2011), the following targets will have been met:

Prevention:

- More than 2.8 million additional free LLINs will have been procured and/or distributed by different NMCP partners (with approximately 1.14 million contributed by PMI) to children under five and pregnant women. 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 and Huila Provinces will be covered in a sixth annual round of spraying. A total of approximately 140,000 households will be sprayed in Huila and Huambo, benefiting more than 700,000 residents; in Cunene Province, an additional 20,000 households will be sprayed, benefiting another 100,000 residents;
- Intermittent preventive treatment of pregnant women with SP will have been expanded. This is expected to reach 60% of all pregnant women attending ANCs nationwide.

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

Treatment:

- Malaria case management with ACTs will have been expanded to reach 60% of all children under five attending MOH facilities nationwide.

PREVENTION ACTIVITIES

Insecticide-Treated Nets

Background:

The NMCP's strategy for ITN distribution follows a two-pronged approach. One approach supports the commercial sales of ITNs at full cost recovery in the capital city Luanda and at a subsidized cost to residents in less urbanized areas. Distribution via this commercial sales method, however, accounts for less than 25% of the total nets brought into the country. The second approach is free distribution of nets through the antenatal and child health clinics to provide free nets to children less than five years old and pregnant women. Free nets are distributed through national campaigns in collaboration with the national immunization program. The MOH recommends the purchase of only long-lasting ITNs (LLINs). The government has waived taxes and tariffs on antimalarial drugs and LLINs, but this policy has yet to be officially approved by the council of ministers.

Due to the high organizational requirements for national campaigns with multiple interventions, the MOH has decided to limit ITN campaigns to municipal health days. Thus, even though a nationwide immunization campaign was carried out in 2009, LLINs were not distributed as part of the intervention package. The details of the municipal level campaigns are being worked out and a meeting with all major stakeholders is being planned.

Even though national HIV seroprevalence is low, estimated at 2.1%, areas in the east along the border with Zambia and in the south, along the border with Namibia have higher infection rates of 6-9.6%. The National HIV/AIDS Control Program has established sites for voluntary counseling and testing. These sites offer an excellent opportunity to distribute LLINs to HIV-positive patients who are at higher risk for malaria.

Progress to Date:

In late 2005, when PMI began activities in Angola, accurate, up-to-date information on nationwide ITN ownership and usage was lacking. A nationwide MIS conducted with the support of PMI in late 2006 and early 2007 indicated that 28% of households owned at least one ITN. In the seven hyperendemic provinces which were targeted during the 2006 measles-ITN campaign, 51% of households owned at least one ITN.

In 2007, more than one million ITNs were provided by the Global Fund, MOH and the Japan International Cooperation Agency for free distribution through antenatal clinics (ANCs) and outreach programs nationwide. In 2008, about 1.47 million LLINs were distributed, of which 734,198 were procured by PMI. Of these, 33,898 were procured by PSI and distributed through the commercial sector on a full-cost recovery in Luanda and subsidized cost to the other urban areas.

In response to flooding in the southern provinces of Angola in 2008, ExxonMobil procured 2,100 LLINs for internally displaced populations in hard to reach areas of Cunene Province and PMI assisted with their distribution. Relief workers went back after the distribution to help the recipients hang the nets over their sleeping spaces.

The 320,000 LLINs PMI procured with FY08 funds through UNICEF arrived in mid-2009 and UNICEF will be distributing these nets through antenatal and child health clinics. By the end of September 2009, UNICEF expects delivery of 850,000 additional nets from UNITAID and 851,000 nets from the Global Fund.

LLIN Distribution in Angola 2006 – 2009

	2006	**2007**	**2008**	**2009**
PMI	540,949	294,200	734,198	411,000
Global Fund, GRA, and other partners	285,707	662,978	737,002	2,100,000
TOTAL	826,656	957,178	1,471,200	>2.5 million

Planned FY2010 PMI activities: ($11,905,000)

Despite the large distributions of LLINs in recent years, LLIN coverage in Angola remains low and will not likely meet the target of 85% set for 2010. PMI will continue to support the NMCP to distribute free LLINs to vulnerable groups including pregnant women, children less than five years old, and people living with HIV/AIDS. Although a large proportion of the rural population cannot afford to purchase a net, many of those living in urban areas can. Therefore, PMI will continue its support for the commercial sales of LLINs at a highly subsidized price and full-cost recovery through the private sector in the urban areas of Huambo, Huila, Cabinda, Kwanza Sul Provinces as well as in the outskirts of Luanda city. This market segmented approach is to ensure that free nets reach the population with the greatest need but unable to afford a net, while persons who can afford to pay for some or all of the cost of a net do so.

Since it is estimated that only 30% of the general population outside of Luanda has access to public health services, routine net distribution to children less than five years old through immunization centers can only reach a small proportion of the target children. To overcome this problem, PMI will reach these vulnerable groups by supporting net distribution to children and pregnant women during municipal child health weeks. Rather than national multi-intervention campaigns, the MOH has decided to conduct child health weeks, organized and managed at the municipal level. UNICEF is supporting the MOH for enhanced service delivery to catch up on immunization for measles, vitamin A and deworming in October or November. Polio and tetanus enhanced services will be conducted in early September.

During recent years, the PMI and other programs have invested heavily in procuring and distributing LLINs in sub-Saharan Africa. Despite enormous investments in LLINs and the goal for universal coverage, the performance and durability of these products' use in real-life setting has not been systematically monitored. Until now, product performance has been extrapolated from laboratory data provided by the manufacturers and other laboratories. Conventionally a 3-5 year lifespan has been assumed. There is anecdotal evidence that washing patterns and practices

vary from one region to another, and this could impact the effectiveness of LLINs in preventing malaria. Monitoring of LLIN performance in real-life settings for durability and efficacy is critical for deciding the periodicity of LLIN distribution as well as selection of an appropriate type of LLIN for a specific setting.

Planned activities with FY2010 funding are as follows:

1. Procure 384,000 LLINs that will be distributed free-of-charge through antenatal and child health clinics and outreach programs to pregnant women and infants nationwide, via UNICEF ($4,000,000);

2. Procure 706,000 LLINs for free distribution in the nine provinces that have PMI-supported NGOs. These nets will be distributed to pregnant women and infants through municipal-level child heath days at the municipal level and/or through any mass distribution that may happen ($7,355,000);

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

4. Support efforts of the MOH and other partners to increase ANC utilization rates through improved service delivery and IEC so that these clinics can be used for free distribution of LLINs to pregnant women and IPTp (costs covered under case management and LLINs); and

5. Monitor LLINs in three provinces (Uige, Kwanza Sul and Malange) for durability and efficacy over a three-year period. PMI-supported NGOs/FBOs currently implementing malaria preventions in these three provinces will distribute LLINs to selected villages. After six months and thereafter at yearly intervals, the NGOs/FBOs will assess all nets that were distributed to ascertain if they are present and in use. A random selection of a sample of nets will be collected and the physical condition of the nets examined. The nets will be tested for residual insecticide levels by WHO bioassays and by chemical analysis ($50,000).

Indoor Residual Spraying

Background:

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. With accumulating evidence of low levels of transmission in Cunene and Namibe Provinces and changes in WHO IRS recommendations to focus on more highly endemic areas, the NMCP and PMI agreed to discontinue IRS in these two provinces. Beginning with the 2007 IRS campaign, therefore, PMI-supported IRS activities focused on Huila and Huambo Provinces only.

