



**USAID**  
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THE PRESIDENT'S MALARIA INITIATIVE  
**SAVING THE LIVES OF MOTHERS  
AND CHILDREN IN AFRICA**

FIRST ANNUAL REPORT  
MARCH 2007





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Cover photo:

A mother and her two children, one of whom has a fever she suspects is due to malaria, sit in front of a health clinic in Rufiji district, Tanzania. PMI is providing lifesaving artemisinin-combination drugs to clinics in this district to treat malaria cases promptly and effectively.

Credit: USAID / Karie Atkinson

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# ABBREVIATIONS AND ACRONYMS

<b>ACT</b>	Artemisinin-based combination therapy
<b>ADDO</b>	Accredited drug dispensing outlet
<b>CDC</b>	Centers for Disease Control and Prevention
<b>CHW</b>	Community health worker
<b>DHS</b>	Demographic and Health Survey
<b>DSS</b>	Demographic Surveillance System
<b>FANC</b>	Focused antenatal care
<b>FY</b>	Fiscal year
<b>GFATM</b>	The Global Fund to Fight AIDS, Tuberculosis, and Malaria
<b>HHS</b>	United States Department of Health and Human Services
<b>HIV/AIDS</b>	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
<b>IDP</b>	Internally-displaced persons
<b>IPTp</b>	Intermittent preventive treatment for pregnant women
<b>IRS</b>	Indoor residual spraying
<b>ITN</b>	Insecticide-treated mosquito net
<b>MCP</b>	Malaria Communities Program
<b>MEDA</b>	Mennonite Economic Development Associates
<b>MoH</b>	Ministry of Health
<b>NGO</b>	Non-governmental organization
<b>NMCP</b>	National malaria control program
<b>PEPFAR</b>	President's Emergency Plan for AIDS Relief
<b>PMI</b>	President's Malaria Initiative
<b>RDT</b>	Rapid diagnostic test
<b>SP</b>	Sulfadoxine-pyrimethamine
<b>UNHCR</b>	United Nations High Commissioner for Refugees
<b>UNICEF</b>	United Nations Children's Fund
<b>USAID</b>	United States Agency for International Development
<b>WHO</b>	World Health Organization



# THE PRESIDENT'S MALARIA INITIATIVE

*“The toll of malaria is even more tragic because the disease itself is highly treatable and preventable. Yet this is also our opportunity because we know that large-scale action can defeat this disease in whole regions. And the world must take action.”* – President George W. Bush, June 30, 2005



USAID / KARIE ATKINSON

Nineteen-year-old Sikiri Mchorike with her sixteen-month-old daughter, in Tanzania's Rufiji district. Pregnant mothers and children are the groups most vulnerable to malaria. The PMI focuses on reaching these two target groups with lifesaving drugs and insecticide-treated mosquito nets.



# EXECUTIVE SUMMARY AND BACKGROUND

## THE PRESIDENT'S MALARIA INITIATIVE AT A GLANCE

### Goal

- Reduce the number of deaths caused by malaria by 50 percent in 15 African countries by 2010.

### Four Key Interventions

- Insecticide-treated mosquito nets
- Indoor residual spraying with insecticides
- Intermittent preventive treatment for pregnant women
- Artemisinin-based combination therapies

### Timeline and Budget

- Year 1: \$30 million in funding for 3 countries
- Year 2: \$135 million in funding for 7 countries
- Year 3: \$300 million in funding for 15 countries
- Year 4: \$300 million in funding for 15 countries
- Year 5: \$500 million in funding for 15 countries

## Accelerating the Fight Against Malaria

Each year, an estimated 300 to 500 million people become ill with malaria worldwide and more than one million die. Of these deaths, 85 percent occur in sub-Saharan Africa. For children in Africa, malaria is a leading cause of death. It also accounts for approximately 40 percent of public health expenditures in Africa and is estimated to cause an annual loss of \$12 billion from the continent's gross domestic product.

In spite of these grim statistics, malaria is a preventable and treatable disease. At a meeting in Abuja, Nigeria, in 2000, African heads of state made a pledge to significantly scale up malaria control efforts in their countries. Since that time, the international community has responded by increasing global advocacy and funding for malaria control in sub-Saharan Africa through the Roll Back Malaria Partnership, The Global Fund to Fight AIDS, Tuberculosis, and Malaria (GFATM), The World Bank Malaria Booster Program, and private donors, such as the Bill and Melinda Gates Foundation. In June 2005, President George W. Bush, recognizing the critical need for greater international efforts to reduce the burden of malaria across Africa, announced the President's Malaria Initiative (PMI).

## Goals of the Initiative

The PMI represents an historic five-year expansion of U.S. Government resources to fight malaria in the region most affected by the disease. The President committed an additional \$1.2 billion in malaria funding to this Initiative and set two ambitious goals for PMI focus countries:

- Reduce the estimated number of deaths caused by malaria by 50 percent; and
- Reach 85 percent of those most vulnerable to malaria – children under five years of age and pregnant women – with a package of four proven and highly effective prevention and treatment measures.

## Structure of PMI

The PMI is an interagency initiative led by the U.S. Agency for International Development (USAID) and implemented together with the Centers for Disease Control and Prevention (CDC) of the Department of Health and Human Services (HHS). It is overseen by a PMI Coordinator and an Interagency Steering Group made up of representatives of USAID, CDC, Department of State, Department of Defense, National Security Council, and Office of Management and Budget.



Dr. Ngajilo, a clinical officer at Kibiti Health Center in Tanzania's Rufiji District, explains to 17-year-old Stamili Rutta how to give ACTs to her ten-month-old son Moja Mohammed.

USAID / KARI ATKINSON

## PMI RESULTS AT A GLANCE

### Angola

- 540,949 long-lasting insecticide-treated nets distributed in seven provinces at high risk of malaria.
- 107,373 houses sprayed with insecticide, and 590,398 people protected in epidemic-prone provinces.
- 1,450 health workers trained in intermittent preventive treatment for pregnant women.
- 587,520 artemisinin-based combination therapy treatments procured and being distributed.
- 129,875 rapid diagnostic tests procured for use in health facilities in nine districts.
- 1,283 health unit staff trained on use of artemisinin-based combination therapy.

### Tanzania

- 130,000 free long-lasting insecticide-treated nets distributed through local health clinics.
- 13,894 of 382,900 infant vouchers distributed have been redeemed for insecticide-treated mosquito nets in just over one month.
- 203,754 houses sprayed with insecticide, and 1,018,156 people protected on Zanzibar.
- 376 health workers trained in intermittent preventive treatment for pregnant women.
- 380,160 artemisinin-based combination therapy treatments procured and distributed to refugees in camps of northwestern Tanzania and residents of Rufiji District.
- 875,000 rapid diagnostic tests procured for use on the mainland and Zanzibar.
- 4,217 health workers trained on use of artemisinin-based combination therapy. Together with health workers trained by other partners, all 121 districts now have government health staff trained in the use of artemisinin-based combination therapy.
- An estimated 128,000 people benefited from larviciding of mosquito breeding sites.

### Uganda

- 305,305 free long-lasting insecticide-treated mosquito nets distributed through clinics and internally-displaced persons camps.
- 505,573 nets retreated with insecticide in 29 districts.
- 103,329 houses sprayed with insecticide, and 488,502 people protected in Kabale District.
- 168 health workers trained in intermittent preventive treatment for pregnant women in 11 districts.
- 261,870 artemisinin-based combination therapy treatments procured, of which 87% have been distributed to health facilities.
- 2,844 health workers trained on use of artemisinin-based combination therapy in 16 out of 80 districts in the country.

**YEAR 1 BUDGET: \$30 million (FY06) and \$4.25 million (FY05)**

### Country Selection

Focus countries were selected and approved by the Interagency Steering Group using the following criteria:

- High malaria disease burden;
- National malaria control policies consistent with the internationally accepted standards of the World Health Organization (WHO);
- Capacity to implement such policies;
- Willingness to partner with the United States to fight malaria; and
- Involvement of other international donors and partners in national malaria control efforts.

### Scaling Up PMI Activities

The PMI began with a budget of \$30 million in Fiscal Year (FY) 2006, which was supplemented by \$4.25 million in reprogrammed FY05 funds. With Congressional approval, the PMI budget will grow to \$500 million in FY2010. The PMI supports four proven and highly effective malaria prevention and treatment measures, which it tailors according to local patterns of disease, malaria control plans, and capacities:

- Insecticide-treated mosquito nets (ITNs);
- Indoor residual spraying (IRS) with insecticides;
- Intermittent preventive treatment for pregnant women (IPTp); and
- Artemisinin-based combination therapy (ACT)

Year	Fiscal Year	Budget	Focus Countries
Year 1	2006	\$30 million	Angola, Tanzania, Uganda
Year 2	2007	\$135 million	Malawi, Mozambique, Rwanda, Senegal (in addition to Year 1 countries)
Year 3	2008	\$300 million	Benin, Ethiopia (Oromiya), Ghana, Kenya, Liberia, Madagascar, Mali, and Zambia (in addition to Year 1 and Year 2 countries)
Year 4	2009	\$300 million	All 15 PMI countries
Year 5	2010	\$500 million	All 15 PMI countries
<b>TOTAL: \$1.265 billion</b>			

### Specific Targets

The PMI has a single set of country-level targets for the four major control measures. These targets are the same for each focus country, and they apply to the populations most vulnerable to malaria – children under age five and pregnant women:

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

### The PMI Approach

The PMI is organized around four operational principles based on lessons learned from over 50 years of U.S. Government efforts in fighting malaria, together with experience gained from implementation of the President's Emergency Plan for AIDS Relief (PEPFAR), which began in 2003. The PMI approach involves:

- Use of a comprehensive, integrated package of four proven prevention and treatment interventions;
- Significantly-increased spending on procurement of lifesaving commodities, such as antimalarial drugs and insecticides for IRS;
- Commitment to strengthen national malaria control programs and to build capacity for eventual country ownership of malaria control efforts; and
- Close coordination with international and in-country partners.

The PMI works within the overall strategy and plan of the host country's national malaria control program (NMCP). Planning and implementation of PMI activities are coordinated closely with each ministry of health. The PMI intends to strengthen in-country capacity so that gains achieved with U.S. Government and other donor support are sustainable.

### Partnerships

Partnerships are at the heart of PMI's strategy. The PMI works closely with multilateral organizations, such as WHO, the Roll Back Malaria Partnership, The GFATM, The World Bank, the United Nations Children's Fund



Spraying the inside walls of homes is a highly effective method to prevent malaria. In Zanzibar, PMI has trained 452 spray operators, such as the one shown practicing here.

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(UNICEF), and with the private sector, including ExxonMobil, and Malaria No More. The participation of non-governmental, faith-based, and community-based organizations with their strong community ties and ability to deliver services to people in remote areas where the formal health system is weak is also crucial to the success of PMI.

### Achieving Results

The PMI is off to a very rapid start. Within six weeks of the President's announcement, PMI had fielded needs assessment teams to all three first-year countries. Within six months, high-impact activities were under way in Angola and Tanzania, and a month later in Uganda.

During the first nine months of the Initiative, PMI supported highly-successful indoor residual spraying campaigns in all first-year countries. These campaigns protected more than two million people and were the first wide-scale spraying programs in these countries in decades.

*“We have the knowledge and the technology to prevent infections and to effectively treat people who have malaria. With this knowledge comes the obligation to act.”*

*– Mrs. Laura Bush, First Lady, August 14, 2005*

In all three countries, PMI has significantly expanded ITN programs and is working to accelerate the transition from regular ITNs to long-lasting nets, which do not require periodic re-treatment. In both Angola and Uganda, private sector providers of ITNs have been supported and strengthened, contributing to sales of more than 600,000 ITNs to those who can afford to pay. In Uganda, PMI supported a campaign that resulted in free re-treatment with insecticide of more than 500,000 existing nets. In total, PMI has procured and supported the distribution of approximately one million ITNs in its first year. In addition, PMI's support for the Angola ITN campaign helped attract contributions of about 400,000 additional ITNs from other donors.

Artemisinin-based combination therapies have already been procured and delivered to all three countries, making this highly effective treatment available to vulnerable populations. The PMI is providing both microscopes and rapid diagnostic tests in all countries to improve the accuracy of malaria diagnosis. To prevent malaria in



Insecticide-treated nets are an essential tool to protect women and their children from malaria.

pregnant women and reduce the incidence of life-threatening low birth weight among newborns, PMI has supported IPTp. In total, more than 10,000 health providers have already been trained in these critical interventions with PMI support.

Highlights of the activities carried out during the first year of PMI in the three countries include:

**Angola:** Beginning in December 2005 in Angola, the PMI supported a spraying campaign in epidemic-prone southern provinces, which included training 350 locally hired spray personnel and protected more than 590,000 people. In addition, PMI provided technical assistance and commodity support to a complementary GFATM-supported spraying program that protected an additional 176,000 people. In July 2006, PMI, in conjunction with the Government of Angola, The GFATM, the Measles partnership, ExxonMobil Foundation, and other donors, supported the free distribution of 826,000 long-lasting ITNs (420,000 contributed by PMI) in seven provinces at high risk of malaria. An additional 120,000 long-lasting nets were sold at subsidized prices to urban residents who had the ability to pay. With support from both The GFATM and PMI, ACTs are now used for the treatment of malaria in health facilities in two provinces.

**Tanzania:** In Tanzania, beginning in mid-December 2005, PMI distributed 130,000 free long-lasting ITNs (233,000 total with contributions by the GFATM) through local health clinics, more than doubling existing ITN ownership rates among pregnant women and children under age five on Zanzibar and Pemba Islands.



Early results of the malaria-control interventions (long-lasting ITN distribution and earlier GFATM provision of ACTs) were dramatic. According to local health reports, the number of laboratory-confirmed malaria cases on Pemba Island dropped 87 percent (from 12,531 to 1,570) between January and September 2006 when compared with the same period the preceding year. Also in Zanzibar, PMI supported an indoor residual spraying campaign that benefited more than one million people. On the mainland, larviciding of mosquito breeding sites in Dar es Salaam is benefiting an estimated 128,000 people, and more than 380,000 ACT treatments have been procured and have arrived in-country.

**Uganda:** To address the alarming rates of malaria mortality in internally-displaced person (IDP) camps in northern Uganda, PMI distributed over 300,000 free long-lasting ITNs to children and pregnant women. In addition, PMI is helping private net producers expand their markets, and more than 500,000 ITNs have been sold to those who can afford to pay. The PMI also procured and began distributing 261,870 pediatric ACT treatments as part of community-based distribution in northern Uganda. In August 2006, PMI completed a spraying campaign in southwestern Uganda that benefited 488,000 people and trained more than 400 sprayers and supervisors who will be capable of implementing future programs. Finally, PMI completed a program that retreated over 500,000 conventional nets with insecticide.

## Looking Forward

The PMI's second year of implementation has begun. Activities are already under way in the four new FY07 countries, and planning missions have begun in several of the eight newly announced FY08 countries. During this year, we intend to address major existing challenges:

- The need for a rapid scale-up of ACT distribution and appropriate use of these drugs in countries with historically weak national pharmaceutical management systems;
- The need to strengthen monitoring and evaluation systems for malaria so that national malaria control programs and partners can monitor the progress of their activities, make adjustments, and report on their results; and
- The need to translate high ITN ownership into high net usage.

The PMI is helping to change attitudes toward malaria control. No more a “fact of life” or an “intractable problem” in sub-Saharan Africa, malaria can be beaten back with a concerted effort from all partners.



USAID / KARE ATKINSON

Jennifer Naya, who is pregnant with her fourth child, receives a free ITN and a dose of sulfadoxine-pyrimethamine (SP) to prevent her from getting malaria, together with counseling about HIV/AIDS.



