

This Malaria Operational Plan has been approved by the U.S. Global Malaria Coordinator and reflects collaborative discussions with the national malaria control programs and partners in country. The final funding available to support the plan outlined here is pending final FY 2013 appropriation. If any further changes are made to this plan it will be reflected in a revised posting.



PRESIDENT'S MALARIA INITIATIVE



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Benin

Malaria Operational Plan FY 2013

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ABBREVIATIONS and ACRONYMS

ACT	Artemisinin-based combination therapy
AL	Artemether-lumefantrine
ANC	Antenatal care
ARM3	Accelerating Reduction of Malaria Morbidity and Mortality
BCC	Behavior change communication
CAME	<i>Centrale d'Achat des Médicaments Essentiels</i> (Central Medical Stores)
CDC	United States Centers for Disease Control and Prevention
CHW	Community health worker
CREC	<i>Centre de Recherche Entomologique de Cotonou</i> (Center for Entomology Research – Cotonou)
CRS	Catholic Relief Services
CY	Calendar year
DHS	Demographic and Health Survey
EUV	End-use verification
FY	Fiscal year
GHI	Global Health Initiative
Global Fund	The Global Fund to Fight AIDS, Tuberculosis, and Malaria
GOB	Government of Benin
HMIS	<i>Système National d'Information et de Gestion Sanitaires</i> (Health Management Information System)
iCCM	Integrated community case management
IPTp	Intermittent preventive treatment of malaria in pregnancy
IRS	Indoor residual spraying
ITN	Insecticide-treated net
LLIN	Long-lasting insecticide-treated net
M&E	Monitoring and evaluation
MOH	Ministry of Health
NMCP	<i>Programme National de Lutte contre le Paludisme</i> (National Malaria Control Program)
PMI	President's Malaria Initiative
RBM	Roll Back Malaria
RDT	Rapid diagnostic test
RMIS	Routine Malaria Information System
SP	Sulfadoxine-pyrimethamine
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization

I. EXECUTIVE SUMMARY

Malaria prevention and control are major foreign assistance objectives of the U.S. Government. In May 2009, President Barack Obama announced the Global Health Initiative (GHI) to reduce the burden of disease and promote healthy communities and families around the world. The President's Malaria Initiative (PMI) is a core component of the GHI, along with HIV/AIDS, tuberculosis, maternal and child health, family planning and reproductive health, nutrition, and neglected tropical diseases.

PMI was launched in June 2005 as a 5-year, \$1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions and reduce malaria-related mortality by 50% in 15 high-burden countries in sub-Saharan Africa. The 2008 Lantos-Hyde Act extended funding for PMI through FY 2014. Programming of PMI activities follows the core principles of GHI: encouraging country ownership and investing in country-led plans and health systems; increasing impact and efficiency through strategic coordination and programmatic integration; strengthening and leveraging key partnerships, multilateral organizations, and private contributions; implementing a woman- and girl-centered approach; improving monitoring and evaluation; and promoting research and innovation.

In December 2006, Benin was selected to receive funding during the third year of PMI. In Benin, malaria is endemic nationwide and is a major cause of morbidity and mortality. It is reported to account for 40% of outpatient consultations and 25% of all hospital admissions. With 39% of the population living below the poverty line and a per capita annual income of only \$750, malaria places an enormous economic strain on Benin's development. According to the World Bank, households in Benin spend approximately one quarter of their annual income on the prevention and treatment of malaria. The most recent Demographic and Health Survey (DHS), conducted from December 2011 to March 2012, showed significant improvement in several key indicators compared to the last DHS in 2006. These indicators included net ownership and usage, and all-cause mortality in children less than five years of age, to name a few.

The Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund) has awarded two malaria grants to Benin. Catholic Relief Services received \$22.6 million to support community case management and health system strengthening in 14 health zones through 2012. Africare's Rolling Continuation Channel Phase 1 grant proposal was awarded \$27.8 million to support two long-lasting insecticide treated net (LLIN) universal coverage campaigns, community case management of malaria, and nationwide procurement of artemisinin-based combination therapies (ACTs) for children under five through 2012. Africare recently submitted a Phase 2 Rolling Continuation Channel proposal to the Global Fund, seeking about \$37.5 million to procure LLINs to distribute in specific health zones during the nationwide campaign scheduled for 2014. If approved, part of this grant will be used to cover up to 80% of the estimated national need for LLINs in the 2014 campaign. The World Health Organization, the United Nations Children's Fund, and other national and international partners continue to support scaling up malaria prevention and control measures in Benin.

This FY 2013 Malaria Operational Plan is based on progress and results to date, as well as input received from the National Malaria Control Program (NMCP) and partners during a planning visit in June 2012. The activities that PMI is proposing complement the contributions of other partners and directly support the NMCP's strategic plan. The proposed FY 2013 PMI budget for Benin is \$16.1 million. The following paragraphs describe the progress to date and FY 2013 plans.

Insecticide-treated bed-nets: The NMCP strategy is to support free distribution of LLINs through antenatal care (ANC) and immunization clinics, distribution of highly-subsidized LLINs through community-based channels, free distribution through mass campaigns, and the sale of LLINs in the commercial sector. PMI procured 280,000 LLINs in FY 2011 using FY 2010 funds. These nets were a contribution to the universal coverage campaign that was conducted by the country over a three-month period starting in July 2011. Approximately 5 million LLINs were distributed nationwide during this campaign. Additionally, PMI procured 410,000 LLINs with FY 2011 funds for distribution through ANC and immunization clinics. Furthermore, PMI paid for the distribution of LLINs in Ouémé-Plateau as part of the follow-up activities related to the cessation of indoor residual spraying (IRS). The impact of these contributions by PMI and other partners can be found in the most recent DHS, which showed an increase in LLIN ownership from 25% in 2006 to 80% in 2012. With FY 2013 funding, PMI will procure approximately 680,000 LLINs for free distribution to pregnant women at ANC clinics and to children under-five at immunization clinics. In addition, PMI will support behavior change communication (BCC) activities, including mass media and community-level approaches (e.g., local radio stations, women's groups) to maintain demand for and promote correct and consistent use of LLINs, as well as to support the supply chain system to ensure a steady supply of LLINs for routine services.

Indoor residual spraying: The NMCP's National Strategy aims to scale up IRS so that spraying occurs in 20 of 77 communes by 2015. To date, only PMI is supporting IRS in Benin, currently focusing on nine communes in the northern district of Atacora, where only one spray round per year is needed due to climatic conditions that limit vector breeding and malaria transmission. PMI achieved this objective in 2012, when all the communes were covered, for a total of 210,380 houses sprayed and 652,777 people protected. With FY 2013 funding, PMI-supported IRS will continue to cover all nine communes of Atacora, protecting an estimated 700,000 people. Meanwhile, in the south, where IRS was done previously, PMI will continue to support universal LLIN coverage as well as entomological and malaria case surveillance to identify and respond to any potential rebound in malaria. Entomological surveillance will also be supported in Atacora, to inform IRS and LLIN planning.

Malaria in pregnancy interventions: The national policy of Benin supports the free distribution of sulfadoxine-pyrimethamine (SP) and LLINs to pregnant women presenting at ANC clinics. While the most recent DHS shows high rate of attendance at ANC clinics (over 80%), the uptake of SP for intermittent preventive treatment during pregnancy (IPTp) is only at 23%. In contrast, and perhaps due to the recent "universal coverage" campaign, the proportion of pregnant women sleeping under an insecticide-treated bed net increased from 20% in 2006 to 75% in 2012. During the past year, PMI provided over 700,000 LLINs and 634,000 SP treatments for use in ANC facilities. With FY 2013 funding, PMI will conduct refresher training of health workers in IPTp, supervise health workers to improve the quality of services, strengthen logistics management for malaria in pregnancy commodities, support BCC activities to promote ANC attendance, procure approximately 1 million treatments of SP, and educate pregnant women and communities on the risks of malaria in pregnancy, the need for early and regular ANC visits, and the benefits of IPTp.

Case management – Diagnosis: During the past year, one laboratory technician and one clinician from each of the 12 departments of Benin were trained in microscopy, and are now serving as national trainers and supervisors for malaria diagnostics in 118 health facilities. An additional 15 laboratory technicians received refresher training. The eighth round of outreach training and supervision was completed in March 2012, a ninth round in June 2012, and another is planned for September 2012. Also, 20 microscopes were purchased to alleviate existing gaps

at reference hospitals. Despite the progress made in malaria diagnosis, 32% of health facilities are still prescribing antimalarial drugs to patients who have a negative rapid diagnostic test or microscopy result, according to the end-use verification survey completed in April 2012. PMI will continue to work collaboratively with the National Referral Laboratory and the NMCP to improve confidence among health professionals in diagnostic testing and the appropriate use of those results when prescribing. With FY 2013 funding, PMI will procure 1.5 million rapid diagnostic tests, 15 microscopes, and provide support for training and supervision of health workers and community agents in improved malaria diagnostics.

Case management – Treatment: In the last 12 months, PMI trained 542 private sector health providers in the new malaria policy to test each case of fever first with a rapid diagnostic test before prescribing treatment with an ACT, if the case is confirmed as malaria. To support this training, PMI, with guidance from the NMCP, developed four training modules: a training manual; a participating nurse’s manual; a participating doctor’s manual; and an orientation manual for pharmacists on the new malaria control policy. Also, PMI distributed 2,000 new malaria case management policy documents countrywide. Approximately 2.6 million ACT treatments were procured in several shipments, and onsite supervision of health workers including benchmark assessments, on-the-spot training on the new algorithm, coaching including supervision of diagnostic activities, and training on the management of severe malaria were completed as well. In FY 2013, PMI will procure approximately 1.5 million ACTs and support improved, quality supervision and training of 90% of healthcare workers nationwide.

Case management – Pharmaceutical management: Over the past 12 months, PMI continued to focus on the reform process at the Central Medical Store, *Centrale d’Achat des Médicaments Essentiels* (CAME). PMI provided technical assistance to review CAME’s action plan that seeks to improve governance and transparency, to assess the capacity of health zones to manage malaria supply chains, and to strengthen malaria supply chain management down to the health zone level. PMI also continued its efforts in supporting the NMCP to improve its logistic management information system for antimalarials. CAME recently finalized a new strategy document, the CAME Strategic Development Project Plan (*Plan Stratégique de Développement* 2012-2016). The plan outlines CAME’s strategic focus over the next five years, including an assessment of its human resource and financial needs. In FY 2013, PMI’s assistance will focus on providing assistance to CAME as it rolls out the plan. PMI will also continue to provide assistance to strengthen the malaria supply management system at the national, district, and health zone level. Support will also include technical assistance to strengthen the logistic management information system in efforts to improve monitoring, storage, and distribution of malaria commodities.

Monitoring and Evaluation: During the last 12 months, PMI and NMCP staff have worked closely on monitoring and evaluation issues, and PMI Resident Advisors have been active participants in the Monitoring & Evaluation Technical Working Group. Also, PMI, via the Regional Institute of Public Health, has continued to support the five sentinel sites and improve the quality of the data. Moreover, PMI has provided ongoing technical and financial support to the Routine Malaria Information System. The 2011 DHS got a late start and was completed in March of 2012, with financial support from PMI and a large investment of staff time, which prevented an even greater delay. In the first quarter of 2013, PMI will review and evaluate the performance of the sentinel site surveillance system and determine if support will be maintained in the FY 2013 budget. In FY 2013, PMI will continue to support improvement of the health management information system, and both end-use verification and malaria indicator surveys.

Behavior change communication: In collaboration with key partners and stakeholders, PMI provided support for qualitative research to identify barriers to desired malaria-related behaviors. Results from this activity will be used to inform the development of the national malaria communication strategy. A multi-pronged approach is being utilized to increase net hang-up and use. In peri-urban areas, PMI continues to work with local nongovernmental organizations with experience in BCC to conduct net promotion. In rural areas where community health workers have been trained to treat malaria, PMI is utilizing these community agents to conduct household visits and follow-up activities. PMI supported the production of BCC materials and other promotional items such as job aids, a messaging guide, a certificate of accomplishment of BCC activities to health promotion agents, banners, and posters. PMI also supported production of radio, TV spots, brochures, training of hang-up volunteers, and the production of media and communication activities for post-insecticide-treated net distribution. In FY 2013, PMI will continue to support parts of this strategy.

Health systems strengthening/Capacity building: Consistent with GHI principles, PMI is intensifying its efforts to build in-country capacity and integrate malaria activities with other U.S. Government programs. In response to the NMCP's human resource challenges, PMI invested in the training and attendance at international conferences of several key NMCP staff. Also, PMI supported two commodities and logistics specialists, who have assumed the role of professionally mentoring counterparts within the NMCP's supply chain management section. PMI also supported two NMCP staff who attended a two-week supply chain management training course in Ouagadougou. In addition, PMI funded the supervision of health workers in health facilities involved in the implementation of malaria activities at the health zone level. PMI continued to focus on the reform process at CAME. The reforms in governance have now been completed and seem to be taking root, but there are still stockouts of ACTs in some health facilities even, although they are available at CAME. In FY 2013, PMI will continue to support training of NMCP staff in several key areas of monitoring and evaluation, including database management. Also, PMI will continue to support strengthening and reinforcing the capacity of the logistics management information system and overall supply chain management.

