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Executive Summary

The President's Malaria Initiative

Sustaining Momentum Against Malaria: Saving Lives in Africa

Fourth Annual Report
April 2010

CDC
Centers for Disease Control and Prevention

Department of Health & Human Services · USA

THE PRESIDENT'S MALARIA INITIATIVE

"In Africa, where the disease burden is the greatest, many countries are making dramatic gains in reducing the terrible burden of malaria, particularly for the benefit of those most vulnerable, so that malaria is no longer an intractable fact of life. Today, I recommit to work with our partners in this fight."

– U.S. President Barack Obama, World Malaria Day celebration, April 24, 2009

ARTURO SANABRIA/PHOTOSHARE

Expectant mothers wait at an antenatal care clinic in Nampula, Mozambique. Malaria infection during pregnancy poses a serious health risk to the mother and her unborn child. The goal of the President's Malaria Initiative is to reduce malaria-related deaths by 50 percent in the 15 focus countries in which it works by expanding coverage of four highly effective malaria prevention and treatment measures to the most vulnerable populations – pregnant women and children under the age of five.

Executive Summary

A Dramatic Scale-Up of Malaria Control Interventions

This report outlines the U.S. Government's (USG's) contributions to a dramatic scale-up of malaria prevention and treatment measures across 15 President's Malaria Initiative (PMI)-supported countries over the past four years. Many of these countries have reported significant reductions in under-five mortality, and there is strong and growing evidence that malaria prevention and treatment efforts are a major factor in these reductions. Throughout this report, we highlight the USG's role in the scale-up of malaria interventions, training of health workers, support for services and commodities, and health systems strengthening. Progress in malaria control is a result of the collective actions of African governments; international donors, including the USG, The Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), and World Bank; and nongovernmental organizations.

PMI PROGRESS AT A GLANCE[1]

	Year 1 (2006)	Year 2 (2007)	Year 3 (2008)	Year 4 (2009)	Cumulative
Number of people protected by indoor residual spraying	2,097,056	18,827,709	25,157,408	26,965,164	N/A[2]
Number of ITNs procured	1,047,393	5,210,432	6,481,827	15,090,302	27,829,954 (19,301,794 distributed)
Number of ITNs procured by other partners and distributed by PMI	-	369,900	1,287,624	2,966,011	4,623,535
Number of ACT treatments procured	1,229,550	11,537,433	15,454,709	29,616,342	57,838,034 (40,113,517 distributed)[3]
Number of ACT treatments procured by other partners and distributed by PMI	-	8,709,140	112,330	8,855,401	17,676,871
Number of health workers trained in use of ACTs	8,344	20,864	35,397	41,273	N/A[4]
Number of rapid diagnostic tests procured	1,004,875	2,082,600	2,110,000	6,153,350	11,350,825 (8,239,825 distributed)[3]
Number of health workers trained in malaria diagnosis (RDTs and/or microscopy)	-	1,370	1,663	2,856	N/A[4]
Number of IPTp treatments procured	-	1,349,999	1,018,333	1,657,998	4,026,330 (3,524,122 distributed)[3]
Number of health workers trained in IPTp	1,994	3,153	12,557	14,015	N/A[4]

[1] The numbers reported in this table are up-to-date as of January 1, 2010, and include all 15 PMI focus countries. In addition, during 2009, the USG provided support for malaria prevention and control activities in the Democratic Republic of the Congo, Nigeria, and Sudan. As a result, (1) more than 852,000 ITNs were procured and distributed; (2) more than 700 health workers were trained in IPTp, and 430,000 IPTp treatments were procured and distributed; and (3) more than 3,000 health workers were trained in the use of ACTs, and more than 6.2 million ACTs were procured, of which 5.4 million were distributed. The USG also provided emergency support for an IRS campaign in Zimbabwe in 2009, which protected 929,600 people.

2 A cumulative count of people protected by indoor residual spraying is not provided since some areas have been sprayed on more than one occasion.

3 Distributed to health facilities.

4 A cumulative count of individual health workers trained is not provided since some health workers have been trained on more than one occasion.

Malaria remains one of the major public health problems on the African continent. It is estimated to cause between 300 and 500 million cases and about 900,000 deaths each year, with 90 percent of those deaths in African children under five years of age. Malaria also places a tremendous burden on national health systems and individual families. 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 gross domestic product. Malaria and poverty are closely linked, and the greatest burden of malaria usually falls on residents of rural areas, where access to health care is most limited.