# CHAPTER 1

*“Malaria is one of the greatest threats to human health and economic welfare on earth.”*

– Ambassador Randall L. Tobias, Director of U.S. Foreign Assistance and USAID Administrator, June 8, 2006



Children under five, such as the Angolan children pictured here, are among those most vulnerable to malaria.

ORC MACRO / ALFREDO FORT

# THE GLOBAL CHALLENGE OF MALARIA

## MALARIA AT A GLANCE

- Each year, an estimated 300 to 500 million people become ill with malaria, and more than one million die.
- Every 30 seconds, an African child dies of malaria.
- More than 80 percent of the world's malaria deaths occur in sub-Saharan Africa.
- Malaria is a leading cause of death of children in Africa.
- Malaria accounts for approximately 40 percent of public health expenditures in Africa.
- Malaria is a preventable, treatable disease.

## Malaria Transmission and Infection

Malaria is a blood-borne infection transmitted to human beings by the bite of female *Anopheles* mosquitoes that carry the malaria parasite. The initial symptoms of a malaria infection include fever, chills, and flu-like illness. The malaria parasite infects and destroys red blood cells, and if left untreated can result in anemia, lung and kidney failure, coma, and death.

Malaria is typically found in warmer regions of the world, such as sub-Saharan Africa, because both the mosquito and the malaria parasite it carries thrive in tropical and subtropical climates. Four types of malaria parasites infect humans. In sub-Saharan Africa, the majority of infections are caused by *Plasmodium falciparum*. This species of parasite is responsible for the most severe form of the disease and for the majority of deaths worldwide. While the infection is treatable with effective antimalarial medications, the emergence of widespread parasite resistance to traditional antimalarial drugs, such as chloroquine, has become a global challenge to malaria control.

## Social and Economic Impact

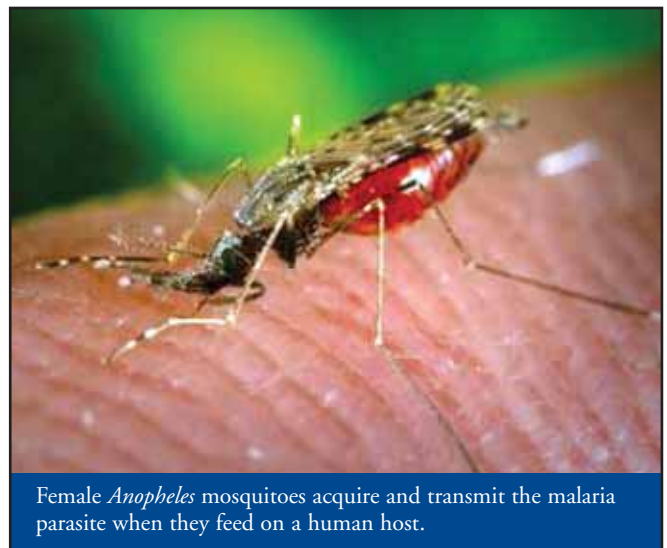
Approximately 3.2 billion people worldwide live in areas at risk of malaria transmission. Each year, an estimated 300 to 500 million of them become ill with malaria, and more than one million die. More than 80 percent of these deaths occur in sub-Saharan Africa. Figure 1.1 shows the distribution of malaria in Africa. While all persons living in areas where malaria is transmitted are at risk of becoming infected, three populations are particu-

larly vulnerable – children under five years of age, pregnant women, and people infected with HIV/AIDS. Malaria is one of the leading causes of death among children in Africa, accounting for approximately 18 percent of deaths in children under five.

Malaria and poverty are closely linked. Economists estimate that malaria accounts for approximately 40 percent of public health expenditures in Africa and causes an annual loss of \$12 billion, or 1.3 percent, of the continent's total gross domestic product. Although malaria eradication efforts during the 1950s and 1960s successfully eliminated or controlled the disease in many areas, malaria remains a major killer in Africa due to a combination of biologic, economic, and political factors. The sub-Saharan climate provides ideal conditions for the malaria parasite and mosquito vector, while poverty and political instability have repeatedly created obstacles to successful malaria control in many African countries.

## Prevention and Treatment Interventions

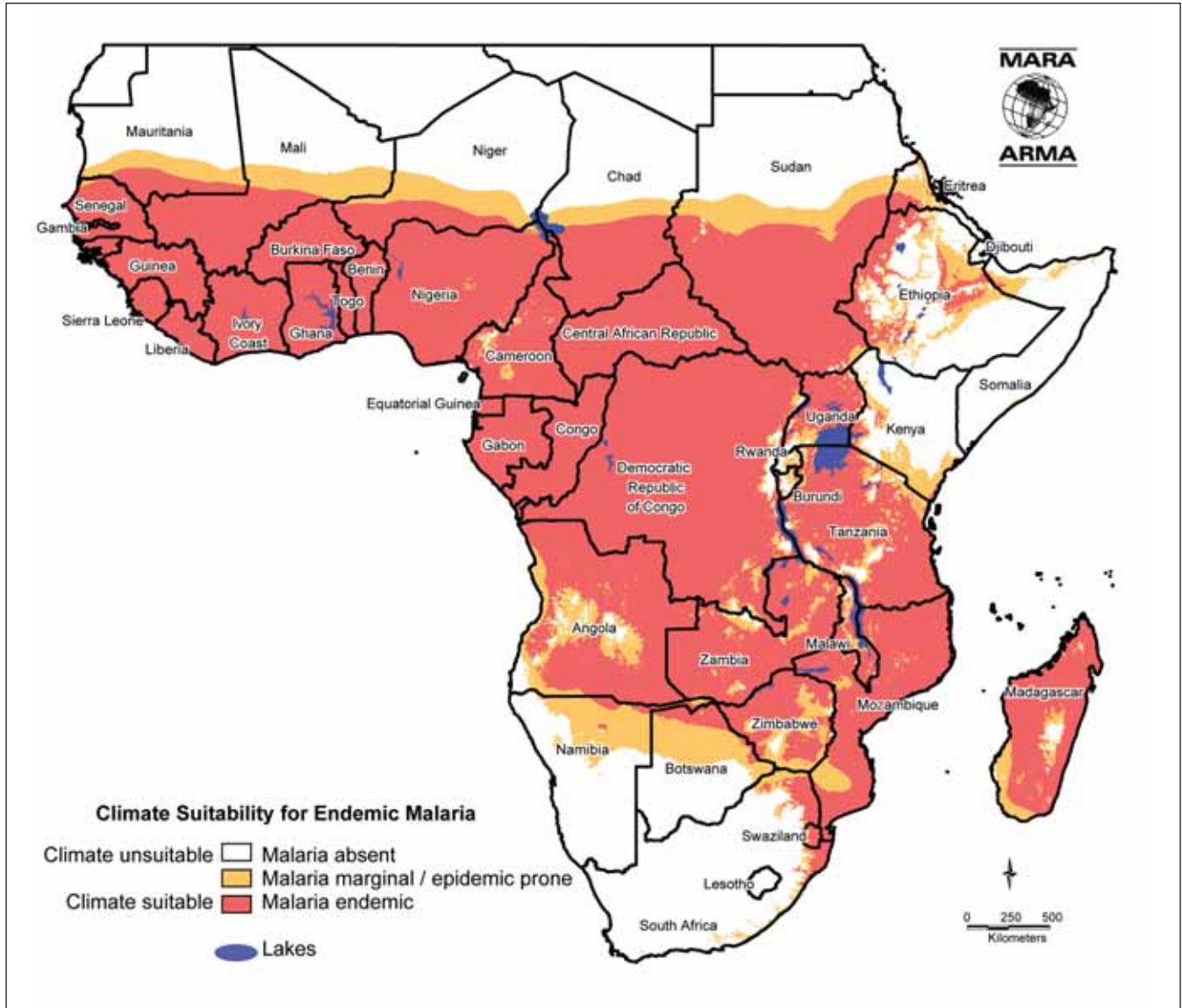
Malaria is both preventable and treatable. While a malaria vaccine is not yet available, several proven and cost-effective prevention and treatment measures exist. These include insecticide-treated mosquito nets, indoor residual spraying of insecticides in homes, intermittent preventive treatment of pregnant women with an anti-



Female *Anopheles* mosquitoes acquire and transmit the malaria parasite when they feed on a human host.



Figure 1.1: Distribution of Endemic Malaria in Africa



malarial drug, and prompt use of artemisinin-based combination therapies for those who have malaria.

The appropriate mix of prevention and treatment interventions varies according to local conditions, including:

- Pattern of malaria disease transmission;
- Mosquito resistance to insecticides and parasite resistance to antimalarial drugs;
- Age and pregnancy status of infected persons; and
- Operational feasibility and sustainability.

### An “Urgent Calling”

First Lady Laura Bush described the defeat of malaria as an “urgent calling,” made even more pressing by the fact that the disease can be prevented. Malaria casts a shadow not only over health, but also educational attainment, worker productivity, and economic investment in sub-Saharan Africa. International development experts agree that malaria control is critical to the continued development of this region. Recognizing the grave threat presented by malaria in sub-Saharan Africa, and in anticipation of the 2005 G8 Summit, President Bush announced the President’s Malaria Initiative, a five-year, \$1.2 billion initiative to cut malaria mortality by 50 percent in 15 African countries with a high burden of malaria.



# CHAPTER 2

*“The PMI is about saving lives – the lives of pregnant women and the lives of young children. With the support of the American people, the PMI is reaching pregnant women with lifesaving drugs and insecticide-treated nets – two key interventions in our fight against malaria”* – Rear Admiral R.T. Ziemer USN (ret), Coordinator, President’s Malaria Initiative, December 27, 2006



The PMI has trained hundreds of spray operators to conduct IRS campaigns, including this team in Tanzania.

USAID / TANZANIA



# MALARIA CONTROL INTERVENTIONS

## INSECTICIDE-TREATED MOSQUITO NETS

### Background

Insecticide-treated mosquito nets (ITNs) are one of three proven malaria prevention measures used by PMI. In Africa, malaria-carrying mosquitoes typically bite late at night or in the early morning hours. A net hung over the bed prevents mosquitoes from biting. When that net is treated with insecticide, it provides much greater protection by repelling and killing any mosquitoes that land on it. ITNs come in a variety of shapes, colors, and sizes to suit local tastes and needs. The insecticides used to treat the nets have been approved for safety and efficacy by the World Health Organization (WHO).

The price of a bed net in local markets of PMI countries varies between \$4 and \$7 dollars. ITNs typically require re-treatment with insecticide about every six months to maintain their effectiveness. By comparison, nets made with a wash-resistant insecticide preparation (long-lasting ITNs) are a recent and promising development in net technology, since they do not require owners to re-treat them on a regular basis. These long-lasting ITNs maintain their full protective effect through a minimum of 20 washes, which translates into protection for three to four years or the lifetime of the net. Whenever possible, PMI purchases long-lasting ITNs rather than the conventional ITNs or re-treatment kits because experience has shown that re-treatment rates are often quite low.

ITNs have been shown to reduce all-cause mortality in children under five by about 20 percent and malarial illnesses among children under five and pregnant women by up to 50 percent.<sup>1</sup> When 80 percent or more of residents in a village use an ITN, even those not sleeping under a mosquito net benefit from the protective effect. A 2003 evaluation of interventions to prevent child mortality estimated that insecticide-treated materials ranked second, after breastfeeding, in terms of the number of childhood deaths they could prevent.<sup>2</sup>

### Scaling Up ITN Use

Insecticide-treated nets represent a relatively simple and low-cost means of preventing malaria, and PMI has focused on scaling-up ITN coverage in all three countries (see Appendix for details). While ITN activities were



tailored to the local conditions and capacities of each country, the following principles and best practices were common to the ITN strategy employed by PMI:

- Targeting children under five and pregnant women, the populations most vulnerable to the severe effects of malaria;
- Supporting a market segmentation approach for ITN distribution, with provision of free ITNs to the poorest and most vulnerable groups while working to increase access to low-cost or subsidized nets for those who can afford them. The goal is to increase the availability, affordability, and demand for ITNs through equitable, sustainable market segmentation;
- Building upon existing ITN activities of ministries of health, donor partners, non-governmental and faith-based organizations, and the commercial sector. In Angola, for example, PMI distributed long-lasting ITNs through a nationwide measles vaccination campaign;
- Whenever possible, procuring and distributing long-lasting ITNs, rather than conventional ITNs, which require re-treatment at periodic intervals;

<sup>1</sup> Lengeler C, Insecticide-treated bednets and curtains for preventing malaria (Cochrane Review), The Cochrane Library, Issue 2 (2002).

<sup>2</sup> Jones G et al. How many child deaths can we prevent this year? The Lancet (2003) 362: 65-71.

- Building host government and commercial sector capacity in ITN logistics and regional supply chain management, to make distribution of nets easier and more cost-effective; and
- Educating owners of ITNs on how to use and care for them properly and why they are important for the prevention of malaria.

## INDOOR RESIDUAL SPRAYING

### Background

Indoor residual spraying (IRS) is a proven and highly effective malaria control measure. During the 1950s and 1960s, IRS, together with improved standards of living, helped eliminate or control malaria in many areas. IRS involves the coordinated, timely spraying of the interior walls of a home with small amounts of insecticides, which kill mosquitoes when they enter the home and rest on walls. The protection provided by spraying lasts from about four to ten months, depending on the insecticide used and the wall surface.

WHO has approved 12 insecticides it considers effective and safe for use in IRS, including DDT (see Box 1). The choice of insecticide depends on whether it is registered for use in the country, the type of wall surfaces to be sprayed, the duration of the transmission season, and resistance levels of the local species of mosquitoes that transmit malaria. The choice of insecticide will also depend on whether or not the national malaria control program plans to apply different insecticides in a rota-



A sprayman applies insecticide to the inside walls of a home in Angola.

USAID/ANGOLA

tion scheme to slow the emergence of resistance. For IRS to be effective, at least 80 percent of the homes in the targeted geographical area must be sprayed.

IRS requires well-trained and supervised spray teams. In sub-Saharan Africa, IRS has traditionally been targeted to the following settings: (1) areas where malaria transmission is seasonal or epidemic and occurs at a relatively low levels, such that only one annual round of spraying is needed; (2) urban settings where local transmission is well documented and public infrastructure exists to accommodate the operational requirements of spraying; and (3) in refugee or internally-displaced persons (IDP) camps. In each of these settings, research

### Box 1: DDT

USAID supports indoor residual spraying (IRS) with DDT as an effective malaria prevention strategy in tropical Africa in those situations where it is judged to be the best insecticide from the standpoint of local transmission of the disease and based on a host-country policy. Its use for IRS to prevent malaria is allowable under the Stockholm Convention – also known as the Persistent Organic Pollutants or POPs Treaty – when used in accordance with WHO guidelines. Some countries do not carry out IRS or have not registered DDT for use in their malaria control programs. The reasons may include insecticide resistance, the epidemiological situation of the country, the organizational capacity of the program, or in some cases, concerns related to their agricultural export market.

DDT is more effective and less expensive than many other insecticides in some situations; as a result, it is a very competitive choice for IRS programs. DDT specifically has an advantage over other insecticides when long persistence is needed on porous surfaces, such as unpainted mud walls, which are found in many African communities, particularly in rural or semi-urban areas.

In FY06, USAID allocated funds for the purchase of DDT in three countries – Ethiopia, Mozambique, and Zambia. In Zambia, as in the other countries receiving IRS support, USAID will provide training and materials for improving national capacity for the safe and judicious use of pesticides in accordance with WHO standards and as stipulated by international agreements, such as the Stockholm Convention.



The PMI has trained hundreds of spray operators to conduct IRS campaigns, including these teams in Angola.

shows that IRS can provide a rapid, short-term reduction in malaria infection rates. More recent evidence from southern Africa and Equatorial Guinea has demonstrated that IRS can also be an extremely effective control measure in areas with higher levels of transmission.

