This Malaria Operational Plan has been endorsed by the U.S. Global Malaria Coordinator and reflects collaborative discussions with the national malaria control programs and partners in country. If any further changes are made to this plan, it will be reflected in a revised posting.

PRESIDENT'S MALARIA INITIATIVE

BENIN

Malaria Operational Plan (MOP) – Year Three

FY 2010

October 1, 2009

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ABBREVIATIONS

ACT	Artemisinin-based combination therapy
AL	Artemether-lumefantrine
ANC	Antenatal care
BASICS	Basic Support for Institutionalizing Child Survival
CAME	*Centrale d'Achat des Médicaments Essentiels* (Central Medical Stores)
CDC	Centers for Disease Control and Prevention
(F)CFA	*Franc de la Communauté financière d'Afrique* (Franc from the Financial Community of Africa)
CHW	community health worker
CREC	*Centre de Recherche Entomologique de Cotonou* (Center for Entomology Research – Cotonou)
CRS	Catholic Relief Services
CSA	*Centre de Santé d'Arrondissement* (small health center)
CSC	*Centre de Santé de Commune* (large health center)
DHS	Demographic and Health Survey
EMICoV	*Enquête Modulaire Intégrée sur les Conditions de Vie des Ménages*
EPI	Expanded Program on Immunization
FBO	Faith-based organization
FY	Fiscal Year
Global Fund	The Global Fund to Fight AIDS, Tuberculosis, and Malaria
GOB	Government of Benin
HMIS	*Système National d'Information et de Gestion Sanitaires* (Health Management Information System)
HZ	*Hôpital de Zone* (Zonal hospital)
IEC / BCC	Information, education, communication/ Behavior change communication
IMCI	Integrated Management of Childhood Illnesses
IPTp	Intermittent preventive treatment of malaria in pregnancy
IRS	Indoor residual spraying
IRSP	*Institut Régional de Santé Publique* (Regional Institute of Public Health)
ITN	Insecticide-treated net
LLIN	long-lasting insecticide-treated net
LQAS	Lot quality assurance sampling
MCDI	Medical Care Development International
M&E	Monitoring and evaluation
MCH	Maternal and child health
MOH	Ministry of Health
NGO	Non-governmental organization
NMCP	*Programme National de Lutte contre le Paludisme* (National Malaria Control Program)
PISAF	*Projet Intégré de Santé Familiale* (Integrated Family Health Project)
PMI	President's Malaria Initiative

PMTCT	Prevention of Mother to Child Transmission (of HIV/AIDS)
PSI	Population Services International
RBM	Roll Back Malaria
RCC	Rolling Continuation Channel
RDT	Rapid diagnostic test
SP	sulfadoxine-pyrimethamine
SPS	Strengthening Pharmaceutical Systems Program
UNICEF	United Nations Children's Fund
URC	University Research Corporation
USAID	United States Agency for International Development
USG	United States Government
WHO	World Health Organization

EXECUTIVE SUMMARY

In December 2006, Benin was selected as one of eight countries to receive funding during the third year of the President's Malaria Initiative (PMI). Malaria is endemic nationwide and is a major cause of morbidity and mortality. It is reported to account for 40% of outpatient consultations, 25% of all hospital admissions, and about 32% of deaths of children under five. With 30% of the population living below the poverty line and a per capita income of only $530 annually, 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 treatment and prevention of malaria.

The Government of Benin (GOB) views malaria control as a top priority for the development of the country and the National Malaria Control Program (NMCP) has developed a five-year strategic plan (2006-2010) to reduce malaria morbidity and mortality by 50% by the year 2010 with the scale-up of long-lasting insecticide treated nets (LLINs), rapid diagnostic tests (RDTs), artemisinin-based combination therapy (ACT), and sulfadoxine-pyrimethamine (SP) for intermittent preventive treatment of malaria in pregnancy (IPTp).

In 2007, the GOB received a four year, $31 million World Bank Booster Program grant, which includes significant support for commodities, particularly ACTs and LLINs. Benin has also been awarded a two five-year malaria grants from the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), one for $22.6 million and another for $110 million, which include support for two universal coverage LLIN campaigns and community case management of malaria nationwide. With these financial resources and support from the World Health Organization (WHO), the United Nations Children's Emergency Fund (UNICEF) and other national and international partners, considerable progress has already been made in scaling-up of malaria prevention and control.

This PMI Year 3 Malaria Operational Plan is based on progress and results to date in Year 2 as well as input received from the NMCP and partners during a planning visit that was carried out in April 2009. This plan was developed with the participation of the NMCP and nearly all national and international partners involved with malaria prevention and control in the country. The activities that PMI is proposing to support complement the contributions of other partners and directly support the NMCP's strategic plan.

The following paragraphs describe the progress to date and Year 3 plans for each of the major interventions.

Insecticide-treated nets (ITNs): The Government of Benin's universal coverage strategy is to provide one net for every two people. In Year 2, PMI procured 835,000 LLINs, and along with contributions from other donors, no gap for routine distribution exists in 2009. The PMI also procured and distributed 60,000 LLINs for highly subsidized distribution through the private sector. In 2010, Benin is planning a universal coverage ITN campaign with support from the Global Fund, which plans to distribute 2.7 million nets nationwide. To fill the gap and cover the needs for nets through routine services in 2010, PMI will purchase and distribute one million free LLINs to pregnant women and children, and an additional 120,000 LLINs through the

commercial sector. The combined activities of PMI and partners should bring household ownership of at least one ITN to at least 85%.

Indoor residual spraying (IRS): PMI has already funded two successful rounds of IRS in four communes in the Department of Ouémé, which protected 521,738 people and achieved a 99% coverage rate of targeted structures in Year 2. In 2010, two more rounds of IRS will be conducted in the same four communes (Sèmè Kpodji, Akpro-Missérété, Adjohoun and Dangbo). In 2011, new IRS target areas in northern Benin will be identified, where malaria transmission is more seasonal, ITN coverage is lower due to accessibility issues, and malaria related morbidity/mortality in priority groups is higher.

Intermittent preventive treatment of malaria in pregnancy (IPTp): Antenatal clinic (ANC) attendance is high in Benin, with 88% of women making at least one ANC visit. In Year 2, 1,291 midwives and nurses were trained by PMI in focused antenatal care and IPTp, leaving only 210 more to be trained nationwide. Supplies of sulfadoxine-pyrimethamine (SP) were obtained with FY07 funds and combined with contributions from other donors, such as the World Bank, all SP needs have been met. In Year 3, PMI will procure 1.9 million treatment doses to cover needs for both 2010 and 2011; support training for newly-hired, public and private health facility midwives and nurses; supervise health workers in IPTp; strengthen logistics management for SP; and support the education of pregnant women and communities on the benefits of IPTp.

Case management:
Diagnosis: To strengthen laboratory diagnosis of malaria, PMI purchased and delivered 30 microscopes to the NMCP in March 2009. The PMI is buying an additional 15 microscopes with FY09 funds, and supporting the training of laboratory technicians and clinicians, with supervision on diagnostics, as part of the integrated supervision strategy. In 2010, PMI will procure 20 new microscopes, which will ensure that all public hospitals have at least one microscope by the end of Year 3. The PMI will continue support to training and supervision of laboratory technicians, support quality assurance/quality control for diagnostics and procure 937,500 RDTs to cover the majority of 2011 needs in the public and private sector nationwide. The World Bank's procurement of RDTs will fill the need for 2010.

Treatment: In 2009, PMI funds were used to train 72 health workers in Integrated Management of Childhood Illness (IMCI) guidelines, and procure artesunate suppositories and drug kits for the management of severe malaria. To support malaria case management in the private sector, Benin's national private treatment protocol has also been revised and 165 private providers have been trained on its contents. For the management of uncomplicated malaria, PMI will procure 350,000 artemether-lumefantrine (AL) treatments for distribution at health facilities and by community health workers in 2010. Together with contributions from other partners, these procurements will meet all Benin's needs in 2010 and 2011. The PMI will also procure injectable quinine drug kits for inpatient treatment of severe malaria, supervise and support health workers, support IMCI training, and provide funding for information, education, communication/behavior change communication (IEC/BCC) related to malaria treatment.

Pharmaceutical Management: The PMI funded an evaluation of the supply chain management system in March 2008 and an assessment of the Central Drugs Warehouse (CAME) in November-December 2008. An action plan for strengthening pharmaceutical management has

been developed, which will serve to strengthen not only ACT distribution, but Benin's supply chain for essential medicines as a whole. In 2010, PMI will support the strengthening of drug warehousing at the regional and district levels to overcome logistical bottlenecks at the national and health zone levels, and support efforts of the Global Fund to improve warehousing. The PMI will also provide technical assistance to CAME, the NMCP, and the Directorate of Pharmacies and Medications to standardize their systems, comply with international norms, and link commodity purchases to actual commodity consumption. The anticipated resulting improvements in logistical systems will benefit the entire health sector; however, the focus of PMI funded activities will be on improving the supply chain for antimalarial drugs.

Monitoring and evaluation (M&E): In Year 2, PMI funds were used to hire a statistician to assist the NMCP in collecting data on commodities and to support the Regional Institute of Public Health in Benin to strengthen three malaria sentinel sites. These sentinel sites have identified site coordinators, and the number of sites will be expanded to a total of seven in 2010. As part of the plan to estimate the impact of malaria control efforts on mortality, PMI will provide technical and financial support to help implement the 2011 DHS, including an increase in sample size for the child mortality and malaria modules. The PMI will also collect, analyze, and report data on process indicators and provide technical assistance to the NMCP with M&E planning and implementation in 2010.

The proposed fiscal year (FY) 2010 PMI budget for Benin is $21 million. Of this amount, 29% is planned for the procurement and distribution of LLINs; 37% for IRS; 15% for pharmaceutical management, procurement of ACTs, drugs for severe malaria, and improved laboratory diagnosis of malaria; 2% for IPTp; and 3% for monitoring and evaluation. Of the total, 45% of FY10 funding will be spent on commodities.

PRESIDENT'S MALARIA INITIATIVE

In June 2005, the United States Government (USG) announced a new five-year, $1.2 billion Initiative to rapidly scale up malaria prevention and treatment interventions in high-burden countries in sub-Saharan Africa. The goal of this initiative is to reduce malaria-related mortality by 50% in PMI countries. This will be achieved by reaching 85% coverage of the most vulnerable groups -- children under five years of age and pregnant women -- with proven preventive and therapeutic interventions, including artemisinin-based combination therapy (ACT), insecticide-treated mosquito nets (ITNs), intermittent preventive treatment for malaria in pregnancy (IPTp), and indoor residual spraying with insecticides (IRS).

The President's Malaria Initiative began in three countries in 2006. Four countries were added in 2007; and eight countries, including Benin, were added in 2008 (for a total of 15 countries). For all of PMI, funding began with $30 million in fiscal year (FY) 2006 for the initial three countries, $135 million in FY 2007, and $300 million in FY 2008 and FY 2009. The projected funding level for FY 2010 is $500 million.

In implementing PMI-supported activities in Benin, the USG is committed to working closely with the host government and within the existing national malaria control strategy and plans. Efforts will be coordinated with other national and international partners, including the World Health Organization (WHO), the United Nations Children's Fund (UNICEF), the Global Fund to

Fight AIDS, Tuberculosis, and Malaria (Global Fund), Roll Back Malaria (RBM), the World Bank Booster Program, and the non-governmental and private sectors, to ensure that investments are complementary and that RBM and Millennium Development Goals are achieved. Country assessment and planning visits for PMI, as well as subsequent evaluations, will be highly consultative and held in collaboration with the National Malaria Control Program (NMCP, *Programme National de Lutte Contre le Paludisme)* and other partners.

This document presents a detailed one-year implementation plan for the third year of the PMI in Benin. It briefly reviews the current status of malaria control and prevention policies and interventions, identifies challenges and unmet needs, and provides a description of planned Year 3 activities under PMI. The plan was developed in close consultation with the NMCP and with participation of all national and international partners involved in malaria prevention and control in Benin. Benin's PMI budget in FY09 was $13.8 million. The total amount of PMI funding requested for Benin is $21 million for FY 2010.

HEALTH SYSTEM IN BENIN

Background

In 2009, Benin's population is estimated to be 8.8 million[1] of which approximately 18% and 6% are children under 5 years of age and pregnant women, respectively[2]. In 2006, more than one third of the country's population was living in poverty[3]. In 2008, Benin ranked 161 out of 179 countries[4] on the Human Development Index and had a gross national income per capita of only $1,250 USD[5]. Life expectancy[6] is 54 years for men and 55 years for women. Educational levels are low – six in ten women and four in ten men have had no schooling[7], and the literacy rate is 28% for women and 55% for men[8]. For the period from 2001–2006, the infant mortality rate was 67 per 1,000 live births, the under-five mortality rate was 125 per 1,000 live births, and the maternal mortality ratio is 397 per 100,000 live births (with estimates taking into account issues of undercounting running as high as 850). The total fertility rate is 5.7 per woman[9].

Administratively, Benin is divided into 12 departments (average 650,000 inhabitants per department), 74 communes and three autonomous areas (Cotonou, Porto Novo and Parakou), 546 *arrondissements* and 3,747 villages.