In a more recent development, the Southern African Development Community (SADC) Strategic Plan 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 Kwando Kubango Provinces that border Namibia. The NMCP has requested PMI to support the SADC initiative by assisting with IRS operations in these provinces; however, given the very low population density in these border areas, IRS will not be very cost-effective and the NMCP and PMI agreed to focus IRS in three towns on the Cunene Province-Namibia border where population mobility between the two countries is greatest. The focus of malaria control activities for the rest of Cunene Province and in 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.

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 will also include entomologic and epidemiologic monitoring of vector control interventions. An estimated 300 Cuban technical personnel will be involved, with one technical person stationed in each municipality. Eight Angolan personnel in each municipality will be trained to carry out larviciding and entomological monitoring. Each municipal team will be supported with a vehicle. 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 Viana and Cacuaco peri-urban communities. While NMCP staff were not involved in negotiations with the Cuban government, NMCP entomology staff is supporting and coordinating the larviciding and entomologic activities, currently underway in Luanda, Huambo, Huila, Kuanza Norte, Benguela and Malange Provinces.

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 were delayed in Years 1 and 2 of PMI implementation until a site for the insectary/laboratory could be agreed upon. In early 2009, the insectary design was modified to incorporate operational and biosafety requirements and the documents necessary to begin construction were completed. Initially, the insectary was to be located at the National Institute of Public Health (INSP) in Luanda. However, thermal fogging against malaria vectors is being carried out in Luanda. The NMCP and INSP are, therefore, considering re-locating the insectary in the neighboring province of Bengo, as part of a new health research center being established there, adjacent to the local medical school, with support from KalousheGolbeink, a Portuguese foundation. In the interim, the NMCP will continue to submit mosquito specimens to the CDC for species identification and malaria infection status.

Progress to Date:

Between October and December 2008, a total of 135,606 houses were sprayed with a synthetic pyrethroid insecticide, protecting approximately 678,030 persons in Huila and Huambo Provinces. This represents 97% of all houses targeted for spraying. This is the fourth year of IRS in urban and peri-urban areas of Huila, the capital of Huila Province and the second year of spraying in the urban and peri-urban areas of Huambo, capital of Huambo Province. A longer-lasting formulation of lambda-cyhalothrin insecticide, ICON® CS, was used in Huambo. In Huila the remaining stock of ICON® Wettable Powder was used in one municipality, Chibia, while Huila municipality was sprayed with ICON® CS. The IRS activities were completed on time and there was a high level of community acceptance. 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. After analysis of a sample of the material to be incinerated, the facility has agreed to accept the waste for incineration. The waste will be transported by truck in a container from Huila and Huambo Provinces.

As in the past, provincial health department staff were involved in the 2008 IRS campaign. A total of 565 men and women were hired and trained as spray operators, supervisors and IEC mobilizers. Provincial Health Department physicians and supervising nurses based in health centers were instructed on clinical symptoms and treatment of pesticide exposure and side effects. Equipment remaining after the October 2008 campaign has been securely stored in warehouses at the provincial capitals of Huila and Huambo Provinces.

Between February 2007 and February 2008 a longitudinal PMI-supported entomologic survey was carried out in Luanda, Huila, and Namibe Provinces. In addition, the NMCP supported a survey in Zaire Province. The *Anopheles* mosquitoes were sent to CDC for species identification and to determine the infectious status of the mosquitoes using the *P. falciparum* malaria sporozoite enzyme-linked immunosorbent assay. A total of 115 mosquitoes were identified by molecular methods. In Huila, 13/17 mosquitoes were identified as *An. arabiensis* and in Namibe, 60/62 mosquitoes were identified as *An. gambiae s.s*. Four specimens from Luanda and 28 specimens from Zaire and Luanda were all identified as *An. gambiae s.s*. Of the 166 specimens tested, 3.01% 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.

An entomology team consisting of a consultant from the Agostinho Neto University in Luanda and the NMCP entomology staff were to conduct an entomologic survey in Huambo in January 2009. The survey was intended to monitor vector species and density and insecticide resistance using the WHO assay. Due to heavy rains, the survey was delayed but is currently rescheduled for late 2009, prior to the next round of spraying. Future entomologic monitoring may be expanded to include Huila and Cunene Provinces.

Planned FY10 activities: ($5,037,500)

1. PMI will assist the NMCP to carry out one round of IRS in Huila Province using the existing stocks of ICON® WP in one municipality and a synthetic pyrethroid to be procured in the other municipality. In Huambo Province, a long-acting synthetic pyrethroid insecticide will be used. The spray operations will take place between August and December 2010 and an estimated 140,000 houses will be sprayed ($5,000,000);

2. PMI will support the NMCP in the SADC malaria pre-elimination initiative 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. In addition to the spraying, PMI will 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 Kwando Kubango. This will include strengthening laboratory diagnosis of malaria, weekly reporting of cases and the development of district-level epidemic response plans (costs covered under IRS and LLIN procurement above). As a separate activity, the

NCMP will collaborate with the Government of Namibia to implement IRS in the sparsely populated areas along the border; and

3. Continue to monitor the risk of malaria transmission in Huambo Province to allow better targeting of IRS and LLIN distribution. This will include collecting and identifying anopheline mosquito vector specimens and monitoring of insecticide resistance, as well as strengthening capacity within the NMCP for entomologic monitoring in areas where IRS and/or LLINs are used. Training for resistance and monitoring of IRS and LLINs will be provided by the CDC and will be established after the insectary and laboratory are completed and a susceptible mosquito colony established ($37,500).

Intermittent preventative therapy of pregnant women

Background:

Prevention and control of malaria in pregnancy was adopted as a national policy by the NMCP in September 2004. The NMCP strategy consists of a three-pronged approach: prompt and effective case management of malaria, promoting regular use of an ITN, and IPTp with at least two doses of SP during pregnancy. The policy is applied countrywide including to areas of low malaria transmission, such as the capital, Luanda. Training materials and guidelines have been produced and in use since May 2006.

According to the 2006-2007 MIS, 80% of pregnant women attended an ANC at least once during their pregnancy; however, only 5% and 2% of pregnant women received IPTp1 and IPTp2, respectively. It is likely the proportion of women receiving IPTp has increased significantly since the MIS as the IPTp policy had just been implemented when the MIS took place. Intermittent preventive treatment of pregnant women is currently implemented in all 18 of Angola's provinces. The Angola health system has specialized health centers which cater to antenatal services. Coordination between the Reproductive Health Division and the NMCP in implementing measures to control malaria in pregnancy needs to be improved and efforts by both the NMCP and PMI in-country staff to foster improved communication continues.

Through Global Fund Round seven, there is a significant contribution for IEC/BCC for IPTp each year, which is expected to contribute to the increase in IPTp uptake.

Progress to Date:

In nine of Angola's 18 provinces, PMI is supporting NGOs/FBOs to improve access to health care delivery. These organizations are implementing activities to scale-up malaria prevention and treatment interventions while in the remaining nine provinces, PMI will support the provincial health authorities to improve malaria program implementation. Data collected from provinces regularly reporting to the NMCP show that more than 470,376 pregnant women received IPTp2 between July 2006 and April 2009. PMI is expecting results from the 2008-2009 Multiple Indicator Cluster Survey to show significant progress in IPTp implementation.