### Expanding IRS Activities

Before PMI began, only a few countries in Africa were carrying out large-scale IRS campaigns, most of these in the southern African region. In Year 1, PMI launched spraying activities in all three countries (see Appendix for details). While IRS activities were tailored to the local conditions and capacities of each country, the following principles and best practices were common to the IRS strategy employed in each country:

- Completion of environmental assessments and plans for the appropriate handling and safe use of insecticides prior to spraying;
- Recruiting and training local residents and provincial health staff to carry out and supervise IRS and build in-country capacity for future spraying activities; and
- House-to-house visits in communities prior to spray campaigns to educate homeowners about IRS and improve acceptance of spray teams.

<sup>3</sup> Kayentao K et al. Comparison of intermittent preventive treatment with chemoprophylaxis for the prevention of malaria during pregnancy in Mali. *J Infect Dis* (2005), 191: 109-116.

<sup>4</sup> Steketee RW et al. The burden of malaria in pregnancy in malaria endemic areas. *Am J Trop Med Hyg* (2001), 64: 28-35.

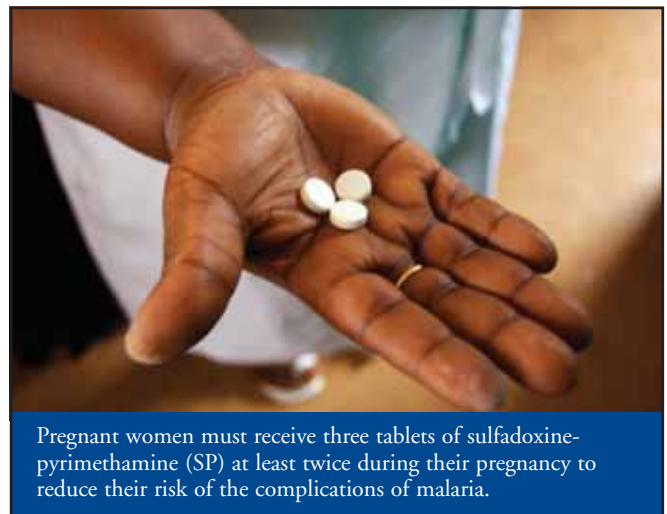
## INTERMITTENT PREVENTIVE TREATMENT IN PREGNANCY

### Background

Malaria infection during pregnancy poses serious health risks for both the mother and her unborn child. Malaria may be transmitted from mother to fetus before or during labor and delivery. If a pregnant woman contracts malaria, she is at much greater risk of anemia, premature delivery, and death. In addition, her newborn child is at higher risk of low birth weight – a leading contributor to infant mortality in Africa. The prevention and treatment of malaria during pregnancy depends on a combination of malaria control measures, including the use of ITNs, laboratory diagnosis for prompt and effective treatment, and intermittent preventive treatment.

Intermittent preventive treatment of pregnant women (IPTp) is a highly effective means of reducing the risk of malaria in both the pregnant woman and her unborn child. It involves the administration of at least two doses of an antimalarial drug, sulfadoxine-pyrimethamine (SP), to the woman during the second and third trimesters of her pregnancy with at least a one-month interval between doses. IPTp reduces the frequency of maternal anemia, malaria infection of the placenta, and the delivery of low birth weight babies.<sup>3</sup> Because in most African countries more than 70 percent of pregnant women attend antenatal clinics, these clinics serve as an attractive platform for delivering preventive treatments. The appropriate use of IPTp could prevent 75,000 to 200,000 infant deaths each year in Africa.<sup>4</sup>

IPTp is only recommended in areas with moderate to high levels of malaria transmission. At present, SP is the



Pregnant women must receive three tablets of sulfadoxine-pyrimethamine (SP) at least twice during their pregnancy to reduce their risk of the complications of malaria.





A head nurse at the antenatal clinic of Gulu Regional Referral Hospital in northern Uganda leads a health education session with pregnant women. The talk includes information about how to prevent malaria during pregnancy with IPTp and the regular use of ITNs.

only drug recommended by WHO for IPTp, but studies are under way to determine the safety and efficacy of alternatives, since resistance to SP is spreading in eastern and southern Africa. SP costs just 10-12 cents per treatment. IPTp is particularly important in pregnant women with HIV/AIDS because HIV infection increases a woman's susceptibility to malaria and reduces her ability to control the infection.

The Centers for Disease Control and Prevention (CDC), with USAID support, is responsible for much of the original research documenting the efficacy of IPTp in reducing malaria-related illness among pregnant women and the risk of death in their children in sub-Saharan Africa, and for the studies of the feasibility of implementing IPTp during routine antenatal clinic visits. Follow-up studies provided evidence on the proper dosing schedules for IPTp with SP in both HIV-positive and HIV-negative pregnant women.<sup>5</sup>

### Expanding IPTp Use

In each of the three Year 1 countries, sufficient resources were already available from the Ministries of Health and other partners for the procurement of SP. Consequently, PMI focused its efforts on (1) training health care workers in the use of IPTp and provision of high-quality antenatal services, and (2) creating demand for antenatal care through health promotion and education activities (see Appendix for details).

## DIAGNOSIS AND TREATMENT

### Background

Artemisinin is an antimalarial drug derived from a plant, *Artemisia annua*, or sweet wormwood, that has been used as a fever remedy in China for more than 1,000 years. The artemisinin family of drugs are the most rapidly-acting and effective antimalarial drugs currently available. Combined with a second effective antimalarial, they have become the standard of care for malaria in most parts of the world where resistance to traditional single drug therapies, such as chloroquine, has become common. This is termed artemisinin-based combination therapy, or ACT. The rationale for using combination therapy for malaria is similar to that for the treatment of tuberculosis and HIV infections. The combination of two or more effective antimalarial drugs greatly reduces the probability of the emergence of malaria parasites that are drug-resistant, and thus prolongs the effective lifetimes of both drugs.

Since ACTs cost 10-20 times more than chloroquine and have a shelf life of just 18-24 months, good pharmaceutical management is critical to their effective use. Unfortunately, many Ministries of Health in Africa have weak drug management and logistics systems. In addition, ACTs are relatively new to most African countries,



Mrs. Kidja Monde holds her 18-month-old son Alfred and a packet of ACT she received at Kibiti Health Center in Rufiji district, Tanzania.

<sup>5</sup> Sirima SB et al. Malaria prevention during pregnancy: Assessing the disease burden one year after implementing a program of intermittent preventive treatment in Koupela District, Burkina Faso. *Am J Trop Med Hyg* (2006), 75(2): 205-211 ; Van Eijk AM et al. Effectiveness of intermittent preventive treatment with sulphadoxine-pyrimethamine for the control of malaria in western Kenya: A hospital based study. *Trop Med Intl Health* (2004), 9(3): 351-360

so large-scale in-service training of health workers and education of patients will be needed.

The high cost of ACTs heightens the need for accurate diagnosis of malaria, which, because of its nonspecific symptoms, may be quite difficult to distinguish from other causes of fever. Microscopic examination of blood smears from patients with suspected malaria is considered the gold standard for diagnosis, but it requires considerable supervisory and logistic support to sustain high quality performance. In recent years, the development and refinement of rapid diagnostic tests (RDTs) for malaria has offered a potentially simpler solution to malaria diagnosis in settings where microscopy is not feasible or sustainable. RDTs are simple to use; however, they do have limitations, including problems with quality control during production and sensitivity to high temperature and humidity. In addition, health care workers may not accept negative test results when those results do not agree with their clinical impression of the cause of a patient's illness.

### Expanding Malaria Diagnosis and Treatment with ACTs

During Year 1, PMI has procured and is distributing ACTs in all three countries, making these highly effective treatments available to vulnerable populations. Because of the importance of accurate diagnosis for the rational use of ACTs, PMI is also supporting national malaria control programs to improve the quality of laboratory diagnosis of malaria (see Appendix for details).



A health worker at a clinic in Tanzania's Rufiji District awaits the results of several rapid diagnostic tests (RDTs), which will tell her which patients have malaria parasites in their blood.

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# CHAPTER 3

*“Malaria is the main killer in Angola. It has had a devastating impact on our population ... if we fight malaria and other diseases effectively, then we can succeed in our reconstruction process.”* – Aguinaldo Jaime, Deputy Prime Minister of Angola, June 8, 2006



The PMI seeks to prevent and treat malaria among children under five, such as this Angolan girl.

USAID/ANGOLA

# ANGOLA

## Malaria in Angola

Angola recently emerged from almost three decades of civil war that severely affected its development. The total population of Angola is about 15 million, of which 68 percent live in poverty. The existing health system covers only about 30 percent of the population.

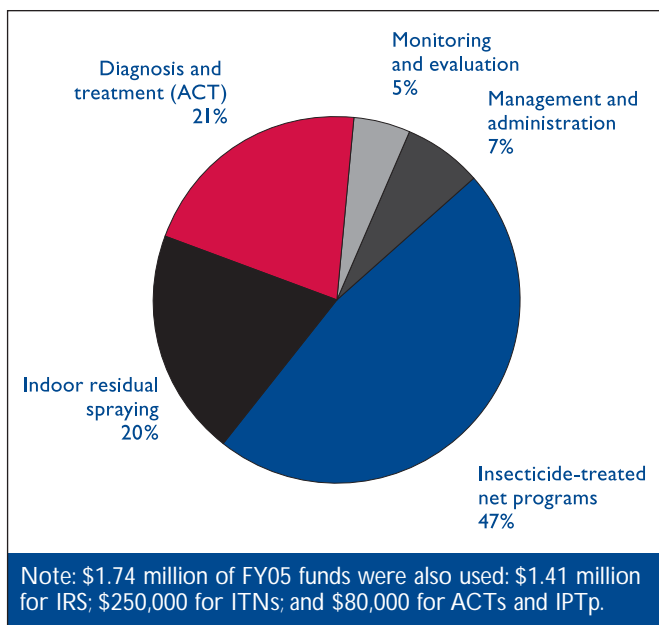
According to the Ministry of Health (MoH), malaria is Angola's leading cause of illness and death. An estimated 85 percent of the population is at risk of malaria and only the highly urbanized center of the capital, Luanda, is malaria free. The central and northern provinces have malaria transmission that peaks between March and May, and again in October and November. Transmission in the south is highly seasonal with periodic outbreaks.



ANGOLA AT A GLANCE		
Indicator	Baseline Coverage	PMI Accomplishments to Date <sup>1</sup>
Pregnant women who slept under an ITN the previous night	9.5% <sup>2</sup>	540,949 long-lasting ITNs distributed
Children under five who slept under an ITN the previous night	9.4% <sup>2</sup>	
Houses in geographic areas targeted for IRS which were sprayed	0 <sup>3</sup>	107,373 houses sprayed and 590,398 people protected
Pregnant women who received IPTp according to national policy	0.9% <sup>2</sup>	1,450 health workers trained in IPTp
Children under five with suspected malaria who received treatment with ACTs within 24 hours of onset of their symptoms	0.7% <sup>2</sup>	587,520 ACT treatments procured and being distributed 129,875 RDTs procured
Government health facilities with ACTs available for treatment of uncomplicated malaria	3.8% <sup>4</sup>	1,283 health unit staff trained on ACTs
<b>YEAR 1 BUDGET: \$7.5 million (FY06) and \$1.74 million (FY05)</b>		
<p>1) The PMI measured Year 1 results in terms of process indicators, rather than outcome indicators. Because of cost considerations, coverage of each intervention will only be measured every two years and its impact on malaria-related illness and death only evaluated at the beginning and end of the Initiative. Results reported in this chapter are up-to-date as of January 1, 2007. 2) Preliminary data as of January 1, 2007, based on 52 percent of interviews completed in nationwide Malaria Indicator Survey. 3) No areas were targeted for spraying by the National Malaria Control Program. 4) Best estimate based on available information as of January 1, 2007.</p>		

**Figure 3.1: Allocation of \$7.5 million PMI Budget in Angola, FY2006**

(Proportion of budget spent on commodities: 62%)



### Scaling Up Interventions in Year 1

President’s Malaria Initiative staff worked closely with the National Malaria Control Program (NMCP) and other national and international partners to identify gaps in malaria funding and coordinate plans with the National Malaria Control Strategy. Angola’s PMI budget for FY 2006 was \$7.5 million (Figure 3.1). An additional \$1.74 million in FY05 funds were used mostly to jumpstart IRS activities. Almost half of the FY06 budget was allocated to long-lasting ITN procurement and distribution. Twenty percent was allocated to indoor residual spraying (IRS), and another 21 percent to diagnosis and treatment activities. Since The Global Fund to Fight AIDS, Tuberculosis, and Malaria (GFATM) and the MoH provided sufficient SP supplies for intermittent preventive treatment for pregnant women (IPTp) in

Angola, PMI focused its efforts on supporting the roll out of IPTp through health worker training. The ExxonMobil Foundation, a long-term supporter of malaria control efforts in several African countries, donated an additional \$1 million to USAID in Angola to further the PMI’s goals in both FY06 and FY07.

### Insecticide-Treated Nets (ITNs)

Angola’s NMCP supports a market segmentation approach to ITN distribution. This consists of free distribution of 70 percent of nets to pregnant women and children under five in more rural areas, subsidized distribution of 20 percent of nets to those same groups in Luanda, and social marketing with cost recovery of the remaining 10 percent of nets in urban areas. The PMI’s activities are closely coordinated with The GFATM’s Round 3 grant to Angola, which is also procuring large quantities of long-lasting ITNs.

Activities related to ITNs supported by PMI during Year 1 included (see Table 3.1):



**Table 3.1: ITN Activities in Angola**

Activity	Location	ITNs Distributed
Distribution of free long-lasting ITNs through joint MoH-led ITN-measles vaccination campaign	7 of the most highly endemic provinces	826,000 long-lasting ITNs (of which 420,000 were procured by PMI)
Distribution of subsidized and cost-recovery long-lasting ITNs	Urban and peri-urban areas	120,949 long-lasting ITNs

Note: It is estimated that one mosquito net will protect about 1.6 people because, on average, two people will sleep under a net 80% of the time.



**Table 3.2: IRS Activities in Angola**

Activity	Location	Houses Sprayed	People Protected	People Trained
IRS campaign	Cunene and Huila Provinces	107,373 houses	590,398 residents of sprayed houses and 100,000 residents living within IRS cordon	350 spraymen and women, supervisors, and clinicians
Assistance to GFATM-supported campaign	Namibe Province	25,329 houses	176,155 residents of sprayed houses	

- Procurement and distribution of 420,000 free long-lasting ITNs in seven of the most malarious provinces as part of a nationwide MoH-led measles vaccination campaign in collaboration with UNICEF and other partners. The GFATM and the ExxonMobil Foundation contributed an additional 406,000 nets. A post-campaign survey in the seven provinces where ITNs had been targeted showed a dramatic increase from estimated baseline levels of net ownership (less than 10 percent) and usage (less than 5 percent). Following the campaign, 94 percent of families surveyed owned a net, and 69 percent of children under five had slept under a net the previous night;
- Procurement and distribution of 120,949 subsidized and cost-recovery long-lasting ITNs through antenatal clinics and commercial outlets in metropolitan Luanda; and
- Demand creation and health education related to ITNs through house-to-house visits, radio spots, drama shows, and discussions with village chiefs in the seven provinces involved in the measles-ITN campaign and in Luanda.

### Indoor Residual Spraying (IRS)

As no large-scale IRS program had been carried out in Angola for more than 10 years, PMI worked closely with

the NMCP and provincial health departments to train staff and conduct spraying in two epidemic-prone provinces in the south of the country.