National Health System

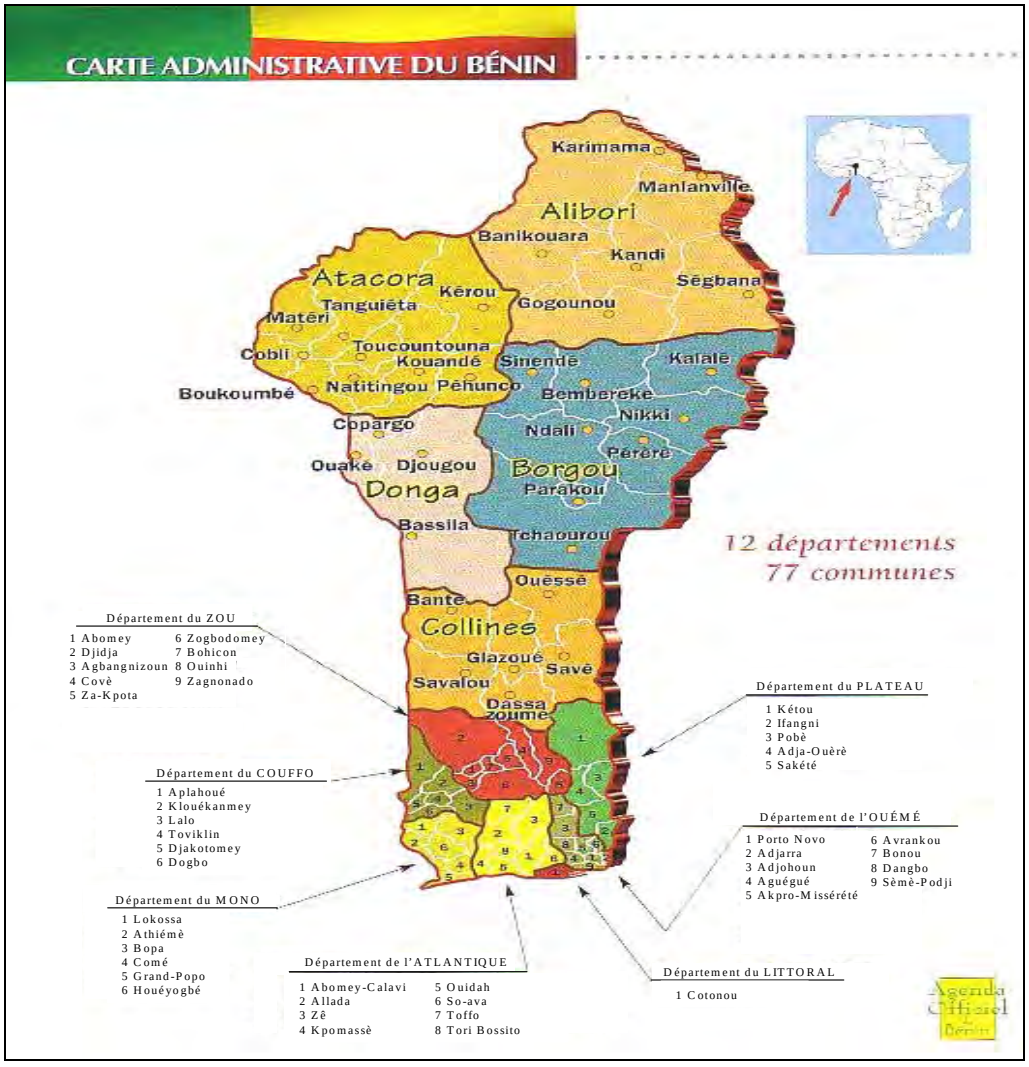
Benin's Ministry of Health (MOH) underwent reorganization in 2005, expanding the number of health directorates, allowing for an additional and special focus on hospitals and health zones. Benin's public health system is organized in a pyramidal structure with three levels:

[1] CIA World Facts Book
[2] 2006 DHS and 2008 HMIS
[3] UNDP's Assessment of Development Results (ADR) for Benin, December 2008
[4] Human Development Reports - UNDP
[5] WHO Benin website http://www.who.int/countries/ben/en/
[6] 2008 World Health Statistics
[7] 2006 DHS
[8] 2006 DHS
[9] 2006 DHS

- **Central**: Ministry of Health and its central Directorates; National Referral Hospital (*Centre National Hospitalier et Universitaire*)
- **Intermediate**: Departmental Directorates for Health, Departmental referral hospitals (*Centre Hospitalier Départemental*). Functionally, there are only six referral hospitals nationwide.
- **Peripheral**: Health zones which contain the following health facilities: Zonal hospital (*Hôpital de Zone*; HZ), District Health Centers (*Centre de Santé de Commune*; CSC), Community Health Centers (*Centre de Santé d'Arrondissement*; CSA), private health facilities, and village health units. In practice, not all health zones have a functioning HZ.

The country's 34 health zones each cover an average population of 230,000 (ranging from 84,000 to 492,000). Health zones contain from one to four communes (average of two communes per health zone).

Benin's 12 administrative departments and 77 districts (*communes*)



In 2006, there were an estimated 592 physicians, 2,952 nurses, 968 midwives, and 512 laboratory technicians working in Benin's public health system. For the country as a whole, there are an estimated 442 CSAs, 75 CSCs, and 305 licensed private health facilities (*Système National d'Information et de Gestion Sanitaires* -- Health Management Information System, HMIS, 2006).

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 NMCP 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.

Health system financing
The Ministry of Health has an Indigent Fund in place, which acts as a mechanism to identify the poorest in the country and to subsidize their user fees. . Although the system is in place, it appears that many people do not know that they are eligible. Public health facilities usually charge direct fees for consultations, procedures, and medicines, except for, in recent years, certain essential health services and commodities like long-lasting insecticide-treated net (LLINs). The fees are kept at the facility level to support the functioning of the facility as outlined by the Bamako Initiative. A *carnet de santé* (health book that acts as a patient chart) must also be purchased to access care at public health facilities. Facility staff members work with community committees to allocate user fees according to policies that are set by the MOH. Community financing represents a substantial share (average of 43%) of local operating costs for the MOH facilities.

Malaria Situation in Benin

Epidemiology
Malaria is a leading cause of morbidity and mortality among children under five in Benin. Roll Back Malaria estimated that in 2004 there were about three million cases of malarial illness (all ages), and the WHO-convened Child Health Epidemiology Reference Group estimated that in the year 2000 about 10,000–13,000 malaria deaths occurred in children under five. The Benin 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).

Entomology/transmission (populations at risk of malaria)
The primary malaria vector in Benin is *Anopheles gambiae s.s.* However, secondary vectors may become important in certain circumstances. Vector abundance tracks seasonal rainfall and transmission fluctuates in step with this pattern. Benin experiences 'long rains,' across the country (April-July) as well as secondary 'short rains' (October-November) in the South. The widespread distribution and continuous breeding of *A. gambiae* in the presence of a large number of humans with circulating malarial parasites results in a stable endemic transmission pattern of malaria nationwide.

Vector resistance to pyrethroid insecticides affects the malaria situation in Benin by reducing the efficacy of IRS as well as ITNs.[10] Resistance management and the use of IRS with a non-pyrethroid insecticide (to kill pyrethroid resistant vectors) guides IRS planning.[11] This management strategy currently relies on the use of carbamate (Bendiocarb), instead of pyrethoid, insecticides. Ongoing rotation of insecticides, based on vector resistance monitoring data, is planned in order to 'protect' ITN efficacy.

Insecticide-treated net replacement programs can affect selection for vector resistance.[12] If nets are not replaced in a timely manner, they eventually deliver a 'sub-lethal' insecticide dose that selects for resistance, by selectively killing 'susceptible' vectors. The potential impact of 'sub-lethal' ITNs on vector resistance could be significant. Meanwhile, the current test for assessing ITN insecticidal decay, the WHO bioassay, is difficult to scale up.[13] A more efficient method, based on a chemical (colorimetric) test, has been developed, standardized, and deployed by PMI against the WHO method.[14]

Key partners in malaria control

The Global Fund

The Global Fund has been involved in malaria control and prevention in Benin primarily through two Principal Recipients: Africare and Catholic Relief Services (CRS), which will expand their activities nationwide in FY10.

- Africare was awarded a US $2.14 million grant through the Global Fund Round Three. Phase Two of the grant was completed in October 2008. The goal of this community-based project, implemented in the Departments of Mono and Couffo, was to reduce malaria-related morbidity and mortality among pregnant women and children under five through: (1) improved use of ITNs among pregnant women and children under five; (2) improved case management of uncomplicated malaria in health facilities and home-based management of fever in under-fives with the use of ACTs; and (3) improved access to IPTp with sulfadoxine-pyrimethamine (SP) for pregnant women. To meet these goals, the grant supported community mobilization and participation, information, education, communication/behavior change communication (IEC/BCC) approaches at the community level, and involvement of local stakeholders in malaria control. Africare is currently conducting a comprehensive evaluation of the different interventions implemented during the project. In October 2008, the Government of Benin submitted a Round Three Rolling Continuing Channel (RCC) application, naming Africare as the Principal Recipient, which has been approved by the Global Fund. The amount of funding currently approved is 80 million Euros (~$110 million) to support the following three principal interventions: (1) two national LLIN distribution campaigns (one in 2010

[10] N'Guessan *et al.* (2007) Reduced efficacy of Insecticide-treated Nets and Indoor Residual Spraying for Malaria Control in a Pyrethroid Resistance Area, Benin. Emerging Infectious Diseases **13**(2)
[11] CREC (2008) Rapport PMI/IRS: Impact of Indoor Residual Spraying on Malaria Transmission, CREC, Cotonou.

[12] Green M *et al.* (2009) Rapid colorimetric field test to determine levels of deltamethrin on PermaNet surfaces: association with mosquito bioactivity. Tropical Medicine and International Health **14**:1.
[13] WHO (2006) Guidelines for the Laboratory and Field Testing of Long-lasting Insecticidal Mosquito Nets. WHO, Geneva. http://wholibdoc.who.int/hq/2005/WHO_CDS_WHOPES_GCDPP_2005.11.pdf.
[14] Green M et al (2009)

and the other in 2013) to reach universal coverage with an average of one net for every two persons, (2) scale-up community case management of malaria with community-level distribution of ACTs in communes not covered by the Global Fund Round Seven grant, and (3) social mobilization to increase IPTp coverage. Africare is now in the process of providing clarifications to its proposal to the Global Fund and hopes to start implementing its activities by early October 2009.

- Catholic Relief Services (CRS) is the Principal Recipient of a five-year, $22.6 million grant awarded through Round Seven of the Global Fund. The goal of this project, "Palu Alafia," is to reduce malaria mortality and morbidity by 30% among children under five by 2012 through the scale-up of community-level distribution of ACTs in 14 of Benin's 34 health zones (covering a total of about 40 communes or about 3.4 million inhabitants). Catholic Relief Services has partnered with Plan Benin, Africare, Medical Care Development International (MCDI), and Caritas Benin to implement this project. Phase One of the project started in July 2008. To date, CRS reported having accomplished the following: recruited all project staff; established all reporting mechanisms and lines of communication with the Global Fund and other partners including the NMCP; developed the project monitoring and evaluation (M&E) plan and tools; developed a number of training manuals for community trainers, health workers, and community-based organizations that will be involved in the project; selected community-based extension health workers; and completed the assessment for the renovation of the health zone depots in the 14 health zones to be covered by the project.

The World Bank

The World Bank contributes to malaria control and prevention in Benin through its Malaria Booster Program, a $31 million four-year grant (2007–2011) to the Government of Benin (GOB). This includes significant support for commodities, including the purchase of ACTs, rapid diagnostic tests (RDTs), SP, and LLINs. The majority of the LLINs (1.4 million) distributed in Benin's 2007 national campaign were purchased with funding from the Booster Program. The Booster Program also provides significant support for training and supervision of health workers and for M&E activities. Over the next two years, the Booster Program is expected to put more emphasis on ITN and ACT strategies. Currently, there are no plans to extend or renew the program past 2011, as the World Bank is shifting its funding focus to regional projects instead of country-specific ones.

The World Health Organization

In 2007/2008, the WHO provided technical assistance to the NMCP to overcome difficulties in implementing the new national malaria control policy, build capacity in the areas of management and research, improve their M&E system, and mobilize resources. The WHO also worked with the NMCP to review its strategic plan to include ITNs and IRS interventions and to develop a supervision card for the integration of case management.

The United Nations Children's Fund

The United Nations Children's Fund's main activity is the Accelerated Child Survival and Development (ACSD) project, which primarily supports the implementation of the Integrated

Management of Childhood Illness (IMCI) strategy, antenatal care (ANC) support, and vaccinations, focused in three Health Zones. Since 2002, UNICEF has trained over 600 community health workers (CHWs) in these three zones on IMCI including malaria case management. In 2008, UNICEF extended the training to another four Health Zones. UNICEF also partnered with PSI to distribute over 70,000 LLINs through routine services and promote their utilization through an IEC/BCC campaign in the Zou Department in Southern Benin.

UniCredit Foundation

The UniCredit Foundation, an Italian group working in the field of international development, solidarity, and cooperation, is supporting the implementation of IMCI and distributing LLINs and ACTs in the Tanguiéta Health Zone in the department of Atakora through its "Tata Somba" project. The goal of the project, started in 2005, is to improve access at all levels to the health services network in the Tanguiéta Health Zone, with particular attention to women of child-bearing age and young children at risk.

NATIONAL MALARIA CONTROL PLAN AND STRATEGY

Malaria is regarded as a high priority disease in Benin and the GOB is a signatory to RBM and the Abuja targets. In 2008, Benin committed approximately 7.2% of its national budget to health and in 2009 its health budget increase to 9%, with about 1% of the health budget allocated for malaria. The GOB changed its national malaria policy in November 2005 to include LLINs, ACTs, and SP for IPTp. The new national policy was issued together with a five-year strategic plan for 2006–2010. The overall goal of the GOB is to reduce malaria morbidity and mortality by 50% from 2001 levels by the year 2010 and to eliminate malaria as a public health problem by the year 2030. The specific objectives of the NMCP's new malaria strategy are to:

- By 2010, ensure that 80% of uncomplicated malaria cases in children under five have been correctly managed at the household or community level within 24 hours of the onset of symptoms;
- By 2010, ensure that 80% of uncomplicated malaria cases have been correctly managed in government health facilities;
- By 2010, ensure that 80% of severe malaria cases have been correctly managed according to the national policy;
- By 2010, ensure that 80% of vulnerable groups (children under five and pregnant women) sleep under an insecticide-impregnated mosquito net; and
- By 2010, ensure that 80% of pregnant women receive IPTp.[15]

CURRENT STATUS OF MALARIA INDICATORS

The table below presents the most recent estimates of malaria indicators, taken from the DHS, a nationally representative household survey conducted from August-November 2006. These

[15] Plan Stratégique Quinquennal de Lutte Contre le Paludisme au Bénin (2006–2010). Programme National de Lutte Contre le Paludisme, République du Bénin. August 2006.

estimates have been accepted as the baseline indicators for PMI-Benin, as no other survey of acceptable quality has been conducted since then. It is important to note that ITN and IRS coverage figures are believed to be considerably higher because of recent large-scale ITN distribution activities, including a national campaign to distribute 1.7 million free ITNs to children under five in October 2007, and two additional IRS campaigns in July–August 2008 and March–May 2009.