II. STRATEGY

A. INTRODUCTION

The President's Malaria Initiative (PMI) is a core component of the Global Health Initiative (GHI), along with HIV/AIDS, and tuberculosis. PMI was launched in June 2005 as a 5-year, \$1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions and reduce malaria-related mortality by 50% in 15 high-burden countries in sub-Saharan Africa. With passage of the 2008 Lantos-Hyde Act, funding for PMI has now been extended through fiscal year (FY) 2014 and, as part of GHI; the goal of PMI has been adjusted to reduce malaria-related mortality by 70% in the original 15 countries by the end of 2015. This will be achieved by continuing to scale up coverage of the most vulnerable groups—children under five years of age and pregnant women—with proven preventive and therapeutic interventions, including artemisinin-based combination therapies (ACTs), insecticide-treated nets (ITNs), intermittent preventive treatment of pregnant women (IPTp), and indoor residual spraying (IRS).

Benin became a PMI focus country in 2008. Despite the country's weak health infrastructure, with support from PMI and other partners, national ITN scale-up and focused IRS scale-up have been quite successful, while there has been modest improvement in IPTp coverage and small improvements in prompt and effective malaria treatment with ACTs.

In June 2011, the majority of PMI activities were grouped under one malaria bilateral program and named Accelerating the Reduction of Morbidity and Mortality (ARM3). Key personnel have been designated in the technical areas of case management, supply chain management, behavior change communication (BCC), and monitoring and evaluation (M&E). Certain elements, such as IRS and commodities procurement, remain centrally managed to ensure that global standards are met.

This FY 2013 Malaria Operational Plan presents a detailed implementation plan for the sixth year of PMI in Benin, based on the PMI Multi-Year Strategy and Plan and the National Malaria Control Program's (NMCP's) five-year National Malaria Strategy. The Malaria Operational Plan was developed in consultation with the NMCP and with the participation of all national and international partners involved with malaria prevention and control in the country. The activities that PMI is proposing to support fit in well with the 2011-2015 National Malaria Control Strategy and Plan and build on investments made by PMI and other partners to improve and expand malaria-related services, taking into account the gap due to the recent Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund) budget issues. This document briefly reviews the current status of malaria control policies and interventions in Benin, describes progress to date, identifies challenges and unmet needs if NMCP and PMI targets are to be achieved, and provides a description of planned FY 2013 activities.

B. MALARIA SITUATION IN BENIN

Epidemiology

Malaria is a leading cause of morbidity and mortality among children under five in Benin. Roll Back Malaria (RBM) estimated that in 2004 there were about 3 million cases of malarial illness (all ages); and the Child Health Epidemiology Reference Group, convened by the World Health Organization (WHO), estimated that the number of malaria deaths in children 1–59 months old was about 10,000 in the year 2000 and about 9,000 in the year 2010¹. The Benin Health Management Information System (HMIS) data also suggest a high burden of morbidity from anemia, much of which is likely caused by malaria. The Benin 2006 Demographic and Health Survey (DHS) found that among children 6–59 months old, 78% had anemia (25% mild, 46% moderate, and 8% severe). Preliminary results of the 2012 DHS found that anemia prevalence in this age group decreased to 58% (26% mild, 29% moderate and 3% severe).

Entomology/transmission (populations at risk of malaria)

Malaria transmission is stable but influenced by several factors such as vector species, geography, climate, and hydrography. The primary malaria vector is *Anopheles gambiae s.s.*; however, secondary vectors may become important in certain circumstances. Widespread distribution and continuous breeding of *A. gambiae s.l.* in the south and more seasonal breeding in the north result in an endemic transmission pattern. In the coastal region, which has many lakes and lagoons, there are two vectors, *A. melas* and *A. gambiae*. North of the coast, malaria is holoendemic and *A. gambiae* is the vector. Northern Benin has a dry season (November to June) and a rainy season (July to October), during which malaria rates are highest.

¹ Lui et al. Global, regional and national causes of child mortality: an updated systematic analysis for 2010 with time trends since 2000, *Lancet* 2012; **379**: 2151-61.

C. COUNTRY HEALTH SYSTEM DELIVERY STRUCTURE AND MINISTRY OF HEALTH ORGANIZATION

Administratively, Benin is divided into 12 departments (average of 650,000 inhabitants per department), 77 communes, and three urban areas (Cotonou, Porto Novo, and Parakou), 546 arrondissements, and 3,747 villages. Benin's public health system has a pyramidal structure with three levels:

- Central: Ministry of Health (MOH) and its central Directorates; one National Referral Hospital (*Centre National Hospitalier et Universities*)
- Intermediate: Departmental Directorates for Health, departmental referral hospitals (*Centres Hospitaliers Départementaux*). There are only six functional tertiary referral hospitals nationwide
- Peripheral: Health zones, which include the following health facilities: zonal hospital (*Hôpital de Zone*), district health centers (*Centre de Santé de la Commune*), community health centers (*Centre de Santé d'Arrondissement*), private health facilities, and village health units. In practice, not all health zones have a functioning zonal hospital. The country's 34 health zones each cover an average population of 262,000 (ranging from 84,000 to 492,000). Health zones serve one to four communes (average of two communes per health zone).

Private health providers

The private health sector in Benin is varied and includes traditional practitioners (unlicensed), private hospitals run by faith-based organizations, private facilities run by licensed health practitioners, unregulated providers, and drug vendors (unlicensed). The MOH is authorized by law to work with licensed facilities and practitioners, but not unlicensed ones. This is a potential obstacle, as the unauthorized private sector is an important source of care for the poor. For example, when health services are unavailable to the public due to MOH strikes, the private sector is the only recourse for basic health services.

D. NATIONAL MALARIA CONTROL PLAN AND STRATEGY

With the support from PMI, WHO, and Roll Back Malaria, the NMCP has developed its new five-year National Malaria Strategic Plan 2011-2015. The vision behind the new strategy is to continue to promote universal access to malaria prevention and treatment interventions, implement activities that encourage positive behavior change, achieve and sustain high coverage levels, thereby reducing malaria's burden and achieving near zero deaths by 2015. The core interventions of the 2011-2015 strategy include:

- Universal coverage with ITNs, with a special emphasis on distributing long-lasting insecticide-treated nets (LLINs) through mass distribution campaigns in July 2011 and 2014. Donors and the Government of Benin (GOB) will continue to support routine distribution to pregnant women during antenatal care (ANC) clinic visits and to children under five years during routine immunization clinics
- Further expanding IRS, which currently covers all nine communes in the department of Atacora
- Universal access to ACTs, as well as improved diagnosis and management of severe malaria
- Emphasis on the prevention and treatment of malaria in pregnancy, particularly on IPTp
- Intensive BCC efforts at all levels, especially at the community level

- Integration of malaria control activities within the health system with an emphasis on human resource development
- Strong monitoring, evaluation, and operations research to monitor progress, evaluate impact, and continuously improve interventions

In its 2011-2015 Strategic Plan, the NMCP seeks to enhance coordination capacity within the decentralized structures at the departmental level. Under this approach, 12 departmental coordinating structures will continue to be supported to improve health outcomes through implementation of policies and strategies and new initiatives defined by the national coordination structures and the GOB such as:

- Waiver of user fees for children under five attending health facilities
- Increasing capacity of community health workers (CHWs)
- Free malaria treatment for children under five and pregnant women

E. INTEGRATION, COLLABORATION, AND COORDINATION

Malaria stakeholders in Benin include government, civil society, the private sector, academia and external donors. The MOH's NMCP, a unit of the National Directorate for Health Protection (*Direction Nationale pour la Protection Sanitaire*), is the government's recognized agent in coordinating and supervising the country's malaria program and policy. Various civil society organizations act as implementing partners of the national malaria program, especially at the community level and in remote areas where neither the MOH nor the NMCP has a presence. Academia's role is to provide technical assistance and training. The private sector is represented by private clinics, individual service providers, commercial establishments, and vendors of goods and services that are used in malaria programs. External donors are foreign assistance providers like PMI, the Global Fund, the African Development Bank, and the World Bank. Beginning FY 2013, PMI and the Global Fund will be the only two principal external donors to the NMCP.

Relationships between the malaria stakeholders described above are collegial and collaborative. There is adequate space in different forums to resolve issues of mutual concern and enough goodwill among stakeholders to resolve differences amicably.

Progress in relationships during the last year

During the past year, the universal bed net distribution campaign was the most significant point of collaboration between the GOB, civil society, the private sector, the media, and external donors. Led by the new Minister of Health, Professor Dorothee Kinde-Gazard, a recognized malariologist, the campaign received interministerial collaboration and visible support from President Yayi Boni, who launched the campaign on national television. Another media event was the launch of the policy to provide free malaria treatment and services to children under five and pregnant women. Stakeholders were engaged in the many meetings, email exchanges, and discussions that preceded the adoption of the policy by the MOH.

Other important points of collaboration have been the development of malaria proposals to the Global Fund by Catholic Relief Services (CRS) and Africare, meetings to analyze the preliminary results of the DHS malaria indicators, the work of the technical working groups, monthly Roll Back Malaria coordination meetings, and the integrated annual work plan workshop.

Benin has experienced some setbacks. The NMCP went through three coordinators in six months. The Global Fund suspended Round 11, putting brakes on a well-advanced national proposal process. And, after five years of investments in the NMCP, the World Bank terminated its involvement in malaria programming.

Nonetheless, stakeholders feel that Benin is poised at a historic moment to embark on the final phase of reducing the large malaria burden that has plagued the country for decades. This has been fostered by the following opportunities for communication and coordination between PMI and other malaria stakeholders in country:

- **NMCP as a hub for communication and coordination.** The NMCP is the designated hub for coordination of malaria activities in Benin. There are three functional technical working groups that have met regularly over the past year: M&E, communication, and supply chain management. Stakeholders volunteer their time to the working groups, based on their in-house expertise and the character of their portfolio. The NMCP annually holds a workshop to harmonize stakeholders' annual plans. This has fostered mutual information-sharing early in the planning process and ensured better coordination. With the new five-year strategic plan, there has been increased coherence in the shared targeting of long-term goals for elimination of malaria as a public health problem.
- **RBM Network.** The NMCP acts as the convener of the RBM network in Benin. The NMCP coordinator is the chair and the WHO malaria advisor is the co-chair. Meetings are held monthly and are well attended. All stakeholders present are given the opportunity to report on their malaria activities during the previous month. This local RBM network is closely linked to the West Africa RBM Network (WARN) and the global RBM Network based in Geneva.
- **The Country Coordinating Mechanism of the Global Fund.** The Country Coordinating Mechanism is designated as the in-country owner of the dual responsibilities of shepherding proposals to the Global Fund Secretariat in Geneva and providing oversight to the successful achievement of objectives of approved proposals. The U.S. Agency for International Development (USAID) sits as a permanent member of the mechanism and is actively involved in the Malaria Working Group.
- **The Partenaires Techniques et Financiers.** The members of this group comprise the major external donors to Benin's health sector (with the exception of China). The group's interests do not all focus on malaria, but the group has been very supportive of health program-related reforms, such as PMI's support to the Central Medical Stores (CAME).
- **One-on-one coordination meetings.** These types of meetings are still the mainstay of coordination efforts in Benin. However, they are time-consuming and are disadvantageous to those partners that are based up-country and do not have offices in Cotonou.
- **The Malaria Operational Planning (MOP) exercise.** The week-long annual visit of colleagues from the U.S. Centers for Disease Control and Prevention (CDC)/Atlanta and USAID/Washington is an excellent opportunity for sharing information, lessons learned, and experiences. The debates in the meetings, the group work, and presentations provide additional insights that enrich the PMI MOP.

F. PMI GOALS, TARGETS, AND INDICATORS

In Benin, the goal of PMI is to reduce malaria-associated mortality by 70% compared to pre-Initiative levels. Pre-initiative levels are those existing during the time period covered by the 2006 DHS. By the end of 2014, PMI will assist Benin to achieve the following targets nationwide, as the entire population is at risk for malaria:

- >90% of households with a pregnant woman and/or children under five will own at least one ITN
- 85% of children under five will have slept under an ITN the previous night
- 85% of pregnant women will have slept under an ITN the previous night
- 85% of houses in geographic areas targeted for IRS will have been sprayed
- 85% of pregnant women and children under five will have slept under an ITN the previous night or in a house that has been 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 government health facilities have ACTs available for treatment of uncomplicated malaria

In July 2012, the Minister of Health directed the NMCP to achieve five bold malaria targets to be achieved by December 2012: 1) 80% of all children with fever receive appropriate care within 24 hours; 2) 80% of all clients receive correct case management of simple and severe malaria; 3) 80% of pregnant women are sleeping under an LLIN; 4) 80% of children under five are sleeping under an LLIN; and 5) 80% of all pregnant women receive two doses of IPTp. The NMCP has established specific work teams with its partners to achieve each of the five results.