Key IRS activities supported by PMI during Year 1 included: (see Table 3.2)

- Training of 350 local personnel to conduct and supervise IRS operations;
- House-to-house visits and distribution of leaflets in all communities scheduled for spraying to educate residents about the risks of malaria and increase acceptance of IRS and cooperation with the spray teams;
- An IRS campaign in Cunene and Huila Provinces, during which 107,373 houses were sprayed; this represents 90 percent of the houses targeted for spraying. The campaign protected at least 590,398 people and was estimated to benefit an additional 100,000 residents whose homes were not sprayed but who lived within a cordon of sprayed houses around the provincial capital; and
- Provision of spray pumps, insecticide, and educational leaflets to allow a GFATM-supported spraying campaign in Namibe Province to start while their equipment and supplies were clearing customs. This campaign covered 25,329 households.

### Intermittent Preventive Treatment for Pregnant Women (IPTp)

Since the MoH and The GFATM were already procuring sufficient sulfadoxine-pyrimethamine (SP) to meet all needs, PMI focused its Year 1 efforts on training health workers in the correct use of IPTp. A total of 1,450 health unit workers were trained in five provinces being supported by PMI during Year 1.

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In preparation for the IRS campaign in southern Angola, 350 locally-hired personnel were trained in spraying operations.

## Diagnosis and Treatment

Although the MoH approved artemisinin-based combination therapies (ACTs) as the treatment of choice for uncomplicated malaria in late 2004, single-drug therapy continues to be used in many rural areas. The GFATM is supporting the procurement and distribution of ACTs in 59 of the country's most populous districts. With PMI and ExxonMobil funding, PMI provided technical assistance to strengthen overall MoH capabilities in the storage, distribution, and appropriate use of antimalarial drugs. In addition, a PMI-supported non-governmental organization (NGO) is facilitating ACT implementation in MoH hospitals and health centers.

Diagnosis and treatment activities supported by the PMI during Year 1 included:

- Procurement of 587,520 ACT treatments, which arrived in-country in January 2007 and are being distributed through MoH facilities in nine districts with the assistance of NGOs;
- Provision of expert technical assistance to strengthen the MoH's antimalarial drug management system and development of provincial- and district-level guides for pharmaceutical management;
- Training of 1,283 health unit staff in the use of ACTs;
- Procurement and arrival in-country of 129,875 rapid diagnostic tests for malaria to be used in the same districts as those targeted for ACT distribution; and



In Angola, PMI is supporting the training of antenatal clinic workers to ensure that women receive a complete package of antenatal care that includes SP as well as an ITN.



The PMI is working with partners to provide technical assistance to the Angolan MoH in pharmaceutical management to ensure safe and effective use of ACTs. Dr. Diabanza, Provincial Malaria Coordinator for Zaire Province and new ACT supplies that were procured by The GFATM in Kuimba Municipal Hospital.

- Completion of a needs assessment for malaria laboratory diagnosis.

## Monitoring and Evaluation

Monitoring and evaluation activities supported by PMI during Year 1 included:

- A nationwide Malaria Indicator Survey to measure coverage of the four major interventions as well as all-cause and malaria-specific mortality in children under five through mothers' reported birth histories and verbal autopsies. As of January 1, 2007, 52 percent of the 3,000 planned households had been visited. The results of this survey will be used as baseline data for PMI in Angola. Preliminary analysis of these interviews showed that prior to the large-scale measles immunization-ITN campaign, 19.7 percent of households owned at least one ITN, but only 9.4 percent of children under five and 9.5 percent of pregnant women had slept under the net the night before. Only 0.9 percent of pregnant women had received IPTp during their pregnancy, and only 0.7 percent of children under five had received an ACT for malaria treatment within 24 hours of the onset of their illnesses;
- A year-long epidemiologic and entomologic assessment of malaria risk in the capital, Luanda, and the southern provinces to provide reliable and up-to-date information on malaria transmission in Angola. The findings from this assessment will help target future ITN and IRS activities; and



# MELANIA'S STORY:

## IRS PROTECTS A MOTHER AND HER CHILDREN IN ANGOLA

Melania is 28 years old and lives with her husband and children, aged two and four, in their modest one-bedroom house in Forte Santa Rita, Namibe Province. She sells fruit and vegetables at the local market, but when her children are ill, she must stop working to care for them, and she struggles to put food on the table for her family. After 27 years of conflict, the vast majority of Angola's citizens, such as Melania, continue to live in poverty.

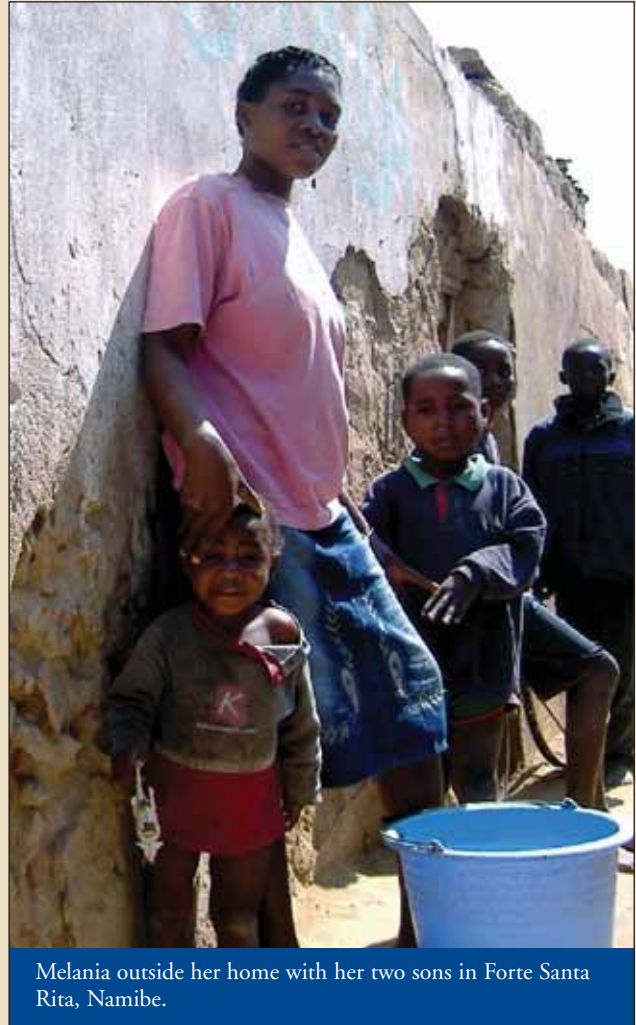
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*"Since my home was sprayed, my children haven't had malaria."* – Melania, Angola.

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Melania lives in southern Angola, an area prone to malaria outbreaks. In Angola, as in most of Africa, malaria is a leading cause of illness and death. Between December 2005 and March 2006, PMI, The GFATM, and WHO assisted the MoH and provincial health authorities to carry out the first large-scale IRS campaign in Angola in more than a decade. This campaign covered more than 130,000 houses in the three southern provinces of Huila, Cunene, and Namibe, where Melania lives.

Before homes were sprayed, an NGO, Christian Children's Fund, trained and mobilized local "activistas" who carried out a health education campaign to ensure that residents understood the purpose and importance of supporting this effort. Melania and her husband were dubious initially. "At first I didn't believe that the spray on the walls would kill the mosquitoes, and I felt it was a waste of time. The truth is that since my home was sprayed, my children haven't had malaria, and I haven't had to take them to the hospital!" observes Melania with a shy smile and a sense of relief. "I am grateful that 'activistas' took the time to visit our homes before the spraying began. Now I am more informed on practical steps I can take to prevent my children from getting malaria and will gladly welcome another campaign." The next round of spraying began in December 2006.



Melania outside her home with her two sons in Forte Santa Rita, Namibe.

- A house-to-house survey in seven provinces following the measles-ITN distribution campaign, which showed a striking increase in net ownership and usage among children under five (from 10% to 69%). The opportunity presented by these house-to-house visits was used to further promote correct use and care of ITNs.

### Challenges and Future Directions

Scaling-up of malaria control activities in Angola will face three major challenges during the coming year:

- Strengthening the MoH pharmaceutical management system to support increased coverage of ACTs and IPTp throughout the country;
- Strengthening the capabilities of the NMCP to monitor and evaluate malaria prevention and treatment activities; and
- Promoting partnerships between NGOs and the MoH to extend ACTs and IPTp coverage to the large rural population who do not have access to government health facilities.

# CHAPTER 4

*“I have visited some of the public health centers in Unguja and Pemba [the two main islands of the Zanzibar Archipelago]; I visited some wards without malaria patients. Before the campaign, such a situation would not be common. [In the past], we were not serious and committed, that is why malaria came back, but this time we are committed and so are the majority of Zanzibaris.”* – Sultani Mohammed Mugheiry, Zanzibar Minister for Health and Social Welfare, October 10, 2006



Mr. Aseidi is the *sheha*, or community leader, of Kianga village in Zanzibar. Together with other *shehas*, Mr. Aseidi received training from PMI to inform and educate fellow community members about IRS.

USAID/JOHN RIBER

# TANZANIA

## Malaria in Tanzania

The United Republic of Tanzania consists of mainland Tanzania and the islands of Zanzibar (Unguja, Pemba, and several other islets), which operate under separate Ministries of Health (MoH). Thirty-six million Tanzanians live on the mainland, and about one million live on the Zanzibar Archipelago. The current life expectancy at birth is 45 years, and about 36 percent of the population lives below the poverty line. Eleven percent of all Tanzanian children die before they reach the age of five years.

Ninety-three percent of the population lives in areas where malaria is transmitted. The remaining population lives in Tanzania's highlands and is generally not considered at risk. In addition, more than 290,000 refugees live in five camps run by the United Nations High Commissioner for Refugees (UNHCR) in northwestern Tanzania and are at an especially high risk of contracting

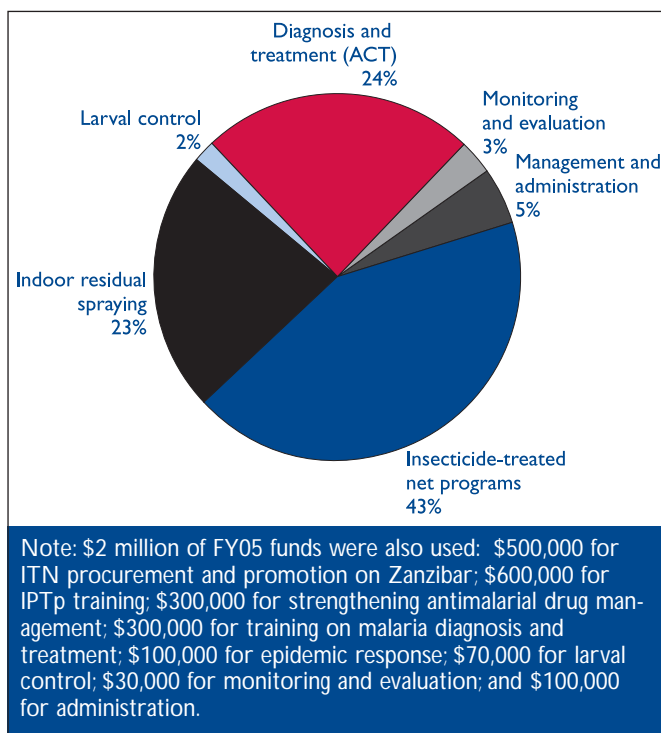


TANZANIA AT A GLANCE			
Indicator	Baseline Coverage		PMI Accomplishments to Date <sup>1</sup>
	Mainland	Zanzibar	
Pregnant women who slept under an ITN the previous night	16% <sup>2</sup>	26% <sup>2</sup>	130,000 long-lasting ITNs distributed and 13,894 infant net vouchers redeemed
Children under five who slept under an ITN the previous night	16% <sup>2</sup>	22% <sup>2</sup>	
Houses in geographic areas targeted for IRS which were sprayed	0 <sup>3</sup>	0 <sup>3</sup>	203,754 houses sprayed and 1,018,156 people protected
Pregnant women who received IPTp according to national policy	22% <sup>2</sup>	14% <sup>2</sup>	376 health workers trained in IPTp
Children under five with suspected malaria who received treatment with ACTs within 24 hours of onset of their symptoms	2% <sup>2</sup>	36% <sup>2</sup>	380,160 ACT treatments procured and distributed 875,000 RDTs procured
Government health facilities with ACTs available for treatment of uncomplicated malaria	<1% <sup>4</sup>	86% <sup>5</sup>	4,217 health workers trained on ACTs
<b>YEAR 1 BUDGET: \$11.5 million (FY06) and \$2 million (FY05)</b>			
<p><small>1) The PMI measured Year 1 results in terms of process indicators, rather than outcome indicators. Because of cost considerations, coverage of each intervention will only be measured every two years and its impact on malaria-related illness and death only evaluated at the beginning and end of the Initiative. Results reported in this chapter are up-to-date as of January 1, 2007. 2) 2004-2005 Tanzania Demographic and Health Survey. 3) No areas were targeted for spraying by the Zanzibar or mainland National Malaria Control Programs. 4) Best estimate based on available information as of January 1, 2007. 5) Roll Back Malaria Coverage Survey (2004).</small></p>			



**Figure 4.1: Allocation of \$11.5 million PMI Budget in Tanzania, FY2006**

(Proportion of budget spent on commodities: 60%)



malaria. In 2004, more than one third of all children under five who were admitted to a hospital suffered from symptoms of malaria. Although 80 percent of Tanzanians live within four kilometers of a public health facility, about 40 percent of those with fever and suspected malaria seek treatment in the private sector.

### Scaling Up Interventions in Year 1

Through an extensive consultative process that included the Tanzania National Malaria Control Program, the Zanzibar Malaria Control Program, and other malaria partners, the PMI Tanzania team identified areas that would benefit most from PMI's investments. The PMI's FY06 budget for the mainland and Zanzibar was \$11.5 million (Figure 4.1). Almost half of this amount was allocated to

programs supporting insecticide-treated mosquito nets (ITNs), with a quarter to indoor residual spraying (IRS), and an equal amount to diagnosis and treatment activities, including purchasing artemisinin-based combination therapy (ACT). Additionally, PMI-supported larval control activities were carried out in the periurban areas of Dar es Salaam. For intermittent preventive treatment of pregnant women (IPTp), The Global Fund to Fight AIDS, Tuberculosis, and Malaria (GFATM) provided sufficient quantities of sulfadoxine-pyrimethamine (SP) to meet all Year 1 needs. The PMI complemented GFATM support by training health care providers to provide an integrated package of antenatal care. To accelerate the start-up of PMI's activities in the country, an additional \$2 million of FY05 malaria funds were used (see footnote in Figure 4.1 for details).

Zanzibar was the focus of PMI's initial "jumpstart" activities. Working in collaboration with The GFATM during a December 2005 campaign, PMI distributed long-lasting ITNs free of charge to almost every pregnant woman and child under five on the islands. In the months following the campaign, selected health facilities reported an impressive 86 percent reduction in laboratory-confirmed malaria cases on Zanzibar, compared with the same period in 2005. In July-August 2006, 96 percent of rural homes on Zanzibar were sprayed, with another round of spraying planned for early 2007. On the mainland, PMI concentrated on supporting the Tanzania National Voucher Scheme for ITN distribution and training health professionals to treat malaria with ACTs. The PMI also worked with the NMCP to provide ACTs to Rufiji District and to refugee camps and surrounding areas in northwestern Tanzania.

### Insecticide-Treated Nets (ITNs)

The PMI has integrated well with mainland Tanzania's National Voucher Scheme for ITNs. This program distributes vouchers to pregnant women through antenatal clinics nationwide, allowing them to purchase ITNs from private retailers at a 75 percent discount. With

**Table 4.1: ITN Activities in Tanzania**

Activity	Location	ITNs Distributed
Free long-lasting ITN distribution in collaboration with The GFATM	Zanzibar	233,000 long-lasting ITNs (of which 130,000 were procured by the PMI)
Launch of infant voucher program as part of the Tanzania National Voucher Scheme	Mainland	13,894 ITN infant vouchers redeemed

Note: It is estimated that one mosquito net will protect about 1.6 people because, on average, two people will sleep under a net 80% of the time.