Malaria Indicators: 2006 Benin DHS	
Proportion of households with at least one ITN	25%
Proportion of children under five years old who slept under an ITN the previous night	20%
Proportion of pregnant women who slept under an ITN the previous night	20%
Proportion of women who received >2 doses of IPTp during their last pregnancy in the last 2 years	<1%
Proportion of children under five years old with fever in the last two weeks who received treatment with ACTs within 24 hours of onset of fever	<1%

GOAL AND TARGETS OF THE PRESIDENT'S MALARIA INITIATIVE

The goal of PMI is to reduce malaria-associated mortality by 50% compared to pre-initiative levels in the fifteen PMI focus countries. By the end of 2010, PMI will assist Benin to achieve the following targets in populations 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 sprayed with IRS in the last six months;
- 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 will have ACTs available for treatment of uncomplicated malaria; and
- 85% of children under five with suspected malaria will have received treatment with ACTs within 24 hours of onset of their symptoms.

EXPECTED RESULTS – YEAR THREE

Prevention:

- Approximately 1.1 million LLINs will have been purchased and distributed by PMI, which should bring household ownership of at least one ITN to approximately 85%;
- Approximately 1.9 million SP treatment doses will be purchased and distributed by PMI will procure, sufficient to cover all needs for pregnant women in 2010-2011 nationwide during routine ANC visits (providing IPTp coverage of at least two doses to all pregnant women in Benin);
- At least 85% of houses for three rounds of IRS (approximately 210,000 households with a population of 750,000 people[16]) in geographic areas targeted for spraying will have been sprayed.

Treatment:

- As a result of the combined efforts of PMI, the World Bank, and the NMCP, all 12 departments nationwide will be using ACTs, and supervision will promote correct case management for malaria in health facilities and hospitals;
- Approximately 350,000 ACT treatments will have been purchased by PMI for distribution via health facilities and community-based workers to fill gaps in coverage for all ages nationwide;
- As a result of combined efforts of PMI, the World Bank, and the NMCP, all laboratory technicians at the commune, health zone, and reference hospital level will have been trained in malaria diagnostics, and all public hospitals will have at least one functional microscope and reagents to conduct microscopy;
- Approximately 937,500 RDTs will have been procured and distributed by PMI for malaria diagnosis in all patients 5 years of age and older with an uncomplicated febrile illness seen at public and private outpatient facilities without microscopy; and
- Approximately 17,462 quinine drug kits for treatment of severe malaria in children under five years of age will have been purchased and distributed to health facilities by PMI.

INTERVENTIONS – PREVENTION

Insecticide-treated nets (ITNs)

Background

The NMCP's Strategic Plan 2006 – 2010 emphasizes the use of LLINs for the prevention of malaria among children under five and pregnant women. The 2006 DHS found that more than half of all households (56%) owned at least one mosquito net of any type (50% rural, 66% urban). However, only 25% of households reported owning at least one ITN and only 20% of children under five and pregnant women said that they had slept under an ITN the previous night. Based upon these data, the NMCP is supporting a four-pronged approach to net distribution in Benin, which includes free distribution through health centers during ANC and immunization clinic visits, distribution of highly-subsidized LLINs through community-based channels, free distribution through mass campaigns, and the sale of LLINs in the commercial market.

[16] This is the total for three rounds of spraying

At the health center level, LLINs are distributed through ANC kits that include SP and other drugs, at a cost of about $1 per kit and have been supported by PMI, UNICEF and the World Bank most recently, and are distributed free to children under five attending immunization clinics. The nets and SP are supposed to be free and the fee covers the other components of the kit. The LLINs sold on the commercial market range in price from $7 to $12. With PMI support, PSI is selling socially-marketed, highly-subsidized nets for about $2 each. As part of the new, "universal coverage" strategy (one net for every two people) free, national LLIN distribution campaigns are being planned for 2010 and 2013, with almost five million nets being planned for the 2010 campaign. The principal funding source for the two national net campaigns will come from the recently awarded RCC Global Fund award.

The projected needs and gap are outlined in the table below. There is not expected to be a remaining gap by the end of 2011, and in fact, there may be a surplus. PMI will consider reprogramming funds targeted for LLINs at that time for other activities if the calculated surplus remains.

LLIN need and gap from January 2009 to December 2011 for ANC and EPI

Items	January - December 2008	January - December 2009	January - December 2010	January - December 2011
ANC need	395,000	408,000	471,841	487,776
EPI need	340,000	351,000	360,000	370,000
Total needs	735,000	759,000	831,841	857,776
Other's contribution	135,000[17]	583,000[18]	0	0
Gap	600,000	176,000	831,841	857,776
PMI's contribution	835,000[19]	803,000[20]	1,627,000[21]	795,159[22]
Gap/surplus after PMI's contribution	235,000	627,000	795,159	-62,617

Progress to Date in Year 2:

During Year 2, PMI procured 835,000 LLINs (using FY08 funds), which were delivered in three consignments. The last shipment is scheduled to arrive in September 2009, for distribution via routine services to children under-five and pregnant women. Using FY09 funds, PMI has already ordered 568,000 LLINs for delivery and distribution through routine services in FY10. As well, PMI implementing partners are working with the government to strengthen storage capacity by providing technical assistance and to distribute LLINs down to the health zone level. They are

[17] From World Bank Booster Program
[18] 475,000 from World Bank Booster Program and 108,000 from UNICEF
[19] Number of nets was adjusted to account for the lower price.
[20] 235,000 surplus carried over from 2008, added to 568,000 in the FY09 MOP.
[21] 627,000 surplus carried over from 2009, added to 1,000,000 in the FY10 MOP
[22] Carry over of from FY10 surplus

also assisting in the transport of these nets from the health zones to the health facilities and in providing support for IEC/BCC to promote ownership and usage of LLINs. The PMI-supported pharmaceutical systems program is continuing to provide support in strengthening logistics management for all commodities, including LLINs, and prepared an assessment that outlined recommendations for improving the system, which the government plans to implement. Together with contributions with those made by the World Bank, all the needs for routine distribution in 2009 have been met. Additionally, PMI implementing partners are continuing to provide support for the sale of LLINs through the private sector and have socially–marketed approximately 29,800 subsidized LLINs in rural areas and 6,320 in urban areas for a total of 36,120 nets. There remains an additional stock of approximately 100,000 nets for sale in 2009-2010. The operations research studies described in the Year 1 MOP to assess whether pyrethroid resistance in Southern Benin reduces the clinical impact of ITNs and IRS interventions are ongoing with all funds having been transferred to the *Centre de Recherche Entomologique de Cotonou* (Center for Entomological Research – Cotonou, or CREC).

Proposed Year 3 activities: *($6,100,000)*

1. *Procure and distribute LLINs for routine services*: Procure approximately one million LLINs for distribution to pregnant women at ANC visits and to children at vaccination clinics. Pregnant women will receive LLINs as part of a kit including one LLIN, one dose of mebendazole, folic acid, iron, and SP at a cost of slightly more than $1 per kit, with the net and SP being given free of charge. These nets, together with contributions from other partners, will cover 100% of the estimated need at both ANC and vaccination clinics until the end of 2011. Costs for this activity include procurement of LLINs, their transport all the way to health zone depots, and to the health facility-level. *($5,500,000)*

2. Strengthen logistics management for LLINs: Continue to provide technical assistance to the Central Medical Store (CAME, *Centrale d'Achat des Medicaments Essentiels*) to improve supply management, forecasting/quantifying, tracking, and storing LLINs and other malaria commodities at the central, regional, and zonal levels. Training of CAME staff at all levels will be conducted. This activity will be coordinated and integrated with logistics management of SP, ACTs, and other malaria drugs, and will continue to carry out the CAME Action Plan developed in FY08. *(Costs covered under Pharmaceutical Management section)*

3. *IEC/BCC for LLINs, IPTp, and ACTs:* Support IEC/BCC strategies including mass media and community-level approaches (e.g. local radio stations, women's groups) to increase demand and promote correct and consistent utilization of LLINs by target groups. Messages will focus on creating demand for ITNs, explaining correct care and use of nets, and emphasizing the importance of ITN use among under-fives and pregnant women. This will be part of a larger integrated BCC/IEC activity for LLINs, IPTp and case management. This will include building the IEC/BCC capacity of the NMCP through routine technical assistance to ensure good coordination of IEC/BCC efforts at the national level. These IEC/BCC activities will be coordinated with IEC/BCC approaches supported through non-governmental organizations (NGOs). (*Costs covered under the IEC/BCC section)*

4. *Procure and distribute LLINs through the private sector*: Procure and distribute approximately 120,000 highly-subsidized LLINs through the private sector, using a social marketing approach

in rural areas. A high subsidy will be applied to these nets so that they are sold at a more affordable price of around US $1-2 and made available to those not targeted by mass distribution campaigns. The design of PMI support through the private sector may also evolve with the advent of universal coverage campaigns, which distribute nets to all population groups and in both rural and urban areas. *($600,000)*

Indoor Residual Spraying (IRS)

Background

The President's Malaria Initiative has supported one round of IRS per year with a carbamate insecticide, Bendiocarb, in Ouémé District. Indoor residual spraying began in July 2008, when approximately 150,000 households, with a total population of about 500,000, were sprayed. The insecticidal effect lasted at least four months, which is enough to cover the major transmission period.[23] While two rounds of IRS per year would extend protection through the secondary transmission period, there are technical and programmatic concerns associated this approach. First, two rounds will double the cost of spraying and there is no guarantee that a second round will result in significantly increase impact. Furthermore, PMI endorses spraying in areas that can be covered by one round of IRS per year; times that are not covered by IRS treatments can be bridged by ITNs (already present in Ouémé and scheduled for scale up to universal coverage in 2009). Finally, other locations in Benin, (e.g. the Northern part of the country) are well suited to IRS because they have lower ITN coverage, will take more time to scale up, have lower vector pyrethroid resistance rates, and experience only one seasonal transmission peak.

Progress to date in Year 2

Two rounds of IRS have been completed. Round one, which took place in July/August 2008 and used the carbamate insecticide Bendiocarb 10 wp (wet-able powder), targeted 151,783 structures in four communes (Ouémé District), of which 142,814 were sprayed (94% coverage, 521,738 people protected). Round two, a repeat of this plan, was completed in May 2009 and achieved 99% coverage of targeted structures.

A "knock down / keep down" strategy for vector control is envisioned by the National Program. This strategy proposes the use of IRS to drive malaria transmission down, followed by universal ITN coverage to sustain gains from IRS going forward, since multiple rounds of IRS can be expected to continually decrease malaria morbidity and mortality. Transmission following the shift to universal ITN coverage should be monitored closely to verify that the "keep down" strategy is working.

Target communities for IRS located in flood zones are not sprayed for ecological reasons. Households near watersheds present the risk of insecticides leaking into waterways. Instead, LLINs are installed in all qualifying structures that do not already have them. Approximately 16,000 LLINs were hung by local women's associations (trained during previous LLIN

[23] CREC (2008) Rapport PMI/IRS: Impact de la pulverization intradomiciliaire (IRA) sur la transmission du paludisme dans L'Ouémé.

campaigns) in 2008. Distribution of a second LLIN to each eligible structure followed the second round of IRS.

Data from entomological and operational monitoring activities informs the planning of IRS. For example, IRS occurs immediately before the main seasonal peak of vector density, which maximizes impact. The use of a carbamate insecticide reflects entomological monitoring (vector resistance) data that indicates an elevated level of resistance to pyrethroids (but no resistance to carbamates) in the IRS target area.[24]

Entomological evaluation of IRS shows that vector biting density, assessed by standardized collection techniques, decreased nearly five fold from baseline during round one of spraying.[25] Insecticidal effect, assessed by standard WHO techniques, remained high four months after IRS.

The PMI supports one operations research activity related to IRS which is investigating the protective efficacy of a combination of LLINs and IRS (with non-pyrethroid insecticide) in an area where the vector has a high (<70% kdr) level of pyrethroid resistance. Two questions are being addressed: (1) is there a measureable improvement in impact when LLINs are combined with IRS; and (2) is it possible to demonstrate that IRS with a non-pyrethroid insecticide can be used to manage vector pyrethroid resistance (thereby sustaining LLIN efficacy)? In July 2008, following a baseline assessment, one round of IRS was conducted in the study area, the Ouidah-Kpomassè Tori Bossito Health Zone, and 1,436 structures were treated. In October 2008, LLINs were hung in the same structures. Entomological collections to assess vector density, taxonomy, resistance, behavior, blood feeding, sporozoite rates, as well as parasitological/clinical measures to evaluate asymptomatic infections and parasite density are ongoing. The evaluation will end in December 2009.

In 2008, PMI also supported an operations research activity related to LLINs and published its results in the report, "Evaluation of technology for determining when to replace LLINs."[26] The technology, a colorimetric assay, proved to be a quick and accurate chemical method for identification of LLINs that would fail the 'gold standard' WHO bioassay test for LLIN insecticidal decay.[27] Support to operationalize the test into entomological monitoring and to transfer the technology to CREC is requested in the 2010 budget, with the goal of estimating the rate of deterioration of ITNs at specific sites, which would provide information on when net replacement should occur.

Proposed Year 3 activities: *($7,844,200)*

1. *IRS implementation:* Two rounds of IRS in Ouémé followed by ITN universal coverage; selection of new northern IRS target areas and one round of IRS prior to the peak of transmission in 2011.