G. PROGRESS ON COVERAGE/IMPACT INDICATORS TO DATE

The table below presents estimates of malaria indicators. Most results were measured by the two most recent DHS surveys, which were nationally representative household surveys. Estimates from the 2006 DHS, which was conducted from August–November 2006 (approximately covering the short rainy season), have been accepted as the baseline indicators for Benin. The 2012 DHS was conducted from December 2011–March 2012 (covering the dry season). The IRS indicator is current for 2012, and the figure was drawn from PMI program monitoring documents, rather than DHS data.

Table A: Malaria indicators

Indicator	2006 DHS	2012 DHS	2012 IRS monitoring report
Households with ≥ 1 ITN	25%	80%	
Children ≤ 5 year sleeping under an ITN the previous night	20%	71%	
Pregnant women who slept under an ITN the previous night	20%	75%	
Women who received ≥ 2 doses of IPTp during their last pregnancy in the last two years	< 1%	23%	
Children ≤ 5 with fever in the last two weeks who received treatment with an ACT within 24 hours of fever onset	<1%	7%	
Houses targeted for IRS that were sprayed			92%

H. OTHER RELEVANT EVIDENCE ON PROGRESS

PMI supported two interventions that have not been focused on by the NMCP: ITNs as protection against malaria for young children and pregnant women and an integrated approach to the management of childhood illness in the community.

During a visit in May 2012 by the USAID/Benin Family Health Team with the Deputy Minister of Decentralization to isolated ANC clinics in Ouémé Department, the demand of recently delivering mothers for mosquito nets was evident: they needed nets to protect them and their babies from malaria. This demand meant that the message on ITNs' protective effect against malaria has been heard correctly by those who were most vulnerable. This also meant that the women who are often without voice in Benin have been empowered to ask for what they deserve. PMI had previously conducted a behavior change campaign in the department on the correct use of bed nets just prior to the national universal ITN distribution campaign conducted in August 2011.

In the recent evaluation of the Integrated Community Case Management (iCCM) Project, many households in the communities surveyed spontaneously expressed concern that the project's activities were coming to an end. Mothers, fathers, schoolteachers, traditional leaders, and government functionaries pleaded with the evaluators to advocate for PMI's continued support for malaria activities.

Such incidents are not isolated. From the north to the south of Benin, communities and households have appreciated the drop in malaria deaths and the much reduced numbers of children with fever.

I. CHALLENGES, OPPORTUNITIES, AND THREATS

Challenges: In Benin, malaria is a major burden on the population's health. The 2012 DHS has shown some significant progress in controlling the disease, but much work remains to be done before the objective of near-zero deaths due to malaria is achieved by 2015. Benin shares the following challenges with most developing countries: 1) an acute health worker crisis – both in terms of absolute numbers and professional qualifications; 2) leadership and management skills of district and departmental supervisors; 3) a weak supply chain management systems, especially at the health zone level where product stockouts and leakages are common; 4) an ineffective HMIS, especially in routine monitoring and data quality; and 5) incomplete implementation of national policies and treatment protocols.

Furthermore, although Benin is a small country, it is culturally diverse and linguistically complex, making communication of concepts and directives difficult to implement. The literacy rate is low: six out of ten adult women have never been to school. Implementing behavior change strategies at different levels requires effort and time. For example, it has been a major challenge over the past two years to ensure implementation of the national policy to treat malaria with ACTs only when the diagnosis is confirmed with an appropriate rapid diagnostic test (RDT) or microscopy.

Other challenges include a growing private sector that needs to be more engaged in malaria control, a growing urban population with little access to services, and a national policy environment that has not given health the appropriate level of priority in budget allocations.

Opportunities: Despite the above challenges, Benin has made substantial progress in the past few years. Benin's new five-year strategy for the NMCP provides clarity on a way forward for malaria control, enabling PMI to align activities with the GOB's priorities. During the MOP design, appropriate MOH and NMCP staff were involved or consulted in all aspects of planning, and they will be fully involved in implementation, monitoring, and evaluation of the program. Some interventions have been scaled-up, such as the universal distribution of ITNs, while others, such as the recent presidential policy decision to provide free malaria treatment for children under five and pregnant women, are being prepared for nationwide implementation. There is a strong, collaborative partnership between the MOH and donors, which constitutes a platform to eliminate malaria as a public health problem in Benin. It is also important to note that the decentralization of the public sector health system has started to generate opportunities for many actors to collaborate actively beyond the MOH's central level. At the health zone and department levels, donors have collaborative arrangements around local health issues that give communities a voice.

Threats: The lack of leadership, good management, and transparent governance within the NMCP and other MOH staff represents a constant threat to the effectiveness and sustainability of malaria interventions. To ensure that activities undertaken by PMI continue beyond its period of support, the transfer of knowledge, capacity, and responsibilities to a strong NMCP and other government staff is vital. Currently, another threat to the NMCP has emerged: the gradual diminution of financial resources, after peaking in 2010. In 2011, the World Bank shifted its assistance to Benin's health sector to a performance-based funding arrangement with a limited number of health zones. The Global Fund has already reduced its contributions to the malaria program, and has postponed any new proposals to 2014. Finally, leadership changes are always a threat – resulting in changes of focus, momentum, and personalities. Different leaders bring different levels of commitment to achieving results and different attitudes towards maintaining transparency in the public sector.

J. PMI SUPPORT STRATEGY

Benin was selected as a PMI focus country in 2008, although large-scale implementation of ACTs and IPTp and wide-spread distribution of ITNs began earlier in 2007 with the support of other donors, notably the World Bank and the Global Fund. The work has progressed rapidly with support from PMI and other partners, in spite of the weak health infrastructure.

In the FY 2010 MOP, PMI decided to group the majority of activities under one malaria bilateral program. Following an application and review process in FY 2011, a new five-year bilateral was awarded at the beginning of FY 2012, titled Accelerating the Reduction of Malaria Morbidity and Mortality (ARM3). Certain elements, such as IRS and commodities procurement, will remain centrally managed to ensure global standards are met and to benefit from the advantages of bulk purchasing via a central mechanism. PMI will work closely with ARM3 to ensure that all technical areas are covered in the work plan through consortium partners and sub-partnership networks. ARM3 key personnel are currently in place to support the following technical areas: case management, supply chain management, BCC, and M&E.

PMI's national-level support for FY 2013 includes a) continued routine distribution of ITNs through ANC and immunization clinics to pregnant women and children under five, respectively; b) improved malaria diagnostics and case management; c) sustained support to the health information system, especially on routine monitoring and periodic evaluations; d) improved pharmaceutical and commodity supply chain management; and e) BCC activities. Capacity building and health system strengthening will focus on improving leadership, management, and governance of the NMCP as a functional unit within the MOH at the central level. Department-level malaria staff will be given the opportunity to build their capacity in malaria epidemiology.

The iCCM Project, currently implemented sub-nationally in three departments, is scheduled to end in July 2012. Future activities in community case management will be absorbed into ARM3, with funding both from PMI and USAID/Benin's Maternal and Child Health funding stream.

In Benin, PMI is but one of several partners, which makes it possible to achieve national coverage with several malaria interventions.

III. OPERATIONAL PLAN

A. PREVENTION

1. Insecticide-treated nets (ITNs)

Background

On July 8, 2011, the NMCP launched a mass distribution campaign for universal coverage of LLINs with support from its partners. The universal coverage goal is to achieve near zero deaths from malaria by 2030. The Global Fund contributed 2.7 million nets, the World Bank 1.7 million nets, PMI 280,000 nets, and the African Development Bank 187,500 nets, for a total of 4,674,800 million nets. There was no gap of LLINs for this campaign. However, Benin expects a gap in a follow-up campaign scheduled for 2014. The NMCP's new strategic plan will continue to support free distribution of LLINs through ANC and immunization clinics and distribution of highly-subsidized LLINs through community-based channels, in addition to universal coverage campaigns. The 2012 DHS found that a majority of all households (86%) owned at least one mosquito net of any type, 80% of households reported owning at least one ITN, and 71% of children under five and 76% of pregnant women said that they had slept under an ITN the previous night. These data confirm significant progress in terms of ITN ownership and usage since the baseline in 2006, when ownership and usage levels were less than 25%.

Table B: LLIN Gap Analysis for 2012-2015

Need and Funding Source	2012	2013	2014	2015
Routine (pregnant women)	488,515	504,392	520,785	537,710
Routine (children under five)	374,341	386,507	399,069	412,039
Mass Distribution campaign			5,368,158	
Total need	862,856	890,899	6,288,012	949,749
Actual Current Need (less already distributed/effective LLINs)	862,856	890,899	6,288,012	949,749
Already committed/distributed				
PMI-MOP FY11	470,000			
PMI-MOP FY12		740,000		
PMI-MOP FY13			700,000	
Government of Benin				
Global Fund				
Carry Over Nets	360,000			
Total already distributed or committed	830,000	740,000	700,000	-
(Gap)/Surplus	(32,856)	(150,899)	(5,588,012)*	(949,749)

Note: Gap analysis data based on population-based estimates provided by the NMCP.

*Pending approval of Africare RCC proposal; if approved, 4,301,000 LLINs will be available.

Progress during the last 12 months:

Using FY 2011 funds, PMI procured 470,000 LLINs for free routine distribution. These nets are anticipated to arrive by November of 2012. This new procurement, added to leftover stock from calendar year 2011, approximately 360,000 LLINs, will be enough to cover the overall LLIN needs for routine distribution, estimated at 862,856 LLINs. The leftover stock remained in the health facility warehouses until May 2012 due to the decision by the MOH to suspend routine distribution for several months after the mass campaign distribution. This decision was reversed in May 2012 and the health facilities have restarted routine distribution.

PMI continues to support the government in the distribution of LLINs to individual health zones together with BCC to promote ownership and use. PMI also continues its support to strengthen logistics management for all commodities, including LLINs, and ensure that routine supervision is maintained.

Finally, PMI is continuing to support and strengthen entomological M&E of PMI vector control interventions in partnership with the Center for Entomological Research – Cotonou (*Centre de Recherche Entomologique de Cotonou*, or CREC). A PMI operational research activity to track LLIN loss (i.e., removal from a house for any reason) following the universal campaign is underway using three WHO indicators: net survivorship, bio-efficacy, and durability. CREC has already completed an LLIN retrospective tracking assessment, which examined nets distributed in 2007. Another assessment is ongoing.

Challenges, opportunities and threats:

The routine distribution of LLINs is a strategy that will presumably contribute to increasing use of health services, especially the ANC clinics and immunization services. The main challenges are related to the management of those services in terms of planning, monitoring, and evaluation of the distribution; availability of the staff committed to those services; the use of LLINs in a proper manner; management of pyrethroid resistance to insecticides used in LLINs; and quality control and efficiency in use by the target group. A new threat is the growing evidence base that suggests that many LLINs develop holes in just the first six months of use. PMI will continue to support the routine distribution of LLINs and to strengthen the health system including the improvement of LLIN management. PMI is supporting studies on the longevity and efficacy of nets distributed and to monitor vector resistance to insecticides. Also, Africare's RCC Phase 2 proposal, which includes most of the LLINs for the 2014 campaign, has yet to be approved; this is another potential threat to success.

Plan and justification:

PMI will continue to work closely with the NMCP and other RBM partners to support health system strengthening, management of commodities including LLINs, and monitoring of vector resistance to insecticides. While the universal coverage campaign in 2014 is an important activity, the PMI contribution will be small compared to the total need.

Proposed activities with FY 2013 funding: (\$4,500,000)

1. *Procurement of LLINs:* Procure and ensure delivery of approximately 680,000 LLINs for routine distribution at health facilities to pregnant women at ANC visits and to children at immunization clinics. Pregnant women will receive LLINs as part of a kit including one LLIN,

mebendazole, folic acid, iron, and SP. Some of these LLINs might be used for the 2014 campaign. (\$4,500,000).

2. Indoor Residual Spraying (IRS)

Background:

Table C summarizes previous PMI-supported IRS activities, including one round of spraying per year, except in 2010. Perennial malaria transmission in the South, where IRS began, outlasted the three- to five-month IRS duration of insecticidal effect. As a result, the impact of IRS was suboptimal. After three years, IRS was shifted to the North, where the residual insecticidal effect of a single spray round would last long enough to cover the more seasonal transmission season. LLIN distribution was strengthened in the South to protect residents left without IRS.

IRS has always been executed with the carbamate class of insecticides due to widespread vector-pyrethroid resistance. Discussions about pre-emptive IRS insecticide rotation to an alternative insecticide class, the organophosphates, are ongoing.