Launched in 2005, the President's Malaria Initiative (PMI) is a five-year, $1.2 billion expansion of USG resources to reduce the intolerable burden of malaria and help relieve poverty on the African continent. The goal of PMI is to reduce malaria-related deaths by 50 percent in 15 countries with a high burden of malaria (see map on page 10) by expanding coverage of four highly effective malaria prevention and treatment measures to the most vulnerable populations – pregnant women and children under five years of age.

Wearing personal protective equipment, a spray operator prepares his pump during an IRS campaign in Ethiopia. In 2009, PMI-supported IRS activities protected nearly 27 million people.

The 2008 Lantos-Hyde Act authorized an expanded PMI program for 2009–2013. PMI is a key component of the U.S. Government's Global Health Initiative, which was announced by President Obama in May 2009 (see box on page 7). As a result, the PMI strategy was revised to achieve Africa-wide impact by halving the burden of malaria in 70 percent of at-risk populations in sub-Saharan Africa, or approximately 450 million people.

Scaling Up Coverage of Malaria Interventions

PMI supports four proven and cost-effective prevention and treatment interventions: insecticide-treated mosquito nets (ITNs), indoor residual spraying (IRS) with insecticides, intermittent preventive treatment for pregnant women (IPTp), and prompt use of artemisinin-based combination therapies (ACTs) for those who have been diagnosed with malaria. PMI helps countries to scale up access to these interventions nationwide.

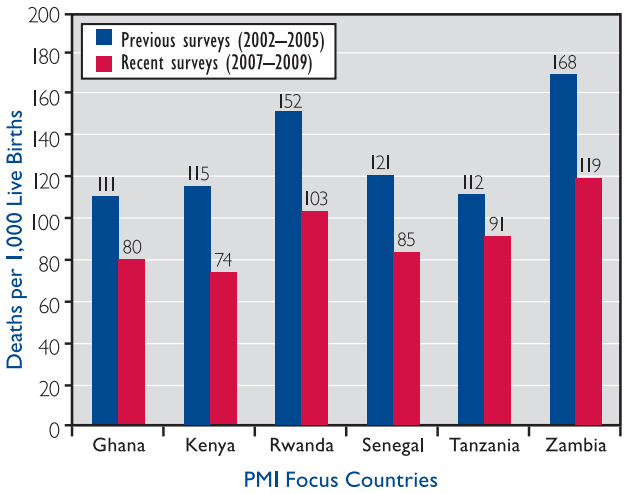
Since 2006, substantial progress has been made in scaling up training, focus country capacity building, and malaria prevention and treatment measures across the 15 PMI focus countries, in collaboration with national malaria control programs (NMCPs) and other donors. In 2009 alone, PMI procured more than 15 million long-lasting ITNs, protected approximately 27 million residents by spraying their houses with residual insecticides, and procured more than 29 million ACT treatments (see PMI Progress Table on page 2). The effective and growing collaboration with other donors is evidenced by the nearly 3 million long-lasting ITNs and the 8.8 million ACT treatments procured by other partners, which PMI helped to distribute. In addition, in 2009, PMI trained tens of thousands of people in key aspects of malaria control, including more than 41,000 health workers in the use of ACTs. In all 15 focus countries, PMI provided support to improve the pharmaceutical management of antimalarial drugs and other essential medical products.

Now, four years into PMI, dramatic increases in the coverage of malaria control measures are being documented in nationwide household surveys as a result of the contributions of PMI, prior USG assistance, national governments, and other donors. Nationwide household surveys are the best way to measure population coverage with health interventions; however, because of their cost and effort required, they are only repeated every two to three years in most countries. During the past three years, six PMI countries – **Ghana**, **Kenya**, **Rwanda**, **Senegal**, **Tanzania**, and **Zambia** – reported the results of nationwide household surveys that allow a comparison with

earlier nationwide household surveys, which are used as the PMI baseline. In these six countries, household ownership of one or more ITNs increased from the baseline range of 15 to 38 percent to a 2007–2009 range of 33 to 60 percent. At the same time, usage of an ITN the night before the survey almost doubled from an average of 22 to 41 percent for children under five and about the same amount for pregnant women. This increased ITN ownership and use, together with an average of 22 million residents protected each year for the past 3 years across the 15 PMI countries by PMI-supported IRS, means that a large proportion of the at-risk populations in these 15 countries are now benefiting from one or more highly effective malaria prevention measures. Over the same period of time, the proportion of pregnant women who received two or more doses of IPTp for the prevention of malaria has increased from a baseline average of 24 to 37 percent. Follow-up nationwide household surveys for the remaining nine PMI focus countries will be completed between 2010 and 2012 to permit an assessment of progress across all 15 PMI countries.