[24] CREC (2008) Rapport PMI/IRS: Impact of Indoor Residual Spraying on Malaria Transmission, CREC, Cotonou.
[25] CREC (2008) Rapport PMI d'etape: Donnees entomologiques et sociologiques obtenus dans le cadre des activities de recherché en prelude aux operations de pulverization (IRS).
[26] Green M et al (2009). Tropical Medicine and International Health **14**(4):1-8
[27] Green M et al (2009). Tropical Medicine and International Health **14**(4) :1-8

Two rounds of IRS will be conducted in four current IRS communes (Sèmè Kpodji, Akpro-Missérété, Adjohoun and Dangbo) in the Department of Ouémé. Spraying with a carbamate insecticide to manage pyrethroid resistance will be timed such that indoor walls and roofs of targeted structures remain insecticidal during the period of peak transmission, and will be accompanied by appropriate community mobilization and IEC/BCC efforts to ensure acceptance and compliance with IRS. Round two of spraying, scheduled for August-September 2010, will target the same structures and provide protection during the second transmission peak (October-November). During round two, all targeted structures will be surveyed for the presence of at least two correctly-hung-ITNs. Structures that do not meet this criterion will be provided with either one or two ITNs to be hung over sleeping spaces with instruction on use and compliance provided to occupants. Following the second round in 2010, no additional rounds of IRS will be implemented by PMI in Ouémé, and a long term IRS strategy developed with FY09 funds will guide future spray operations. As a first step in the IRS transition process, an IEC/BCC campaign will be conducted to inform the community about the MOH's long-term strategy. In 2011, IRS activities will likely move to northern Benin, targeting areas where malaria transmission is more seasonal, ITN coverage is lower due to difficult access, and malaria related morbidity/mortality in priority groups is higher. New IRS targets areas will be identified based on coverage surveys and clinical assessments. The actual number of structures to be sprayed in the north will depend on cost estimates from IRS implementing partners. *($7,500,000)*

2. *Support the national malaria vector surveillance program including*: (1) insecticide resistance surveillance; (2) assessment of IRS insecticide decay rates for LLINs and IRS-treated surfaces; (3) impact of IRS on vector taxonomy, density, behavior. *($270,000)*

3. *Environmental Compliance Monitoring:* Support in FY10 will be provided to ensure appropriate environmental compliance at spray sights and to build capacity in Benin for host-country environmental compliance for IRS activities. *($50,000)*

4. *Centers for Disease Control and Prevention* (*CDC) technical assistance for vector control activities. ($24,200)*

Intermittent preventive treatment of malaria in pregnancy (IPTp)

Background

Intermittent preventive treatment for pregnant women was adopted as a national policy in November 2004 and officially introduced in all 12 departments in Benin during 2005. The protocol consists of two treatment doses with SP during pregnancy. Although the WHO policy recommends a third dose of SP in areas with an HIV seroprevalence of over 10%, the NMCP recommends that HIV positive women receive a third dose. Intermittent preventive treatment in pregnancy is not recommended for HIV positive women taking cotrimoxizole prophylaxis. Training and roll out at the facility level has been completed.

Antenatal care clinic attendance is high in Benin. The 2006 DHS found that 88% of women make at least one ANC clinic visit and rates of attendance are higher in urban (93%) than rural (85%) areas. During their last pregnancy, 84% of women reported that they made at least two and 61% made four or more ANC clinic visits. As expected with the high level of multiple ANC

visits, pregnant women attend their first ANC clinic visit relatively early, on average at 4.2 months.

The 2006 DHS found that only 5% reported receiving SP and <1% received two doses of SP from ANC visits. The low uptake of SP a year and a half later is undoubtedly related to a slow roll out and implementation of the IPTp policy, as well as overuse of SP for treating routine malaria and logistic bottlenecks in the drug delivery system from the central level down to the health facility. However, there is some indication that IPTp uptake is improving with data from a recent 2008 LQAS showing 35% coverage compared to the very low percentage from 2006. If appropriate training and post-training support for midwives and nurses, who together provide 80% of ANC consultations, and a steady supply of SP, are maintained, then achieving the target coverage of 85% will be possible.

The 2006 HMIS puts the number of midwives in the public sector at 968. This differs from figures recently provided by several senior MOH personnel of 1,400 midwives in the public sector and an additional 600 in the private sector. The 2006 HMIS also reports that there are 489 peripheral public health facilities and 305 private health facilities reporting through the public health system. Although the number of midwives is greater than the number of peripheral facilities, they are unevenly dispersed and in a number of facilities nurses facilitate ANC clinics and deliveries.

Two treatments of SP (6 tablets) for IPTp are included in the ANC kit. This kit, provided at a cost of 500 Franc from the Financial Community of Africa (CFA, *Franc de la Communauté financière d'Afrique*) (about $1), also includes iron supplements, folic acid, mebendazole, and one LLIN. The first SP treatment is delivered at the time that the kit is provided to the client and is administered as a direct observed treatment. The second treatment is held at the health facility and given as a direct observed treatment during a follow up ANC visit, at least one month later.

Progress to date in Year 2:

In Year 2 (FY08 funding) PMI trained 66 trainers to be focused antenatal care and IPTp trainers, and each of the 34 health zones arranged for training in their zones. Thus far, 1,291 midwives and nurses have been trained by PMI in focused ANC and IPTp, with only 300 more to be trained nationwide, using the standardized training curriculum for ANC that was adopted by the MOH and partners in 2008. As well, PMI provided support to improve supervision of health workers in the implementation of IPTp. Supplies of SP were obtained with FY07 resources (with another 800,000 treatment doses to be procured in FY09) and combined with contributions from other donors, such as the World Bank, there have been no gaps in country-level SP stocks, including those targeting seropositive women. In spite of this, stock-outs still occur at the health facility level. A PMI-funded assessment report outlined recommendations to improve supply chain management and distribution at the health facility level, including those for SP, and the NMCP and CAME have plans to implement these recommendations in the coming year, which include re-establishing their legal authority as well as establishing an independent board to monitor their activities. Support for IEC/BCC programs has generated messaging and communication activities that are aimed to improve household understanding of the importance of IPTp, so that women who attend ANC are more knowledgeable and more likely to demand SP.

Proposed Year 3 activities: *($276,000)*

1. *Procure SP*: PMI will fill the entire gap for SP for Year 3. This is projected to be approximately 1,900,000 treatment doses to cover 960,000 pregnant women (in both 2010 and 2011) and includes additional doses needed for HIV seropositive women. *($76,000)*

2. *Train health workers in IPTp*: PMI will support training for any newly-hired, public and private health facility midwives and nurses. *($200,000*)

3. *Supervise health workers in IPTp*: PMI will provide support for the supervision of midwives and nurses, in both public and private health facilities, to correctly deliver SP in the context of the focused antenatal care approach. This supervision is part of an integrated approach for supervision at health facilities. (*Costs covered in Case Management Treatment section*.)

4. *Strengthen logistics management for SP*: PMI will provide technical assistance to the CAME to improve supply chain management, forecasting/quantifying, tracking, and storage of SP. Training of CAME staff at all levels (central, regional, and health zone) will be conducted. These activities will be combined with the other support that PMI will provide to improve logistics management (see the Pharmaceutical Management, LLIN and Case Management sections of this document). *(Costs covered Pharmaceutical Management section)*

5. *IEC/BCC for IPTp*: PMI will support IEC/BCC to promote ANC attendance and educate pregnant women and communities on the benefits of IPTp. This will include support for mass media (including local radio stations) as well as community-level approaches such as training of community-based workers. Immunization outreach sessions will be used as opportunities for educating women. This will be part of a larger integrated IEC/BCC activity to satisfy needs for case management, LLINs, and IPTp. Additional IEC/BCC activities for IPTp are being planned by Africare as part of its Round 3 RCC proposal. *(Costs covered in IEC/BCC section)*

INTERVENTIONS -CASE MANAGEMENT

Diagnosis

Background

Under the NMCP's malaria case-management policy, children under five years of age with a febrile illness should receive presumptive antimalarial treatment, regardless of whether the child is treated in a health facility or community setting. For this age group, no diagnostic test is needed. For patients five years of age and older with febrile illness, however, the policy recommends reserving antimalarials for those with a positive diagnostic test (microscopy or RDT). In general, diagnostic testing is being scaled-up at the same time as ACTs. The policy includes use of RDTs throughout the health system, and RDTs are often the only diagnostic test performed at the peripheral level. Per the NMCP policy, RDT distribution is free of charge. Although microscopy is supposed to be available in hospitals and larger health facilities, such facilities often lack functional microscopes, and laboratory workers' ability to perform microscopy is likely to be sub-optimal. With funding from the World Bank Booster Program and

USAID, the NMCP is working with the MOH Division of Diagnostics and PMI implementing partners to train facility-based health workers at all levels on the appropriate use of RDTs and use of results to manage fever cases. Supervision activities will promote correct use of malaria diagnostics.

Existing training materials have an algorithm indicating that under-fives with a febrile illness should be tested with microscopy or an RDT and such children should be treated, regardless of whether the test is positive or negative. This apparent contradiction was pointed out to a NMCP staff member, who explained that they wanted to test the policy of presumptive diagnosis by comparing the clinical diagnoses with test results. Nonetheless, the algorithm is potentially confusing, and a meeting was held in October 2008 to review and make recommendations for revising the algorithm and the related training materials. An NMCP staff member said that printing revised training materials might happen towards the end of the year, which is concerning because a substantial amount of training has already occurred.

The NMCP estimates that a total of 129 microscopes are needed in Benin to cover the need for the departmental hospitals, HZs, and commune health centers through 2015. The need for microscopes is defined by the NMCP as a minimum of two microscopes for every departmental hospital and HZ and one microscope for every commune health center. Purchases of microscopes planned under PMI with FY08 and FY09 funds and by the World Bank Booster Program have reduced the gap to 74.

Regarding RDTs, the PMI team roughly estimated needs for the public sector in 2010 and 2011 are 628,000 and 648,000, respectively. The assumptions are: 1) patients 5 years of age and older with an uncomplicated febrile illness are seen at outpatient facilities without microscopy (and thus should be tested with an RDT), and 2) only 25% of patients with severe malaria (all ages) are tested with an RDT because most severe cases are seen at hospitals with microscopy. The private sector need is estimated to be about half that of the public sector. Notably, as RDTs have only recently been introduced, there are no data on consumption rates. As of March 2009, the 586,000 RDTs already in HZs and CAME are enough to cover needs through the end of 2009. The GoB, African Development Bank, and the World Bank Booster Program will procure 463,000 RDTs later this year, which will cover the needs for about the first 9 months of 2010. The estimated gap for the rest of 2010 and all of 2011 is one million RDTs, of which PMI will procure 937,500.

The PMI team in Benin has a commodities and logistics specialist who is working closely with the NMCP, CAME, and health facilities. If the team discovers that 937,500 RDTs are not needed in FY10, then these funds will be reprogrammed. The World Bank, WHO, and UNICEF also have a joint committee that meets quarterly to discuss the collection of consumption data, and the PMI team has a planned FY09 health facility survey to gather data on RDT stock levels, as well as RDT use by healthcare workers. Data from the FY09 health facility survey, scheduled for fall 2009, will inform FY10 RDT procurements and determine whether or not reprogramming is necessary. The PMI also plans to conduct the end-use verification tool in FY10, which will also help monitor RDT stock levels on a quarterly basis at the facility level.

Progress to date in Year 2

From September 22 to October 3, 2008, PMI supported an assessment of the malaria diagnostic capacity of the MOH at the national and sub-national level. During their visit, the team met with officials from a number of government institutions including the NMCP, the National Laboratory Directorate, the Reagent Supply and Quality Assurance Service, and the National Medico-Social Institute (one of the two laboratory training schools) as well as other PMI partners. They also assessed a sample of health facilities using a structured Laboratory Assessment Tool, RDT Assessment Tool, and malaria slide sets of known composition to establish a baseline diagnostic capability for microscopy. As a result of their assessment, PMI's diagnostic partner revised its work plan and made a number of recommendations including the combination of the training of laboratory and clinical supervisors, the completion of the purchase of specified equipment and supplies; and the support of an integrated supervision program within the joint supervision plan developed by the NMCP. The PMI also supported the development of an English and French version of the training manual for the combined training of the laboratory and clinical supervisors and hired an in-country coordinator to manage and follow-up on the implementation of its activities in coordination with the NCMP. The training of laboratory technicians, clinicians, and supervisors began in June 2009.

In March 2009, the NMCP received the 30 microscopes purchased by PMI with FY08 funds, which have been distributed to a wide range of service providers including five Department Hospitals; five public health zone hospitals; two private health zone hospitals; three to the National level, including the National Lab, National Hospital and National Maternity Hospital; 12 to public commune level health centers; one to a private commune level health center; and two to the NMCP. The PMI also purchased an additional 15 with FY09 funds bringing the total number of microscopes purchased to 45. In collaboration with PMI implementing partners, the NMCP is currently in the process of determining the distribution process for this second batch of microscopes among health facilities that do microscopy.

Proposed Year 3 activities: *($902,100)*

1. *Procure microscopes and laboratory consumables:* Procure 20 new microscopes, reagents for microscopy (e.g. slides, giemsa stain, etc.), and if appropriate, replacement parts to repair existing microscopes. This procurement, along with past contributions, ensures that all public hospitals have at least one microscope and that about one-quarter of the remaining gap nationwide will be filled (20/74, or 27%). *($60,000)*

2. *Train and supervise laboratory technicians, and support quality assurance/quality control for diagnostics:* To improve and maintain microscopy and RDT use for malaria diagnosis nationwide, support a quality assurance/quality control system that includes refresher training and supervision for laboratory technicians, and a quality control system (e.g., assessing microscopists' skills against gold standard slides, and comparing a small sample of RDT results against microscopy to assess RDT accuracy). This activity will be coordinated with the World Bank-supported training to ensure malaria diagnostics are used correctly. *($100,000)*

3. *Procure RDTs:* Procure 937,500 RDTs to cover the majority of 2011 needs in the public and private sector nationwide. The World Bank's procurement will fill the need for 2010. *($730,000)*

4. *CDC technical assistance on diagnostics:* CDC staff will conduct one technical assistance visit to help assess the diagnostics quality assurance/quality control system. This activity is justified given the limited in-country experience with quality control systems for RDTs. *($12,100)*

Treatment

Background

Uncomplicated malaria
The first-line treatment for uncomplicated malaria is the ACT artemether-lumefantrine (AL, or Coartem®). Artesunate-amodiaquine (AS-AQ, Arsucam®) is recommended for patients under six months of age, for those who cannot tolerate AL, and when AL is not available. As mentioned above, under-fives with a febrile illness should receive presumptive antimalarial treatment, with no testing required under the national policy. Additionally, IMCI guidelines state that under-fives with anemia should be treated with an antimalarial.

The ACT policy was rolled out at the national level in August 2008. Artemisinin-based combination therapies are available in the regional and health zone warehouses throughout the country and health staff has been trained. Training activities were primarily funded by the World Bank Booster Program. There is availability of ACTs in some private pharmacies, although they are expensive. A comprehensive scale-up strategy in the private sector is still being formulated by the NMCP. In order to increase access to ACTs in all sectors, the NMCP is currently working on its application to the Affordable Medicines Facility – malaria (AMFm), which, if successful, would make highly subsidized ACTs available to all buyers in the country.