A health worker in Tanzania's Morogoro district gives a mother a voucher that she will exchange for a discounted ITN at a retail shop. PMI's support for this infant voucher program means that she only needs to pay the small top-up fee.

PMI funding, a similar “infant voucher” program for children less than one year of age was instituted in 2006 to increase ITN coverage among this vulnerable age group. The PMI is also supporting the roll-out of a completely new voucher program on the mainland, which will make long-lasting ITNs available for free to families who cannot afford the minimum top-up

amount. On Zanzibar, PMI collaborated with The GFATM to distribute free long-lasting ITNs to pregnant women, children under five, and people living with HIV/AIDS.

Activities related to ITNs supported by PMI during Year 1 included (see Table 4.1):

- Distribution of 233,000 free long-lasting ITNs to every pregnant woman and child under five on Zanzibar, of which 130,000 were funded by PMI. The PMI also funded ten NGOs to conduct follow-up household visits in all districts to ensure that nets had been correctly hung and to provide general malaria education. Following this joint PMI-GFATM campaign, health facilities reported an 87 percent reduction in laboratory-confirmed malaria cases (compared to the same period in 2005); and
- Distribution of 382,900 infant vouchers since the launch of the program in late November. In just over one month of operation, 13,894 of those vouchers have been redeemed for insecticide-treated mosquito nets.

### TRAINING HEALTH WORKERS TO PREVENT MALARIA AMONG PREGNANT WOMEN IN TANZANIA

Francisca Lyoba, a health worker at an urban health center in Tanzania's Morogoro District, is one of 376 health workers in Tanzania who received PMI-funded training on intermittent preventive treatment for pregnant women (IPTp). The six-day training is part of pre-service midwifery education. IPTp is just one component of a comprehensive antenatal care program recommended by the World Health Organization and supported by the U.S. Government, called Focused Antenatal Care, or FANC.

The idea of FANC is to combine all the needs of the pregnant women into four antenatal clinic visits. While 95 percent of pregnant women come for at least one antenatal visit, only 64 percent come for four visits. These visits are critical to the health of the mother and her infant.



Health worker Francisca Lyoba gives expectant mother Halima Athmani medicine to prevent her from getting malaria.

*“It is important to come in for the medicines, as malaria can cause anemia, stillbirth, and low infant birth weight.”* - Francisca Lyoba, Tanzania

Twenty-eight-year-old Halima Athmani, who is five months pregnant, came to the clinic for her first dose of IPTp. She will receive at least one more dose during her pregnancy. “It is important to come in for the medicines, as malaria can cause anemia, stillbirth, and low infant birth weight,” Francisca Lyoba communicated to the young mother. She also counseled Halima on the importance of sleeping under an insecticide-treated mosquito net and taking advantage of the national voucher program that allows pregnant mothers and infants to obtain nets at a very low price.

## NETS AND SPRAYING HELP PREVENT MALARIA IN A ZANZIBARI FAMILY

Clothes hanging to dry, chickens roaming around, a dirt floor kitchen with pots and pans hanging on the wall, bright red tomatoes soaking in a bucket. This is home to Saida Ali Haji and her three children who live in Paje, a dusty, coastal town in Zanzibar. It is a home that is no longer hospitable to malaria mosquitoes. In August 2006, a PMI-supported indoor residual spraying campaign sent teams to spray 200,000 households with insecticide, which protected more than one million people from malaria.

The 34-year-old mother of three heard about the spraying campaign through a village meeting called by the “sheha,” or community leader. She was told she had to remove their furniture and food and cover other belongings with woven mats. “The spraying has been a good thing,” said Mrs. Haji. “There are not only fewer mosquitoes in our home, but also less flies and cockroaches.” As she knitted, her six-month-old son, Ali, nestled in her lap. “Malaria is a chronic problem in our village as there is a large mosquito population.” Two years ago Saida had malaria with fever, joint pain, and vomiting. A year later her 5-year-old daughter Rahma had malaria and just seven months ago her 12-year-old daughter Nihifadhi came down with the disease.



Saida Ali Haji and her three children at their home in Zanzibar, which was sprayed with PMI support in August 2006.

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*“There has been a great change in malaria here because of the availability of nets, medicines to treat malaria, and now the recent spraying effort. Five years ago we had quite a few malaria cases in children, but now we have few cases.”* - Saida Ali Haji, Zanzibar

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The family has one long-lasting ITN that they were given free at the health clinic and one conventional net they bought five years ago at a local shop for about two U.S. dollars. A health worker at the clinic gave her instructions on how to use the nets.

“There has been a great change in malaria here because of the availability of nets, medicines to treat malaria, and now the recent spraying effort. Five years ago we had quite a few malaria cases in children, but now we have few cases”, Saida said. Preliminary results are indeed encouraging: Following the PMI and GFATM-supported net distribution campaign, health facilities reported an 87 percent reduction in laboratory-confirmed malaria cases when compared to the same period in 2005.

### Indoor Residual Spraying (IRS)

In partnership with the Zanzibar Malaria Control Program, PMI completed a highly successful round of spraying in September 2006 that protected more than one million people. Prior to this campaign, no large-scale spraying had been conducted on Zanzibar since 1986. The PMI funded the purchase of insecticide and equipment, training of spray teams, logistics, and house-to-house visits in all communities before the campaign to educate residents about IRS and ensure their cooperation.

Key IRS activities supported by PMI during Year 1 included (see Table 4.2):

- Training of 536 local personnel to conduct IRS and supervise operations;
- A large-scale IRS campaign on Zanzibar, during which 203,754 houses were sprayed. This figure represents 96 percent of all houses that had been targeted for spraying; and
- Prior to spraying, house-to-house visits in all ten sprayed districts to educate and inform families about IRS. The PMI also engaged community leaders, including Muslim clerics, known as shehas, to disseminate information about IRS at the village level.

**Table 4.2: IRS Activities in Tanzania**

Activity	Location	Houses Sprayed	People Protected	People Trained
IRS	Zanzibar	203,754 houses	1,018,156 residents of sprayed houses	536 (including 452 spray operators, 56 team leaders, 10 site managers, and 18 supervisors)

**Table 4.3: Diagnosis and Treatment Activities in Tanzania**

Activity	Location	Commodities Distributed	People Trained
Distribution of ACTs	Mainland	380,160 ACT treatments procured and distributed to health facilities (299,520 for refugee camps; 80,640 for Rufiji District)	Training of 4,217 health workers on proper ACT use
Distribution of RDTs to health facilities	Mainland	775,000 RDTs procured	Training needs are being met by other partners
	Zanzibar	100,000 RDTs procured and distributed to health facilities	

### Larval Control

Control of the immature or larval stages of the mosquito can be a highly effective malaria control measure when their breeding sites are limited in size and number. This approach to malaria control has infrequently been used in Africa but has proven to be successful in other locations. During FY06, PMI funded a larval control program in the periurban areas of Dar es Salaam. Each week, more than 26,000 potential breeding sites are monitored, and sites with mosquito larvae are treated with insecticides. As a result of this program, an estimated 128,000 residents of these areas are benefiting from improved malaria protection.

### Intermittent Preventive Treatment for Pregnant Women (IPTp)

Using FY05 funds, PMI focused its support on curriculum development for pre- and in-service training of health workers in IPTp. The PMI also supported the development of an IPTp health education strategy on the mainland. Since The GFATM provided sufficient quantities of SP for Year 1 needs, PMI complemented GFATM support by training 376 health care workers on IPTp.

### Diagnosis and Treatment

Zanzibar introduced ACTs as the treatment of choice for uncomplicated malaria in 2003, and these drugs are now being used in all health facilities. On the mainland, PMI supported the purchase and distribution of ACTs in Rufiji District and in five refugee camps in northwestern Tanzania. In collaboration with other partners, including the World Health Organization (WHO), Italian Cooperation, the NMCP, and The GFATM, PMI

funded the training of health workers in the new ACT treatment guidelines, and procured rapid diagnostic tests (RDTs) to improve the quality of malaria diagnosis for both the mainland and Zanzibar.

Diagnosis and treatment activities supported by PMI during Year 1 included (see Table 4.3):

- Assistance to the NMCP to develop an ACT distribution plan dealing with procurement, storage, inventory management, and other supply chain issues. This included a training of trainers for 32 regional pharmacists and 150 district-level pharmaceutical personnel. With resources from the PMI, a commodity tracking system is also being put into place;
- Procurement of 380,160 ACT treatments for refugees in UNHCR refugee camps of northwestern Tanzania and residents of Rufiji District. In both areas, distribution of PMI-procured ACTs has already begun;
- Training of 4,217 health workers on ACT use on the mainland. With support from PMI, The GFATM, WHO/Italian Cooperation, and the NMCP, all 121 districts now have government health staff trained in ACT use. With The GFATM and PMI's support, more than 4,500 health facilities now have ACTs in stock; this represents almost 100 percent of all health facilities on the mainland; and
- Procurement of 875,000 RDTs for use on the mainland and Zanzibar. Of these, 100,000 have already been distributed to health facilities on Zanzibar.

## WORKING WITH THE PRIVATE SECTOR IN TANZANIA

Tucked in a bustling market place in Morogoro Town, there is a shop that stands out among the vegetable and fruit stalls, tables piled with dried fish, and tailors going about their work on old-fashioned sewing machines. Posters of different kinds of mosquito nets cover the front doors and the interior of the shop. Mr. Herman Kimambo, the owner, is dedicated to one business – selling mosquito nets – and he has been in that business since 1996.

The wholesaler is a participant in the Hati Puginzo program, the kiSwahili name for the Tanzanian National Voucher Scheme, a nationwide ITN distribution program implemented by the faith-based organization Mennonite Economic Development Associates (MEDA). Retailers and wholesalers are selected for the program after signing a contract in which they agree to track and report information on the vouchers and show that they have enough capital to start a business.



Mr. Herman Kimambo in his wholesale shop in Morogoro Town, Tanzania.

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Mr. Kimambo participates in this program by selling bed nets directly to individual pregnant women and indirectly to retailers at the wholesale price. His role is to ensure sufficient stocks of nets for retailers. He also collects vouchers and returns them to the bed net manufacturers in a timely manner so that the voucher cycle runs smoothly. Pregnant women receive a voucher during their antenatal visits. They then take the voucher to participating retailers, select a net that suits their taste and needs, and pay the small “top-up” amount for that net. The redeemed voucher is then sent back to the MEDA office where each one is reviewed to make sure it has been used properly.

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*“As a result of this voucher program, my monthly sales have increased by seventy-five to one hundred percent.”* - Herman Kimambo, Tanzania

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The wholesaler sells both traditional ITNs and long-lasting ITNs. Traditional ITNs have to be re-treated with insecticide about every six months and come with a net re-treatment tablet in a small packet. The nets he sells come in dark blue, white, green, light blue, round and square shapes and range in size from 4x6x5 feet to 9x6x7 feet. The top-up fee depends on the size and type of net and ranges from \$0.25 to about \$2 per net. His average profit margin on a bed net is between \$0.08 and \$0.16, which he earns from setting the wholesale price slightly higher than the actual price of the net.

“As a result of this voucher program, my monthly sales have increased by seventy-five to one hundred percent,” the businessman says as he holds up a hand-written chart with different columns tracking his sales. On average, he sells two thousand nets per month. He also explains that new retailers, who had never bought nets from him before, are now buying from him.

With the addition of the infant voucher program funded through the PMI and implemented by MEDA, Mr. Kimambo expects his sales will increase even more as demand for the nets grows. “Sales could shoot up over one hundred percent,” he asserts, his stock of nets neatly displayed around him.

Approximately 36 percent of all deaths in children under five in Tanzania are due to malaria. “Efforts like Hati Puginzo have reduced the burden of malaria in the district,” says Dr. Mtey, District Health Officer for Morogoro District. “Families and communities must understand the importance of using bed nets – for the program to be sustainable, the demand for nets has to come from them.”

## Monitoring and Evaluation

Baseline data on mortality of children under five and coverage of the four major control measures were obtained from the 2005/2006 Demographic and Health Survey (DHS). This survey was conducted between October 2004 and February 2005 with a nationally-representative sample of more than 10,000 households. The

all-cause mortality rate for children under age five was estimated at 112 per 1,000 live births for the period from 2000-2004. In other words, during this period, 11.2 percent of children died before their fifth birthday. Compared to previous mortality rates, this survey already indicated a substantial decline in under-five mortality





Akidas mother cashes in her voucher at a retail shop for a net after paying a small top-up fee. She chooses a 6x6 foot ITN - the most popular net among women because of its large size.

from 147 per 1,000 live births for the period 1995-1999, probably due to general improvements in health care and the standard of living. In Tanzania, with support from the PMI, births and deaths are being tracked within defined populations at two demographic surveillance system (DSS) sites; all deaths are then followed up with an interview (sometimes called a verbal autopsy) with the parents of the deceased child. While these sites do not provide nationally-representative data, the estimated proportion of deaths attributed to malaria for children under age five at these sites will be used together with information on all-cause under-five mortality obtained from nationally-representative surveys to assess reductions in malaria mortality for children at the national level at the end of the PMI.

Among all households surveyed during the Demographic and Health Survey, 23 percent owned at least one ITN. This proportion varied across urban and rural areas, with 25 percent ownership in urban areas and only 7 percent ownership in rural areas of the mainland. Sixteen percent of children under five and 16 percent of pregnant women had slept under an ITN the night before the survey. These figures may underestimate true bednet usage, as the survey was not conducted during peak malaria transmission season. Among women who gave birth in the five years prior to the survey, 22 percent had received IPTp during their last pregnancy.

### Challenges and Future Directions

Following the highly successful ITN campaign on Zanzibar during Year 1, PMI will work with the Zanzibar Malaria Control Program to determine how best to sustain high levels of coverage with long-lasting ITNs among pregnant women and children under five. Additionally, PMI will consult with Malaria Control

Program staff to decide how much longer regular IRS should be continued on Zanzibar, given the striking reductions in reported malaria cases and the already high levels of ITN coverage in the population.

On the mainland, PMI will support nationwide expansion of the infant voucher scheme of the Tanzania National Voucher Scheme. The voucher program to provide free long-lasting ITNs to the poorest families will also be expanded. Since nets currently offered through the voucher scheme require periodic re-treatment with insecticide, PMI will support Tanzanian net manufacturers to adopt new technology to produce longer-lasting ITNs. To close the gap between net ownership and net use, PMI will promote regular use of ITNs through mass media, rural road shows, and other community-based approaches. IRS will be expanded to cover an estimated 40,000 houses in two rounds of spraying in Muleba District, which recently had a malaria outbreak. The PMI will continue to provide support for the nationwide scale-up of IPTp.

Beginning in early 2007, PMI will provide subsidized ACTs to Accredited Drug Dispensing Outlets (ADDOs). ADDOs are part of an innovative program that trains private drug sellers to correctly diagnose and treat illnesses, such as malaria. These outlets are then accredited by the Tanzanian government. By providing ACTs to these ADDOs, PMI will reach the large proportion of malaria patients who are treated outside the formal government health system. The PMI will also provide assistance to strengthen the Tanzanian Government Medical Stores Department to improve pharmaceutical management throughout the country.



Children receive a net at the dual launch of PMI and the *Kataa Malaria* campaign, on December 19, 2005, which was attended by at least 10,000 Zanzibaris, including the President of Zanzibar, the First Lady, and the Minister of Health and Social Welfare.