Planned FY2010 activities: (MIP activity costs are covered under case management costs)

1. Continue to support NGOs/FBOs to implement IPTp and LLIN distribution through health facilities as well as effective case management of malaria cases in pregnant women in the nine provinces where these groups are working.

CASE MANAGEMENT

Malaria Diagnosis

Background:

The treatment of malaria in most MOH facilities in Angola is based on clinical diagnosis. Confirmatory microscopy for malaria is only available in hospitals and larger health centers and the quality of those diagnoses varies considerably from one facility to the next. Rapid diagnostic tests (RDTs) are now used in most public health facilities with ACTs.

The NMCP Strategic Plan (2008-2012) includes a new national policy about the use of RDTs, which is being disseminated in all new training sessions focusing on malaria diagnosis and treatment. Under this new policy, RDTs are recommended where microscopic diagnosis is not available. In areas of stable malaria transmission (i.e., hyper- and mesoendemic areas) children under five years of age are to be treated presumptively based on the integrated management of childhood illness algorithm whereas older children and adults are to receive confirmatory testing before treatment is given. In areas of low transmission, such as Luanda and the four southern provinces, all patients regardless of age are to be tested before treatment is given. It is hoped that this new policy will avoid unnecessary prescription of artemether-lumefantrine (AL).

Progress to Date:

Seven hundred and fifty-thousand RDTs and 25 microscopes and 25 microscopy kits, each one sufficient to test 1,000 patients, were procured and distributed with FY07 funds. With FY08 funds, PMI procured another 600,000 RDTs that have arrived in country and are being distributed to all of Angola's 18 provinces. In addition, 43 microscopes and an equal number of microscopy kits have also been procured with FY08 funds, arriving in country in June 2009. With FY09 funds, 450,000 RDTs and 30 microscopes and an equal number of microscopy kits will be procured. Part of the country's needs for RDTs is being met by Round 7 of the Global Fund grant.

In October 2007, CDC, together with the Instituto Nacional de Saude Publica, organized a microscopy training workshop for ten senior malaria laboratory technicians, selected from the provinces. These trained technicians have been gradually cascading training to other technicians in the provinces. Thus, in 2008, PMI supported the training of 1,356 health workers in laboratory diagnosis of malaria with microscopy and/or RDTs in the provinces of Kwanza-Sul, Kwanza-Norte, Malange, Huambo and Zaire. All training sessions used standardized laboratory training materials and laboratory aids developed by CDC and translated into Portuguese.

Planned FY2010 PMI activities: ($1,010,000)

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 come to fruition and malaria cases fall, the need for high quality laboratory diagnosis of malaria as well as the need to further target the use of relatively expensive ACTs will become more important. As part of the Improving Malaria Diagnosis (IMaD) Project's initial laboratory assessment, a visit was undertaken to the provinces of Luanda and Benguela. This provided the necessary baseline information for the development of the year 1 work plan which is currently under implementation. IMaD's main focus will be on quality control, prioritizing provinces where PMI-supported sentinel sites are located.

Planned activities with FY2010 funding are as follows:

1. Procurement of 50 compound microscopes and 148 microscopy kits (slides, alcohol, cotton, staining reagent, immersion oil, etc.) to serve the current 50 microscopes plus the 25, 43 and 30 PMI-funded microscopes acquired with FY07, FY08 and FY09 funds respectively ($300,000);

2. Procurement of 600,000 RDTs ($360,000);

3. Continued technical assistance 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 services for malaria diagnosis in collaboration with the Instituto Nacional de Saude Pública. In particular, emphasis will be placed on training of clinical workers to adhere to the results of laboratory tests when administering treatment ($300,000); and

4. Technical Assistance to in-country partners in the correct use of laboratory diagnostic test results ($50,000).

Pharmaceutical management

As Angola enters Year 5 of the PMI, there continues to be a need for high-quality technical assistance to strengthen the existing pharmaceutical management system. The absence of both a national health care and a medicines policy in Angola has proven challenging, although there is currently an advanced draft of a health care policy, developed with support from WHO and awaiting ratification by the GRA. It is unknown if future MOH plans include a national medicines policy but it is likely that lack of a Food and Drug Board contributes to delays in the promulgation of any formalized policy on essential medicines. Mandated by the Department of National Medicines and Equipment, the National Essential Drugs Program (NEDP) bears responsibility for the quantification, procurement, and distribution of malaria commodities (in addition to all other non-HIV/AIDS essential medicines and equipment). The NMCP is responsible for the selection of malaria commodities in collaboration with the NEDP. Angola does not have an essential medicines list and each national program (i.e., malaria, tuberculosis, trypanosomiasis, family planning, etc.) is responsible for developing its own list. Lists are submitted to the NEDP and the requisite commodities are procured. For the NMCP, the NEDP

procures only WHO prequalified products but 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 is AL. An alternative first-line therapy is artesunate-amodiaquine. Parenteral quinine is the approved treatment for severe malaria and parenteral artemether or artesunate are the approved alternative therapies. For the treatment of uncomplicated malaria in pregnancy, oral quinine is recommended during the first trimester and AL or quinine during the second and third trimesters

The public healthcare structure is divided into three delivery points. Eight national level hospitals comprise the tertiary health level. The secondary service delivery level is made up of 18 provincial hospitals, followed by the primary health service level, comprised of 228 municipal hospitals and 1,453 health centers. Thus, each of the 164 municipalities in the country has at least one government-operated hospital. At the community level and representing the lowest point of service delivery, are the health posts where out-patient services are provided and where referral can be made to higher delivery points. In the absence of a national essential medicines list, hospital drug formularies, formulary committees, or standardized treatment guidelines, there is a broad range of drugs for any one therapeutic class that varies from hospital to hospital and province to province. In addition, lower-level health facilities supplement their MOH stocks with locally-available medicines purchased using funds generated from service fees. Medicines purchased from these private sector vendors are often of questionable origin and their quality cannot be guaranteed.

Progress to Date:

During 2009, the Strengthening Pharmaceutical Systems (SPS) Project continued their close collaboration with the NEDP and the NMCP to strengthen the existing pharmaceutical management system, especially to improve malaria drug quantification, distribution, and storage, as the nationwide roll out of AL has placed additional burdens on the supply chain. The SPS Project has continued to work with the PMI-funded NGOs in nine provinces to assist in the ongoing implementation and scale-up of AL.

Collaboration between the DELIVER and SPS projects in the form of joint technical assistance to the NMCP, NEDP, National Malaria Program Officers and other key malaria partners resulted in a revised ACTs distribution plan based on 2007 and 2008 morbidity data provided to the MOH during routine annual reporting. This is part of the overall logistics management strengthening provided to the NMCP and NEDP in an effort to not only find and remedy obvious gaps but also apply best practices in supply chain management, given the available infrastructure in Angola. This also included support by the two PMI-funded programs to the NEDP in requesting the inclusion of rectal artesunate for pre-referral treatment of suspected severe malaria into the essential medicine kits supplied to the provincial warehouses. The referral artesunate suppositories will be included into the kits as of January 2010.

Guidelines in stock management at the health facility level as well as the management of antimalarials at provincial warehouse levels, previously developed in collaboration with the NMCP and NEDP, have been made available to the NEDP and partners for dissemination. Provincial warehouse staff have also been trained in inventory management practices to better

track malaria commodities. 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 SPS and DELIVER. 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. PMI partners routinely engage in these supervisory activities throughout the year. The standard operating procedures used at the central medical stores are under review and will be tailored for implementation at provincial level stores.