Artemether-lumefantrine is sold to patients in public health facilities (blister packs of 6, 12, 18, and 24 tablets are sold for 150CFA [~ $0.33], 300CFA [~ $0.66], 450CFA [~ $1.00], and 600CFA [~ $1.33], respectively). An important issue that partners have raised several times is whether ACTs should be sold at all. The NMCP maintains that ACT prices are similar to the prices charged for chloroquine and SP (the drug that ACTs are replacing), and that funds from drug fees are needed to support the health system (e.g., paying for the transportation of drugs, covering the general costs of running health facilities). Funds from ACT fees, however, are reportedly kept in a special account for purchasing additional ACTs to contribute to the sustainability of ACTs in Benin. This policy, which provides a profit margin for the health facility for all drugs except ACTs, has resulted in a disincentive for using ACTs. The MOH has informed partners that it is reviewing this policy. Partners will continue to work with the GoB to understand more clearly the current justification for selling drugs, clarify how the drug fees are to be used and managed, and work to ensure that cost of drugs and cost recovery policies are reduced as barriers to utilization of ACTs.

Estimated oral ACT needs in health facilities for 2010 and 2011[28]

Weight category	Estimated ACT treatment courses needed for 2010*		Estimated ACT treatment courses needed for 2011*	
	Artemether-lumefantrine	Artesunate-amodiaquine	Artemether-lumefantrine	Artesunate-amodiaquine
<5 kg	0	75,815	0	78,279
5–14 kg	358,914	18,890	370,579	19,504
15–24 kg	242,354	12,755	250,231	13,170
25–34 kg	27,488	1,447	28,381	1494
35+ kg	292,051	15,371	301,543	15,871
Total (by ACT type)	**920,807**	**124,278**	**950,734**	**128,318**
Total (for each year)	**1,045,085**		**1,079,052**	

In 2010 and 2011, about one million AL treatments will be needed for health facilities each year (about 60% for children under five and about 40% for older children and adults). According to the RCC proposal, the community needs for 2010 and 2011 are 992,626 and 868,332 respectively. However, the true ACT need for community-based distribution is difficult to characterize accurately because these programs are just starting now, and no information is available for consumption or anticipated utilization. By 2008, about two million treatments had already been purchased by USAID and other partners, primarily for health facilities. Some of these medicines had been delivered to health facilities. However, large stocks (400,000 ACT treatments) still remain in the CAME's warehouse (some with expiration dates in August and September 2009) and many health facilities have reported stock-outs for a month or more. Additionally, the President of Benin donated 100,000 ACT treatment courses to the Gambia. Regarding community-based distribution programs, the Global Fund projects (CRS in Round 7 and Africare under the RCC) have the funds to purchase all the ACTs needed for community-based distribution in all 34 health zones in Benin. In summary, the distribution of ACTs to the health facilities remains problematic, although USAID staff and PMI-funded contractors are diligently working with the NMCP and the Cabinet of the Minister of Health to try and resolve the bottlenecks. To summarize, in theory, ACT needs for 2010 and 2011 appear to be covered by other partners; however, in practice, it is not clear that supplies will be available on time. Therefore, to guarantee that there will not be ACT stock-outs, PMI will cover 50% of the estimated need in 2011. These funds can be reprogrammed if there is no gap.

Cost estimation for ACTs for 2011

Packet	Treatments needed	Price per treatment	Cost
6 x 1	280,458	$0.52	$145,838.16
6 x 2	256,396	$1.03	$264,087.88
6 x 3	66,004	$1.54	$101,646.16
6 x 4	97,074	$2.08	$201,913.92

[28] Estimates based on population projections and HMIS data on the number of malaria/febrile illness episodes managed in public and licensed private health facilities. It is assumed that under-fives with uncomplicated illnesses will be treated with an ACT presumptively, older children and adults will be tested, and 50% of older children and adults will be treated with an ACT.

Total	**699,932**		**$713,486.12**
50% of total	**349,966**		**$356,743.06**

Severe malaria

The NMCP's policy recommends treating severe malaria with quinine. Injectable artesunate or artesunate suppositories are recommended for pre-referral treatment of severe malaria. For pregnant women, all malaria cases are considered severe, and the recommended treatment is quinine. Severely ill cases identified in peripheral outpatient health facilities should be referred to a larger health facility with an inpatient ward. For children under five, based on HMIS data on the burden of severe malaria cases seen at health facilities, the estimated need for 2009 is 180,000 artesunate suppositories and 54,000 inpatient treatments. The World Bank Booster Program plans to purchase 17,000 inpatient treatments. For patients five years of age and older, the estimated need is 31,000 inpatient treatments.

Case management quality and pharmacovigilance

One issue transcending patient age, illness severity, and health care setting (i.e. inpatient, outpatient, or community level) is the quality of case management. Studies in Benin under the old chloroquine policy found the quality of care and supervision to be inadequate. An operations research project in Benin conducted before PMI began found that IMCI training plus health worker supports (strengthened supervision, job aids, and non-financial incentives) significantly improved quality; although, further improvements were still possible. The World Bank Booster Program supports some supervision activities conducted by the NMCP.

The GOB has developed a draft plan for pharmacovigilance with technical support from WHO (*Plan National pour la Mise en Oeuvre de la Pharmacovigilance*). The plan, though not yet finalized, includes forms to report adverse events as well as a curriculum for pharmacovigilance training that includes antimalarials. The World Bank Booster Program is ready to support pharmacovigilance activities, but they are waiting for the NMCP to develop a plan and propose activities, which they have not yet done.

Progress to date in Year 2:

Regarding the management of uncomplicated malaria, the NMCP used World Bank funds to train health workers on the ACT policy in all public health facilities. To complement these activities, PMI funds were used to train 72 health workers in IMCI guidelines. Funds from PMI have also been used to support supervision and quality improvement activities. To date, PMI activities have focused on training supervisors (12 national trainers and 39 departmental trainers have been trained on facilitative supervision) and performing some supervision visits. Supervision visits are expected to continue throughout the remainder of 2009. By March 2010, the PMI will also have procured 250,000 ACT treatment doses for the treatment of children under five in two departments.

For the management of severe malaria, PMI has procured 180,000 artesunate suppositories, of which 67,500 have been distributed to health facilities, as well as 75,000 drug kits. On the other hand, little progress has been made in the training of health workers for the management of severe malaria, since the NMCP has yet to finalize treatment guidelines for severe malaria, which are needed before training can begin.

Finally, regarding case management in the private sector, the treatment protocol has been revised and harmonized with the public sector protocol. To date, 165 private providers have been trained on the revised protocol.

Proposed Year 3 activities: *($1,419,100)*

1. *Procure ACTs:* Procure 350,000 AL treatments for distribution at health facilities and by CHWs. Together with contributions from other partners, these procurements meet all Benin's needs in 2010 and 2011 for all ages nationwide. If evidence exists of other donors procuring ACT drugs to fill the gap, the funds will be reprogrammed for other needs. *($357,000)*

2. *Procure drug kits for inpatient treatment of severe malaria:* Procure 17,462 injectable quinine drug kits (including glucose solution, perfusion equipment, etc) for inpatient treatment of severe malaria for children under five to meet nationwide needs for 2010. *($140,000)*

3. *Supervise and support health workers to follow case management and prevention guidelines:* Support a supervisory strategy, 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 who distribute ACTs), developing practical tools, supporting travel, conducting on-the-job observation and training, monitoring, and promoting use of diagnostic results to ensure appropriate treatment, providing feedback, collecting, analyzing and using data to improve planning and training, motivating supervisors and supervisees, and according authority to implement changes identified during supervision. The focus of supervision for this activity will be at the health facility level (with less attention on CHWs, as the rollout of CHW programs is being covered by the Global Fund and through community-based PMI implementing partners). Technical experts from MOH and CDC will provide oversight for this activity. The key goals are to: (1) provide supervision (as described above) to at least 90% of health workers nationwide with malaria-related responsibilities at least once every three months, (2) ensure that at least 90% of patients (all ages) needing an antimalarial receive an effective antimalarial, and (3) ensure that at least 90% of patients (all ages) not needing an antimalarial do not receive an antimalarial. Part of the funding (at least $100,000) will directly support some NMCP supervision expenses. These activities will be evaluated with monitoring data (based on supervisors' reports), health facility surveys (e.g. the survey planned for 2009), and the End-Use Verification Tool (which will be used quarterly). *($600,000)*

4. *Support IMCI training:* Support IMCI training for newly hired health workers and health workers in the private sector (estimated number needing training is 300) to contribute to national scale-up of IMCI. According to RBM and Benin's MOH, IMCI is the vehicle through which under-fives with suspected malaria should be treated. The IMCI guidelines ensure treatment of key non-malaria causes of child deaths that often operate in concert with malaria. *($255,000)*

5. *Management of severe malaria:* Support refresher training and supervision on appropriate management and referral practices for severe malaria in all 55 hospitals nationwide. Although training for health workers on malaria case management will have already occurred, past studies and experience suggest that treatment of severe illness tends to be a weakness of case management programs. *($55,000)*

6. *IEC/BCC for treatment:* Support a broad communication strategy on the risks of malaria, the need for prompt referral to health facilities for treatment (uncomplicated and severe malaria), and the importance of compliance with ACTs. Messaging will emphasize prompt and correct treatment for children under five and pregnant women, and will include support for mass media (including local radio stations) as well as community-level approaches, such as the training of community-based workers. This will be part of a larger integrated IEC/BCC activity to satisfy needs for case management, LLINs, and IPTp. Activities will be coordinated with IEC/BCC approaches implemented by NGOs funded by another PMI mechanism at the community level. *(Costs covered in IEC/BCC section)*

7. *Strengthen logistics management for ACTs and severe malaria drug:* Improve malaria commodities logistics management (see the LLIN, IPTp, and Pharmaceutical Management sections). These activities will ensure the availability of key antimalarial commodities needed for proper case management at the facility level. *(Costs covered in Pharmaceutical Management and other above mentioned sections)*

8. *CDC technical assistance for supervisory systems:* Technical assistance visit from CDC to assist in the implementation of a supervisory system for health worker performance. *($12,100)*

PHARMACEUTICAL MANAGEMENT

Background:

Benin's pharmaceutical management system is weak. Various assessments carried out by PMI and other partners have identified serious problems and irregularities that hinder the country's ability to supply essential malaria commodities in a timely, organized, and transparent manner.

Observations during a PMI assessment in 2007 and subsequent supervision missions have identified serious issues around ITN stock-outs and a need to assess and upgrade warehouses for malaria commodities at all levels (central, regional and health zone). Another review conducted in March 2008 focused on the central and regional levels of the CAME, which stocks all the pharmaceutical products for the public sector. The reviews verified earlier findings and identified a number of problems, including: long stock-outs of commodities at health facilities (despite large quantities at the central level), the presence of monotherapies (chloroquine) no longer recommended by the NMCP, presence of commodities close to expiration, failure to respect price guidelines on the sale of ACTs in health facilities, inadequate storage space and conditions, limited means of transportation, inadequate qualified human resources, failure to base quantities supplied on consumption data, a lack of sufficient data to make rational decisions, a lack of standard procedures and tools for tracking products down the supply chain, poor management of

warehouses, a lack of standardized supervision and training procedures, and poor analysis of information.

These problems, coupled with late delivery by suppliers have led to stock-outs and the emergence of parallel supply channels by other public institutions, private organizations, government partners, and NGOs that fall outside the control of the Directorate of Pharmacies and Medications (*Direction des Pharmacies et du Médicament*).

In addition to problems with the management of pharmaceuticals, some outstanding legal and policy issues are also undermining the efficient operations of the system. An absence of accountability for mismanagement of products exists at various levels and current policies regarding pricing and management of funds provide a disincentive for the use of ACTs and RDTs in health facilities.

Finally, the ambiguous legal status of CAME presents another obstacle to achieving the effective management of pharmaceuticals in Benin. Since its creation, CAME has had a statute of autonomy through a memorandum of understanding with the MOH. This memorandum of understanding expired in April 2007 and has not yet been reviewed or renewed, which is having an impact on CAME's operations as the customs services is putting pressure on CAME to pay its fiscal taxes before clearing its products for importation into the country.

Progress to date in Year 2:

To address the needs for a functioning system, with skills in forecasting, management, tracking of commodities, and improved storage conditions, PMI is financing several interventions in pharmaceutical management.

To address systematic problems that go beyond the scope of the initial pharmaceutical management system assessment early 2008, PMI actively engaged CAME and supported its assessment in November 2008. The assessment, carried out by SPS, identified gaps and weaknesses in governance and internal management that limit CAME's ability to carry out its role in procurement and distribution of health commodities within the public sector.

The PMI's implementing partners have begun a number of activities to improve the management of commodities including organizing a redistribution of ACTs to avoid expiration of a large number of treatments, supporting planning exercises, and strengthening forecasting and quantification capacity at the central and regional levels.

The PMI has also supported the development of an Action Plan to strengthen CAME and the pharmaceutical management system, which was presented to the MOH authorities and the cabinet members of the Ministry in charge of development and planning and will be shared among the donor community. Benin's MOH supports the Action Plan and has asked all donors to work with PMI to fund its inception. The participation of multiple partners with a stake in the commodities logistics system will ensure the development of a coordinated and comprehensive action plan that will strengthen the system at all levels. PMI has recruited an international legal advisor and a local consultant who are in the process of proposing and aiding in the establishment of a proper legal framework for CAME.

Proposed Year 3 activities: *($855,000)*

1. Strengthen logistics management for LLINs, SP, ACTs, and severe malaria drugs: The PMI will support reforms needed at CAME and the supply chain management system. The PMI will assist with implementing the reforms resulting from the CAME assessments and the rest of the supply chain. Targeted investments will be made to support reforms and capacity building within CAME and to support activities to strengthen the public sector logistics and supply chain management system with respect to malaria drugs and related commodities. An emphasis will be placed on strengthening drug warehousing at the regional and district levels to mitigate logistical bottlenecks and avoid large stocks of ACTs at the national and health zone levels. The PMI will support efforts of the Global Fund to improve warehousing capacity by providing for the office equipment for the refurbished health zone depots if needed. The PMI will provide further technical assistance to CAME, NMCP and the Directorate of Pharmacies and Medications to improve management of malaria commodities, supervision, and data collection. Activities will continue focusing on standardizing the system, complying with international norms, and emphasizing linking commodity purchases to actual commodity consumption in order to avoid stock-outs and commodity expiration. It is anticipated that the resulting improvement in logistical systems would bring benefits across multiple healthcare delivery areas (e.g. HIV and family planning); however, the focus of PMI funded activities will be on improving the malaria supply chain. *($700,000)*

2. Drug quality control: Support the National Laboratory for Quality Control to improve drug quality control capability through the following activities: procurement of supplies for quality control of malaria drugs, establishment and implementation of quality control standards for antimalarial drugs, training of laboratory technicians, and establishment of quality control mini-labs at the field level. PMI will also support the ongoing development and implementation of a pharmacovigilance system. *($75,000)*

3. End-Use Verification: Pharmaceutical and supply chain strengthening activities will include end-use verification and monitoring of availability and utilization of key anti-malarial commodities at the health facility level. Specifically, this will entail regular monitoring visits to a sample of health facilities and regional warehouses to evaluate stock levels, management of malaria commodities, use of ACTs and RDTs, data quality, and frequency of training and supervision. *($80,000)*

COMMUNITY-BASED INTERVENTIONS

Background

In March 2009, the NMCP released its National Directives for Community and Home-Based Management of Malaria (*Directives nationales pour la prise en charge du paludisme au niveau communautaire et à domicile au Bénin selon la nouvelle politique*, NMCP 2009), which approves the distribution of and treatment with ACTs at the community level. This strategy document also outlines the importance of developing a community-based surveillance system to track changes in malaria morbidity and mortality, and also emphasizes the need to collect data on the side effects of ACTs in communities.