# CHAPTER 5

*“Following the spraying [in Kabale District], the number of malaria cases in health facilities has dropped so much that people will tell you malaria is no longer a big threat.”* – Patrick Tusiime, Director of Health Services, Kabale District, Uganda, October 2006



PMI has distributed insecticide-treated nets to people in refugee camps, such as this mother, in Northern Uganda.

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# UGANDA

## Malaria in Uganda

Uganda has a population of 28.2 million people, with 35 percent living in poverty. Two decades of civil war and unrest in northern Uganda have displaced 1.6 million people, resulting in large populations living in camps. A recent survey by the World Health Organization (WHO) and other partners indicates that the northern districts of Uganda have the highest per capita death rate in the country.

Malaria is endemic in 95 percent of Uganda and represents the country's leading cause of illness and death, according to the Ministry of Health (MoH). In 2003 the MoH reported that malaria accounted for up to 40 percent of outpatient care visits and 25 percent of hospital admissions. Nearly half of hospital inpatient deaths among children under five years of age are due to malaria.

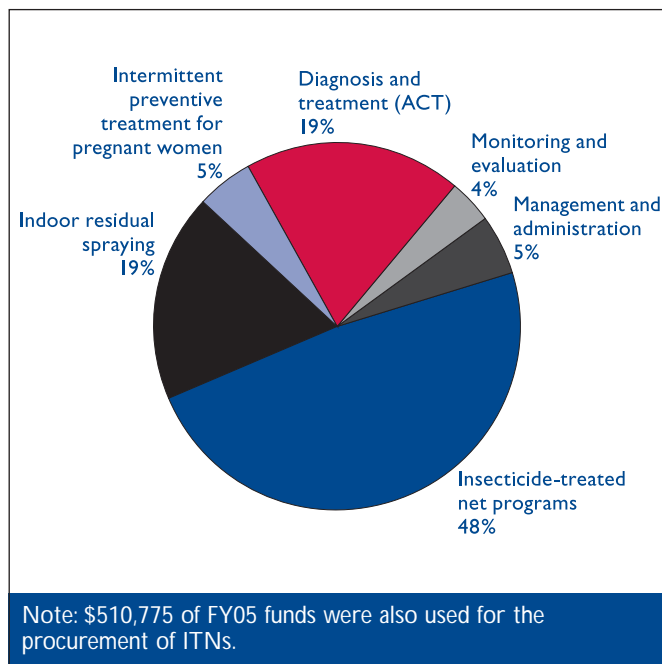


UGANDA AT A GLANCE		
Indicator	Baseline Coverage	PMI Accomplishments to Date <sup>1</sup>
Pregnant women who slept under an ITN the previous night	10% <sup>2</sup>	305,305 free long-lasting ITNs distributed through clinics and IDP camps
Children under five who slept under an ITN the previous night	10% <sup>2</sup>	505,573 nets retreated with insecticide
Houses in geographic areas targeted for IRS which were sprayed	0 <sup>3</sup>	103,329 houses sprayed and 488,502 people protected
Pregnant women who received IPTp according to national policy	17% <sup>2</sup>	168 health workers trained in IPTp
Children under five with suspected malaria who received treatment with ACTs within 24 hours of onset of their symptoms	1% <sup>2</sup>	261,870 ACT treatments procured, of which 87% have been distributed to health facilities
Government health facilities with ACTs available for treatment of uncomplicated malaria	0% <sup>4</sup>	2,844 health workers trained on ACTs in 16 out of 80 districts in the country <sup>5</sup>
<b>YEAR 1 BUDGET: \$9.5 million (FY06) and \$510,775 (FY05)</b>		
<p><small>1) The PMI measured Year 1 results in terms of process indicators, rather than outcome indicators. Coverage of each intervention will only be measured every two years and its impact on malaria-related illness and death only evaluated at the beginning and end of the Initiative because of cost. Results reported in this chapter are up-to-date as of January 1, 2007. 2) Uganda 2006 Demographic and Health Survey Preliminary Report. 3) No areas were targeted for spraying by the National Malaria Control Program. 4) ACTs were not implemented in MoH facilities until March 2006. 5) UPHOLD, Quality Assurance Report 2006.</small></p>		



**Figure 5.1: Allocation of \$9.5 million PMI Budget in Uganda, FY2006**

(Proportion of budget spent on commodities: 45%)



supporting insecticide-treated mosquito nets (ITNs), and another 19 percent each to indoor residual spraying (IRS) and to diagnosis and treatment activities, including procurement of artemisinin-based combination therapy (ACT). Since The Global Fund to Fight AIDS, Tuberculosis, and Malaria (GFATM) and the MoH were providing sufficient quantities of sulfadoxine-pyrimethamine (SP) to meet all Year 1 needs for intermittent preventive treatment of pregnant women (IPTp), PMI focused its efforts on the roll out of IPTp through health worker training. To accelerate the start up of PMI's activities in country, an additional \$510,775 of FY05 malaria funds were used for the purchase of ITNs.

The PMI began its activities in Year 1 with two "jump-start" activities in the high-need internally-displaced persons (IDP) camps of northern Uganda: an ITN distribution and promotion campaign and distribution of ACTs. These two activities were selected because of their potential for significant health impact. Subsequent activities were designed to build upon these initial efforts.

### Scaling Up Interventions in Year 1

The PMI worked closely with Uganda's Inter-Agency Coordination Committee for Malaria, the MoH, and other partners to plan Year 1 activities. The PMI's FY06 budget for Uganda was \$9.5 million (Figure 5.1). Almost half of this amount was allocated to programs

### Insecticide-Treated Nets (ITNs)

As in Angola and Tanzania, Uganda uses a market segmentation approach for ITN distribution. Full-cost nets are sold by retailers in urban areas. In areas where no commercial market currently exists (or is not viable), subsidized nets are available to those who can afford to

**Table 5.1: ITN Activities in Uganda**

Activity	Location	ITNs Distributed
Distribution of free long-lasting ITNs in IDP camps	4 districts (northern Uganda)	147,318 long-lasting ITNs
Distribution of free long-lasting ITNs	5 districts	76,865 long-lasting ITNs
Distribution of free long-lasting ITNs through antenatal/child health clinics	4 districts (northern Uganda)	76,432 long-lasting ITNs
Distribution of subsidized and full-cost ITNs through the commercial sector <sup>1</sup>	Rural and peri-urban areas nationwide	414,047 ITNs 155,237 long-lasting ITNs 17,000 subsidized nets
Distribution of free long-lasting ITNs to people living with HIV/AIDS	15 districts	4,690 long-lasting ITNs
Re-treatment of ITNs with insecticides	29 districts	505,573 ITNs retreated with insecticide

1) PMI support to a non-governmental organization to develop a commercial market for ITNs led to the sale of 586,284 ITNs.  
Note: It is estimated that one mosquito net will protect about 1.6 people because, on average, two people will sleep under a net 80% of the time.



A family receives two long-lasting ITNs in their village in northern Uganda.

pay a portion of the cost of the net. Free nets are distributed to children under five, people living with HIV/AIDS, and the poorest segment of the population. Although 34 percent of all Ugandan households own a mosquito net, many of these nets are either untreated or no longer have active insecticide on them.

Activities supported by PMI during Year 1 included (see Table 5.1):

- Procurement and distribution of 147,318 free long-lasting ITNs in 269 IDP camps in northern Uganda;
- Procurement and distribution of 76,865 free long-lasting ITNs in five other districts with historically low ITN coverage rates;
- Distribution of 76,432 free long-lasting ITNs to pregnant women attending antenatal/child health clinics;
- A health education campaign to explain the value of the nets in preventing malaria and promote their correct use. The campaign included leaflets in local languages, radio shows, T-shirts with malaria slogans, cartoon strips, billboards, and training of 1,160 local council leaders in 30 districts to promote ITN use at the community level;
- Support through a non-governmental organization (NGO) for development of a commercial market for

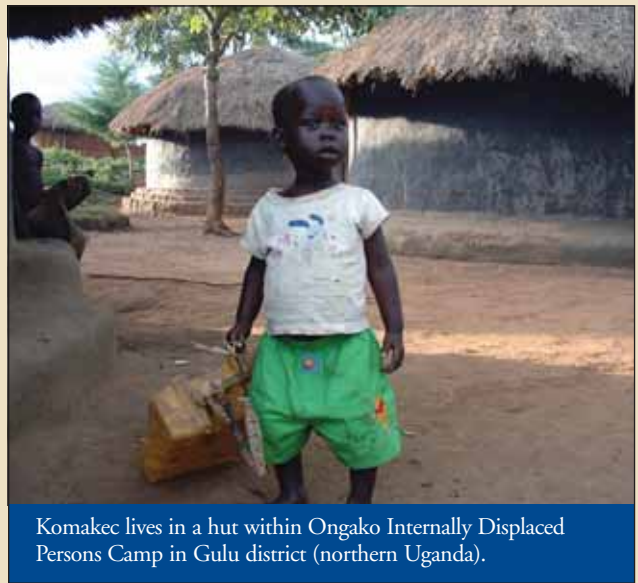
## KOMAKEC'S STORY:

### AN INSECTICIDE-TREATED NET BRINGS LUCK TO A BOY

In early March 2006, 15-month-old Komakec Emanuel got very sick. His mother, Oroma Monica, took him to the health clinic near their home in the Ongako Internally Displaced Persons Camp (IDP) in Gulu District, northern Uganda. Komakec had a high fever and was vomiting and convulsing. When they reached the clinic, Komakec was immediately admitted. After Komakec was diagnosed with malaria, his mother expected the worst. She had already lost two sons to malaria before they reached the age of three. In fact, when he was born, she named her son "Komakec," which means "I am unlucky" in Acholi. She feared that malaria would also take him.

At the clinic, Komakec received lifesaving antimalarial combination drugs that had been supplied through The GFATM. Once he was well, Komakec went home with a long-lasting ITN provided by PMI. By using the net consistently, Komakec is significantly less likely to become ill with malaria again. Asked how she manages to hang the net given the limited space in her hut, Oroma explained that she ties the net up every evening as she spreads out the mat for sleeping and removes it in the morning.

The PMI has distributed \$1,700,000 worth of free long-lasting ITNs in nine districts in northern Uganda. Because coverage in this region is lower than the national average, PMI launched its net distribution effort in IDP camps, such as the one where Komakec lives. Komakec has not been sick since he started sleeping under the net, although he used to get sick every two months. Perhaps Komakec is not so unlucky after all.



Komakec lives in a hut within Ongako Internally Displaced Persons Camp in Gulu district (northern Uganda).



Long-lasting ITNs provided by the PMI are distributed free to families in Uganda's northern district of Lira.

ITNs, particularly in rural and peri-urban areas of the country, where most mosquito nets are not treated with insecticides. This support included demand creation through radio spots, billboards, and cartoons in newspapers, as well as assistance to net distributors. As a result of this program, a total of 586,284 nets were sold by private retailers over the past 12 months;

- Establishment of a granting mechanism to ensure a reliable supply of long-lasting ITNs to NGOs for free distribution in the communities in which they work;
- Coordination between the President's Emergency Plan for AIDS Relief (PEPFAR) and PMI to distribute 4,690 free long-lasting ITNs to people living with HIV/AIDS;
- Free re-treatment of 505,573 conventional nets with insecticides in 29 districts; and
- A pilot program for distribution of long-lasting ITNs to pregnant women and children under five through community health workers that can serve as a model for other areas.

### Indoor Residual Spraying (IRS)

The PMI worked with the National Malaria Control Program (NMCP) during Year 1 to introduce IRS to Kabale District, which is prone to malaria epidemics. Between March and August 2006, the PMI procured insecticide, spray pumps, and safety equipment, hired and trained spray personnel, and sprayed more than 100,000 houses. As a result of this experience, the NMCP has updated and strengthened their national IRS policies to include spraying to control malaria in high transmission areas and IDP settings, in addition to IRS for epidemic control. The NMCP also improved planning, reporting, and environmental and human health safety requirements related to IRS.

During Year 1, PMI supported (see Table 5.2):

- Training of 450 local personnel to conduct and supervise IRS;
- Spraying of 103,329 houses in Kabale District, which represents 96 percent of all houses targeted for spraying; and
- Prior to the campaign, activities to promote IRS were carried out in all communities targeted for spraying. This included radio talk shows, film screenings, community meetings at the sub-county, parish, and village levels, and announcements through the local media.

### Intermittent Preventive Treatment for Pregnant Women (IPTp)

Although Uganda's national policy is that pregnant women should receive two doses of SP as part of their antenatal care, in practice, IPTp is not widely implemented. This is due to a variety of factors, including lack of access to antenatal clinics, a weak drug distribution system, and low levels of awareness about IPTp among pregnant women and health workers. Since The GFATM and the MoH procured sufficient quantities of drugs for IPTp in Uganda, PMI focused its efforts on (1) training health workers to implement IPTp as part of an integrated package of antenatal care services (called

**Table 5.2: IRS Activities in Uganda**

Activity	Location	Houses Sprayed	People Protected	People Trained
IRS campaign	Kabale District	103,329 houses	488,502 residents of sprayed houses	450 (including 307 spray operators, 47 team leaders, 28 washpersons, 20 supervisors, and 48 clinicians)





UPHOLD

Workers in the northern Ugandan district of Gulu process bundles of long-lasting ITNs procured by PMI.

Focused Antenatal Care, or FANC), and (2) promoting IPTp among pregnant women.

Key IPTp activities supported by PMI during Year 1 included:

- Development of Uganda-specific IPTp training manuals for health workers together with training of 168 health workers in 11 districts; and
- Development and dissemination of health education materials about IPTp in collaboration with the health education unit of the MoH. This included wall charts, radio spots, dissemination of fact sheets, and 1,000 radio listening clubs (consisting of 10-15 members each).

### Diagnosis and Treatment

The MoH of Uganda approved artemether-lumefantrine, an ACT, as the treatment of choice for uncomplicated malaria in 2004 and obtained its first supplies through The GFATM in 2006. The major challenge to the nationwide scale-up of ACTs is the weak pharmaceutical management system; however, Uganda already has a very extensive community-based program for malaria treatment using non-ACT drugs, which will facilitate rapid

### CARTOONS AND BILLBOARDS BOOST MOSQUITO NET SALES IN THE PRIVATE SECTOR

An NGO supported by the U.S. Government has been working with the private sector in Uganda over the past three years to promote ITNs. This work, combined with marketing campaigns, such as in-store consumer promotions and “Squitos” cartoons strips in daily newspapers and roadside billboards, has seen the annual number of nets distributed in Uganda jump from 280,295 in 2002 to about 2.5 million in 2004. In 2005, 93 percent of nets distributed in Uganda came from the private sector, and the number of outlets selling nets has increased from just five in the capital, Kampala, to 1,164 nationwide.



Cartoons and billboards are successfully boosting sales of mosquito nets in Uganda's retail shops.



Helen Onen, a community health worker (CHW) in Ongaka internally-displaced persons camp in northern Uganda, is one of the CHWs who helped distribute long-lasting ITNs purchased by PMI in March 2006.

expansion of ACTs to rural areas as this program transitions to using ACTs.

Diagnosis and treatment activities supported by PMI during Year 1 included (see Table 5.3):

- Procurement of 261,870 ACT treatments for northern Uganda, of which 87 percent have been distributed to health facilities or through community health workers who are part of the Ugandan government's system of community-based treatment of malaria. Since this is one of the first times in Africa that ACTs have been administered by community health workers, PMI is supporting an evaluation of this approach;
- Provision of technical assistance in pharmaceutical management and logistics for the distribution of 3.8 million ACT treatments purchased by The GFATM;
- Technical assistance to the MoH to develop a plan for distributing, storing, reporting, and monitoring ACTs at the national and district levels;

- Training of 2,844 health workers in 711 health facilities in the use of ACTs as first-line treatment; and
- Purchase of laboratory equipment for post-shipment testing and monitoring of drug quality as required by Ugandan law, as well as training of 15 government workers and 4 private sector technicians in quality control.