Table C: PMI-supported IRS² activities by year

Date	Region	District	Structures Sprayed	Population Protected
7-8/2008	South	Ouémé	142,813	521,698
3-4/2009	South	Oumé	156,223	512,491
3-4/2010	South	Ouémé	166,910	636,448
8-9/2010	South	Ouémé	200,036	623,904
5-6/2011	North	Atacora	145,247	426,232
5-6/2012	North	Atacora	210,380	652,777

Progress during the last 12 months:

IRS coverage was expanded to nine communes. An IRS-free buffer zone was established around Penjari National Park, to insure that spraying did not conflict with any park environmental regulations. IRS entomological monitoring data collected before and after round six indicated that spraying reduced all entomological indicators of transmission. For example, the entomological inoculation rate, estimated to be on the order of one infective bite per person every two nights during the transmission season was so low after IRS that it was undetectable by standard methods.³ Other PMI entomology indicators, including vector density, biting rate, and biting behavior, also declined. IRS insecticidal effect, based on wall testing, lasted four to five months, which covered the transmission season.

² PMI IRS partner End-of-Spray Season Report

³ PMI IRS entomology monitoring and evaluation activity report (2011)

Challenges, opportunities and threats:

Challenges

- Vector-carbamate resistance: Evidence of possible vector resistance to carbamates, observed in 2011³ at one site, was detected again in 2012. Insecticide resistance management based on pre-emptive rotation to the organophosphate class of insecticides, recommended by WHO⁴ and PMI⁵, is under consideration as a remedial approach.
- Expanding IRS coverage: Vector-pyrethroid resistance has been shown to reduce the impact of LLINs.⁶ IRS with a non-pyrethroid insecticide is the only resistance management counter-measure until nets treated with non-pyrethroid insecticides become available. Yet IRS, as it is currently implemented, cannot be scaled up due to cost issues. IRS could be made more cost-effective by switching from a blanket approach in which all approved structures in a targeted area are treated to a targeted approach, in which only the highest burden (30-40%) communities in the IRS area are sprayed. Such an IRS stratification approach would also deliver insecticides over a wider area and might also be used to manage the spread and intensification of pyrethroid resistance, a major threat to LLINs.

It should be noted that in 2013, there will not be an expansion of IRS (beyond Atacora) or change in IRS strategy. Blanket coverage of all PMI-authorized structures will continue as in previous years. Once the implementing partner provides cost data for the 2012 round (nine communes), it will be possible to determine whether sufficient funds are available to cover the same area in 2013. Alternative scenarios, in the event of a funding shortage, include scaling back spraying or allowing the NMCP to decide how much of Atacora to spray. The team will remain open to reprogramming funds for such changes and increasing the proposed budget if NMCP agrees.

Opportunities

- Shifting to a stratified IRS model and expanding targeted coverage area farther south in the future: Switching from a blanket approach to a targeted one will better focus IRS impact on high-burden communities. This could occur when LLIN coverage is being increased (proposed 2014 universal campaign). IRS provides added benefit to LLINs.⁷ It is also the only intervention currently in place to manage the spread of pyrethroid resistance, which threatens the impact of LLINs. A targeted approach to IRS would require surveillance that could identify high, medium, and low burden communities. Also, the actual cost of spraying a structure under the stratification approach must be calculated, since spraying fewer houses over the same target area (e.g., all of Atacora) will most likely be more costly than blanket spraying the same number of houses by limiting IRS to half of the communes of Atacora.

Threats

- Loss of support for IRS: PMI funding of IRS may decrease this year, at the request of the NMCP, in order to fill existing LLIN gaps. However, published reports⁵, as well as early results from PMI entomological monitoring and operations research-funded LLIN

⁴ WHO. Global Plan for Insecticide Resistance Management.2012

⁵ PMI technical Guidance on IRS (2010)

⁶ Beach to provide reference

⁷ Hamel *et al.* paper

tracking assessments, show that the LLIN strategy is threatened by vector-pyrethroid resistance, as well as premature (before replacement) failure of LLIN bio-efficacy and durability. Novel approaches to IRS offer remedial relief until new LLIN products can address these problems.

Plans and justification:

Annual, single-round IRS to reduce transmission and manage pyrethroid resistance will continue in the nine communes of Atacora. Better access to LLINs with the next national campaign planned for 2014 will further strengthen the net intervention in IRS areas. Entomological monitoring, described in a PMI IRS entomology work plan, will continue to inform IRS and LLIN activities. Vector-pyrethroid susceptibility, the indicator of greatest interest because resistance is seen everywhere, remains the indicator of greatest interest for informing IRS planning. IRS with non-pyrethroid insecticides is used to counter this problem as well as to control transmission. PMI will continue to support entomology surveillance at ten sites across Benin. Of these, six sites, four in IRS areas, and two in non-IRS (comparison) areas, will be used to evaluate the impact of IRS and to track vector-insecticide resistance. The four additional sites, located to the south of the IRS area, will be used to monitor vector-insecticide susceptibility, especially to pyrethroids, which are used on LLINs, and to better model the spread of resistance genes in the vector population.

In addition to tracking pyrethroid resistance, PMI has identified one population of *An. gambiae* s.s. that is possibly resistant to carbamates. As a result it may be necessary to consider preemptive rotation to organophosphates. Large-scale cultivation of cotton and other agribusiness activity in the North is associated with the site and may be a source of selection pressure for resistance. To meet this challenge, PMI may switch from IRS with carbamates to IRS with organophosphates, as WHO has proposed to meet such challenges⁸. A plan involving biannual rotation between IRS insecticide classes may be implemented, and the carbamate insecticide used in IRS in 2013 may be replaced. The NMCP, advised by PMI and CREC, will use vector-insecticide susceptibility data for all WHO-approved classes of IRS insecticides to support the strategy.

Proposed activities with FY 2013 funding: (\$3,244,976)

1a. *IRS implementation:* The IRS plan of 2011 will be repeated. There will be one round of spraying, protecting approximately 200,000 houses (for planning purposes) in Atacora District. This will be the fourth round of spraying in the North. Insecticide resistance patterns, assessed following the 2013 IRS round, will be used to inform the choice of insecticide for IRS. PMI will also continue to support integrated training of spray operators and community mobilizers identified in collaboration with local physicians, heads of health posts, mayors, and village leaders. BCC efforts to promote acceptance of and compliance with IRS will precede the spray round. BCC efforts for IRS will be used to inform beneficiaries about the positive benefits of IRS in controlling and preventing malaria, the environmental and safety issues related to the use of insecticide for IRS, and the importance of continuing to use bed nets year-round. PMI will also assist the NMCP to develop an IRS stratification plan to collect and analyze supporting surveillance data for use in identifying high-, medium-, and low-risk health zones in the IRS area (in support of future IRS activities based on stratification). (\$3,100,776);

⁸ WHO 2012. Global Plan for Insecticide Resistance Management.

1b. *Support community mobilization for IRS*: Preparation and sensitization of communities being targeted for IRS to ensure compliance and high coverage. (Costs covered in IRS implementation, 1a.).

2. *Entomological monitoring for spray areas and selected sentinel sites*: Annual vector-insecticide susceptibility monitoring at 10 sites will inform selection of IRS insecticides, map trends in vector susceptibility, evaluate the impact of resistance management strategies and assess IRS + LLIN impact; IRS entomological assessment at six sites: four IRS-targeted sites plus two non-IRS (LLIN) sites. (\$120,000); and

3. *Technical assistance for vector control*: One CDC trip will provide support to the NMCP for LLIN loss evaluation in areas with both IRS and LLINs, based on lessons from PMI's OR assessment of LLIN loss, ending in 2013. A second trip will be used to design and supervise an expanded entomological surveillance to evaluate LLIN and IRS intervention in the North and to identify which types of data to use for IRS stratification in the future. (\$24,200).

3. Intermittent preventive treatment of malaria in pregnancy (IPTp)

Background:

The NMCP adopted IPTp as a national policy in November 2004. In 2005, the NMCP officially introduced IPTp as part of a comprehensive ANC package in all 12 departments and, as of 2010, has completed training and implementation at the health facility level and continued to provide refresher training and strengthen formative supervision. The national policy recommends pregnant women receive two doses of sulfadoxine-pyrimethamine (SP) during pregnancy; HIV-positive women should receive weekly cotrimoxazole prophylaxis.

Two SP treatments for IPTp are included in each ANC kit. This kit, provided at a cost of approximately \$1, also contains iron supplements, folic acid, mebendazole, and one LLIN. In practice, both the SP and LLIN components of this kit are provided separately and free of charge by the midwife, at the time of the visit, while the other items in the kit are provided at a minimal cost at the pharmacy. The first SP treatment is delivered at the time that the kit is provided to the client and is administered under direct observation. For the second treatment, the second dose is stored at the health facility and given to the client, directly observed, when she returns for a follow-up ANC visit one month later.

ANC clinic attendance is high in Benin. The 2012 DHS showed that 86% of pregnant women make at least one ANC clinic visit (this rate is 57% in Alibori and 97% in Ouémé); 84% of pregnant women made at least two visits; and rates of attendance are higher in urban (91%) than rural (82%) areas. As expected, with the high level of multiple ANC visits, pregnant women attend their first ANC clinic visit relatively early in their pregnancy, at 4.2 months.

According to the 2006 DHS (before IPTp scale-up), <1% of pregnant women received two doses of SP during their ANC visits. This rate increased to 23% according the 2012 DHS. To scale-up IPTp, 66 national trainers were trained on the updated ANC curriculum covering malaria in pregnancy. They led a nationwide cascade training of 1,546 midwives and health care workers from 2008 and 2010. PMI has also supported efforts to improve supply chain management to ensure the availability of commodities, including SP, and to strengthen quality improvement activities (e.g., supervision) to ensure that health workers follow clinical practice guidelines. Appropriate training and post-training support for midwives and nurses, who together

provide 86% of ANC consultations, combined with a steady supply of SP and modest increases in ANC attendance, are important factors for this increase.

Progress during last 12 months:

As of June 2012, guidelines for malaria prevention in pregnancy and related training modules were revised. The training and supervision plans were developed to scale up IPTp in all 34 health zones in Benin. To cover 2011 and 2012 needs, 1,217,590 SP tablets were purchased. An additional 900,000 doses of SP will be purchased to cover 2013 needs. A quick assessment conducted by PMI showed that SP is available and will cover all public and private sector needs for 2013.

Challenges, opportunities and threats:

Despite progress since the 2006 DHS, IPTp coverage remains relatively low in Benin. Key barriers are believed to be rooted in misbeliefs about the safety of SP, delayed first ANC visits, and the cost of the ANC kits. Furthermore, lack of respectful, quality care on the part of some service providers has a negative impact on the delivery of IPTp. The NMCP, in partnership with WHO and PMI, are undertaking a rapid study in October 2012 to better identify systemic factors that impact the IPTp program in urban and rural contexts in Benin. The findings from this research will help in developing an appropriate strategy to scale up the national IPTp program. Another opportunity is the Minister of Health's recent mission letter directing NMCP to achieve five malaria results by December 2012, including ensuring that 80% of all pregnant women receive two doses of IPTp. A specific working group will help the NMCP to develop the appropriate strategy to achieve this objective.

Plan and justification:

In FY 2013, PMI will focus its efforts on procuring SP, increasing IPTp through the private sector, strengthening communications around IPTp with specific messaging, and improving the performance of health workers who provide routine ANC services.

Proposed activities with FY 2013 funding: (\$33,000)

1. *Procure SP:* Procure 1,050,000 treatments of SP and fund delivery to Cotonou to cover 2014 needs of an estimated 520,785 pregnancies. Treatment will be available in the public and private sectors according to the national policy. (\$33,000); and

2. *Provide support for supervision and refresher training of health workers in IPTp to improve quality of service:* PMI will continue to support on-site supervision and refresher training for public and private health facility midwives and nurses to correctly deliver SP in the context of the FANC. Training will include benchmark assessments, on-the-job training of the new treatment algorithm, and coaching. Supervision will continue to be part of an integrated approach for supervision at health facilities. (Costs covered in Case Management-Treatment section).

B. CASE MANAGEMENT

1. Diagnostics

Background:

Effective case management of malaria depends on early, accurate diagnosis with microscopy or RDTs, followed by prompt, appropriate treatment. In February 2011, the NMCP updated their malaria case management guidelines to align them with WHO standards, recommending universal diagnostic testing for malaria. All patients with suspected malaria should be tested using microscopy or an RDT, including children under five years old, and treatment decisions should be based on test results. In 2012, PMI provided support to ensure wide dissemination of this new policy. The current malaria policy includes the use of RDTs throughout the health system, and RDTs are often the only diagnostic test performed at the peripheral level. Although testing is recommended for all suspected malaria cases, including at the community level, only 200 CHWs are trained to use RDTs. NMCP envisions scaling-up the use of RDTs by CHWs in 2012. In general, diagnostic testing is being scaled-up at the same time as ACTs; however, implementation is still challenging. A 2009 health facility survey found that only 48% of patients needing diagnostic testing were tested, and 23% of patients with a negative test result still received antimalarial treatment. In March 2011, concerns were raised about the management and use of RDTs. The latest end-use verification (EUV) survey conducted in a representative sample of 128 health centers in April 2012 showed that 5% of health facilities visited had a stockout of RDTs but only 39% had an updated stock card. The implementation of the new recommendation on universal testing and the use of RDTs by CHWs will result in an increased demand for RDTs.