The scale-up of ACTs in sub-Saharan Africa has been slower than that for ITNs, IRS, and IPTp due to several factors, including that most countries only adopted ACTs as their first-line treatment for malaria in 2003–2004. Prior to that time, the World Health Organization (WHO) was recommending that all children under five with a fever be treated presumptively for malaria. With the increasing use of diagnostic testing for patients with suspected malaria, the ACT coverage indicator (proportion of children under five with a fever in the last two weeks who were treated with an ACT) no longer accurately reflects progress with ACT scale-up. Still, there are other indications that access to ACTs has increased dramatically in the 15 PMI focus countries since 2005–2006. For example, in Angola in 2005, ACTs were only available in public health facilities in about 10 of the country's 164 districts. By 2008, ACTs were being used in public health facilities in all 164 districts. Nationwide surveys carried out in late 2008 and early 2009 in Benin, Madagascar, Uganda, and Zambia by ACT Watch, a Bill and Melinda Gates Foundation-funded project, showed that between 66 percent (Benin) and 86 percent (Madagascar) of public health facilities surveyed in the four countries had the first-line ACT in stock on the day of the survey.

FIGURE 1
Reductions in All-Cause Mortality Rates of Children Under Five in Six PMI Countries



Note: The countries included in this graph are those PMI focus countries for which there are two data points from nationwide household surveys for the indicator.

Achieving Impact

In all six PMI countries with paired nationwide household surveys, substantial reductions in all-cause mortality in children under five years of age have been documented; these reductions range from 19 to 36 percent (see Figure 1, above). This represents the cumulative effect of malaria funding by PMI, USG prior to PMI, national governments, and other donors.

While a variety of factors may be influencing the decline in under-five mortality rates, there is strong and growing evidence that malaria prevention and treatment efforts are playing a major role in these reductions. For example:

- In **Senegal**, a 30 percent reduction in all-cause mortality in children under five between 2005 and 2008 has been documented. Although several factors may be involved, it is highly likely that this dramatic reduction is due at least in part to rapid increases in the coverage of malaria interventions. Household ownership of one or more ITNs has increased from 36 percent in 2006 to 60 percent in 2008. The proportion of pregnant women who received two or more doses of IPTp increased from 12 to 52 percent between 2005 and 2008. At the end of 2007, Senegal introduced rapid diagnostic tests (RDTs) for malaria in all of its health facilities, and in 2008, 73 percent of all suspected malaria cases were tested. Although no national-level baseline data are available to compare malaria prevalence,

LISA KRAMER/PMI

A mother stands by the crib of her child, who is being treated for severe malaria in Ghana. PMI works with its partners to help ensure that children under five with malaria infections are promptly diagnosed and treated to prevent progression of the infection to a severe, life-threatening illness.

fewer than 6 percent of children under five had malaria parasites in the 2008 nationwide survey, a level much lower than would be expected in most West African countries. The U.S. Agency for International Development (USAID) has supported malaria control efforts in Senegal since 1999. In fiscal year (FY) 2006, $2.2 million in PMI funding was provided, followed by $16.7 million in FY 2007, $15.9 million in FY 2008, and $15.7 million in FY 2009.

- In **Zambia**, the proportion of households with at least one ITN has increased from 38 percent in 2006 to 62 percent in 2008. More importantly, the use of ITNs by children under five almost doubled from 24 percent in 2006 to 41 percent in 2008. The National Malaria Control Program of Zambia estimates that, since 2003, more than 7 million ITNs have been distributed throughout the country. During the same time period, the prevalence of anemia among children six months to five years of age declined by 71 percent, from 14 to just 4 percent, and malaria parasite prevalence dropped from 22 to 10 percent. It is highly likely that these results contributed significantly to the drop in all-cause under-five mortality from 168 deaths per 1,000 live births in 2002 to 119 per 1,000 in 2007. USAID has supported malaria control efforts in Zambia since 2002, including $7.6 million in FY 2006. PMI provided $9.5 million in FY 2007, followed by $14.9 million in FY 2008, and $14.7 million in FY 2009.