### Monitoring and Evaluation

Baseline data for PMI on coverage with ACTs, IPTp, and ITNs were obtained from the 2006 Demographic and Health Survey (DHS), conducted between May and October 2006 with a nationally-representative sample of about 10,000 households. The results reported here are from the preliminary report of that survey. Among all households in the survey, 16 percent owned at least one ITN. This proportion varied across urban and rural areas, with 26 percent ownership in urban areas and only 14 percent ownership in rural areas of the country. Ten percent of children under five and 10 percent of pregnant women had slept under an ITN the night before the survey. Among women who gave birth in the five years prior to the survey, 17 percent had received IPTp during their last pregnancy.

The 2006 DHS will provide baseline data on all-cause mortality for children under five. In Uganda, the PMI is supporting the collection of malaria-specific mortality data for children under five in two ways: (1) with a verbal autopsy for recent deaths in children under five as a follow-on to the 2006 DHS; and (2) through follow-up of all deaths with a verbal autopsy within a defined population in Iganga District, where a demographic surveillance system (DSS) site already exists. At DSS sites, births and deaths are tracked within defined populations and all deaths are followed up with a verbal autopsy. Verbal autopsies have only recently been conducted in the Iganga site, and results are not yet available on a sufficient number of deaths to estimate malaria-associated mortality for that area.

**Table 5.3: Diagnosis and Treatment Activities in Uganda**

Activity	Location	Commodities Distributed	People Trained
Distribution of ACTs to selected populations	Northern Uganda	261,870 ACT treatments procured, of which 228,870 (87%) have been distributed to health facilities and community-based workers	Training of 2,844 health workers on proper ACT use

## ATSA'S STORY:

### A RE-TREATED NET HELPS PREVENT MALARIA IN ONE UGANDAN FAMILY

Atsa Namuy Omba, mother of three, can now sleep at night knowing that her re-treated mosquito nets are protecting her children in the midnight hours. That's when female *Anopheles* mosquitoes feed on human blood, transmitting the *Plasmodium* parasite that causes malaria. The family's bed nets were re-treated through a PMI-funded effort that re-treated more than 500,000 nets with insecticide, benefiting about 800,000 Ugandans such as Atsa.

"Before we bought the nets, my kids were getting malaria every two months," said Mrs. Omba, who lives in Wakiso District about 5 miles from Uganda's capital Kampala. "Since we began to use the nets, my 2-year-old son has only been infected once in a year," she said.



Atsa Omba's mosquito net has been re-treated with support from PMI.

USAID / JIMMY NAMBOK

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*"Before we bought the nets, my kids were getting malaria every two months."* – Atsa Omba, Uganda

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Before they got their mosquito nets, the family suffered financially because they were constantly at the hospital with their children. They are farmers and earn their living selling milk from their cows and vegetables they grow. Mrs. Omba learned about the bed nets through the advice of health workers at the hospital near her home. Following this advice, she spoke about it with her husband, Mustafa Luvega. Next thing she knew, he had gone to the market to buy two nets for about four U.S. dollars each.

### Challenges and Future Directions

During Year 1, PMI established a strong foundation upon which to scale up interventions over the next three to four years. The major challenges in Uganda during Year 2 will be to:

- Expand ITN and IRS activities beyond the northern and southern areas targeted during Year 1. In Year 2, IRS will be expanded from one district to three districts, including two epidemic-prone districts and one highly endemic district, plus selected IDP camps in the North;
- Assist the MoH as it introduces ACTs as the treatment of choice for malaria; as part of this effort the PMI will assist with the roll out of ACTs at the community level through the well-established network of Community Drug Distributors; and

- Expand support for Focused Antenatal Care training and promote early attendance at antenatal clinics to ensure all pregnant women receive at least two doses of IPTp.

The PMI is also partnering with the nonprofit organization, Malaria No More, to provide 550,000 long-lasting ITNs, which will be distributed free by community health workers to pregnant women and children under five in villages throughout Uganda.



# CHAPTER 6

*“Coordinated partnerships of international donor resources are not only essential, but also the measure of our commitment to alleviating poverty and human suffering.”* – Dr. Kent R. Hill, Assistant Administrator for Global Health, June 8, 2006



Zanzibari women attend a malaria-related educational session at a health facility.

USAID TANZANIA

# PARTNERSHIPS

Partnerships are at the heart of the President's Malaria Initiative's (PMI) strategy. Given the enormous burden of malaria and the ambitious target of reducing malaria deaths by half by 2010, effective partnerships, particularly at country level, are essential to reach the maximum number of people. For this reason, the PMI closely coordinates its activities with host country governments, other U.S. Government agencies, international organizations, other bilateral, multilateral, and private donors, and non-governmental (NGO) and faith-based organizations.

## Host Country Governments

The PMI works within the overall strategy and plan of the host country's national malaria control program. Planning and implementation of PMI activities are coordinated closely with the host government Ministry of Health (MoH). The PMI's long-term goal is to strengthen in-country capacity so that gains achieved with U.S. Government and other donor support can be sustained. Some examples include supporting refresher training for laboratory workers, quality control of malaria diagnosis, training provincial and district level staff to plan and conduct indoor residual spraying (IRS), and



An Angolan mother and child receive a free long-lasting ITN at the launch of the measles-ITN campaign in M'banza Kongo, Zaire province, Angola in the presence of Angolas Vice Minister of Health, Dr. José van Dunem (background), U.S. Ambassador Cynthia G. Efirid and Norwegian Ambassador Arild R. Øyen.

improving pharmaceutical supply and management systems for the proper distribution and use of artemisinin-based combination therapies (ACTs) and intermittent preventive treatment for pregnant women (IPTp). In some cases, malaria control policies were “on the books”, but had not yet been put into practice.

## ANGEL'S STORY:

### AN HIV-POSITIVE MOTHER RECEIVES A LONG-LASTING ITN

Angel Kapiisi is a 29-year-old woman who lives with her son in Ibanda District in Uganda. She is one of an estimated 520,000 adult women in Uganda who are HIV-positive. Angel has suffered repeatedly from malaria and was finding it difficult to pay for her medicines. But all that was before she learned about long-lasting ITNs at her psychosocial support group meetings at Ruhooko Health Centre. Angel was one of 4,690 HIV-positive people to receive a free net from a non-governmental organization supported by PMI in collaboration with PEPFAR. These nets were given to mothers attending support group meetings or post-test HIV clubs in PMI-supported health facilities. Angel had never owned a net before and had not thought of buying one for herself. She now uses it regularly with her son and has been malaria-free for the past three months. Angel calls upon fellow mothers to be tested and learn their HIV status. She also encourages everyone living with HIV/AIDS to go to support meetings, for if she had missed such a meeting, she would have missed out on a mosquito net.



Angel Kapiisi is an HIV-positive mother who has received a free long-lasting mosquito net through PMI.



With PMI support, these policies are now being implemented for the first time. As PMI enters its second year in the first three countries, we are focusing more on

**“We must foster an environment in which the right people are connected to each other, and to the right ideas, and at the right time, which is now.”**

*– Stephen B. Blount, MD, Director, Coordinating Office for Global Health, Centers for Disease Control and Prevention, June 8, 2006*

building the capacity of MoH systems and personnel. This effort will include improving financial and program management, information, education and communication, community mobilization, demand creation, and monitoring and evaluation capabilities of the National Malaria Control Program (NMCP).

### PMI Collaboration with PEPFAR

The PMI is also working to strengthen links with other U.S. Government programs in-country, especially in the area of HIV/AIDS. Since the President’s Emergency Plan for AIDS Relief (PEPFAR) and PMI both target pregnant women, it makes good programmatic sense to combine services for IPTp and the distribution of insecticide-treated mosquito nets (ITNs) with services to prevent mother-to-child transmission of HIV/AIDS. For example, in Uganda, the PMI provided 4,690 free long-lasting ITNs to people living with HIV/AIDS. The PMI is making plans to collaborate with PEPFAR in a range of countries to coordinate the delivery of antenatal services for pregnant women.

### Multilateral Organizations

The PMI seeks to identify and fill gaps in funding from other global partners engaged in the fight against malaria. In each of the Year 1 PMI countries, the Initiative coordinated its efforts with existing grants of The Global Fund to Fight AIDS, Tuberculosis, and Malaria (GFATM). For example, in Angola, where a major portion of the drugs needed for the initial phase of ACT implementation are provided through a three-year \$40 million GFATM grant, PMI has focused on training health workers and health education to support the scale up of ACTs. In Uganda, 3.8 million ACT treatments purchased by The GFATM were distributed nationwide with technical assistance in developing a plan for storing, distributing, reporting, and monitoring of ACTs at the national and district level from PMI. In Tanzania, PMI

complements GFATM activities by training health care workers in 54 of 121 districts nationwide, while The GFATM trains health workers in other areas.

The PMI also coordinates its activities with The World Bank’s Malaria Booster Program in countries where both institutions are working. At the global level, PMI partners with both the World Health Organization (WHO) and United Nations Children’s Fund (UNICEF) to ensure a steady world supply of high-quality ACTs, ITNs, and rapid diagnostic tests (RDTs) at reduced prices. The PMI and WHO are working together to support increased use of residual spraying with insecticides (including DDT) in Africa. The PMI also works with UNICEF at the country level to coordinate the implementation of activities, such as the joint implementation, in mid-2006, of the MoH-led ITN distribution-measles vaccination campaign in Angola.

### Private Sector Partners

When PMI was launched in June 2005, President Bush urged other donors, including the private sector, to join in a broad campaign to reduce malaria mortality by 50 percent in Africa. The President reiterated this challenge at the White House Summit on Malaria in December 2006.

Several donors in the private sector are already making major contributions to the fight against malaria, including the Bill and Melinda Gates Foundation, one of the



ExxonMobil Foundation announced a grant of \$1 million to support PMI in Angola at a presentation ceremony on January 30, 2007, in Luanda, Angola. Pictured here are (from left to right): James R. Riley, ExxonMobil’s Manager of Government Relations and Public Affairs Business Support, the Angolan Vice Minister of Health Dr. José van Dunem, USAID Mission Director Diana Swain, and U.S. Deputy Assistant Secretary of State Carol Thompson.



## PARTNERING TO SAVE LIVES IN ANGOLA

Getting a mosquito net into the hands of a mother in Angola is not a simple undertaking. It involves numerous steps: the net needs to be manufactured, packaged, shipped, cleared through customs, distributed, and then used properly. These last two steps in the process are critical if those nets are to reach those groups most vulnerable to malaria – pregnant women and children under five. In Angola, as in many settings in sub-Saharan Africa, net distribution is complex and costly in part because of the difficulty involved in reaching people in remote areas where roads are poor and formal health facilities are lacking. Under these conditions, innovative distribution mechanisms are needed. Net distribution is more cost effective when it can be “piggy backed” onto an existing public health intervention. In Angola, PMI did just that, in close collaboration with a number of other major partners.



A campaign worker in Angola wears a T-shirt with the logos of the multiple partners involved in the measles-ITN campaign.

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*“What we are trying to do is not only help the people of Angola, but work very closely with PMI to develop a model of engagement where the private sector can meaningfully tie into PMI countries and PMI projects.”* – Dr. Steven C. Phillips, Medical Director, Global Issues and Projects, ExxonMobil Corporation

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In July 2006, an integrated nationwide campaign reached more than 3.5 million children with measles and polio vaccinations, vitamin A, and de-worming medication. The PMI contributed more than half of the long-lasting ITNs toward the campaign, which distributed a total of 826,000 free long-lasting ITNs to children under five in the seven of the most malarious provinces of the country. The ExxonMobil Foundation contributed both financial support and 70,000 long-lasting ITNs. Early evidence about net use among children following the campaign is very encouraging. A survey conducted 4 to 6 weeks after the campaign showed that the percentage of children under five sleeping under a bed net the previous night averaged 69 percent, up from an estimated 10 percent before the campaign.

This successful campaign was the fruit of a wide-reaching partnership of organizations and donors to which the PMI contributed. The campaign was carried out with the support of the National Malaria Control Program of Angola and the Measles Initiative, a partnership formed to reduce measles deaths in sub-Saharan Africa that is led by the American Red Cross, the United Nations Foundation, WHO, UNICEF, and CDC. This partnership is just one example of how PMI is joining forces with other major global and private donors to ramp up the fight against malaria and save lives.

largest funders of health activities in the world today, and Marathon Oil Corporation with Noble Energy, Inc., which are supporting a highly successful malaria control project in Equatorial Guinea.

In FY06, the largest direct financial contribution to PMI from an external source was a \$1 million donation from ExxonMobil Foundation for activities in Angola. This funding helped support the nationwide Malaria Indicator Survey, promotion and health education activities for ITNs, and strengthening of the MoH pharmaceutical management system. In addition,

ExxonMobil contributed 70,000 nets to the integrated measles vaccination-ITN distribution campaign. In FY07, ExxonMobil has again donated \$1 million in support of PMI’s activities in Angola. The nonprofit organization, Malaria No More, has pledged to provide 350,000 long-lasting ITNs, which, together with 200,000 long-lasting ITNs from PMI, will be distributed free to vulnerable groups in Uganda.

The PMI also supports technology transfer to Tanzanian net manufacturers, together with the NMCP and

NGOs, to ensure in-country capacity to produce high-quality ITNs.

### Non-governmental and Faith-based Organizations

The participation of non-governmental, faith-based, and community-based organizations are crucial to the success of PMI. These groups are well placed to deliver services to people in remote areas where the formal health system is weak. They also have access to community networks and benefit from a high degree of credibility at the community level. The PMI has already begun expanding its activities with non-governmental collaborators. To date, PMI has supported nearly 30 nonprofit organizations, of which five are faith-based. More than one-third of these groups are local, indigenous, nonprofit organizations.

Non-governmental and faith-based organizations have contributed in major ways to PMI's successes during Year 1. For example:

- In Tanzania, PMI funded two faith-based organizations, Mennonite Economic Development Associates and World Vision, to expand the Tanzanian National Voucher Scheme for ITNs to include infants as well as people who are unable to afford full-cost or subsidized nets;
- In war-torn northern Uganda, PMI has funded a British NGO to distribute long-lasting ITNs to refugees in areas where the health infrastructure has been shattered by years of civil unrest. With PMI support, the Malaria Consortium has conducted mass mosquito net re-treatment campaigns in which a total of 505,000 nets were retreated with insecticide. A local group, Pulse Communications, Ltd., is ensuring that nets are used properly through education/entertainment approaches to reach residents at the community level; and
- In remote districts of Angola, an NGO is supplying lifesaving ACT drugs to those most in need, while the Christian Children's Fund has carried out innovative promotion and education activities before and during indoor residual spraying. The PMI has also worked in partnership with the American Red Cross and the International Federation of Red Cross and Red Crescent Societies to include long-lasting ITNs in integrated immunization campaigns in Angola and Rwanda.



USAID Mission Director Pamela White, Zanzibar's Minister of Health Dr. Mohammed Jiddawi, and U.S. Ambassador Michael L. Retzer (from left to right) attend the launch of PMI's indoor residual spraying campaign in Zanzibar.

USAID / KIM WYLLIE

### The Malaria Communities Program

On December 14, 2006, First Lady Laura Bush announced the Malaria Communities Program (MCP) at the White House Summit on Malaria. The MCP is a \$30 million program to identify and support new partner organizations, both U.S.-based and indigenous, to carry out sustainable malaria prevention and control activities under PMI. The MCP's goal is to contribute to achievement of PMI targets by increasing local ownership and capacity to undertake sustainable, community-based malaria prevention and treatment activities. To accomplish this, the MCP will competitively award cooperative agreements to groups positioned to work at the community level in PMI countries to: expand and promote proper use of ITNs; support prevention and treatment of malaria in pregnant women; promote improved malaria case management, including community-based treatment efforts; and support indoor residual spraying and other vector control efforts through education and communication. All MCP partner organizations will work under the leadership of the NMCP and malaria control partners in the target PMI country.