The need for a robust pharmaceutical management information system at the Angomedica central warehouse (and ultimately at each of the provincial warehouses) is critical to support accurate quantification, procurement, and distribution services nationwide. Working with a newly implemented and Angolan Government-funded warehouse management software called UNILOG (installed by a Brazilian company), Angomedica staff have been trained, but gaps may still exist. More recently, an IT consultant from MSH/SPS visited the country, reviewed the UNILOG's functioning and concluded that UNILOG is a capable warehouse management information system. However, UNILOG is not being utilized to its full capacity but an SPS consultant concluded that UNILOG could be adapted for all levels of the EDP's supply chain system. It would be prudent to strengthen the pharmacy management information system (PMIS) across all levels of the supply chain, i.e., from the national warehouse through to the provincial warehouse and down to end users. A comprehensive PMIS rolled out across the provincial warehouses will facilitate improved logistics management across all commodities and will also contribute to fewer stock outs of all essential medicines.

Following discovery of the largest theft of ACTs in December 2008 from the central medical stores (CMS) facility, Angomedica, a change in security arrangements was made. Prior to the December theft, access to the facility was governed by a team from Angomedica and a team from the NEDP. Employees from both Angomedica and NEDP staffed the facility and multiple sets of keys existed. The management of Angomedica now resides entirely with the NEDP. The former Angomedica team was relieved and all staff working in Angomedica as of June 2009 were employed through the NEDP (excluding three pharmacists from Cuba, seconded to the CMS as part of the recent agreement between the Cuban and Angolan governments regarding health system strengthening).

Angomedica is a large facility of about 2,200 square meters enclosed by either concrete or fenced walls around its perimeter with a gated entrance staffed by a 24-hour guard. The compound has been separated into two distinct areas, bisected by a thick fence running from ceiling to floor and from one end of the building to the other. Formerly, the warehouse compound that NEDP used for the storage of essential medicines and other medical equipment was part of the production unit of Angomedica where non-warehousing activities took place. Installation of the fence following the December theft helps to minimize foot traffic within the area relegated for drugs and medical storage; only employees of NEDP have access to these commodities. In addition to the fence, there is also an area reserved for higher-valued commodities (such as AL) cordoned off by another fence that completely encases a large secured area (about a fifth of the entire warehouse). Drugs and other essential commodities are now classified into three categories: A, B and C groups where group A products are the most costly and C, the least. Rapid diagnostic tests and AL are considered group A commodities. All group

A drugs are to be kept inside the fenced off area within Angomedica. Security checks have been implemented whenever a consignment arrives and leaves the facility.

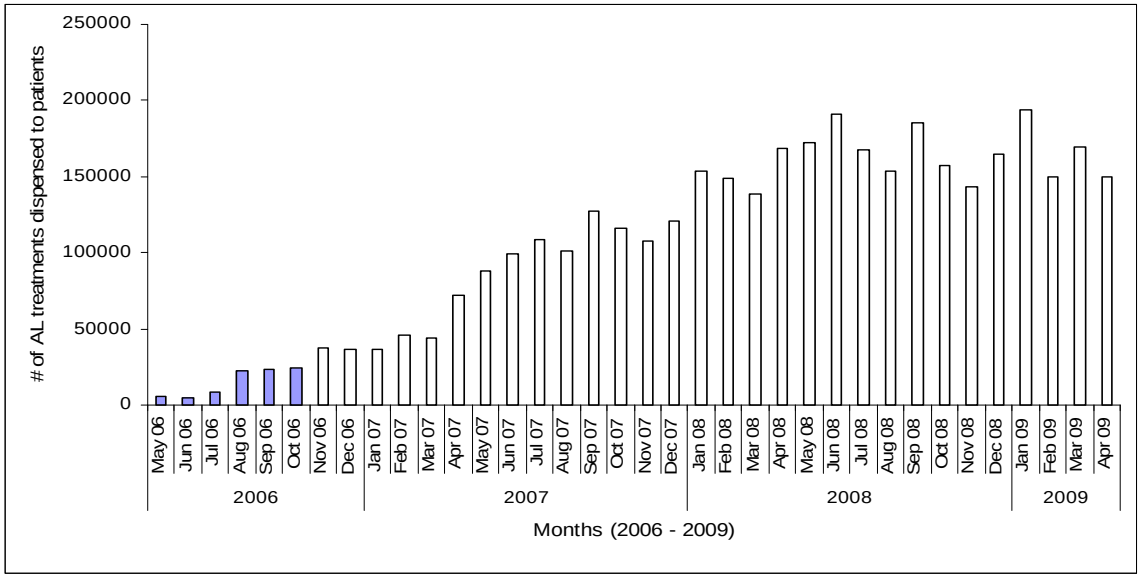
In spite of these efforts to strengthen commodities security surrounding Angola's malaria supply chain, another theft of PMI-funded AL from Angomedica occurred in May 2009. Three individuals, including the chief logistician of Angomedica, have been arrested and the Minister of Health has also taken an interest in this ongoing issue. Given the financial and human resources invested, PMI has decided to bypass the Angomedica warehouse and take charge of the transportation to the provincial level, at which point commodities would enter back into the government supply chain for subsequent distribution down to facility level. During June 2009, there was an audit by the Inspector General Office regarding the thefts. This report is due by the end of September 2009.

Malaria treatment

In January 2007, the NMCP made a change in its policy, extending treatment with ACTs to all age groups, accelerating the roll out of AL during the subsequent months. By April 2009, all of Angola's 164 municipalities nationwide had implemented ACTs through a network of 1,459 health facilities in all 18 provinces. Since the beginning of 2009, more than 870 health workers have been trained in case management with AL, with PMI support in the provinces of Kwanza Sul, Benguela, Huila, Kwanza Norte, Malange, Huambo, Zaire and Uige. Initial resistance on the part of some physicians to receive training in the new policy has decreased and AL is now the accepted treatment across the country. Nevertheless, there remain many foreign physicians serving in rural areas of Angola who have little first-hand experience with malaria or its treatment. In the nine provinces where PMI is supporting NGOs, foreign physicians receive NCMP guidelines for malaria treatment and attend case management training coordinated by the NGOs. Additionally, the Global Fund grant includes training of foreign physicians. The former Vice Minister has required that all physicians receive training in the new policy but this has not yet been extended to the rest of the country.

At the same time, the system for monitoring the roll out of ACTs and IPTp has been strengthened and National Malaria Program 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 the newly-established municipal M&E officers, government employees who receive a monthly financial incentive through the Round 7 Global Fund malaria grant to further support the NMCP's reporting system. The following graph shows the dramatic increase in the number of ACT treatments administered monthly nationwide from May 2006 through April 2008 with a leveling off of treatments dispensed after that.

Expansion of Coartem® rollout in Angola May 2006 – April 2009



The MOH has been increasing its contribution to malaria control efforts and thus far in 2009, procured a total of 1.5 million generic AL tablets or about 80,000 treatment courses. The MOH has also procured and distributed an additional 640,000 generic AL treatments, 2.4 million quinine tablets, and more than 1.1 million SP tablets through the kit system to the provinces of Malange, Kwanza-Norte, Moxico and Bie. The MOH will continue to meet all national needs in terms of intravenous quinine and artesunate for the treatment of severe malaria in public health facilities.