Community-case management activities in Benin currently involve a wide range of partners including USAID, UNICEF, Africare, CRS, NGOs, and a number of faith based organizations (FBOs). Most community-based treatment programs in the country select CHWs with village input, after which these elected individuals may be formally linked to either a CSA or CSC. Certain programs elect CHWs through existing local women's groups and manage community-case management activities through these networks.

In recent years, Benin's Global Fund Round 3 grant, for which Africare is the Principal Recipient, and MCDI, supported by USAID, have each piloted community-based maternal and child health (MCH) programs. The malaria components of these interventions have included the community-based sale of ITNs and ITN retreatment kits, and the treatment of febrile children under five. In addition to community-based malaria case management, the MCDI intervention also included IEC/BCC to address childhood pneumonia and diarrheal diseases.

The Global Fund Round 7 grant, for which Catholic Relief Services is the Principal Recipient, began in July 2008 and is being implemented in collaboration with Plan Benin, MCDI and Caritas Benin. Funds from Round 7 are being used to extend community and home-based management of uncomplicated malaria from three to 14 of the country's 34 health zones and introduce community-based treatment with ACTs. In the coming year, the RCC of Benin's Round 3 grant proposes to expand the coverage of community-based treatment of malaria nationwide, and will necessitate strong collaboration with PMI's community case management program.

Progress to date in Year 2

In Year 1, PMI proposed to support an integrated, community-based child health intervention in health zones designated by the NMCP. Due to a number of contracting delays, this activity has been slow to start. Nevertheless, in Year 2 PMI supported the development of a paper on experiences with community case management in Benin, drawing from the experiences of Africare, Plan, MCDI, and UNICEF, and assisted the NMCP in ACT quantification for the community level in collaboration with other partners.

The PMI's community-based program targets five health zones in two departments, which were selected with the National Program. The PMI's in-country team is also working in close collaboration with the Global Fund to harmonize community-case management approaches and not duplicate efforts, given the RCC's intended nationwide focus.

Proposed Year 3 activities: *($941,500)*

1. *Support implementation of community-based child health interventions by NGOs/FBOs*: In Year 3, PMI will support ACT distribution for children under five by CHWs in the health zones of Kandi-Ségbana-Gogounou, Banikoara, Ouaké-Copargo, Djougou-Bassila and Tchaourou, which were identified by the NMCP as having low access to health services and high child mortality. The activity will be co-financed by USAID/Benin Maternal and Child Health funds and will include community-based delivery of ACT, cotrimoxazole, and oral rehydration salts and zinc, the latter two of which will be procured with MCH funds. This activity also includes distribution of LLINs free of

charge to pregnant women in rural areas with low ANC attendance. The PMI will develop guidelines, train and supervise CHWs, develop innovative methods to motivate CHWs, support the distribution system, and assess progress to increase coverage in these five communities. Activities will be implemented by NGOs/FBOs under sub-agreements with a lead agency. Results of the activities in these health zones will be closely monitored and documented. *($906,500)*

2. *Support for Peace Corps Community-based Activities:* In FY10, the PMI will also provide continued support for community-based malaria control projects carried out by Peace Corps Volunteers. *($35,000)*

INFORMATION, EDUCATION, and BEHAVIOR CHANGE COMMUNICATION

Background:

In 2006, the NMCP drafted a National Malaria IEC/BCC Strategy with technical assistance from the WHO. This document was designed to be an integrated communication plan that would streamline messages and tools for all partners working on malaria in Benin. Although the strategy was developed several years ago, until recently, the NMCP had no IEC/BCC point person, nor a convening body through which to realize activities under this plan. In order to strengthen the capacity of the NMCP to carry out the strategy and related activities, PMI supported the establishment a National Malaria Communications Working Group *(Groupe Technique de Travail en Communication)*, which receives routine technical assistance from a number of PMI implementing partners. The group is responsible for reviewing the technical content of all IEC/BCC messages pertaining to malaria, and is in the process of creating an inventory of existing communication support materials in Benin.

The Communications Working Group held its first meeting in December 2008 and is scheduled to meet on a quarterly basis. Members of the group include the NMCP, USAID/PMI, Research Triangle Institute , URC/PISAF, Africare, CRS, PSI, the World Bank, WHO, UNICEF, and Peace Corps. The NMCP has included key IEC priorities in its 2009 integrated plan, which is being used to prepare monthly and quarterly plans for all activities.

Over the past five years, the Global Fund Round 3 grant to Africare has also supported malaria messaging at the community level through organized social mobilization campaigns, support to women's animation groups, and training of CHWs in BCC. The recently awarded RCC ($110 million) includes a significant IEC/BCC component, which will encourage prompt treatment for febrile children at the community level, timely referral of severe malaria cases, and use of ANC to increase IPTp uptake among pregnant women.

Progress to date in Year 2

In 2008, PMI supported the education of 54,628 people, including 8,937 pregnant women and 45,691 parents and guardians of children under five, via a broad range of interpersonal communications activities. Through its IEC/BCC implementing partners, 5,620 pregnant women

were educated on IPTp, 22,034 parents and guardians of children under five were educated on ACTs, and 26,974 individuals were informed on the importance and regular use of LLINs. A wide range of materials for dissemination at the community level have been developed, including malaria prevention flyers, guides for community workers, and posters for use in ANC and child health clinics. In the first quarter of 2009, 26 radio emissions on malaria prevention and control were also broadcast in major urban areas nationwide.

The PMI launched a mass media campaign in Benin in April 2009, which features radio and TV spots, posters, flyers and billboards. Messages for this campaign were developed in collaboration with other partners during a meeting of the NMCP's Communication Working Group and final materials have been submitted to partners for review. Focus group studies were also conducted with target groups to pre-test messages for the campaign.

For PMI's IRS activities, an IRS IEC/BCC strategy was developed in 2008 in collaboration with the NMCP. This strategy utilized the results of formative research on the main audiences targeted by IRS and has since been integrated into the national integrated action plan for malaria activities.

One component of the IRS communications strategy is the recruitment of IEC mobilizers, selected by village leaders, who are trained on IRS and responsible for social mobilization in their village. In 2008-2009, PMI supported the recruitment and training of 253 community mobilizers (123 female and 130 male), who performed door-to-door visits to all IRS targeted houses, distributed leaflets, and informed community members about the benefits of IRS, as well as the precautions to be taken before, during, and after spraying. The PMI also supported sub-contracts to five community radios that broadcast information on IRS, which included radios spots, shows, and skits.

Upon completion of the 2008 IRS round, an end-of-spray workshop revealed that some households were not informed about the spray schedule with a sufficient amount of time, resulting in certain households not being ready on spray days. Subsequently, the Benin IRS technical committee recommended increasing the number of IEC mobilizers from one to two per village. Due to the increase in number of mobilizers, the 2009 team was able to carry out their activities in half the time, when compared to the 2008 schedule[29]. The new IEC approach therefore proved effective both technically and financially, and the IRS acceptance rate increased from 94% in 2008 to 98% in 2009.

To measure results in IEC/BCC, USAID/Benin, with non-PMI funding, will undertake a Knowledge, Attitudes, and Practice (KAP) survey in 2009, which includes an evaluation of malaria-related messaging.

Proposed Year 3 activities: *($400,000)*

1. IEC/BCC for LLINs, IPTp, and ACTs: In Year 3, PMI will continue to support a comprehensive IEC/BCC program to increase demand and promote correct and consistent utilization of LLINs by target groups, promote ANC attendance to increase IPTp coverage and

[29] The 253 mobilizers for the 2009 spray round carried out activities in a period of ten days, rather than 150 mobilizers from 2008, who carried out activities over three weeks.

educate pregnant women on the benefits of IPTp, and emphasize the correct and prompt treatment of children under five and pregnant women with ACTs. Results from the 2009 KAP survey will be used to determine the effectiveness of Year 2 BCC efforts and make appropriate programming corrections. *($400,000)*

To increase demand and promote the correct use of nets, both mass media and community-level approaches (e.g. local radio stations, women's groups) will be utilized. Messages will explain the correct use and care of nets, and will continue to emphasize the importance of ITN use among children under five and pregnant women. To promote early ANC attendance and educate women on the benefits of IPTp, the same approaches will be used, in addition to targeted education through immunization outreach sessions. The communication strategy for treatment will educate target groups on the risks of malaria, the need for prompt referral to health facilities for treatment (for both uncomplicated and severe malaria), and the importance of compliance with ACTs.

2. IEC/BCC for IRS: In Year 3, PMI will continue to support IEC/BCC for IRS to inform beneficiaries about the positive benefits of IRS in controlling and preventing malaria; about their role before, during, and after the spray operations; about the environmental and safety issues related to the use of insecticide for IRS; and about the importance of continuing to use bed nets year-round. The PMI will support training of IEC mobilizers identified in collaboration with local physicians, heads of health post, mayors, and village leaders. The most efficient mobilization methods used in the 2008 and 2009 campaigns will be replicated, including village gatherings and door-to-door visits to explain the purposes, benefits, and precautions associated with IRS and to answer any related questions or concerns. The IEC campaign will begin at least four weeks prior to the start of the spray operations and will continue throughout spraying to reinforce messages and minimize refusals. *(Costs covered in IRS section under IRS implementation)*

HIV/AIDS and MALARIA

Background:

The results of the 2006 Demographic and Health Survey (DHS) found a relatively low HIV prevalence rate of 1.2% among the general population, with high levels of infection among populations with high-risk behaviors, such as commercial sex workers (national seroprevalence of 25.5% in 2006), truck drivers (5%) and military personnel (8%).[30] The number of people living with HIV/AIDS in Benin was estimated at approximately 69,009 in 2007. The projected number of people living with HIV/AIDS in 2012 is 163,749. The rate of infection with HIV is expected to remain fairly stable, with an estimated 5,765 new cases in 2007 and 5,794 new cases projected for 2012. The estimated number of HIV positive pregnant women was 5,002 in 2007 and is estimated to increase to 10,371 by 2012.[31]

[30] Institut National de la Statistique et de l'Analyse Economique (INSAE) [Benin] et Macro International Inc. 2007 : Enquête Démographique et de Santé (EDSB-III) – Bénin 2006. Calverton, Maryland, USA : Institut National de la Statistique et de l'Analyse Economique et Macro International Inc.

[31,4,5,6] Rapport National de Situation à l'intention de L'UNGASS, Bénin. Comité National de Lutte Contre le SIDA, République du Bénin. 2008. http://data.unaids.org/pub/Report/2008/benin_2008_country_progress_report_fr.pdf. Accessed May 27, 2008.

Benin has extensive experience with prevention of mother-to-child transmission (PMTCT) and voluntary counseling and testing interventions thanks to the leadership of the MOH/PMTCT program and support from the World Bank, USAID, the Global Fund and other partners working in the HIV/AIDS sector. Since voluntary counseling and testing was introduced in 2002, the numbers arriving for testing have continued to steadily increase, with the total number reaching 76,853 in 2007.[32]

In 2001, Benin officially opted for an antiretroviral access strategy that includes young children. At the end of 2007, there were 48 sites equipped for case management of HIV/AIDS, and by 2007, 12,535 patients were receiving treatment with antiretrovirals.[5]

In terms of prevention of HIV, community education and condom distribution and promotion activities are carried out by government agencies and other partners and are supported by funding from USAID. The number of PMTCT sites reached 184 in 2007, and 2,378 women received antiretroviral therapy to prevent transmission of HIV to their children in 2006.[6]

National policies give limited guidance on synergies between care of malaria and HIV. HIV-positive pregnant women should receive a third does of IPTp. PLWHA and AIDS orphans are considered vulnerable target groups with regard to malaria prevention, but there are no specific activities targeting these groups.

Proposed Year 3 Activities: *(Costs covered in other sections)*

As Benin is not a focus country under the President's Emergency Plan for AIDS Relief, USAID supports HIV/AIDS activities in Benin through its bilateral health projects. The PMI support to health systems in Benin will also benefit HIV/AIDS control programs. In addition, several specific activities in Year 3 of PMI should contribute to HIV/AIDS control and the protection of people living with HIV/AIDS from other infections. HIV positive pregnant women will receive LLINs through PMI-supported routine ANC services at health facilities as well as through community-based distribution of LLINs in two departments with low ANC attendance. Prevention of mother-to-child transmission activities in Benin will also benefit directly from the IEC/BCC activities promoting early ANC attendance. Furthermore, as a priority for PMI in Year 3 is to strengthen the pharmaceutical management system in Benin, the expected improvements in commodities management, logistics, and data collection will benefit HIV/AIDS and other health programs as well as the malaria control program. Finally, efforts to strengthen the quality of laboratory diagnosis, to establish sentinel disease surveillance sites, to support drug quality control capability, and to support health facility supervision will benefit the entire health system including HIV/AIDS programs.

NEGLECTED TROPICAL DISEASES AND MALARIA

Benin does not currently have a national strategy for control of Neglected Tropical Diseases. Many international fora have taken place during the past two years in the country to discuss these diseases, the most recent of these being the Buruli Ulcer summit organized in Benin on March 29-31, 2009, under the auspices of WHO. Recommendations were made at the end of the summit

that each participating country should develop a national strategy to prevent and control Neglected Tropical Diseases. Benin's MOH is currently developing its strategic plan, with technical assistance from WHO. The new strategy will offer new possibilities for integration with malaria control activities.