Table D: Gap analysis for RDTs for 2012-2015

Needs and Funding Source		CY 2012	CY 2013	CY 2014	CY 2015
Total needs		3,886,903	3,945,435	4,016,348	4,428,351
Commitments	Government of Benin	-	300,000	-	-
	Global Fund/RCC FM/Africare	-	389,486	-	-
	Global Fund/Round 7/CRS	-	408,079	-	-
	U.S. Government/PMI	1,000,000*	1,000,000**	1,500,000***	-
Carry Over RDTs		-	-	-	-
Total RDTs Available		1,000,000	2,097,565	1,500,000	-
(Gap)/Surplus		(2,886,903)	(1,847,870)	(2,516,348)	(4,428,351)

Note: Gap analysis is based on population based estimates provided by the NMCP.

*Quantities funded with FY 2011 funding

**Quantities funded with FY 2012 funding

***Quantities proposed for FY 2013 funding

The estimated need for RDTs for 2014 is greater than 2 million tests (see Table D). In 2013, PMI will have purchased 1 million RDTs to cover the country's gap. Microscopy is supposed to be available in hospitals and larger health facilities. The NMCP estimates that Benin needs a total of 129 microscopes to cover departmental hospitals, health zones, and commune health centers through 2015. The need for microscopes is defined by the NMCP as a minimum of two microscopes for every departmental and health zone hospital and one microscope for every commune health center. In 2009, the World Bank purchased ten microscopes. Since 2008, PMI has purchased 65 microscopes and microscopy reagents. Thus, over half (58%) of the NMCP's need has been met.

PMI continues to support a comprehensive diagnostics strengthening program that involves the training of clinicians and laboratory technicians, the implementation of a quality control and quality assurance system, and strengthening supervision to ensure that health workers follow clinical practice guidelines. Despite progress in improving laboratory worker skills and diagnostic performance, efforts need to be maintained in training and formative supervision for health providers. PMI is placing an emphasis on the regular collection and reporting of reasonably valid monitoring data to assess key health facility indicators that measure the availability of commodities (e.g., RDTs), the appropriate use of diagnostic testing and antimalarials, and the frequency of supervisory visits for health workers. It is not clear, however, if this information is being gathered throughout the health information system. Therefore, PMI will make certain that "improvement of health information and data" is included in its implementing partner's work plan.

Progress during the last 12 months:

During the past year, one laboratory technician and one clinician from each of the 12 departments of Benin were trained in microscopy, and they are now serving as national trainers and supervisors for malaria diagnostics in 118 health facilities. In 2012, 15 additional laboratory technicians received refresher training. The eighth round of outreach training and supervision was completed in March 2012, a ninth round in June 2012, and another is planned for September 2012. Despite the progress made in malaria diagnosis, 32% of health facilities are still prescribing antimalarial drugs to patients who have a negative RDT or microscopy result according to the EUV survey completed in April 2012. PMI will continue to work collaboratively with the National Referral Laboratory and the NMCP to improve confidence among health professionals in diagnostic testing and the appropriate use of those results when prescribing. This support will include training and supervision of laboratory technicians and the development of a quality assurance/quality control system.

PMI will have purchased 1.5 million RDTs to cover needs for 2013 and basic materials needed for the existing microscopes. In addition, 118 advanced user guides for the laboratory diagnosis of malaria will be developed and disseminated in the health facilities.

Challenges, opportunities and threats:

While building demand for RDTs per the revised national directive for case management of children under five, Benin is confronted with a funding and logistics challenge to rapidly train and equip CHWs to use RDTs. Furthermore, with over half of the population seeking medical care from the private sector, it will be important to ensure supervision and quality control of diagnostics at these sites. Currently, only accredited private facilities receive this support from

the MOH. With the cancellation of Round 11 funding cycle, there is some uncertainty about what the Global Fund will contribute to malaria commodities, including RDTs.

Plans and justification:

To contribute to improved diagnostics, PMI's plan for FY 2013 is to help fill the supply gap of RDTs and microscopes and continue supportive supervision and quality controls of malaria diagnostics and quality controls.

Proposed activities with FY 2013 funding: (\$1,355,000)

1. *Procure RDTs:* The estimated need for RDTs for calendar year 2014 is over 2 million RDTs, and to date no partner is planning to help fill this gap. However, recent health facility reports have found that RDT consumption rates are lower than those for ACTs. Therefore, with FY 2013 funds, PMI will plan on providing only 1.5 million RDTs toward filling this gap. However, recognizing that the estimated needs for RDTs (and other commodities, such as ACTs) are imprecise, the team will remain flexible about purchasing commodities and might reprogram some of the funds to purchase more or less RDTs and ACTs, depending on ongoing assessments of usage and revised quantifications. PMI will work with the NMCP and other partners to clarify the true need, better understand RDT usage patterns, and ensure that supplies do not exceed demand. (\$1,110,000);

2. *Procure microscopes and laboratory reagents:* Procure 15 microscopes and laboratory reagents. (\$45,000); and

3. *Support supervision and strengthening of malaria diagnostic activities:* This activity will include supervision, implementing policies and standard operating procedures, maintaining microscopes, training, procuring reagents, and conducting periodic review of malaria diagnostics and quality control of slides/RDTs. (\$200,000).

2. Treatment

Background:

The NMCP updated its malaria case management guidelines in February 2011 to recommend universal diagnostic testing for malaria. Artemether-lumefantrine (AL) remains the first-line treatment for uncomplicated malaria in Benin. Artesunate-amodiaquine is recommended for patients under six months of age, for those who cannot tolerate AL, and when AL is not available. ACTs are available in the regional and health zone warehouses throughout the country and health staff have been trained to correctly treat malaria since 2008. According to the latest EUV survey (April 2012) only 26% of health facilities visited had all the presentations of AL.

In May 2011, the President of Benin publicly announced that all malaria treatments should be free of charge for children under five years and for pregnant women. This initiative was launched in October 2011. The main issue raised by this initiative is the replenishment of ACT stock at the health facilities. It was agreed that the Government would reimburse the cost of service delivery, including drugs, to health facilities after verification of diagnostic and drugs registers. The reimbursement process is taking place gradually and due to the delay of the reimbursement, most health facilities complain of the limited funds available for the replenishment of ACT stock. In collaboration with other donors, PMI continues to provide training on the treatment protocol for

uncomplicated malaria to service providers in the public and private sectors and continues to support supervision of uncomplicated malaria treatment at the outpatient level.

To support the integration of malaria case management into the broader arena of treating childhood illnesses, PMI has supported training in WHO's integrated management of childhood illness.

Severe malaria: The NMCP policy recommends treating severe malaria with quinine. Injectable artesunate or artesunate suppositories are recommended for prereferral treatment of severe malaria. The national guidelines consider all cases of malaria in pregnant women to be severe in order to underscore the urgency of treating these cases. The recommended treatment depends on the trimester of pregnancy. For uncomplicated malaria, quinine is recommended during the first trimester and ACTs during the second and third trimesters. For severe malaria, quinine is recommended for all terms of pregnancy. Severe cases identified in peripheral outpatient health facilities should be referred to a larger health facility with an inpatient ward.

At the community level, PMI supports the iCCM of childhood illness including malaria, diarrhea, malnutrition, and pneumonia. CHWs are being trained to manage uncomplicated malaria cases and to refer children with complicated malaria. The MOH has developed national guidelines for community health promotion by clarifying roles and responsibilities of different actors, including the CHWs. According to these guidelines, CHWs can treat uncomplicated malaria with ACTs at the community level and refer severe cases to health facilities. The policy recommends testing all suspected cases of malaria before treatment. Most CHWs are trained in uncomplicated malaria treatment with ACTs but not all are trained yet to perform RDTs. Given the limited quantity of RDTs, priority is given to the health facilities. In practice, a CHW covers 20 to 30 households. There are two categories of CHWs. Those who are based in villages which are more than 5 km from health facilities are trained to treat malaria with ACT and other childhood diseases such as diarrhea and pneumonia. Those CHWs who are based in villages less than 5 km from a health facility are trained mainly in health promotion activities.

The 2012 DHS found that only 7% of children under five years old with fever in the preceding two weeks were treated with an ACT within 24 hours of symptom onset. This value is only slightly higher than the baseline of <1% from the 2006 DHS. Possible causes of this disappointing result include decreased care-seeking, poor treatment quality for children who are brought to a health worker, ACT stockouts, and increasing use of diagnostic testing (as children with a negative test result should not be receiving an antimalarial). A review of the final 2012 DHS results, along with some field visits, should reveal the causes of the low proportion for the treatment indicator.

Progress during the last 12 months:

The private sector accounts for almost 60% of health facilities in Benin. Therefore, it cannot be overlooked in the fight against malaria. During the past year, 542 private sector health providers were trained in the new malaria policy. To this end, PMI, with the support of the NMCP, developed four training modules: a training manual, a participating nurse's manual, a participating doctor's manual, and an orientation manual for pharmacists on the new malaria control policy. Two thousand new malaria case management policy manuals have been produced and will be disseminated countrywide shortly.

Approximately 2.6 million ACT treatments will have been procured in several shipments for older children and adults. On-site supervision of health workers has been supported, including benchmark assessments, on-the-spot training on the new algorithm, coaching (including supervision of diagnostic activities), and training on the management of severe malaria.

Challenges, opportunities and threats:

With the roll-out of iCCM and the integration of RDTs, the treatment of confirmed malaria among infants less than six months is now feasible in Benin. The NMCP is interested in introducing AL to CHWs in high-mortality health zones with low access to formal health services. At the same time, according to the 2012 DHS, timely care seeking for children with fever is very low, and some data suggest preferential treatment of male children. Factors that may contribute to the lower than expected levels of ACT consumption following the national introduction of case management by CHWs need to be assessed and likely include ACT supply problems, acceptability of the selected CHWs, and household decision-making behaviors. Public-private partnerships need to be strengthened to ensure that the largely unregulated private sector receives supportive supervision. There is growing commitment by the NMCP to be more inclusive of the private sector and to overcome policy barriers to collaboration.

Plans and justification:

PMI's plan for FY 2013 is to continue to support filling the ACT supply gap, supply chain management, in-service integrated management of childhood illness training, supportive supervision, assistance to the NMCP to integrate treatment of confirmed malaria among infants less than six months of age, and widening the scope of the planned private sector assessment to include a focus on malaria case management.

Table E: Gap Analysis for ACTs for 2012-2015

ACT Needs and Funding Source		2012	2013	2014	2015
Total Needs		3,598,614	3,299,482	2,963,826	2,289,026
Commitments	Government of Benin	-	602,347	-	-
	Global Fund/RCC FM/Africare	715,440	320,687	200,453	190,430
	Global Fund/Round 7/CRS	625,814	200,000	57,716	100,803
	U.S. Government/PM I	1,200,000*	2,600,000**	1,500,000** *	-
Carry Over Treatment Courses		-	208,649	632,202	-
Total Available Treatment Courses		3,807,263	3,931,683	2,132,202	291,233
(GAP)/Surplus		208,649	632,202	(831,624)	(1,997,793)

Note: Gap analysis data based on population based estimates provided by the NMCP

*Quantities funded with FY 2011 funding

**Quantities funded with FY 2012 funding

***Quantities proposed for FY 2013 funding

Proposed activities with FY 2013 funding: (\$3,507,924)

1. *Procure ACTs:* For AL, procure approximately 232,000 packs of 6 tablets, 295,000 packs of 12 tablets, 99,000 packs of 18 tablets, and 727,000 packs of 24 tablets. For artesunate-amodiaquine, procure approximately 129,000 treatments (\$2,057,924);

2. *Support subsidization of severe malaria treatment:* As part of the new national policy to provide free treatment to children under five and pregnant women, PMI will provide subsidies to selected facilities. Facilities will be selected based on the following criteria: the presence of trained staff in case management of severe malaria, emergency triage, and urgent treatment strategies; the absence (or the lack of sufficient) equipment or supplies to support case stabilization; and a history of consistent data reporting and good performance. Under the leadership of the NMCP, donors need to better coordinate their joint efforts. The World Bank has committed to provide support to eight health zones. Treatment costs for severe malaria range from \$42 per child under five to \$52 per pregnant woman. (\$200,000);

3. *Support quality improvement and supervision of healthcare workers at the facility level:* Support supervisory visits, as part of a comprehensive quality assurance approach, to ensure high quality malaria case management with ACTs, focused ANC (which includes IPTp and ITN distribution), and the distribution of ITNs during routine immunization clinics. The quality

assurance and quality improvement component of this activity will include improvement at the health facility level, as well as community involvement in health and oversight in health center management. The system, which will be coordinated with the MOH, will incorporate training of supervisors (including those responsible for supervising the CHWs that distribute ACTs), developing practical tools, supporting travel, conducting on-the-job observation and training, monitoring, and promoting correct use of diagnostic results. The training will also reinforce appropriate treatment, providing feedback, collecting, analyzing and using data to improve planning and training, and motivating supervisors and workers. It also includes training supervisors to implement changes identified during supervision. The focus of supervision will be at the health facility, as the rollout of CHW programs is being covered by the Global Fund and through community-based PMI implementing partners. Technical experts from the MOH and PMI will provide oversight for this activity. The key goals are to provide supervision to at least 90% of health workers nationwide with malaria-related responsibilities at least once every three months; ensure that at least 90% of patients needing malaria testing are tested; ensure that at least 90% of patients (all ages) needing an antimalarial receive an effective treatment; and ensure that at least 90% of patients (all ages) not needing an antimalarial do not receive one. Progress in reaching each of these four goals will be quantitatively monitored and reported every three to six months. These activities will be evaluated with monitoring data (based on supervisors' reports), health facility surveys, and the EUV tool, which will be used quarterly. (\$500,000);

4. *Support malaria training for health workers:* Support training of health workers on new case management guidelines, which will target outpatient health facilities. (\$150,000);

5. *Support integrated management of childhood illness training:* Support in-service training of health workers in integrated management of childhood illness (\$100,000); and

6. *Support community-case management of malaria, pneumonia, and diarrhea:* Support community-case management of malaria, which will ensure AL distribution by CHWs targeting children under the age of five years, focusing on three health zones identified by the NMCP that have low access and high mortality rates. These funds will be combined with other USAID funding streams to ensure that the comprehensive community case management package is delivered, not just the malaria component. (\$500,000).