- Analysis of household survey data from **Rwanda** showed that between 2005 and 2008, ITN use in children under five increased from 13 to 58 percent. Over approximately the same time period, the proportion of hospital deaths attributed to malaria fell from 41 to 16 percent. All-cause mortality in children under five also declined by 32 percent between 2005 and 2008. USAID has supported malaria control efforts in Rwanda since 2002. In FY 2006, PMI provided $1.5 million in funding, followed by $20 million in FY 2007, $16.9 million in FY 2008, and $16.3 million in FY 2009.

- In **Tanzania**, all-cause under-five mortality fell from 112 deaths per 1,000 live births in 2005 to 91 per 1,000 in 2007. At about the same time, household ownership of ITNs increased from 23 percent in 2005 to 38 percent in 2007. A recent survey showed that children who slept under an ITN in Tanzania were 40 percent less likely to have malaria parasites in their blood than children who did not sleep under an ITN. In the capital, Dar es Salaam, malaria prevalence fell from 24 percent in 2004 to just 4 percent in 2008, and the prevalence of severe anemia in children six months to five years of age fell by 30 percent between 2004 and 2007. USAID supported malaria control efforts in Tanzania between 1999 and 2005, including $2 million in FY 2005. Beginning in FY 2006, PMI provided $11.5 million in funding, $31 million in FY 2007, $33.7 million in FY 2008, and $35 million in FY 2009.

PMI – A Partner in Malaria Control

PMI is committed to working with a broad range of partners, most importantly national governments and NMCPs, as well as multilateral and bilateral institutions and private sector organizations (see Partners Table on page 6). During the past year, PMI expanded collaboration with the private sector, nongovernmental organizations (NGOs), and faith-based organizations (FBOs). These groups often have strong bases of operation in under-served rural areas, where the burden of malaria is greatest. The Malaria Communities Program (MCP), launched in December 2006, catalyzes partnerships with small national and international NGOs and FBOs.

Examples of PMI Partners in Malaria Control

Multilateral and Bilateral Partners	Private Sector and Foundations
• Roll Back Malaria Partnership • United Nations Secretary-General's Special Envoy for Malaria • World Health Organization • United Nations Children's Fund (UNICEF) • The Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) • World Bank • United Kingdom Department for International Development	• Malaria No More • Global Business Coalition • Bill and Melinda Gates Foundation • United Nations Foundation (Nothing but Nets) • ExxonMobil Foundation • Clinton Foundation • Carter Center

To date, MCP has awarded 20 grants to 18 organizations that are implementing activities in 12 PMI countries. In total, PMI has supported nearly 200 nonprofit organizations; more than 45 of these are faith based.

The success of PMI is linked to the efforts of other major donors. At the global level, PMI sits on the board of directors of the Roll Back Malaria (RBM) Partnership and is an active member of the U.S. Government's delegation to the Global Fund. At the country level, PMI staff members actively participate in malaria stakeholders groups, including the Global Fund Country Coordinating Mechanism. PMI staff members play an active role in all RBM working groups, including the Monitoring and Evaluation Reference Group. During the past four years, PMI, the ExxonMobil Foundation, Malaria No More, and other donors contributed funding to the Harmonization Working Group of the RBM Partnership to improve the success rate of African countries applying for Global Fund malaria grants. As a result of this support, in Rounds 7 through 9, the success rate of Global Fund malaria proposals from countries that received technical support from the Working Group nearly doubled from the 32 percent rate in Round 6. PMI also works with WHO and other technical partners to reach consensus on issues such as how best to use microscopic diagnosis and RDTs in different epidemiological and clinical settings; how to improve quality standards for antimalarial drugs, especially ACTs; and how to roll out community-based treatment of malaria with ACTs.

Integration with Maternal and Child Health Programs

Malaria prevention and control activities, including those supported by PMI, are a cornerstone of comprehensive maternal and child health services in Africa and make a significant contribution to strengthening capacity to deliver those services. ITNs are distributed principally through antenatal and child health clinics or through integrated campaigns that include other interventions, such as vitamin A supplementation or vaccinations. Evidence suggests that this approach increases the number of women who attend these facilities and campaigns.