New NMCP treatment guidelines include pre-referral treatment with rectal artesunate, which has been added to the Essential Drug List. It is expected to be included in the essential drug kits by January 2010.

The GRA has requested that future PMI procurements of AL contemplate the newly-approved dispersible formulation for the lower age groups whereas the standard oral tablet form would continue to be used for adults. The GRA is also considering purchasing of this new dispersible formulation of AL. Recently, the National Directorate of Medicines and Equipment initiated contacts with Novartis for the acquisition of the private sector packaged AL with the aim of making it available at a subsidized price to the private sector in Angola.

A variety of antimalarial drugs, including chloroquine, artemisinin monotherapies, and generic formulations of various ACTs continue to circulate in the private sector in Angola. The Dafra product, Co-Artesiane® (a generic formulation of AL), is commonly found in private pharmacies.

Progress to Date:

Because of concerns about the poor access of local population to health facilities outside the capital, Luanda, it was agreed that PMI would support implementation of AL through the existing NEDP system, but with assistance from locally-established NGOs in the nine provinces where PMI is supporting their activities. The PMI-supported training in pharmaceutical management and the roll out of ACTs and IPTp in Huambo Province has been seen as a major

success by the NEDP and NMCP. Part of this work is being supported by a donation from the ExxonMobil Foundation to USAID/Angola.

In the process of updating the National Malaria Strategic Plan (2008–2012) and its respective gap analysis, a refined ACT quantification and budgeting was carried out using the following assumptions: total population of at that time of 16 million, 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. With the ongoing scale-up of malaria prevention activities, it is not expected that this estimated annual ACT consumption will increase; instead, it is expected to stabilize and eventually decrease over the years as the number of malaria episodes decrease and the differential malaria diagnosis of fever improves.

Estimated artemether-lumefantrine needs per year (from 2009 onwards)

Patient weight	**Age group**	**Blister type (tablets)**	**No. of blisters needed**	**Percent**
5 to 14 kg	Under 3 years	1 x 6 (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**

The PMI procured a total of 580,000, 3.2 million, and 3.0 million AL treatments with Years 1, 2, and 3 funds, respectively and will procure an additional 3.5 million treatments with Year 4 funds. 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. Through this grant, 1,335,360 AL treatments that are expected to reach the country before the end of 2009. The Global Fund Round 7 has no funds for training in case management and only very limited funds for supervision. It was agreed that the Global Fund-procured ACTs will be 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. As part of the Global Fund Round 7 grant, funds are available to re-establish sites around the country for monitoring the efficacy of antimalarial drugs. A total of eight sites are planned.

Private Sector ACTs

Although difficult to ascertain exact figures, current data supports estimates that about one-half of caregivers in sub-Saharan Africa initially seek treatment for childhood fever at point-of-service facilities in the private sector. Some data estimate as many as 60% of febrile cases are treated in the private sector. Private sector drug sellers are typically subject to less stringent regulatory control and are, therefore, more likely to offer low-quality antimalarial monotherapies. If ACTs are available, they are often significantly more expensive than the same

product offered in the public sector and are typically produced locally (and of questionable quality). The NMCP, NEDP and other provincial and national health authorities in Angola recognize the role private drug sellers/pharmacies play in effective pharmaceutical management as well as the volume of people reached through this venue. While little is known about the prescribing and dispensing habits in the private sector, it is estimated that up to 50% of all ACT sales are attributed to this market. Failure to engage with the private sector is a significant lost opportunity for improving access to good quality, effective ACTs; strengthening rational drug use; and providing malaria case management when possible. Targeting the private sector can also facilitate implementation of approved first-line ACTs across all 18 provinces, adherence to national malaria treatment guidelines, and improved accuracy surrounding forecasting and quantifications in the public sector by the NEDP as more realistic consumption data can be captured from an otherwise unknown segment of the market.

As part of the National Malaria Strategic Plan for 2008–2012, the NMCP has made the decision to support ACT use at the community level, although it is not clear how this will be accomplished since very few areas have community health workers and this will considerably increase the nationwide ACT needs. In response to the NMCP's interest in a field trial of AL delivery through the private sector, in FY08 PMI agreed to fund a pilot study in the Municipalities of Huambo and Cáala in Huambo Province.

Conducted in close collaboration with the Provincial Health Directorate and the Private Sector Pharmaceutical Association, the one-year pilot study (with the possibility of a one-year extension) was designed to assess private sector distribution of ACTs in one province, Huambo. Ultimately, outcomes from this study should help inform the NMCP and NEDP on the feasibility of rolling out ACTs initially into other municipalities of Huambo and then to other provinces by facilitating a better understanding of private sector market dynamics. By establishing a small network of private sector outlets for distribution of an over-branded, competitively priced artemether-lumefantrine for children less than five years of age, the pilot will look to improve caretakers' knowledge about the signs and symptoms of malaria and how to respond.

Progress to date:

In collaboration with national malaria partners, the private sector ACT pilot began in two municipalities in Huambo Province. With a population of approximately 1.3 million, Huambo is the second most malarious province in Angola with approximately 615,000 malaria cases annually. There have been to date two supervisory visits to 90 registered private pharmacies (chosen in part with the DPS) to provide each of the facilities with advanced training. Currently 79 licensed private pharmacies have been identified for the pilot phase. 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" have been completed. The launch of ACTs in the private pharmacies took place July 2009.

Planned FY2010 PMI activities: ($11,650,000)

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

capacity. The complexity of AL implementation must not be underestimated with the short shelf-life of the drug (18–24 months), the high cost of ACTs in commercial markets in Angola ($6–10 per treatment; and up to $20/treatment in some private drug sellers), the risk of counterfeits, and the high levels of coverage that need to be attained.

As the Global Fund and PMI remain the two primary sources of ACTs for Angola, collaboration between the two organizations is critical. It is important that weaknesses in the supply system be addressed as soon as possible. In addition, given the low access to health care in Angola, PMI in collaboration with the Global Fund Round 7 grant will also place a high priority on supporting NGOs/FBOs to facilitate ACT implementation in areas that are currently underserved by the MOH. The NMCP estimates that approximately 50% of malaria cases are treated at either private clinics or at the community level. Therefore, PMI will continue to work with the NMCP and other partners to consolidate ways of engaging the private sector in increasing access to safe and effective treatment. This will be coordinated with efforts to improve case management and malaria prevention in pregnant women at ANCs within the same health facilities, and will include assistance with training and supportive supervision of health care workers, IEC, and monitoring and evaluation.