CAPACITY BUILDING WITHIN NATIONAL MALARIA CONTROL PROGRAM

Background:

With malaria program resources expanding rapidly in recent years, especially from PMI, possible funds from Phase II for the World Bank Booster Program, and the Global Fund, the NMCP must acquire adequate managerial and technical capacity to provide effective leadership and coordination within the MOH, with other government ministries and with partners. Frequent changes in MOH and NMCP leadership and staffing shortages at the central and peripheral levels have impeded the NMCP's ability to manage existing and new malaria program activities effectively. Increased funding for malaria (upcoming Global Fund Round 3 RCC and other initiatives) is increasing the NMCP management and coordination burden. In the meantime, there seems to be no effort to reinforce the program's leadership to allow it to carry out its expanded responsibilities. Additional staff is needed to meet the NMCP's obligations, including an M&E expert, a health planner (to be supported by the World Bank Booster program), a logistician, a midwife, a pharmacist, a parasitologist, an epidemiologist or malariologist, and an expert on supervision/quality improvement, among others.

Progress to date in Year 2:

Several initiatives have been taken place in 2008 and early 2009 to reinforce the capacity of the NMCP to coordinate the increasing resources for the malaria program in accordance with the capacity strengthening plan submitted by the NMCP. With PMI FY08 funds, PMI implementing partners have assigned a communications specialist and a statistician to work with the NMCP to assist with designing and implementing social mobilization and M&E activities.

In 2009, two candidates were identified through a transparent selection process with participation from *l'Institut de Recherche pour le Développement's* (IRD) to attend the Masters 2 entomology course at the *Institut Régional de Santé Publique* in Ouidah, Benin. The two candidates will work for NMCP and CREC when they complete their training and no more entomology training will be supported in FY10 with funds from PMI.

The World Bank Booster Program is currently funding the expansion and renovation of the NMCP building. When completed, this will enable the NMCP to have an adequate and proper working environment for its staff, be able to recruit additional staff, and to host both PMI in-country advisors. It will also provide enough space for the statistician and the communication specialist recruited under PMI to support the NMCP.

To address key organizational issues within the NMCP and increase its leadership capacity to better coordinate increasing resources for malaria in Benin, the PMI team is recommending a reorganization of the NMCP. An audit will be conducted in FY09 by PMI with the technical collaboration of WHO to identify organizational and operational weaknesses within the program and to recommend actions to improve the program's effectiveness.

In collaboration with other donors and in its capacity as a major donor for the health sector, USAID continues to advocate for a strong NMCP in Benin. The weak management capacity of the NMCP has become a critical concern and USAID is initiating a policy dialogue with the Minister of Health with the involvement of the US Ambassador to make appropriate changes to the NMCP. Finally, Ministry of Health officials have requested that PMI assist with conducting an organizational audit of the NMCP. It is expected that this exercise will lead to build a more solid and responsive NMCP.

Proposed Year 3 activities: *($160,000)*

In Year 3, PMI will contribute to reinforcing the capacity of the NMCP and other related units of the MOH as follows:

1. Capacity building of the NMCP and CREC: Capacity building will focus on educational and training activities that will improve and strengthen the NMCP's technical capabilities (knowledge, skills, and competencies) in all domains required to be able to manage and coordinate a comprehensive malaria control program. In addition to capacity building activities planned for FY09, PMI will continue supporting training and capacity strengthening of the NMCP and CREC staff in management, monitoring and evaluation, epidemiology, malariology and IEC/BCC. Capacity building activities at CREC constitute a small investment on behalf of PMI, which complements funding from other donors and reaps large returns, since CREC's research in the past has been very operational, including studies on insecticide resistance and bed net replacement strategies. Without CREC's involvement, the quality of entomological M&E data for program decisions would be poor at best, rather than the highly quality data currently available. This is important in Benin where insecticide resistance poses a documented challenge for the insecticide-based interventions of PMI partners.

The PMI will work in collaboration with the World Bank to make training activities for the NMCP more effective and more outcome-oriented. Once the NMCP is reorganized based on the recommendations of the organizational audit, appropriate training will be supported under the FY10 budget including study tours to visit successful national malaria control programs in the region to learn from their experiences, accomplishments, and best practices. As in FY09, PMI will continue to actively promote government commitment to increase the NMCP staffing to the minimum levels required to function and coordinate effectively. This will involve the active engagement of the Ministries of Health, Finance and others that can influence the process. *($160,000)*

COMMUNICATION AND COORDINATION

Background

The NMCP's national strategic plan includes the need for a multi-sectoral committee for coordinating activities related to the prevention and control of malaria in Benin. The following communication and coordination mechanisms exist in Benin:

Country Coordinating Mechanism
The Country Coordination Mechanism for the Global Fund for TB, HIV and Malaria has scheduled meetings with all participants twice a year. However, extraordinary sessions can be held when needed. Also, a technical unit meets monthly to assess progress made. Benin is currently expecting a significant increase in resources from the Global Fund Round 3 RCC that aims to achieve universal coverage LLINs through two national distribution campaigns, national coverage of community-based case management of malaria, and increased demand for IPTp. The Round Seven activities focusing on community-based distribution of ACT drugs are currently being implemented in 20 communes out of 77. PMI will coordinate with Africare, CRS and other GF grantees to help achieve the goal of bringing LLIN use, community case management of malaria and other childhood illnesses, and use of IPTp to scale. USAID is a voting member of the Country Coordination Mechanism.

Malaria Partners/RBM
The Malaria Partner/RBM group has been re-invigorated and is meeting monthly. Participation at these meetings consists of NMCP staff, USAID, PSI, UNICEF, WHO, the World Bank, the private sector, and other NGOs/FBOs working in the field of malaria. There remains a specific need to revitalize the technical working groups to ensure that work-plans and activities of various malaria partners are well coordinated with the NMCP**.** The USAID/Benin will continue to be an active participant in this group.

Proposed Year 3 Activities

Although there are no specific planned activities for "Coordination and Communication" the PMI Resident Advisors will provide technical support to the MOH for both planning and implementation of PMI activities. There will also be one to two additional local staff hired to support PMI activities. The PMI team will closely coordinate PMI activities with the NMCP and the World Bank Booster Program, and serve as active members of the Malaria Partners/RBM group. More emphasis will be put on M&E and strengthening the pharmaceutical management system. (*Costs for these positions are covered under the Staffing and Administration section*)

PRIVATE SECTOR PARTNERSHIPS

Currently, there are no established public-private partnerships working for malaria control in Benin. When the MOH organizes annual funds raising activities, the private sector provides support. A real strategy to promote public-private partnership to control malaria has yet to be developed.

MONITORING AND EVALUATION PLAN

Background

The NMCP's national M&E plan (*Plan de Suivi et d'Evaluation de la Lutte Contre le Paludisme au Benin 2007-2010*, December 2006) describes a multi-institutional M&E Technical Working Group, monitoring of programmatic process indicators with routine data collection systems, periodic evaluations of outcome indicators, and epidemiologic surveillance. Five specific components are highlighted: 1) information from the HMIS system, Integrated Disease Surveillance and Response, and sentinel surveillance sites; 2) data collection on commodity stocks and management via a logistics management information system; 3) community-based malaria surveillance via women's groups and CHWs; 4) measurement of impact indicators via household surveys such as the DHS; and 5) regular monitoring of quality of health services via Lot Quality Assurance Sampling (LQAS) methodology. The status of key indicators, using the 2006 DHS results, is shown in the 'Current Status of Malaria Indicators' section.

A DHS was done in 2006 that included all-cause child mortality, anemia, and the standard malaria module. The next DHS is planned for 2011, and to maximize its value for evaluating malaria control activities, the survey should measure *Plasmodium falciparum* prevalence and child mortality with an increased sample size. For child mortality, the increased sample size would allow a measurement for a three-year period before the survey (2008–2011), when malaria control activities were particularly robust. (Deaths are rare events, so one must go back several years (typically five years) to gather data on enough deaths for an adequately precise estimate of the mortality rate. As the scale-up of malaria control interventions has been most robust beginning at about 2008, for a DHS conducted in 2011, it is preferable to measure mortality between 2008 and 2011. However, as this three-year period is shorter than the usual five-year period, there will probably be too few deaths for an adequately precise estimate of the mortality rate. Therefore, to ensure that enough deaths are included in the survey, the sample size (of women of reproductive age) must increase.) To track household indicators between the two DHS, there are two potential sources: a LQAS survey in November 2008, and the *Enquête Modulaire Intégrée sur les Conditions de Vie des Ménages* in mid-2009. The LQAS survey, which was conducted by the NMCP and funded by the World Bank, was designed to evaluate the October 2007 national LLIN distribution campaign. Unfortunately, the survey used non-standard indicators, which limits its utility as a data source for PMI's formal evaluation. Despite these limitations, the PMI team will try to use the results to guide programmatic activities. The *Enquête Modulaire Intégrée sur les Conditions de Vie des Ménages* is a large household survey principally funded by the Millennium Development Account to track progress towards Benin's national poverty reduction strategy and conducted by the National Statistics Institute (*Institut National de la Statistique et de l'Analyse Économique*). With an additional $150,000 in PMI funding and technical assistance, the National Statistics Institute (in collaboration with UNICEF) will expand the survey to include RBM intervention coverage indicators.

To assess the availability of antimalarials and diagnostic equipment and the quality of malaria-related case management in health facilities, the MOH and PMI had both planned to conduct health facility surveys. The MOH survey (funded by the World Bank) was planned to be done in 2008 and designed to assess curative care at outpatient facilities; although due to delays, it will be done in 2009. The PMI survey was planned for 2009 and was intended to complement the

MOH survey by covering facilities not included by the MOH (e.g., ANC clinics and hospitals). As it now appears that both the MOH and PMI health facility surveys will occur in 2009, discussions are underway to combine them into a single, more comprehensive survey.

Malaria is included in Benin's HMIS system of notifiable diseases. Each month, public health facilities are expected to report on the number of malaria cases, deaths, and case-fatality rates. Although data are stratified by age group and facility type (inpatient vs. outpatient), before PMI, no effort had been made to distinguish clinically diagnosed cases from those that are confirmed by laboratory testing. The system has limited capacity and there were concerns about the accuracy, timeliness, and coverage of the data, as well as how the data are used for decision-making. Seven health zones have been designated as sentinel sites, where health facilities routinely collect data (e.g., number of malaria cases, with or without laboratory confirmation) for the HMIS system plus malaria cases among pregnant women. Facilities that can perform microscopy are expected to test suspected malaria cases and report slide-positivity rates. The World Bank Booster Program had planned to strengthen these sites by purchasing microscopes and supporting some training on malaria diagnosis. The NMCP periodically conducts surveys in the sentinel sites to assess trends in RBM indicators of malaria intervention coverage. Special studies are also conducted periodically to monitor insecticide resistance and antimalarial resistance. In January 2009, PMI funded the Regional Institute of Public Health in Benin to strengthen hospitals in three sentinel sites to collect data on malaria morbidity and mortality with the number of sentinel sites to be expanded to a total of seven in 2010. In November 2008, PMI funds were used to hire a statistician to assist the NMCP in collecting monitoring data on commodities (e.g., ITNs, ACTs, and RDTs) distributed per year by the NMCP and donors; however to date, this person has not been well utilized. Meetings with the NMCP in April 2009 encouraged better use of this person. Data on rainfall are available from a local meteorological institute. No demographic surveillance sites exist in the country.

There are also several M&E activities to track progress in malaria control at the sub-national level. The USAID-funded Integrated Family Health Project and Africare have conducted household surveys in their project areas. UNICEF has conducted surveys to evaluate its Accelerated Child Survival and Development program.

The World Bank Booster Program is supporting several M&E activities, including monitoring related to the ITN distribution campaign; finalizing a national M&E plan; collecting routine data on process indicators relevant to malaria control (including a baseline survey, data collection tools, and setting up a database); LQAS surveys; M&E activities related to the logistic management information system; strengthening epidemiological monitoring at sentinel sites; monitoring LLIN efficacy and resistance to insecticides; monitoring antimalarial drug efficacy; and supporting a pharmacovigilance system.

The NMCP noted a lack of trained staff to oversee M&E activities, especially statistical capacity and data analysis for program decision-making. A mechanism exists (Benin's RBM partnership, chaired by the NMCP) to coordinate among partners on M&E; however, this mechanism needs strengthening.

<u>Progress to date in Year 2:</u>

A statistician was hired in November 2008 to provide assistance on measuring process indicators. Also, in collaboration with the Benin School of Public Health, health facility-based surveillance of malaria impact indicators has been implemented in three sites. High-quality data are expected each month, beginning in August 2009.

Proposed Year 3 activities: *($662,100)*

1. *Support the planning and implementation of the 2011 DHS:* Provide technical and financial support to the planning and implementation of the 2011 nationwide DHS, including an increase in sample size for the malaria and child mortality module. *($300,000)*

2. *Technical assistance on measuring process indicators:* Collect, analyze, and report data on process indicators quarterly as well as "confounder" data such as rainfall, in addition to building NMCP capacity. Data will be collected by contacting partners each month, and data on rainfall will be collected from a governmental department that measures rainfall in several sites in Benin. Key process indicators include: the number of ITNs distributed by all partners, the number of health workers trained (e.g., in case management, diagnosis with RDTs, prevention of malaria in pregnancy, and home-based management of fever), and the frequency of supervision. The NMCP specifically mentioned that it was challenging to keep up with the activities of multiple partners. This activity includes a provision for field visits. *($50,000)*

3. *Health facility-based surveillance:* Up to seven HZs in the NMCP's existing sentinel sites will be selected and strengthened for the implementation of health facility-based surveillance in support of the PMI M&E framework. This activity, in collaboration with World Bank Booster activities, will include technical assistance to improve the capacity of these sites to collect reliable data on inpatient malaria cases and deaths. *($300,000)*

4. *CDC technical assistance for M&E:* CDC staff will conduct one technical assistance visit to assist the NMCP with M&E planning and implementation. *($12,100)*

STAFFING AND ADMINISTRATION

Two health professionals have been recruited as Resident Advisors to oversee the PMI in Benin, one representing CDC and one representing USAID. In addition, one Foreign Service National has been hired to support the PMI team. All PMI staff members are part of a single inter-agency 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 these positions were interviewed and evaluated jointly by USAID and CDC.

These two PMI professional staff work together to oversee all technical and administrative aspects of the PMI, including finalizing details of the project design, implementing malaria prevention and treatment activities, monitoring and evaluation of outcomes and impact, and reporting of results. Both staff members report to the USAID Mission Director, and the CDC staff person is supervised by CDC both technically and administratively. All technical activities

are undertaken in close coordination with the MOH/NMCP and other national and international partners, including the WHO, UNICEF, the GFATM, 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.