EQUIP LIBERIA

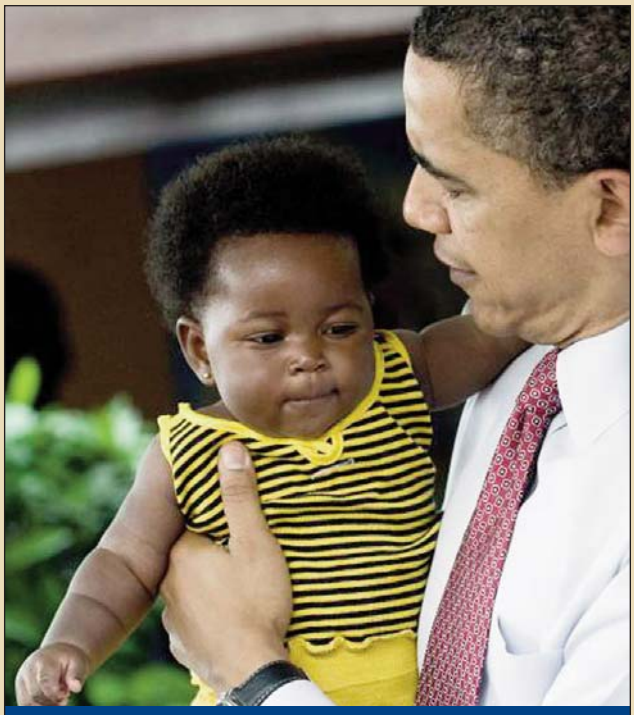
Men ferry bales of ITNs across a river during a net distribution campaign in Nimba County, Liberia, that involved a Malaria Communities Program grantee, Liberian government officials, and PMI implementing partners. More than 180,000 nets were distributed during the campaign.

PMI and the Global Health Initiative

Malaria prevention and control is a major foreign assistance objective of the USG and is a core component of President Barack Obama's Global Health Initiative, a six-year, comprehensive effort announced in May 2009 to reduce the burden of disease and promote healthy communities and families around the world. The U.S. Congress has authorized a substantial increase in resources for malaria prevention and control for the period of FY 2009–2013 and calls for a multi-year USG strategy to combat malaria globally.

As part of the Global Health Initiative, the USG has developed an expanded PMI strategy directed at:

- **Achieving Africa-wide impact** by halving the burden of malaria (morbidity and mortality) in 70 percent of at-risk populations in sub-Saharan Africa (approximately 450 million people), thereby removing malaria as a major public health problem and promoting economic growth and development throughout the region;
- Increasing emphasis on **strategic integration** of malaria prevention and treatment activities with maternal and child health, HIV/AIDS, neglected tropical diseases, and tuberculosis programs, and on **multilateral collaboration** to achieve internationally accepted goals;
- Intensifying current efforts to **strengthen host country health systems** to ensure sustainability;
- Assisting host countries to revise and update their national malaria control strategies and plans to reflect the declining burden of malaria, and linking programming of USG malaria control resources to those host country strategies;
- Ensuring a **women-centered approach** for malaria prevention and treatment activities at both the community and health facility levels, since women are the primary caretakers of young children in most families and are in the best position to help promote healthy behaviors related to malaria; and
- Limiting the threat of malaria multidrug resistance in Southeast Asia and the Americas.



SAUL LOEB/AFP PHOTO

President Barack Obama holds a child during a tour of the La General Hospital in Accra, Ghana, in July 2009. The U.S. Government's commitment to fight malaria is a key component of our nation's foreign assistance strategy and the Global Health Initiative.

IPTp is a key element of antenatal care, and antimalarial drugs are provided as part of antenatal and child health services. PMI also supports integrated management of childhood illness programs; implementation of community-based treatment of fever in which childhood pneumonia, malaria, and diarrhea are diagnosed and treated by trained community health workers; and focused antenatal care programs that provide a comprehensive package of services for pregnant women during antenatal clinic visits.

Building Capacity of National Health Systems

Both directly and indirectly, PMI resources help build health systems and strengthen overall capacity in host government ministries of health (MOHs) and NMCPs. In highly endemic countries, MOH statistics indicate that malaria often accounts for up to 50 percent of pediatric outpatient visits and hospital admissions. By reducing the burden of malaria in these countries, PMI aims to facilitate the use of critical resources and allow overstretched health workers to concentrate on controlling other childhood illnesses, such as diarrhea and

pneumonia. PMI's goal is to enable national governments to be able to control malaria on their own. MOHs and NMCPs must be able to provide leadership combined with technical and managerial skills to plan, implement, evaluate, and adjust, as necessary, their malaria control efforts. Effective NMCPs require staff with expertise in a variety of fields, including entomology, epidemiology, case management, monitoring and evaluation, laboratory diagnosis, supply chain management, behavior change communications, and financial management. In 2009, PMI efforts to strengthen health systems included:

- Providing $9 million in FY 2009 funding for pharmaceutical management activities to help MOHs, NMCPs, and national essential drugs programs improve the forecasting; procurement; quality control; storage; and distribution of antimalarial and other drugs, and for training and supervision of pharmacy and medical store staff and health workers to ensure the correct usage of these drugs;

- Funding for the training of more than 41,000 health workers on case management with ACTs, more than 2,800 in malaria laboratory diagnostics, and more than 14,000 in IPTp;

- Supporting NMCPs to collect and report data of high quality by conducting routine surveys, strengthening national health management information systems and malaria surveillance programs, and improving epidemic detection and response;

- Providing PMI resident advisors who give direct technical advice and management support to the staff of NMCPs; and

- Collaborating with NMCPs and other partners, such as the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) and WHO, to strengthen laboratory diagnosis of malaria. These efforts to upgrade laboratory services help improve the overall quality of primary health care, diagnosis, and treatment.

Malaria Research

The U.S. Government is committed to significantly reducing the global burden of malaria by supporting research through a coordinated and collaborative approach. The USG malaria research portfolio involves several USG agencies, including the Centers for Disease Control and Prevention (CDC) of the Department of Health and Human Services (HHS), the National Institutes of Health of the HHS, the Walter Reed Army Institute of Research of the Department of Defense, and USAID. These USG agencies work with a wide range of partners that include other government agencies, private companies, universities, research institutes, and non-governmental organizations. Highlights of advances in USG-supported malaria research include basic malaria biology, vaccine and drug development, and operational research to improve project implementation and impact.

Looking Ahead

An impact on malaria-related illnesses and deaths is already being seen, providing encouragement that malaria can be controlled and removed as the major public health problem on the African continent. In spite of this progress, however, we cannot afford to be complacent. Weak health infrastructures hamper malaria and other disease control programs and threaten the sustainability of these efforts. Together with our partners, PMI is tackling these challenges. With the increased funding for malaria under the Global Health Initiative, the USG has the opportunity to expand malaria prevention and treatment efforts across the continent.

For more information about PMI and to access the full report, please visit http://www.pmi.gov.

PMI BACKGROUND

PMI Structure: PMI is an interagency initiative led by USAID and implemented with CDC. It is overseen by the U.S. Global Malaria Coordinator, who is advised by an Interagency Steering Group made up of representatives of USAID, CDC/HHS, Department of State, Department of Defense, National Security Council, and Office of Management and Budget.

PMI Country Selection: The 15 focus countries were selected and approved by the Coordinator and the Interagency Steering Group using the following criteria:

- High malaria disease burden;
- National malaria control policies consistent with the internationally accepted standards of 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.

PMI Approach: PMI is organized around four operational principles based on lessons learned from more than 50 years of USG experience in fighting malaria, and experience gained from implementation of PEPFAR, which began in 2003. The PMI approach involves:

- Use of a comprehensive, integrated package of proven prevention and treatment interventions;
- Strengthening of health systems and integrated maternal and child health services;
- Strengthening of NMCPs and capacity building for country ownership of malaria control efforts; and
- Close coordination with international and in-country partners.

PMI works within the overall strategy and plan of the host country's NMCP, and planning and implementation of PMI activities are coordinated closely with each MOH.