Planned activities with FY2010 funding are as follows:

1. Procure approximately 4.5 million AL treatments, store them in a centrally-located private warehouse in Luanda and distribute, through private transport, to the provincial-level NEDP stores in Angola's 18 provinces ($4,825,000);

2. Support technical assistance 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 ($150,000);

3. Support the final costs of a pilot study of ACT implementation through the private sector. It is hoped findings from this pilot will help with the future expansion of ACTs in the private sector. Thus far, $500,000 and $200,000 have been allotted to this pilot in the FY08 and FY09 PMI budgets respectively ($150,000);

4. Together with the MOH and other partners, continue to provide technical assistance to the MOH and NEDP at the central, provincial, and district 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 an expert in pharmaceutical management based in country, as well as through short-term technical assistance visits ($600,000);

5. Facilitate provincial-level supervision by the NMCP through NGOs 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 ($400,000);

6. 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). Together with Lunda Norte Province mentioned below in point 7, this will cover 50% of Angola's 18 provinces ($4,325,000); and

7. Facilitate improved case management through training by PMI-supported NGOs in nine provinces in collaboration with the NMCP. In Lunda Norte and Cunene, implement ACTs in areas not currently served by the MOH and promote health education related to ACTs, ITNS, IPTp in the same areas. In Luanda, where the level of malaria transmission is very low, promote correct use of laboratory diagnostic test results and rational use of antimalarial drugs to patients with fever in a low transmission area ($1,200,000).

EPIDEMIC SURVEILLANCE AND RESPONSE

Background:

The National Epidemiological Surveillance System collects weekly reports on malaria from the four epidemic-prone provinces in the south. Since these cases are clinically-diagnosed, not all districts report on a regular basis, and there are delays in releasing reports to the NMCP, these data are of limited use for the detection of epidemics. Although the National Malaria Control Strategy for 2008–2012 includes early detection and rapid containment of malaria epidemics as one of its objectives, district- and provincial-level epidemic control plans do not exist and existing systems for epidemic detection and response are generally weak and poorly organized.

The four southern provinces of Namibe, Cunene, Huila, and Kwando Kubango bordering Namibia are regarded as epidemic prone, but careful mapping of the epidemic risk in this area has never been carried out.

Progress to Date:

The PMI is taking a multi-pronged approach to build capacity within the health departments of the southern provinces to detect and respond to malaria outbreaks, should one occur. During the latter half of 2008, a PMI-supported consultant worked with provincial health authorities to

develop provincial plans for epidemic identification and containment. The PMI is working with UNICEF to increase distribution of LLINs in the south, through both routine channels and large-scale campaigns. 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. Stocks are being rotated to avoid expiry.

Planned FY2010 PMI activities: ($500,000)

Malaria outbreaks in the four provinces bordering Namibia have the potential of causing considerable morbidity and mortality with very little warning. The single greatest obstacle to mounting an effective response to malaria epidemics in the four southern provinces is the lack of a reliable malaria surveillance system. This problem should be remedied by the ongoing efforts of the NMCP to improve malaria epidemiologic surveillance at the provincial level.

Planned activities with FY2010 funding are as follows:

1. Provide support through WHO to strengthen epidemiologic surveillance and timely reporting on malaria as part of an early warning system in Huila, Cunene, Namibe and Kwando Kubango. Continue to maintain an epidemic response stockpile of antimalarial drugs, insecticides, spray pumps, and protective IRS gear at one or two provincial level sites in the four southern epidemic-prone provinces. Lubango, the capital of Huila Province, is an attractive site due to its central location and good roads to both Cunene and Namibe Provinces ($500,000);

2. Support entomologic and epidemiologic studies in Huambo and Huila Provinces to guide IRS activities and ITN distribution. Insecticide resistance data will be collected using the CDC bottle bioassay method (costs covered under Preventive Activities section); and

3. Continue PMI support to improving the quality of malaria laboratory diagnosis and strengthening pharmaceutical management systems, avoiding stock outs of ACTs in the four southern provinces so that they are better prepared to respond to a malaria epidemic. In addition, PMI will seek to ensure that the southern provinces are targeted in any LLIN distributions that take place during the next 12 months (costs covered under Case Management and ITN sections).

CAPACITY BUILDING WITHIN THE NATIONAL MALARIA CONTROL PROGRAM

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 (NPO), who are based in Luanda and provide technical support in the areas of monitoring and evaluation, finance, logistics, data management, and IPTp/IMCI. To strengthen capacity at the provincial level, 18 NPOs 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 each municipality, 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 during the last four years, such as:

1. 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 writing the successful $78 million Global Fund Round 7 malaria proposal that is currently in implementation. 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;

2. Undertaking regular supervisory visits to the field, which were instrumental in drawing attention to the need for supportive supervision to complement the training activities that have been taking place. As a result, a more regular schedule of supervision by NMCP is now being implemented using standardized supervision tools;

3. Working with NMCP on developing technical guidelines on monitoring and evaluation, RDTs, ACTs, LLINs and IPTp;

4. Helping organize the first Malaria Partners' Forum in Angola. Members of the forum's permanent secretariat meet regularly to discuss specific technical matters as well as forge further expansion of the malaria partners forum activities beyond the capital, Luanda; and

5. Review of PMI and Malaria Communities Program applications to support NGOs/FBOs in malaria prevention and control activities in Angola.

In addition, the PMI in-country team in collaboration with USAID Washington and CDC Atlanta contributed to the development of the protocol, training, data collection and review of the Luanda malaria survey published in the March issue of the American Journal of Tropical Medicine and Hygiene. The in-country PMI team was also involved in all phases of a health facility survey, in Huambo province, lead by CDC Atlanta in 2007.

Planned FY2010 PMI activities: (no additional costs, activities costed under case management section)

1. Continue training and supervision of laboratory technicians;

2. Continue training of health workers in case management, pharmaceutical management systems, IPTp and correct use of bednets; and

3. Facilitation of a provincial-level supervision by the NMCP through NGOs 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-job supervisory visits, every quarter to all municipalities. The follow-up supervision visits will then focus on pre-identified problems at each level.

COMMUNICATION AND COORDINATION

Coordination and communication among partners involved in malaria prevention and control in Angola has always been challenging. A Malaria Task Force was formed around the Global Fund proposal made up of PMI, MOH, WHO, UNICEF, PSI, and UNDP/Global Fund staff, but NGO/FBOs and other partners working on malaria usually do not participate. As part of the Task Force, a malaria technical working groups exist, but in the past they have only met irregularly.

Progress to Date:

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.

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 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. Elections took place during the first Forum meeting, establishing a leadership hierarchy including a presidency (currently occupied by the Angolan Red Cross), two vice president positions (occupied by Consaude and PSI), and a permanent secretariat, comprised of six permanent seats occupied by the PMI; WHO; UNICEF; the World Bank; HIV/AIDS, Malaria, Sexually-Transmitted Diseases, and Tuberculosis (HAMSET) Control Project; and NMCP. Three rotating members of the secretariat were also elected and are currently occupied by MENTOR, Save the Children, and Cessor, a national NGO.

During the past year, the Forum and its elected leadership have continued to meet approximately every two months and two provincial Forum meetings have been held, one in Benguela and one in Malange. As yet, individual working groups have not been set up. PMI was asked by the NMCP Director to support the establishment of a secretariat for the Partners' Forum that would be located at one of the two Vice Presidents' organizations. PMI set funding aside for this effort in the FY09 budget but, though efforts have been made to hire a secretariat coordinator, thus far no one suitable has been found for the position.

As part of the progress made toward improving communication not only amongst malaria partners but also toward improving public awareness regarding malaria, 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, PSI has also helped promote and influence malaria behavior throughout Luanda as well as in some provincial areas through development of two radio spots and two television spots and a national communication campaign that focused on net use and treatment-seeking behavior and included both television (300 placements) and six radio stations (3,200 placements), immediately followed by an impact study.