3. Pharmaceutical Management

Background:

The NMCP National Malaria Control Plan and Strategy contains goals for the supply, distribution, and management of drugs and products for malaria prevention and control with the following objectives:

- Facilitate the purchase of ACTs, SP, LLINs, and RDTs as needed
- Streamline spending
- Ensure sustainable distribution of essential products to support malaria prevention
- Improve inventory management
- Encourage proper use of drugs and LLINs
- Monitor/evaluate the process of purchasing and distribution
- Measure the performance of supply and distribution

The Central Medical Store, *Centrale d'Achat des Médicaments Essentiels* (CAME), is the entry point for commodities into the pharmaceutical system. CAME recently finalized a strategy document, CAME Strategic Development Project Plan. The plan outlines CAME's strategic focus over the next five years, including an assessment of its human resource and financial needs. It also defines how CAME will improve distribution and warehousing, with a focus on better geographic distribution through the use of regional warehouses. The goals for CAME for the period 2012 to 2016 are as follows:

- Improve conditions for product storage and for personnel
- Improve personnel management
- Ensure effective and continuous availability of pharmaceuticals
- Ensure the quality of medicines to the people served
- Improve the quality of customer service
- Improve CAME's visibility

Progress during last 12 months:

Over the past 12 months, PMI has continued to focus on the reform process at CAME. PMI provided technical assistance to review CAME's action plan that seeks to improve governance and transparency. The reforms in governance have now been completed and seem to be taking root. Board decisions are transparent, and a recent external audit came up with no significant reportable items. The use of the new software to improve the information system at CAME continues to be a challenge, indicating an ongoing need for training and supervision of its users. The software, Medistock, is a commodities management tool that is used at health zone depots to monitor stock movements (e.g., input, issuing, invoicing); commodities managers in all 34 health zones were trained in the last two years on commodities logistics management, with a focus on quantification, data tracking, and record keeping. Also, PMI continues to promote Pipeline, a forecasting and procurement planning software currently used at the central level by the supply chain management technical working group.

In 2011, the NMCP and CAME signed a memorandum of understanding that clarified the role each party plays in relation to PMI-funded commodities provided to the GOB. The document also set the rules for the management of money generated by proceeds from selling antimalarials. A bank account was created to receive the proceeds generated by the sale of ACTs. The GOB has agreed to utilize the savings later to fund the procurement of additional doses of antimalarials and other malaria-related activities. A review of the practices related to the use of the money in the bank account has led to the revision of some terms of the memorandum. The new policy of free treatment for malaria services has effectively eliminated the possibility of a solid funding stream for ACT replenishment through the proceeds.

In 2011, USAID commissioned Deloitte to assess the public sector pharmaceutical supply chain and to develop assessment tools for future use in countries across Africa. The final report showed that the supply chain is "performing" as opposed to "lagging," the latter of which characterizes a system severely lacking in transparency. This was evidence of progress in supply chain management, an area that has received major PMI investments. Still, much work needs to be done, especially at the health zone level, where more than one-quarter of facilities are reporting ACT stockouts.

In collaboration with key partners and stakeholders, PMI provided support to review the status of health zones. It was found that health zones are not officially recognized structures within the

MOH, or within pharmaceutical law and policy. As such, advocacy at the highest levels will be required to gain this recognition. A PMI-funded assessment of health zones found that zonal managers were not following approved guidelines and standard protocols for management of health commodities. Technical assistance was provided to strengthen health zone malaria supply chain management, including the clarification of the role of the health zone in supply chain management. In addition, training will be provided to all health zone managers in stock management and drug regulation policies.

PMI also continued its efforts in supporting the NMCP to improve its logistics management information system for antimalarials. An evaluation of the national malaria supply chain was carried out using the Logistics Indicator Assessment Tool in all facilities that were selected for the EUV survey. The preliminary results of the April 2012 assessment found that supply problems persist, with 29% facilities having no ACT and only 26% having all four types. A further 6% had no SP. Based on the findings, PMI will support efforts to develop and/or revise existing pharmaceutical supervision tools used by the MOH to supervise health zones.

PMI continued its participation in the NMCP-hosted technical working group for supply chain management of antimalarials. All major donors supporting malaria activities in Benin are represented in the technical working group, including Africare, CRS, and United Nations Children's Fund (UNICEF), as well as PMI. This working group meets every two months to review and monitor drug consumption and to update a joint procurement plan.

Challenges, opportunities and threats:

Although there have been substantial investments in the supply chain management system over the past three years, Benin continues to show weaknesses in its pharmaceutical management system. Absence of reliable data on commodities management results in frequent stockouts of life-saving antimalarials. Based on various assessment findings (e.g., Logistics Indicator Assessment Tool, EUV), PMI will provide support to implement recommendations of the assessments in an effort to strengthen Benin's supply chain management system.

Plans and justification:

In FY 2013, PMI will continue to build on the efforts recorded over the last few years to construct a more sustainable health system by implementing a set of targeted interventions. PMI's contribution will focus on capacity building for the pharmaceutical and supply chain management systems. In collaboration with other stakeholders, PMI will support the implementation of the strategic development plan, strengthen health zone malaria supply chain management, strengthen logistic management information system, and monitor the storage and distribution of malaria commodities. In addition, as PMI strongly encourages countries to establish routine, periodic evaluations of the efficacy of the antimalarials, PMI in Benin will support antimalarial testing.

Proposed activities with FY 2013 funding: (\$600,000)

1. *Strengthen logistics management information system and supply chain management:* Continue to support and strengthen the national logistics management information system as well as the supply chain management system from the central level down to the health facilities. (\$550,000). Specific activities will include the following:

- Strengthen logistics management information system and supply chain management
- Provide technical assistance in the roll-out and implementation of CAME's strategic development plan
- Provide assistance to strengthen CAME and NMCP's capacity for forecasting of antimalarial drug and RDT needs and gaps
- Provide assistance to strengthen quality control, storage, distribution, and inventory management down to the health facility level
- Improve feedback and reporting on consumption/stocks from health facility to district and higher levels
- Monitor the implementation/evaluation of coverage
- Conduct EUV/monitoring of availability of key antimalarial commodities at the facility level

2. *Drug quality control testing*: Provide support to National Laboratory for Quality Control to conduct routine testing of ACTs entering the port and spotchecks at facility levels, according to the FY 2013 MOP Guidance (\$50,000).

C. MONITORING & EVALUATION/OPERATIONS RESEARCH

Background:

The NMCP recently updated its national malaria M&E plan (*Plan de Suivi-Evaluation du Programme de la Lutte Contre le Paludisme 2011–2015*). As with the last five-year plan, the key elements include a multi-institutional M&E Technical Working Group, monitoring of programmatic process indicators with routinely collected data, periodic evaluations of outcome indicators, and epidemiologic surveillance. Thus, Benin has three main sources of malaria information, all of which are supported and strengthened by PMI: 1) household and health facility surveys; 2) malaria surveillance from sentinel sites; and 3) the national HMIS. PMI support for entomological surveillance is described in the IRS section.

1) The national surveys provide the most reliable data. DHSs, which are household surveys, have been conducted in 2006 and 2011–2012 (earlier DHSs from 1996 and 2001 collected little data on malaria). DHS includes all-cause child mortality, anemia, and the standard malaria module, and the 2012 DHS also measured *Plasmodium falciparum* prevalence. The next DHS is planned for 2016. Notably, the 2006 and 2012 DHSs were not completely comparable for some malaria indicators, as the former was done at the end of the rainy season and the latter was done during the dry season. Another nationally representative household survey (the Leadership and Development, or LEADD survey), based on the Malaria Indicator Survey methodology, was conducted in November 2010. However, methodological concerns and the use of non-standard indicators have left doubts on the validity and utility of the results. The incoming CDC Resident Advisor will re-assess the data validity, as this would be a potentially important source of information.

Health facility surveys have been conducted periodically. In 2009, a nationally representative survey was done to assess the availability of malaria-related commodities, diagnostic capacity, and other supports (e.g., health worker training and supervision), as well as the quality of malaria case management. EUV surveys of commodity availability have been done on small convenience samples of health facilities in 2010 and 2011; and one larger EUV survey on a representative sample of health facilities was done in April 2012. For hospitalized patients, a pilot inpatient survey was conducted in July 2010, which showed (based on a very small sample) that about

two-thirds of patients with suspected malaria were tested and about two-thirds of patients with test results were treated according to national guidelines. A national survey, with objectives and methods similar to those used in the 2009 survey, is planned for 2012 or 2013.

2) The malaria sentinel surveillance system began in 2001 in a relatively large number of health facilities; but by 2007, the system was no longer functional. In 2008, PMI and the World Bank Booster Program revived surveillance activities in a more focused way. Since January 2009, PMI has funded the Regional Institute of Public Health in Benin to strengthen hospitals in five sentinel sites, enabling them to collect data on malaria morbidity and mortality. However, the quality of these data has been questioned, in particular because a relatively low proportion of patients (63% in 2010 and 60% in 2011) with suspected malaria have been tested, due in part to shortages of RDTs. PMI support for entomological surveillance is described in the IRS section.

3) The national HMIS reports on the number of malaria cases, deaths, and case fatality rates at the health facility level. Before PMI, no effort had been made to distinguish clinically diagnosed cases from those confirmed by laboratory testing. Additionally, concerns existed about the accuracy, timeliness, and coverage of the data, as well as how the data were used for decision-making. With the support of PMI, the World Bank, and WHO, the NMCP is strengthening the malaria module of the national HMIS (i.e., Routine Malaria Information System [RMIS]) so that at least 80% of public and private health facilities can accurately report malaria data. The system collects and reports on twenty key malaria indicators each month. The module was recently updated to include reports from community-level actors; however, reporting completeness is a challenge.

Additional M&E activities have also been initiated to track progress in malaria control at the sub-national level. The USAID-funded Child Survival Project and Africare community case management projects conducted household surveys in their project areas. UNICEF has conducted surveys to evaluate its Accelerated Child Survival and Development program.

The child survival baseline assessment covering three health zones in the midregion of the country found that 79% of children 0 to 59 months slept under an LLIN the previous night. During the survey, 62% (n=174) of mothers of children with a fever said that they went outside their home to seek treatment for the child's fever. This care-seeking was done primarily on the day after the fever began. The mothers sought care primarily at the health center, private clinics, and from roaming medicine vendors. No mother in the sample of those whose children had had a fever in the past two weeks sought treatment from a CHW. It is important to mention, however, that the CHWs had been out of stock of multiple medications for many months at the time of the survey.

The weighted average of children who had a fever in the past two weeks for whom the mothers sought care at a health center and within 24 hours of the fever who received an ACT from a qualified health facility worker was 35%.

The USAID-funded community case management project successfully introduced SMS messaging to track referrals made by CHWs in two communes. During the initial period of March–May 2012, 51 severe malaria referrals and 60 stock request alerts were received.

Regarding OR, PMI has supported the following:

- CREC and *Institut de recherche pour le développement* to conduct studies on the longevity of LLINs
- Evaluate the added benefit of IRS in settings where LLIN ownership is high and insecticide resistance to pyrethroid insecticides is highly prevalent (results published)
- Evaluate chemical (colorimetric) methodology for assessment of LLIN bio-activity (verification that LLINs meet WHO standard for effective LLIN) (results published).

Results could be used to help guide redesign of the national strategy and program activities, in particular stratified or targeted spraying, or replacement of LLINs in specific areas where transmission remains high and net durability low.