PMI FUNDING SUMMARY

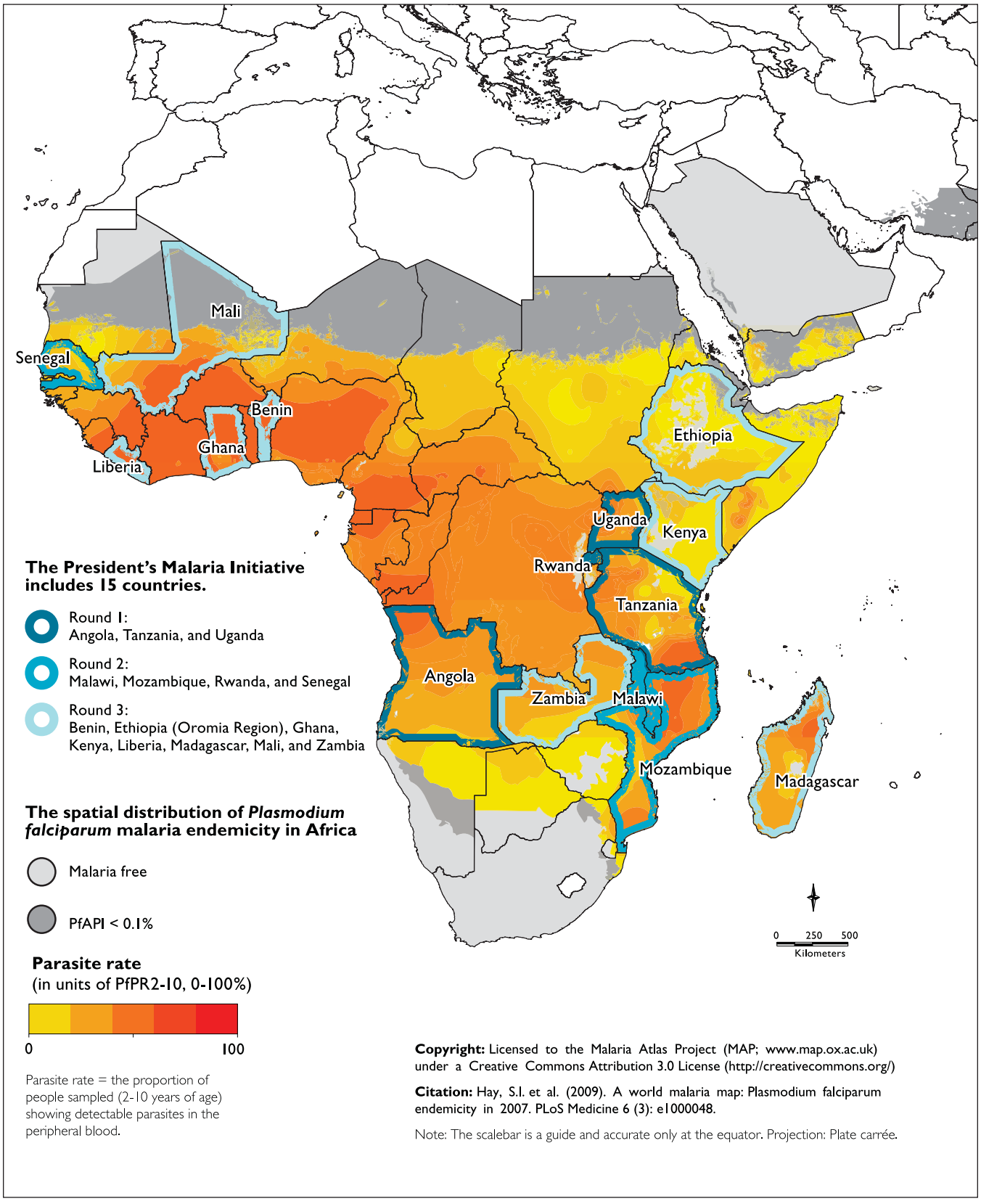
Fiscal Year (FY)	Budget	Focus Countries
2006	$30 million[1]	Round 1: Angola, Tanzania, and Uganda
2007	$135 million[2]	Round 2: Malawi, Mozambique, Rwanda, and Senegal (in addition to Round 1 countries)
2008	$300 million[3]	Round 3: Benin, Ethiopia (Oromia Region), Ghana, Kenya, Liberia, Madagascar, Mali, and Zambia (in addition to Round 1 and Round 2 countries)
2009	$300 million	All 15 PMI focus countries
2010	$500 million	All 15 PMI focus countries
TOTAL: $1.265 billion		

[1] In addition, Angola, Tanzania, and Uganda also used $4.2 million in FY 2005 funds for malaria activities.

[2] This total does not include $25 million of additional FY 2007 funding, of which $22 million was used for malaria activities in the 15 PMI focus countries. In addition, Malawi, Mozambique, Rwanda, and Senegal used $11.9 million in FY 2006 funds for malaria activities as allocated by the U.S. Global Malaria Coordinator.

[3] Benin, Ethiopia (Oromia Region), Ghana, Kenya, Liberia, Madagascar, Mali, and Zambia also used $23.6 million of FY 2006 and $42.8 million of FY 2007 funding (of which $2.8 million was included in the $25 million additional FY 2007 funding) as allocated by the U.S. Global Malaria Coordinator.

PMI Focus Countries and Malaria Distribution in Africa



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