Planned FY2010 PMI activities: ($35,000)

If the NMCP is to fulfill its leadership role in the malaria control effort in Angola, continuing efforts to improve communication and coordination among the variety of different groups involved in malaria activities in Angola will be needed. The success of the 2008–2012 National Malaria Control Strategy, the implementation of the Global Fund Round 7 grant, the development of future Global Fund proposals, and PMI in Angola will depend on a close and effective working relationship between the NMCP and its partners.

The Malaria Partners' Forum provides an ideal venue to share information among national and international partners and ensure good coordination of malaria control activities. The PMI, especially through its in-country staff, will support the partnership by providing administrative support to the regular meetings of the Forum, and participating actively in its various working groups.

Planned activities with FY2010 funding are as follows:

1. In-country PMI staff will continue to provide administrative support to the NMCP in the monthly meetings of the Malaria Partners' Forum, made up of representatives of the NMCP, WHO, UNICEF, UNDP/Global Fund, private sector, NGOs/FBOs, and PMI. The Forum will continue to develop and strengthen regarding malaria surveillance and monitoring and evaluation, diagnosis and treatment, malaria in pregnancy, issues surrounding vector control as well as BCC (no additional cost to PMI); and

2. Support the Partners' Forum to hire a part-time administrative assistant, facilitating improved communication between partners, dissemination of minutes, etc ($35,000).

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:

Since 2006, ExxonMobil has contributed $1 million each year to support PMI objectives in Angola. In 2006, these funds were used to support social marketing of ITNs, IEC to promote increased demand for and correct usage of ITNs and the roll out of ACTs and IPTp, and drug distribution and pharmaceutical drug management. ExxonMobil 2007 funds were 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 four NGOs/FBOs that were working in five provinces; namely, Huambo, Kwanza Sul, Kwanza Norte, Malange, and Zaire where the government health infrastructure is still weak. The results of this effort have been very positive. The NGOs are coordinating closely with provincial authorities, provincial NPOs and Malaria Supervisors. ExxonMobil 2008 funds, which became available in early 2009, are being used, together with PMI funding, to continue to support implementation of ACTs, IPTp, and ITNs in nine provinces; Huila, Benguela, Huambo, Kwanza Sul, Kwanza Norte, Lunda Norte, Uige, Malange and Zaire Provinces.

Planned FY2010 PMI activities: (No additional cost to PMI)

If ExxonMobil funding is available in 2009, it will be used as in 2008 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

Monitoring and evaluation strategies measure progress against project goals and targets to identify problems in program implementation, providing information to support program modifications. This is a critical component of malaria control and is given high priority within PMI. 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 50% and achieving 85% coverage targets with specific interventions over the course of the program. 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 and malaria-specific mortality in children under five (collected through verbal autopsies) will be interpreted together with data on anemia, parasitemia, available information on malaria cases and deaths reported from sentinel health facilities, 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 of 2,600, the confidence intervals around the estimate of malaria-specific mortality are very large.

The National Institute of Statistics started a third MICS in May 2008, supported by UNICEF and PMI. This survey is being added to a larger World Bank-supported household income and expenditure survey. It is being conducted in four separate sessions over a 12-month period with 3,000 households visited in each session/quarter (a total of 12,000 households), which will allow provincial-level analyses. Because of the very large number of questions, each household will be visited on four successive days for one hour to cover all questions. The full malaria module of the MICS is included in the survey instrument and this will provide mid-point coverage data for PMI on ITNs, IPTp, and ACTs. The malaria questions are spread out over the four daily visits of

each quarterly survey. Most malaria questions are included in the first day's interview; IPTp during the second interview; and ITN ownership in the fourth day's interview. The 2008 MICS will also provide an estimation of all-cause mortality rates for the five year period from 2003-2007. The final results of this survey are expected to be made available by the end of 2009.

PMI has provided funding to four NGOs (World Vision, Africare, MENTOR, and Consaude) to collect data on malaria morbidity and mortality in the four provinces in which they are working. These sentinel sites have been collecting aggregated data since June 2008. PMI-supported NGOs provide local supervision and a USAID Mission bilateral project provides ongoing training and overall oversight for data management to the sentinel site staff and generates monthly reports which are transmitted to partners, including PMI. Using the sentinel site data, the health facilities and supervisory NGOs have been able to detect stock outs and potential stock outs of medications and diagnostic supplies and remedy those problems. Routine data quality revealed problems with the parasitologic confirmation of diagnoses, necessitating additional training. The data will also be used by the NMCP to further monitor trends in malaria burden from these sites.

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.

Planned FY2010 PMI activities: ($3,162,500)

The nationwide survey at the end of five years of PMI work in Angola will take place in late 2010 or 2011. It is not known at this time whether or not a DHS survey will take place about that time, but if this occurs, PMI would support verbal autopsies of under five deaths identified during that survey. Alternatively, PMI will support an MIS with an expanded sample size in 2010 or 2011 to allow estimation of both all-cause under-five mortality.

Planned activities with FY2010 funding are as follows:

1. Support to an MIS (or DHS) in 2010/2011 with an expanded sample size or a DHS with verbal autopsy, which will provide information on both all-cause mortality and malaria-related mortality for children under-five ($3,000,000);

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

3. Contribute to a five-year assessment of the national health system ($50,000); and

4. Technical assistance for the MIS/DHS and for routine monitoring and evaluation with the objective of strengthening the capacity of the NMCP ($12,500).

STAFFING AND ADMINISTRATION

Planned FY2010 PMI activities: ($2,200,000)

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 most 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/her 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 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

Table 1

President's Malaria Initiative — Angola
Year 5 (FY10) Timeline of Activities

ACTIVITY	2009			2010								
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Initiate procurement of commodities (AL, ITNs, and RDTs)												
Announce/award NGO/FBO grants												
Distribution of subsidized and full-cost ITNs in urban areas												
IRS campaign in Huila and Huambo Provinces												
National Multiple Indicator Cluster Survey												
Build in-country insecticide resistance testing capability; evaluate duration of insecticides on traditional surfaces												
Strengthen MOH antimalarial drug management system												
Improve diagnostic capabilities of MOH laboratory staff												

Table 2
President's Malaria Initiative — Angola Planned Obligations for FY10 ($)