Progress during the last 12 months:

M&E Support

- PMI and NMCP staff have worked closely on M&E issues, and PMI Resident Advisors have been active participants in the M&E Technical Working Group.
- PMI, via the Regional Institute of Public Health, has continued to support the five sentinel sites and improve the quality of the data. However, there have been concerns about the low proportion of patients with a febrile illness who are tested for malaria.

HMIS Support

- PMI has provided ongoing technical and financial support to the RMIS. Performance had plateaued with only 38% of facilities submitting a complete report as of December 2011; however, there was a marked increase in January–March 2012 with 61%. This improvement in reporting was influenced by several factors. Monthly reporting became an essential condition for the NMCP to reimburse the costs incurred by the health facilities that provided free treatment for children under five and pregnant women. Also, regular supervision helped motivate the health facilities to produce timely reports. The maintenance of computers in health facilities, carried out with the support of ARM3, helped to ensure that the reporting software Logsnigs was fully operational.

Survey Support

- PMI provided substantial financial support for the 2012 DHS. Furthermore, when obstacles arose that risked delaying fieldwork, the PMI team demonstrated leadership by engaging other partners and high levels of the Benin government to overcome the obstacles. Regrettably, even with these actions, fieldwork was delayed by several months, which meant the survey was done in the dry season instead of the late rainy season.

Operations Research

- PMI-supported research projects made substantial progress in the past 12 months. A study on the effect of IRS in the context of high LLIN ownership and use was completed and the results were published. A second study on the longevity of LLINs produced insightful preliminary results.

Challenges, opportunities and threats:

In general, M&E efforts are hampered by a lack of trained local NMCP and MOH staff to oversee M&E activities, especially in the areas of statistics and data analysis. Additionally, delays replacing CDC's Resident Advisor has left the PMI in-country team short-handed. A mechanism to coordinate M&E exists (Benin's RBM partnership, chaired by the NMCP); however, this mechanism needs strengthening. Additionally, concerns exist on the ability of the malaria sentinel sites to implement universal testing of suspected malaria cases—which is now national policy. And there are concerns about obtaining a high level of reporting via the RMIS. Despite these concerns, there is some guarded optimism that PMI's implementing partner will be able to work with the NMCP to strengthen these activities. Moreover, the newly hired CDC Resident Advisor will begin soon.

Plans and justification:

As the NMCP and PMI have worked closely for several years on M&E plans and activities, PMI's plan for FY 2013 is to continue supporting the systems that have been joint NMCP-PMI priorities (e.g., malaria sentinel sites, RMIS, capacity building, and surveys).

Proposed activities with FY 2013 funding: (\$1,137,100)

1. *Strengthen HMIS:* PMI will continue support to strengthen procedures and indicators for malaria in the national HMIS and comprehensive strengthening of the overall system. The funding will support the NMCP's efforts to implement PMI's recommendations, in particular: 1) the creation of a dedicated RMIS office at the NMCP with dedicated equipment (e.g., desktop computer, phone, filing cabinets); 2) increased technical assistance and material support to the zonal offices; 3) creation of a final, detailed (and updated) indicator list with better case definitions; 4) improving and printing data collection tools and quarterly bulletins; and 5) the creation and printing of written documentation (i.e., standard operating procedures, protocols) with specific tasks, dates, and person responsible for all levels participating in the RMIS. RMIS data will be used in conjunction with sentinel site data (see next activity) to gain a more complete picture of malaria epidemiology in Benin (\$150,000);
2. *Support sentinel sites surveillance:* Five existing sentinel sites will continue to be strengthened for the implementation of health facility-based surveillance in support of the PMI M&E framework. Sentinel site data will be used in conjunction with RMIS data (see preceding activity). The sentinel site activity includes technical assistance to improve the capacity of these sites to collect reliable data on inpatient malaria cases and deaths. Given the importance of increasing the malaria testing rate in Benin, including at sentinel sites, PMI is closely supervising the implementing partner agreement for effective scale up of malaria diagnosis. This activity will be reviewed in the first quarter of 2013 to evaluate its performance and determine if PMI support will continue. The evaluation will assess indicators such as the proportion of patients with a febrile illness that are tested, the completeness, consistency, and accuracy of reported data, and the evidence that the results are being used to manage malaria control efforts. (\$100,000);
3. *Support Malaria Indicator Survey:* Provide technical and financial support for the planning and implementation of a Malaria Indicator Survey in 2014. The year 2014 is the halfway point between the 2012 DHS and the next expected DHS in 2016. (\$725,000);

4. *Conduct EUVs:* Quarterly monitoring of the availability and utilization of key antimalarial commodities at the health facility level. (\$150,000); and
5. *Provide technical assistance for M&E:* CDC will conduct one technical assistance visit to support the NMCP with M&E. PMI Resident Advisors, in collaboration with the NMCP, will determine technical priorities in M&E and will request an appropriate headquarters-based technical advisor. (\$12,100).

D. BEHAVIOR CHANGE COMMUNICATION

Background:

In 2006, the NMCP developed a National Malaria BCC strategy as part of the National Malaria Control Plan and Strategy (2006-2011). This document was designed to be an integrated communication plan that would standardize messages and tools for all partners working on malaria in Benin. The NMCP is now planning to develop and implement a new integrated communication plan that accompanies the new National Malaria Control Plan and Strategy (2011-2015). The new integrated communication plan will include strategies for advocacy, BCC, and social mobilization. The NMCP would like to identify key behaviors and interventions that will be the basis of the integrated communication plan.

As part of the National Malaria Control Plan and Strategy, the NMCP has identified the following target indicators for BCC:

- 100% of heads of households in urban and rural areas know that LLINs are an effective means of prevention against malaria
- 100% of mothers and/or caregivers of children know the treatment for uncomplicated malaria
- 100% of mothers and/or caregivers of children know that treatment with ACTs requires positive confirmation with RDTs
- 100% of mothers and/or caregivers know the signs of malaria
- 100% of pregnant women in urban and rural areas are aware of IPTp and its advantages

Since 2005, USAID, and now PMI, has funded support to BCC activities related to malaria in Benin. In addition, PMI funds a National Malaria Communications Working Group (*Groupe Technique de Travail en Communication*), which receives routine technical assistance from a number of PMI implementing partners. Members of the group include the NMCP, PMI, Research Triangle Institute, University Research Corporation, Africare, CRS, Population Services International, the World Bank, WHO, UNICEF, and the Peace Corps. The group is responsible for reviewing the technical content of all BCC messages pertaining to malaria and will play a key role in developing an updated integrated communication plan.

Progress during last 12 months:

In collaboration with key partners and stakeholders, PMI provided support for qualitative research to identify barriers to desired malaria-related behaviors. Results from this activity will be used to inform the development of the national malaria communication strategy.

A multi-pronged approach is being utilized to increase net hang-up and use. In peri-urban areas, PMI continues to work with local NGOs with experience in BCC to conduct net promotion. In

rural areas where CHWs have been trained to treat malaria, PMI is utilizing these community agents to conduct household visits and follow-up activities. PMI supported the production of BCC materials and other promotional items such as job aids, message guides, certificate of accomplishment of BCC activities to health promotion agents, banners, and posters. PMI also supported production of radio, TV spots, brochures, training of hang-up volunteers, and the production of media and communication activities for post-distribution. In support of the NMCP's BCC campaign, PMI supported 900 radio broadcasts in three languages. In addition, PMI funding was used to train 300 health workers and supervisors involved in the LLIN campaign. Additional funding was used to train 1,308 community mobilizers and 679 town criers in preparation for the LLIN distribution campaign. A total of 32,000 certificates were issued to households that had hung up their LLINs. Following the LLIN distribution campaign, a rapid assessment study was completed to evaluate the effectiveness of the communication and social mobilization strategy that had been used for the campaign distribution. The assessment compared intervention areas to four non-intervention communes. The assessment showed a difference in the percentage of observed nets hung (72% vs. 58%); however, knowledge levels and coverage of nets were not significantly different. It is important to note that in a zone that was previously supported with IRS, there was an increase in coverage with both pregnant women and children under five sleeping under treated nets.

For communication activities related to IRS, PMI adopted a new and streamlined approach under which the majority of IRS agents trained as spray operators are also used for community mobilization, structure identification, and enumeration activities, which has improved the link between community mobilization and spray operations.

Challenges, opportunities and threats:

Preliminary results from the most recent DHS shows an improvement of behaviors around the use of LLINs, with the percentage of those who slept under an ITN the night before the survey increasing in both children under five (from 20% to 71%) and in pregnant women (from 20% to 76%). Unfortunately, with treatment of children under five with fever, only 27% received antimalarial drugs the same or the next day. This contrast in data illustrates both an opportunity and challenge for BCC to reinforce desired behaviors around the proper and consistent use of malaria products and services. The development and rollout of the new communication strategy will provide an opportunity for partners and stakeholders to review current barriers around these and other malaria interventions and will also provide an opportunity to develop interventions that address specific barriers.

Plans and justification:

In FY 2013, PMI will support implementation of the new national integrated communication strategy. As part of these efforts, PMI will support the development of the proposed new integrated communication plan, through ARM3. ARM3 will provide technical assistance through the provision of reference documents and through TA in developing BCC strategies. In addition ARM3 will facilitate partner meetings to discuss the development of the strategy as well as providing continuous input/feedback until completion of the strategy, as well as continuous M&E of all BCC-supported activities. In line with the National Malaria Control Plan and Strategy, activities will be focused on raising awareness of households on the importance of the use of LLINs, recognizing signs of malaria, increasing care-seeking behavior within 24 hours of the onset of fever, and improving IPTp coverage by encouraging mothers to attend ANC early.

PMI will also continue its support for community mobilization for IRS. PMI-supported BCC activities will be implemented at both the national and community level.

Proposed activities with FY 2013 funding: (\$450,000)

1. *Support the development and implementation of the new national integrated communication strategy. Support household visits and group education to promote net use and malaria prevention; recognizing signs of malaria; increasing care-seeking behavior; and encouraging ANC attendance and IPTp through women's groups, CHWs, and mass media:* To promote the hang-up, use, and maintenance of LLINs, PMI will continue to employ a multipronged approach to behavior change. BCC strategies will be focused at the community level, but will use mass media approaches when appropriate. Messages will focus on explaining correct care and use of nets and emphasizing the importance of ITN use among children under five and pregnant women, as well as all other members of a household. In peri-urban areas, PMI will contract with local NGOs with experience in BCC to conduct net promotion activities. In areas where CHWs are being trained to treat malaria, PMI will utilize these community agents to conduct household visits and follow-up activities. In addition to interpersonal communication for year-round net use, PMI will also target pregnant mothers to attend ANC early to receive IPTp and work with caregivers to ensure that febrile children are brought in for treatment within 24 hours of the onset of fever. This activity will include support for community-level approaches, such as training of community-based workers and mass media campaigns over public radio. Immunization outreach sessions will be used as opportunities for educating women. (\$450,000).

E. HEALTH SYSTEMS STRENGTHENING/CAPACITY BUILDING

Background:

PMI is a component program of Benin's GHI country strategy. Health systems strengthening (HSS), and women, girls, and gender equality are the two key principles chosen as emphases in the implementation of the GHI strategy. In the last two years, the NMCP and PMI have focused on three major challenges of the NMCP as a unit within Benin's health system: 1) NMCP lacks adequate human resource capacity – both in numbers and skills sets – to plan, manage, and coordinate a comprehensive malaria program; 2) the health information system is inefficient; and 3) the management of the health commodities supply chain is especially weak at the periphery, resulting in pilfering, stockouts, and expiration of drugs and RDTs. With these priorities in mind, PMI has worked in close collaboration with the GOB and other stakeholders (WHO, the Global Fund, UNICEF, bilateral partners, and NGOs) to reduce these barriers to reinforce the delivery of malaria interventions. PMI's support in strengthening the health system and the integration of malaria interventions with other programs has been proven to have positive spill-over effects to other MOH units and health programs, especially child and maternal health.

Many donors are working to strengthen Benin's public sector health system. One important mechanism is the Health Compact, signed in 2011, which was promoted by health-focused multilateral organizations and European donors to strengthen the health system. Important signatories include: the Global Fund, the Coopération Technique Belge, the World Bank, and more recently, the Coopération Française through their recently approved Muskoka Initiative. The purpose of the compact is to maximize aid effectiveness to the health sector through the

support of country systems. USAID/Benin is not a signatory to the compact and is still in the early stages of implementing procurement reforms under USAID Forward. The MOH is a principal recipient under Benin's Global Fund Round 9 grant that includes an HSS component. Although the grant has not yet been released, the Global Fund Board approved \$43.7 million for HSS activities nationwide. The African Development Bank has also been implementing a project to strengthen the health system in three departments (Zou, Donga, and Borgou), and the Global Alliance for Vaccines and Immunization is conducting a three-year project focusing on neonatal care and immunization. The World Bank is also supporting a \$22.8 million project to increase the coverage of quality maternal and neonatal health services in eight health zones in Benin.