# CHAPTER 7

*“PMI is a very different way of doing business than past practice. The hallmarks of the PMI are first and foremost programming based on clearly-defined numerical targets for outcomes. Second is transparency in how the money is being spent. Third is a robust and effective monitoring and evaluation plan. This approach provides assurance that taxpayers’ money is being spent effectively.”* – Michael Miller, USAID Deputy Assistant Administrator, January 19, 2006



Monitoring and evaluation is a key component of all PMI activities. Here, a community health worker in northern Uganda shows a record-keeping ledger.

USAID/JIMMY NYAMBOK

# MONITORING AND EVALUATION

Monitoring progress on a routine basis and evaluating the outcome and impact on health or deaths in the population are essential for successful health programming. Routine monitoring activities allow program managers to identify problems in program implementation so that suitable modifications can be made. Evaluation activities enable program managers to determine whether desired goals and targets are being met. The PMI monitoring and evaluation strategy will draw on the experiences of both USAID and CDC in working with malaria programs over the last fifty years and build on the new USAID malaria data management system that was launched in 2005.

## Monitoring Activities

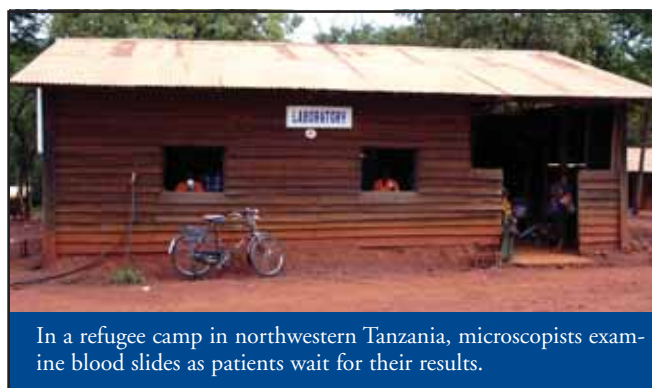
Specific PMI-funded activities are monitored on a regular basis to allow in-country program managers to track progress, make adjustments, and redirect resources as needed. Activities within the four main intervention areas – insecticide-treated mosquito nets (ITNs), indoor residual spraying (IRS), intermittent preventive treatment of pregnant women (IPTp), and case management with artemisinin-based combination therapies (ACTs) – are tracked through reports from implementers and international and local partners. Types of activities that are monitored include procurement, distribution, and availability of commodities for the prevention, diagnosis, and treatment of malaria; training of health care workers; and health education efforts.

## Evaluation Activities

The PMI has established a single set of targets for its four primary interventions: ITNs, IRS, IPTp, and ACT. These targets establish the levels of coverage to be achieved by the end of PMI and are the same for each focus country. The targets support the achievement of PMI's goal to reduce malaria deaths by 50 percent. The PMI's evaluation framework is aligned with the standard methodology for malaria program evaluation adopted and promoted by the Roll Back Malaria Partnership. Coverage indicators will be estimated at baseline, midpoint, and at the end of PMI. The impact of PMI-supported efforts on deaths in children under five years of age will be estimated at baseline and again at the end of PMI (see Box 1).

The evaluation strategy includes:

- Measurement of coverage with ITNs, IPTp, ACTs, and IRS at baseline, midpoint, and the end of PMI to see if coverage at the national level has increased as expected;
- National estimates of deaths from all causes for children under five at baseline and at the end of PMI. Deaths from all causes among children under five is a routine health indicator collected through nationally-representative surveys, such as Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys, in countries where routine registration of deaths is not available;



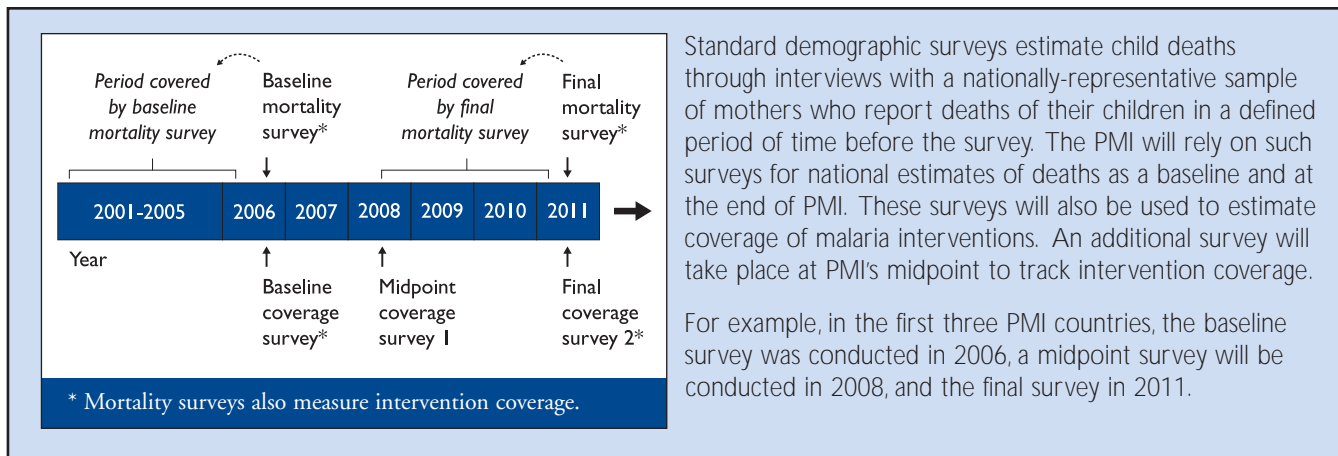
CDC/BOB WIRTZ



ORC MACRO/ALFREDO FORT



## Box 1: Timing of Mortality and Intervention Coverage Surveys



Standard demographic surveys estimate child deaths through interviews with a nationally-representative sample of mothers who report deaths of their children in a defined period of time before the survey. The PMI will rely on such surveys for national estimates of deaths as a baseline and at the end of PMI. These surveys will also be used to estimate coverage of malaria interventions. An additional survey will take place at PMI's midpoint to track intervention coverage.

For example, in the first three PMI countries, the baseline survey was conducted in 2006, a midpoint survey will be conducted in 2008, and the final survey in 2011.

- Collection of data on deaths attributed to malaria from selected demographic surveillance system (DSS) sites and, in some cases, national surveys (such as DHS). This information, along with information on deaths from all causes for children under five, coverage of malaria interventions, and other relevant factors, will be analyzed together to estimate reductions in malaria-associated deaths;
- Collection of data on the frequency of anemia and malaria infection among children under five to assess impact on malaria-related morbidity; and
- Additional information on antimalarial drug and insecticide resistance, drug quality and safety, mosquito populations and transmission, quality of health care, and service availability in health facilities will be collected through special surveys and targeted studies.



Health workers at Mafiga clinic in Tanzania's Morogoro District check vouchers redeemed for ITNs against the antenatal clinic register to ensure correct usage of the vouchers.

### Estimating Coverage of PMI Indicators

Evaluation of progress toward PMI's coverage targets will be collected primarily through demographic surveys of a representative sample of national households, which will measure:

- The percentage of households with a pregnant woman and/or children under five years old that own at least one ITN;
- The percentage of children under five years old who slept under an ITN the previous night;
- The percentage of pregnant women who slept under an ITN the previous night;
- The percentage of pregnant women and children under five years old who slept under an ITN the previous night or in a house that has been protected by IRS;
- The percentage of women who have completed a pregnancy in the last two years who have received two or more doses of IPTp during that pregnancy; and
- The percentage of children under five with suspected malaria who have received treatment with ACTs within 24 hours of onset of their symptoms.

The percentage of houses in geographic areas targeted for IRS that have been sprayed will be determined from routine spraying records. The percentage of government health facilities that have ACTs available for treatment of uncomplicated malaria will be obtained by health facility surveys.





A field worker examines mosquitoes from a household pyrethrum spray catch to monitor mosquito densities, particularly in areas where IRS is being implemented.

### Estimating Malaria-Related Deaths

In most sub-Saharan African countries, the majority of deaths among children under five occur outside the formal health system. The specific cause of death is often unknown and is rarely recorded. Because the PMI goal is to halve malaria deaths and because 80-90 percent of malaria deaths in Africa occur in children under five, it is important to be able to estimate the proportion of those deaths associated with malaria. To do this, interviews (sometimes called verbal autopsies) are conducted with parents of deceased children. During these interviews, parents are asked to recall the symptoms and the duration of their child's fatal illness. This information is then used to classify the cause of death. In Year 1 PMI countries, verbal autopsies are included in the 2007 Malaria Indicator Survey in Angola, and the Uganda 2006 DHS. In Tanzania, malaria-related deaths were estimated based on verbal autopsies carried out within the defined population of a DSS site in Rufiji District.

As PMI countries reach their 85 percent coverage targets with the four major interventions, malaria-related deaths among children under five will decline. To determine whether changes in deaths at the population level are associated with the efforts of the national malaria control program, PMI, and other partners, deaths from all causes and malaria-related deaths in children under five will be interpreted together with general health data, coverage indicators, and climatic factors, such as rainfall, that influence malaria transmission.

### Accountability and Transparency of PMI

Providing information to the public on funding allocations, procurements, program activities, milestones, and results in a timely and accurate manner is a high priority for PMI. The PMI communication strategy calls for information about PMI and its operations to be made available through multiple communication channels, including PMI newsletters, public announcements, press releases, various international events, and the PMI Web site ([www.fightingmalaria.gov](http://www.fightingmalaria.gov)). Latest news and updates on PMI activities from the field are continuously collected and shared through these channels. As of December 31, 2006, more than 90 percent of all contracts and agreements related to PMI activities had been posted on the PMI Web site, and annual reports from implementing partners will be added in the near future.

# CHAPTER 8

*“The campaign against malaria is a broad and challenging undertaking, requiring cooperation among many different countries, agencies, and programs.”* – Mrs. Laura Bush, First Lady of the United States, June 8, 2006



Zanzibari girl at a health clinic.

USAID TANZANIA / CHARLES LLEWELLYN

# FUTURE DIRECTIONS

In its first year, the President's Malaria Initiative (PMI), working with local and international partners, has made significant progress in scaling up malaria prevention and treatment activities in Angola, Tanzania, and Uganda. In addition, "jump-start" activities to launch PMI in the four Year 2 countries have already begun using Fiscal Year (FY) 06 and early FY07 funding:

- In Malawi, 186,000 long-lasting ITNs have arrived and will soon be distributed free of charge to pregnant women attending antenatal clinics nationwide;
- In Mozambique, a mass bed net re-treatment campaign took place in five provinces in November 2006, resulting in the re-treatment of approximately 450,000 nets;
- In Senegal, 100,000 mosquito nets were re-treated with insecticide; and
- In Rwanda, 555,000 doses of sulfadoxine-pyrimethamine have been procured for intermittent preventive treatment (IPTp) nationwide, and 866 health workers have been trained on malaria in pregnancy in preparation for the official nationwide launch of IPTp in December 2006.

## White House Summit on Malaria

On December 14, 2006, the President and Mrs. Bush hosted a White House Summit on Malaria in Washington, D.C., to raise awareness about malaria and mobilize a grassroots effort to save millions of lives from the disease in Africa. This event brought together international experts; corporations and foundations; African civic leaders; and voluntary, faith-based, and nonprofit organizations. At this Summit, the President and First Lady:

- Launched the Malaria Communities Program – a \$30 million initiative to build new and sustainable malaria control projects in Africa by providing grants to indigenous non-governmental organizations and faith-based organizations to support malaria control work and help families take charge of their own health;



Mrs. Laura Bush delivers her remarks at the White House Summit on Malaria, on December 14, 2006, in Washington, D.C.



President George W. Bush welcomes President Boni Yayi of Benin to the White House on December 14, 2006. Among other issues, the two leaders talked about joint efforts to combat HIV/AIDS and malaria in Benin.

- Designated April 25, 2007, as "Malaria Awareness Day," to raise awareness in the United States about malaria and to reaffirm U.S. commitment to overcome this disease; and
- Announced the eight Year 3 PMI countries – Benin, Ghana, Kenya, Liberia, Madagascar, Mali, Zambia, and Oromiya Region in Ethiopia (see Box 1).



## Box1: Map of Africa showing countries supported by PMI in Years 1, 2, and 3



Needs assessment and planning visits to these eight new countries will take place between February and May 2007 to develop operational plans for the start of activities in late 2007. With continued support from Congress, PMI expects to reach an additional 30 million beneficiaries with lifesaving malaria prevention or treatment measures during 2007 in the seven Year 1 and 2 countries, while it builds in-country capacity and sustainability.



# APPENDIX

## Summary of Results by Intervention

### 1. Indoor Residual Spraying

#### PMI IRS Activities by Country, FY 2006

Country	Houses Sprayed (percent of houses targeted)	People Protected	People Trained <sup>3</sup>
Angola <sup>1</sup>	107,373 (90%)	590,398 <sup>2</sup>	350
Tanzania	203,754 (96%)	1,018,156	536
Uganda	103,329 (96%)	488,502	450
<b>TOTAL</b>	<b>414,456</b>	<b>2,097,056</b>	<b>1,336</b>

1) In addition to the activities reported in this table, PMI provided assistance to a GFATM supported campaign in Angola, during which 25,329 houses were sprayed and 176,155 residents were protected. 2) An additional 100,000 residents whose homes were not sprayed but who lived within a cordon of sprayed houses are estimated to have benefited from this activity. 3) Includes spray operators, supervisors, and ancillary personnel.

### 2. Insecticide-Treated Mosquito Nets

#### PMI ITN Activities by Country, FY 2006

Country	Free ITNs Distributed	Subsidized/full cost ITNs Distributed <sup>1</sup>	ITNs Re-treated with Insecticide
Angola	420,000	120,949	None
Tanzania	130,000	13,894	None
Uganda	305,305	586,284	505,573
<b>TOTAL</b>	<b>855,305</b>	<b>721,127</b>	<b>505,573</b>

1) This includes ITNs distributed as well as vouchers distributed and redeemed.  
Note: It is estimated that one mosquito net will protect about 1.6 people because, on average, two people will sleep under a net 80% of the time.



### 3. Intermittent Preventive Treatment in Pregnancy

#### PMI IPTp Activities by Country, FY 2006

Country	Number of Health Workers Trained in IPTp	Other Accomplishments
Angola	1,450	
Tanzania	376	IPTp has been included in the curricula of all nurse-midwifery certificate schools
Uganda	168	District health education units have been supported to develop education materials for antenatal clinics and at the community level to create demand for IPTp among pregnant women
<b>TOTAL</b>	<b>1,994</b>	

### 4. Diagnosis and Treatment

#### PMI Diagnosis and Treatment Activities by Country, FY 2006

Country	Number of Rapid Diagnostic Tests	Number of ACT Treatments	Number of Health Workers Trained in ACTs
Angola	129,875 RDTs	587,520 treatments procured and arrived in country	1,283
Tanzania	875,000 RDTs (of which 100,000 distributed)	380,160 treatments procured and distributed to health facilities	4,217
Uganda	0	261,870 treatments procured, of which 228,870 distributed	2,844
<b>TOTAL</b>	<b>1,004,875</b>	<b>1,229,550</b>	<b>8,344</b>

# ACKNOWLEDGMENTS

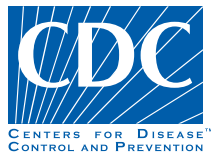
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The First Annual Report of the President's Malaria Initiative is dedicated to the staff of host governments, international and local partners, and all U.S. Government staff who have contributed to the achievements described in these pages.



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