Planned Activity	Mechanism	Budget (*commodities)*	Geographic Area	Description of Activity	Relation to Interventions
PREVENTIVE ACTIVITIES					
Procurement of LLINs for routine distribution via ANC and EPI	Grant to UNICEF	4,000,000 *(3,070,000)*	Nationwide	Purchase/distribution of 384,000 LLINs to pregnant women/children <5 through clinics, outreach programs, child health days, routine distribution, including BCC/IEC and tracking	ITNs
Procurement and distribution of LLINs for rapid scale-up with municipal campaigns	DELIVER/NGOs	7,355,000 *(5,640,000)*	9 provinces with PMI-funded NGOs	Purchase/distribution of 706,000 LLINs for increased population coverage	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 implementation of three-province study to gather data on LLIN longevity and durability; also provide technical assistance with evaluation	ITNs
Indoor residual spraying	IRS IQC Global Task Order	5,000,000 *(2,500,000)*	Huila, Huambo, and Cunene Provinces	Procurement of insecticide, spray equipment/supplies to spray 160,000 households; 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	Luanda, Huila, Huambo & Cunene Provinces	Technical assistance visit for entomologic monitoring & resistance testing in NMCP; includes support for specific reagents and other laboratory diagnostic materials	IRS
SUBTOTAL: Preventive Activities		***16,942,500 (11,210,000)***			
CASE MANAGEMENT ACTIVITIES					
Procurement of microscopes/laboratory supplies	DELIVER	300,000 *(300,000)*	Nationwide	Procurement of laboratory diagnostic equipment, reagents and supplies including 25 microscopes	Case management
Procurement of RDTs	DELIVER	360,000 *(360,000)*	Nationwide	Procure 600,000 RDTs	Case management
Facilitate training, supervision and quality control of malaria laboratory diagnosis	World Learning	300,000	Nationwide	Facilitate technical assistance by National Institute for Public Health on quality control of laboratory diagnosis (microscopy and RDTs)	Case management
Technical support for laboratory training	CDC	50,000 (CDC TDYs)	Nationwide	Providing assistance to in-country partners in the correct use of laboratory diagnostic test results	Diagnosis and treatment
Procurement of artemether-lumefantrine for public sector and private sector pilot	DELIVER	4,825,000 *(4,825,000)*	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 for import/clearance, distribution and management of ACTs	DELIVER	150,000	Nationwide	Provide assistance in clearance and initial distribution from port of entry through central medical stores	ACTs
Continue pilot implementation of ACTs in private sector	Mentor	150,000	Huambo	Final year for pilot of artemether-lumefantrine in private sector with possible expansion to additional municipalities	Case management
Strengthen Ministry of Health antimalarial drug management system	SPS	600,000	Nationwide	Strengthen pharmaceutical mgmt. related to antimalarial drugs including regular supervision, Provincial training of pharmacists, assist with printing case management documents	ACTs
Support to NGOs/FBOs	Sub-grant to NGOs/FBOs through World Learning	4,325,000	8 provinces	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
SUBTOTAL: Case Management		**11,060,000** ***(5,485,000)***			
OTHER ACTIVITIES					
Facilitate improved case management through training in collaboration with NMCP	SES	1,200,000	Luanda, Lunda Norte and Cunene Provinces	Implement ACTs in areas of Lunda Norte and Cunene not currently served by MoH together with IEC/BCC related to ACTs, ITNS, and IPTp. Promote correct use of laboratory diagnostic test results and rational administration of antimalarial drugs to patients in	Diagnosis and treatment

Planned Activity	Mechanism	Budget (*commodities)*	Geographic Area	Description of Activity	Relation to Interventions
				Luanda	
Epidemic preparedness and response	WHO	500,000	Huila, Cunene, Namibe, Kwando Kubango Provinces	In collaboration with the RTI, continue to develop/establish an early warning system and build provincial capacity to respond to malaria epidemics, stockpile of insecticides, ACTs, and RDTs to respond to epidemics	Epidemic response
Malaria Partners' Forum	TBD	35,000	Nationwide	Continued administrative support for secretariat of Malaria Partners' Forum	Coordination of malaria partners
Health systems assessment	USAID	50,000	Nationwide	PMI-contribution to a USAID-supported comprehensive five-year health system assessment	M&E
Facilitation of provincial level supervision by NMCP through NGOs	TBD	400,000	Nationwide	Strengthen NMCP capacity to supervise malaria activities at provincial level	Case management
SUBTOTAL: Other Activities		**2,185,000**			
MONITORING AND EVALUATION					
Malaria Indicator Survey 2010	ORC Macro	3,000,000	Nationwide	Initial planning for 2010 MIS with expanded sample size	M&E
End-use verification	SPS	100,000	Nationwide	Quarterly monitoring of commodity availability and use at health facility level	M&E

Planned Activity	Mechanism	Budget (*commodities)*	Geographic Area	Description of Activity	Relation to Interventions
Technical assistance for routine monitoring and evaluation	CDC	12,500 (CDC TDY)	Nationwide	Routine monitoring and evaluation to strengthen capacity of NMCP and INSP	M&E
SUBTOTAL: Monitoring and Evaluation		**3,112,500**			
IN-COUNTRY MANAGEMENT AND ADMINISTRATION					
In-country staff; administrative expenses	CDC/USAID	2,200,000	Nationwide	Staffing and general administrative support for PMI	All interventions
SUBTOTAL: Management/Admin.		**2,200,000**			
GRAND TOTAL		**35,500,000** ***(16,695,000)***	***Commodities represent 47% of total budget***		

Table 3

President's Malaria Initiative — Angola
Year 5 (FY10) Estimated Budget Breakdown by Intervention

Area	Commodities		Other		Total	
	$	%	$	%	$	% of Total
Insecticide-treated nets	8,710,000	73	3,195,000	27	11,905,000	34
Indoor residual spraying	2,500,000	50	2,537,500	50	5,037,500	14
Case management	5,485,000	57	4,147,750	43	9,632,750	27
Intermittent preventive treatment of pregnant women	0	0	1,823,250	100	1,823,250	5
Monitoring and evaluation	0	0	3,112,500	100	3,112,500	9
Epidemic detection and response	0	0	500,000	100	500,000	1
Other activities	0	0	1,289,000	100	1,289,000	4
Staffing and administration	0	0	2,200,000	100	2,200,000	6
Total	**16,695,000**	47	**18,805,000**	53	**35,500,000**	100

Table 4
Year 5 (FY10) Budget Breakdown by Partner*

Partner Organization	Geographic Area	Activity	Budget
UNICEF	Nationwide	Procurement and distribution of LLINs	4,000,000
DELIVER	Nationwide	Procurement of diagnostic equipment and supplies, RDTs, AL and LLINs, including LLINS distribution	5,635,000
DELIVER/NGOs	Nationwide	Procurement and distribution of LLINs through NGOs	7,355,000
IRS IQC Global Task Order	Huila, Huambo, Cunene Provinces	IRS, entomologic surveillance and insecticide monitoring	5,000,000
World Learning — sub-grants to NGOs/FBOs	8 provinces, nationwide	ACT and IPTp implementation in underserved areas, including BCC/IEC; also quality assurance for laboratory diagnostics; also facilitate training, supervision and quality control of malaria diagnostics; also includes continuation of ACT private sector pilot	4,625,000
Strengthening Pharmaceutical Systems	Nationwide	Strengthening MOH drug management system and implement end-use verification	700,000
TBD	Nationwide	Facilitate NMCP supervisory capacity building at provincial level through NGOs	400,000
USAID	Nationwide	Contribution for five-year evaluation for health system assessment project	50,000
ORC Macro	Nationwide	MICS survey with expanded sample size	3,000,000
TBD	Nationwide	Oversight of Malaria Partners' Forum	35,000
TBD	Nationwide	Integrated IEC/BCC related to ITNs	500,000
Mentor	Huambo	Final year for implementation of ACTs private sector pilot with possible expansion to additional municipalities	150,000
SES	Luanda, Lunda Norte, Cunene Provinces	a) ACT and IPTp implementation in areas not currently served by MoH, including IEC/activities (Lunda Norte, Cunene) b) Promote correct use of laboratory diagnostic test results and rational use of antimalarials (Luanda)	1,200,000
WHO	Huila, Cunene, Namibe, Cwando Cubango	Strengthen epidemic preparedness and response through development of MEWS, stockpile of insecticides, ACTs and RDTs	500,000

*Does not include budget for staffing/administration of $2,200,000 or $150,000 for CDC temporary duty (TDY)