Universal health care financing through the Régime d'Assurance Maladie Universelle is a new MOH priority, and was launched by President Yayi Boni on December 19, 2011. It is based on the currently extant mutuelles, the grassroots health cooperatives, supported by several aid organizations in Benin including USAID, Coopération Suisse, Coopération Technique Belge, and WHO. This initiative will have a great impact on the mechanisms for delivery of malaria services throughout Benin. PMI will follow the progress of development of this new strategy.

Progress during the last 12 months:

In response to the NMCP's (and MOH's) various human resource challenges, PMI invested in the training and attendance at international conferences of several key NMCP staff. Key areas of interest were M&E, supply chain management system (for essential antimalarial drugs, bed nets, and diagnostic equipment), and program management.

Earlier in the year, PMI's support for a pharmacist seconded to the NMCP to improve pharmaceutical management ended. This advisor's inputs helped to improve planning and supply chain monitoring; these inputs were especially helpful during the run-up to the universal bed net distribution campaign in the summer of 2011. In the last six months, this responsibility has shifted to ARM3: two commodities and logistics specialists have assumed the role of professionally mentoring counterparts within the NMCP's supply chain management section. PMI also supported two NMCP staff who attended a two-week supply chain management training course in Ouagadougou.

Shortly after the universal bed net distribution campaign, PMI funded the supervision of health workers in health facilities involved in the implementation of malaria activities at the health zone level. A similar review and supervision was completed six months after the introduction of the policy of free malaria treatment and services to pregnant women and children under five.

Challenges, opportunities and threats:

Benin has been fortunate to have several major technical and financial partners in recent years. At this juncture, it is important to build on the leadership, management, and governance capacities in country. Further, with global financial crisis and reforms with the Global Fund, it will be necessary to find sustainable funding to maintain the gains achieved in controlling malaria in Benin.

Plans and justification:

In the next year, PMI will focus on developing capacity within the MOH in the areas of leadership, management, and governance. PMI will work with the MOH to identify key figures within the NMCP who will benefit most from such a training program. This support will be through a multidonor consortium ensuring a broad-based and long-term commitment that will accompany these objectives to completion. PMI will also support the training of department- and health zone-level staff responsible for malaria services in basic epidemiology, program management, and monitoring. The combined results of these HSS activities is to enable the NMCP to shape, own, manage and monitor malaria services at the central, district, and health center levels.

Proposed activities with FY 2013 funding: (\$150,000)

1. *Support capacity building of the NMCP including M&E system:* PMI will provide support for the staff training plan that will be developed by the NMCP. The focus will include M&E, and will include training, database management, and support for a technical working group. PMI implementing partners will develop an action plan to address the key current weaknesses identified and follow up implementation of the plan. (\$150,000).

F. STAFFING AND ADMINISTRATION

Two health professionals have been recruited as resident advisors to oversee PMI in Benin, one representing CDC and one representing USAID. The CDC Resident Advisor will be joining the in-country team by December 2012, replacing the previous advisor who left in December 2011. In addition, one locally engaged staff has been hired to support the PMI team, joining the team in July 2012. All PMI staff members are part of a single interagency team led by the USAID Mission Director. The PMI team shares responsibility for development and implementation of PMI strategies and work plans, coordination with national authorities, managing collaborating agencies, and supervising day-to-day activities. Candidates for resident advisor positions (whether initial hires or replacements) will be evaluated and/or interviewed jointly by USAID and CDC, and both agencies will be involved in hiring decisions, with the final decision made by the individual agency.

The CDC and USAID PMI Resident Advisors are integrated into the Family Health Team of USAID/Benin. These two professional staff work together to oversee all technical and administrative aspects of PMI, including finalizing details of the project design, implementing malaria prevention and treatment activities, M&E of outcomes and impact, and reporting of results. Both staff members report to the USAID Mission Director and the CDC Resident Advisor is supervised by CDC both technically and administratively. All technical activities are undertaken in close coordination with the MOH/NMCP and other national and international partners, including WHO, UNICEF, the Global Fund, World Bank, and the private sector.

The USAID Mission Director approves the hiring of local staff to support PMI activities either in ministries or in USAID. Because of the need to adhere to specific country policies and USAID accounting regulations, any transfer of PMI funds directly to ministries or host governments needs to be approved by the USAID Mission Director and Controller.

Proposed activities with FY 2013 funding: (\$1,122,000)

1. *USAID technical staff*: Support one resident advisor and malaria specific staff member. (\$500,000);
2. *CDC technical staff*: Support one resident advisor. (\$300,000); and
3. *FSN staff and other in-country administrative expenses*: Cover ICASS costs (\$322,000).

Table 1
President's Malaria Initiative – Benin
Budget Breakdown by Partner for FY 2013 (\$16,100,000)

Partner Organization	Geographic Area	Activities	Budget
DELIVER	Nationwide	Procure LLINs, SP, RDTs, ACTs, microscopes, and reagents	7,745,924
ARM3	Nationwide	Support training, supervision, BCC, supply chain management, diagnostics, iCCM, health systems strengthening, capacity building and M&E	3,200,000
IRS IQC (Abt Associates)	9 Communes in Atacora	Support IRS	3,100,776
CREC	9 Communes in Atacora	Support vector surveillance and insecticide resistance monitoring	120,000
USP	Nationwide	Support drug quality control	50,000
TBD	Nationwide	Conduct a Malaria Indicator Survey in 2014	725,000
CDC-IAA	National	Technical assistance for entomology and M&E	36,300
	Cotonou	Support for one resident advisor	300,000
USAID/Benin	Cotonou	Support for one resident advisor and locally-engaged staff and other administrative costs	822,000
TOTAL			\$16,100,000

Table 2

President's Malaria Initiative – Benin

Planned Obligations for FY 2013 (\$16,100,000) – July 24, 2012

Proposed Activity	Mechanism	Budget		Geographical area	Description
		Total	Commodity		
PREVENTIVE ACTIVITIES					
Insecticide Treated Nets					
1. Procurement of LLINs	DELIVER	4,500,000	4,500,000	Nationwide	Procurement of 680,000 LLINs for delivery through routine services at health facilities. This includes delivery up to the health zone level. Some of these nets may be used for the 2014 universal coverage campaign.
SUBTOTAL ITNs		\$4,500,000	\$4,500,000		
Indoor Residual Spraying					
1a. IRS implementation	IRS IQC	3,100,776		Nine communes in Atacora (northern Benin)	One round of IRS in northern Benin; includes training for personnel, equipment/insecticide procurement, community mobilization, and IRS implementation

Proposed Activity	Mechanism	Budget		Geographical area	Description
		Total	Commodity		
1b. Support community mobilization for IRS	IRS IQC	(included in IRS implementation costs)		Nine communes in Atacora (northern Benin)	Preparation and sensitization of communities being targeted for IRS to ensure compliance and high coverage
2. Entomological monitoring for spray areas and selected sentinel sites.	CREC	120,000		Nine communes in Atacora (northern Benin)	Entomological monitoring in the spray areas and sentinel sites. CREC will involve NMCP personnel trained in entomology
3. Technical assistance for vector control	CDC IAA	24,200		IRS areas	Funding for two technical assistance visits to monitor IRS and entomological surveillance
SUBTOTAL IRS		\$3,244,976	\$0		
Intermittent Preventive Treatment in Pregnancy					
1. Procure SP	DELIVER	33,000	33,000	Nationwide	Procure approximately 1,050,000 doses of SP treatments to cover 2014 needs (# of pregnancies estimated at 525,000 in 2014). SP bought will also be available to the public and private sector according to the national policy
2. Provide support for supervision and refresher training of health workers in IPTp to improve quality of service	ARM3	Costs covered in Case Management-Treatment section		Nationwide	On-site supervision and refresher training of healthcare workers including benchmark assessments, on-the-spot training on new algorithm, and coaching
SUBTOTAL IPTp		\$33,000	\$33,000		

Proposed Activity	Mechanism	Budget		Geographical area	Description
		Total	Commodity		
SUBTOTAL PREVENTIVE		\$7,777,976	\$4,533,000		
Case Management					
Diagnosis					
1. Procure Rapid Diagnostics Tests (RDTs)	DELIVER	1,110,000	1,110,000	Nationwide	Procure 1.5 million RDTs to cover needs for 2014
2. Procure microscopes and laboratory reagents	DELIVER	45,000	45,000	Nationwide	Procure 15 microscope kits that include microscopes and reagents. Additional laboratory reagents will be provided for use with existing microscopes
3. Support supervision and strengthening of malaria diagnostic activities	ARM3	200,000		Nationwide	Supervision, development of policies, standard operating procedures, maintenance of microscopes, training, conduct periodic review of malaria diagnostics, and quality control of slides/RDTs
SUBTOTAL -- Diagnosis		\$1,355,000	\$1,155,000		
Treatment					
1. Procure ACTs	DELIVER	2,057,924	2,057,924	Nationwide	Procurement of approximately 1.5 million ACT treatments for older children and adults
2. Support subsidization of severe malaria treatment	ARM3	200,000		TBD	As part of the new national policy to provide “free” treatment to children under five and pregnant women, PMI will provide subsidies to selected facilities

Proposed Activity	Mechanism	Budget		Geographical area	Description
		Total	Commodity		
3. Support quality improvement and supervision of healthcare workers at the facility level	ARM3	500,000		Nationwide	On-site supervision of healthcare workers including benchmark assessments, on-the-spot training on new algorithm, and coaching including supervision of diagnostics activities
4. Support malaria training for health workers	ARM3	150,000		Nationwide	Support training of health workers on new case management guidelines, which will target outpatient health facilities
5. Support integrated management of childhood illness training	ARM3	100,000		Nationwide	Support in-service training of health workers in integrated management of childhood illness
6. Support community case management of malaria, pneumonia and diarrhea	ARM3	500,000		Nationwide	Support an iCCM program in five health zones, which complements the Global Fund iCCM program for malaria
SUBTOTAL -- Treatment		\$3,507,924	\$2,057,924		
Pharmaceutical Management					
1. Strengthen logistics management information system and supply chain management	ARM3	550,000		Nationwide	Strengthen the national logistics management information system as well as the supply chain management system from the central level down to the health facilities through the improvement of supply chain management, forecasting/quantifying, tracking, and storage of malaria commodities (ACTs, SP, RDTs)

Proposed Activity	Mechanism	Budget		Geographical area	Description
		Total	Commodity		
2. Drug quality control testing	USP	50,000		Nationwide	Provide support to the national laboratory for quality control to conduct routine testing of ACTs entering the port and spot checks at facilities
SUBTOTAL - Pharmaceutical Management		600,000			
SUBTOTAL CASE MANAGEMENT		\$5,462,924	\$3,212,924		
Monitoring and Evaluation					
1.Strengthen HMIS	ARM3	150,000		Nationwide	Strengthen procedures and indicators for malaria in the HMIS and comprehensive strengthening of system overall, including RMIS
2.Support sentinel sites surveillance	ARM3	100,000		Nationwide	Technical assistance to five sites for collection of reliable data on inpatient malaria cases and deaths. This support is conditional based upon 2013 performance
3.Support Malaria Indicator Survey	TBD	725,000		Nationwide	Support to conduct a Malaria Indicator Survey (MIS) in 2014, which will be two years after the last DHS
4.Conduct EUV surveys	ARM3	150,000		Nationwide	Monitoring of availability and utilization of key antimalarial commodities at the health facility level
5.Provide technical assistance for M&E	CDC IAA	12,100		Nationwide	Funding for one CDC advisor to provide technical assistance for M&E

Proposed Activity	Mechanism	Budget		Geographical area	Description
		Total	Commodity		
SUBTOTAL - M & E		\$1,137,100	\$0		
Behavior Change Communication					
1. Support development and implementation of new integrated communication strategy. Support household visits and group education to promote net use and malaria prevention, recognizing signs of malaria and increasing care seeking behavior and encouraging ANC attendance and IPTp through women's groups, CHWs, and mass media	ARM3	450,000		Nationwide	Support mass media (including local radio spots), as well as community-level approaches, such as training of community-based workers to promote net use, to recognize signs of malaria, to increase care seeking behavior and to encourage ANC attendance and IPTp through women's groups, CHWs, and mass media
SUBTOTAL BCC		450,000	0		
Capacity building					
1. Support capacity building of NMCP including M&E System	ARM3	150,000			Continued support for training, including online training in logistics/management, conferences, workshops, equipment (i.e., computers), and human resource capacity building. M&E strengthening will include a database, data manager, and an M&E website
SUBTOTAL Capacity Bldg.		150,000	0		
In-country Staffing and Administration					
1. USAID technical staff	USAID	500,000			Support to USAID resident advisor
2. CDC technical staff	CDC IAA	300,000			Support to CDC resident advisor

Proposed Activity	Mechanism	Budget		Geographical area	Description
		Total	Commodity		
3. FSN staff and other in-country administrative expenses	USAID	322,000			Support for FSN staff and other administrative expenses.
SUBTOTAL - In-Country Staffing		\$1,122,000	\$0		
GRAND TOTAL		\$16,100,000	\$7,745,924		