Table 1
President's Malaria Initiative – *Benin*
Year 3 (FY10) Timeline of Activities

X Activity funded by FY09 Funds

Activity funded by FY10 Funds

ACTIVITY	2009			2010												2011						
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL
Phased procurements of commodities including ACTs, severe malaria drug kits, RDTs, SP, LLINs, and microscopes																						
Transport of LLINs from health zone depots to health facilities			X			X			X													
Strengthen logistics management for LLINs, SPs, ACTs, and severe malaria drugs	X	X	X	X	X	X	X	X	X	X												
Implement IEC/BCC strategies to increase demand and utilization of LLINs, ACTs, and IPTp at all levels of the health system	X	X	X	X	X	X	X	X	X	X												
Implement community-based distribution of ACTs and LLINs with focused IEC/BCC support in 3 selected departments	X	X	X	X	X	X	X	X	X	X												
Distribute highly-subsidized LLINs with social marketing through the private sector	X	X	X	X	X	X	X	X	X	X												
Conduct entomological evaluation of IRS in targeted areas																						
Implementation of IRS campaign and development of a long-term IRS strategy																						
Conduct supervision of health workers on IPTp, ANC-focused services, malaria case management, and distribution of LLINs during vaccination visits	X	X	X	X	X	X	X	X	X	X												
Train health workers on IPTp in the context of F-ANC	X	X	X																			
Conduct refresher training and supervision of laboratory technicians to assure malaria	X	X	X	X	X	X	X	X	X	X												

diagnostics proficiency																						
Support quality assurance/quality control system for malaria diagnostics	X	X	X	X	X	X	X	X	X	X												
Support scale-up of IMCI training	X	X	X	X	X	X	X	X	X	X												
Conduct supervision of health workers on appropriate management and referral practice for severe malaria	X	X	X	X	X	X	X	X	X	X												
Strengthen the National Laboratory for Quality Control to improve malaria drug quality control	X	X	X	X	X	X	X	X	X	X												
Conduct end-use verification survey			X																			
Strengthen National HMIS system	X	X	X	X	X	X	X	X	X	X												
Support the planning and implementation of the 2011 DHS																						
Provide technical assistance on measuring process indicators	X	X	X	X	X	X	X	X	X	X												
Conduct health facility-based surveillance in support of PMI M&E framework																						
Strengthen the capacity of the NMCP	X	X	X	X	X	X	X	X	X	X												
Health Facility Survey																						

Table 2
President's Malaria Initiative – *Benin*
Planned Obligations for FY 2010 (USD $21,000,000)

Proposed Activity	Mechanism	Budget *(commodities)*	Geographic area	Description of activity
PREVENTION				
Insecticide-Treated Bednets				
1. Procure and distribute LLINs for routine services	DELIVER Malaria Task Order 3	5,000,000 *(5,000,000)*	Nationwide	Procure 1,000,000 LLINs for free routine distribution. Includes costs to transport nets to health zone depots.
	New Mission Malaria Bilateral	500,000	Nationwide	Transport LLINs from health zone depots to health facilities.
2. Strengthen logistics management for LLINs	New Mission Malaria Bilateral	*Costs covered in Pharmaceutical Management section*	Nationwide	Training and technical assistance to the Central Medical Stores staff on forecasting, supply management, tracking, and storage of LLINs.
3. IEC/BCC for LLIN use	New Mission Malaria Bilateral	*Costs covered in IEC/BCC section*	Nationwide	Support IEC/BCC strategies including mass media and community-level approaches (e.g. local radio stations, women's groups) to increase demand and promote correct and consistent utilization of LLINs by target groups.
4. Procure and distribute LLINs through the private sector	New Mission Malaria Bilateral	600,000 *(600,000)*	TBD	Procure and distribute approximately 120,000 highly-subsidized LLINs through the private sector, using a social marketing approach in urban areas. *(note: funding for this activity may be reprogrammed to support the 2010 national campaign if necessary)*

Proposed Activity	Mechanism	Budget *(commodities)*	Geographic area	Description of activity
5. Routine Net Longevity Monitoring	CREC	45,500	3 Sites TBD	Routine monitoring of nets to assess the longevity of insecticide and durability of LLINs
SUBTOTAL: Insecticide-treated bednets		**$6,145,500** ***($5,600,000)***		
Indoor Residual Spraying				
1. IRS implementation and development of a long-term IRS strategy	IRS IQC Global Task Order	7,500,000 *(2,500,000)*	4 communes in Ouémé/Plateau Department	- Conduct two rounds (March 2010 and August 2010) of IRS in South Benin in the same areas that were sprayed in 2008 and 2009 (Sémé Kpodji, Akpro-Missérété, Adjohoun and Dangbo) with an estimated total of 141,154 households and a population of 521,738. Households located in ecologically-sensitive areas will only receive LLINs. This activity includes training for personnel, equipment/insecticide procurement, sensitizing the community, and carrying out IRS activities. - Conduct one round of IRS in 2011 in new sites based on current evaluation being conducted in the 1st IRS area.
2. Entomological monitoring for spraying and support for the national vector resistance surveillance program	CREC	270,000	Ouémé/Plateau Department	Continue supporting surveillance activities of vector resistance and efficacy of LLINs at the national level: - surveillance of vectors - entomological evaluation in IRS in the target areas and the LLINs distributed in the non-eligible zones (entomological surveys before, during, and at one-month intervals after IRS)

Proposed Activity	Mechanism	Budget *(commodities)*	Geographic area	Description of activity
3. Environmental Compliance Monitoring	EMCAB	50,000	Ouémé/Plateau Department	Support provided to ensure appropriate environmental compliance at spray sights and to build capacity in Benin for host-country environmental compliance
4. CDC technical assistance for vector control activities.	CDC	24,200	N/A	Technical assistance visits (2) to monitor planning and implementation of vector control activities.
SUBTOTAL: IRS		**$7,844,200** ***($2,500,000)***		
Malaria in Pregnancy (IPTp)				
1. Procure SP	DELIVER Malaria Task Order 3	76,000 *(76,000)*	Nationwide	Procure 1,900,000 SP treatments to cover 2010 and 2011 needs (# of pregnancies estimated: 471,841 in 2010 and 487,776 in 2011). SP bought will also be available to the public and private sector according to the national policy.
2. Train health workers in IPTp in the context of F-ANC	New Mission Malaria Bilateral	200,000	Nationwide	Training of all newly hired midwives and nurses in health facilities (public health facilities and private faith-based facilities) to deliver SP in the context of focused ANC.
3. Supervise health workers in IPTp	New Mission Malaria Bilateral	*Costs covered in Treatment section*	Nationwide	Routine supervision of midwives and nurses in health facilities (public health facilities and private faith-based facilities) to deliver SP in the context of F-ANC. These supervisions will be conducted as part of the integrated supervision approach. *(note: supervision component to be consolidated under M&E section)*
4. Strengthen logistics management for SP	New Mission Malaria Bilateral	*Costs covered in Pharmaceutical Management section*	Nationwide	Training and technical assistance to the Central Medical Stores staff on forecasting, supply management, tracking, and storage of SP.

Proposed Activity	Mechanism	Budget *(commodities)*	Geographic area	Description of activity
5. IEC/BCC for IPTp	New Mission Malaria Bilateral	*Costs covered in IEC/BCC section*	Nationwide	Continue to support IEC/BCC approaches to promote ANC attendance and uptake of IPTp. *(note: this activity is also being planned by Africare as part of its Round 3 RCC proposal)*
SUBTOTAL: Malaria in Pregnancy		**$276,000** ***($76,000)***		
CASE MANAGEMENT				
Diagnostics				
1. Procure microscopes and laboratory consumables	DELIVER Malaria Task Order 3	60,000 *(60,000)*	Nationwide	Procure 20 microscopes and reagents for microscopy. *(note: the current estimated need is a total of 129 microscopes (PMI has already bought 30 microscopes in FY08 and is planning to buy another 15 microscopes in FY09; Booster has already bought 10)*
2. Train and supervise laboratory technicians, and support quality assurance/quality control for diagnostics	New Mission Malaria Bilateral	100,000	Nationwide	To improve and maintain microscopy and RDT use for malaria, continue supervision for laboratory technicians, including a quality control system.
3. Procure RDTs	DELIVER	684,500 *(684,500)*	Nationwide	Procure 937,500 RDTs to cover 2011 needs in the public and private sectors. *(note: needs for 2010 are being covered by Booster)*
4. CDC technical assistance on diagnostics	CDC	12,100	N/A	Technical assistance visit (1) to help assess the diagnostics quality assurance/quality control system.
SUBTOTAL: Diagnostics		**$856,600** ***($744,500)***		
Treatment				

Proposed Activity	Mechanism	Budget *(commodities)*	Geographic area	Description of activity
1. Procure ACTs	DELIVER Malaria Task Order 3	357,000 *(357,000)*	Nationwide	Procure 350,000 treatments for distribution at health facilities and at the community level through Community Health Workers. The estimated needs for 2011: 280,458 (6x1) 256,396 (6x2) (6x3) 66,004 (6x4) = 699,932 treatments PMI will cover 50% of the needs since most of the needs are being met by other partners.
2. Procure drug kits for inpatient treatment of severe malaria	DELIVER Malaria Task Order 3	140,000 *(140,000)*	Nationwide	Procure 17,462 quinine drug kits for inpatient treatment of severe malaria cases.
3. Supervise and support health workers to follow case management and prevention guidelines	New Mission Malaria Bilateral ($500K) NMCP ($100K)	600,000	Nationwide	Strengthen and help implement a supervisory strategy, as part of a comprehensive quality assurance and integrated approach, to ensure high quality malaria case management with ACTs, focused ANC (including LLINs and IPTp), and ITN distribution during routine immunization visits.
4. Support IMCI training	New Mission Malaria Bilateral	255,000	Nationwide	Support IMCI training for newly hired health workers and health workers in the private sector (total of 300) to contribute to national scale-up of IMCI. This includes an 11-day training as well as a supervisory follow-up visit.
5. Management of severe malaria	New Mission Malaria Bilateral	55,000	Nationwide	Conduct formative supervision on appropriate management and referral practices for severe malaria in hospitals.

Proposed Activity	Mechanism	Budget *(commodities)*	Geographic area	Description of activity
6. IEC/BCC for treatment	New Mission Malaria Bilateral	*Costs covered in IEC/BCC section*	Nationwide	Support broad communication strategy on the risks of malaria, the need for prompt referral to health facilities for treatment, and the importance of compliance with ACTs.
7. Strengthen logistics management for ACTs, and severe malaria drugs	New Mission Malaria Bilateral	*Costs covered in Pharmaceutical Management section*	Nationwide	Training and technical assistance to the Central Medical Stores staff on forecasting, supply management, tracking, and storage of LLINs.
8. CDC technical assistance visit for supervisory systems	CDC	12,100	NA	Technical assistance visit (1) from CDC to assist in the development of a scope of work for health worker performance.
SUBTOTAL: Treatment		**$1,419,100** ***($497,000)***		
PHARMACEUTICAL MANAGEMENT				
1. Strengthen logistics management for LLINs, SP, ACTs, and severe malaria drugs	New Mission Malaria Bilateral	700,000	Nationwide	Training and technical assistance to the Central Medical Stores staff on forecasting, supply management, tracking, and improving malaria commodity storage.
2. Drug quality control	USP-DQI	75,000 *(10,000)*	Nationwide	Procure reagents for the quality control of the malaria drug for the National Laboratory for Quality Control; assist with the expansion of drug quality control in the field with the use of mini-labs.
3. End Use Verification	SPS	80,000	Nationwide	Monitoring of availability and utilization of key anti-malarial commodities at the health facility level
SUBTOTAL: Pharmaceutical Management		**$855,000** ***($10,000)***		

Proposed Activity	Mechanism	Budget *(commodities)*	Geographic area	Description of activity
COMMUNITY-BASED INTERVENTIONS				
1. Community-based distribution of ACTs and LLINs with focused IEC/BCC support at the community level	New Task Order under BASICS III with sub-grants to NGOs/FBOs	906,500	2 departments TBD (same as in FY08 and FY09)	Continue NGO/FBO implementation of community-based distribution of ACTs and LLINs with community-based IEC/BCC strategies in 2 departments with low access to health services and high child mortality. Includes technical assistance for NGO partners. This activity will also include the case management of ARI, which is being financed by USAID/Benin MCH funds.
2. Support for Peace Corps community-based activities	Peace Corps	35,000	Nationwide	Continued support for community-based malaria control projects carried out by Peace Corps Volunteers
SUBTOTAL: Community-Based Activities	**$941**	**,500**		
IEC/BCC				
1. IEC/BCC for LLINs, IPTp, and ACTs	New Mission Malaria Bilateral	400,000	Nationwide	Support strategies to increase demand and utilization of LLINs, ACTs, IPTp, ANC kits, and RDTs at all levels of the health system and technical assistance for NMCP in IEC/BCC.
2. IEC/BCC for IRS	IRS IQC	*Costs included in IRS Implementation*	4 communes in Ouémé/Plateau Department	Train and recruit IEC mobilizers for IRS to carry out IEC campaign four weeks prior to spraying

Proposed Activity	Mechanism	Budget *(commodities)*	Geographic area	Description of activity
SUBTOTAL: IEC/BCC		**$400,000**		
CAPACITY BUILDING WITHIN NATIONAL MALARIA CONTROL PROGRAM				
1. Capacity building of the NMCP and CREC	New Mission Malaria Bilateral	160,000	N/A	Support training of new and current MOH staff involved in the prevention and control of malaria via a blended learning approach, which would include distance learning; support continuing education of new and current NMCP and CREC staff via participation of scientific conferences and study tours.
SUBTOTAL: Capacity building		**$160,000**		
MONITORING AND EVALUATION				
1. Support the planning and implementation of the 2011 DHS	TBD	300,000	Nationwide	Technical and financial support to the planning and implementation of the 2011 DHS (malaria and mortality modules - increasing the sample size)
2. Technical assistance on measuring process indicators	New Mission Malaria Bilateral	50,000	N/A	Quarterly collection, analysis, and reporting of process indicators and "confounders".
3. Conduct health facility-based surveillance in support of the PMI M&E framework	IRSP (via Implementation Letter)	300,000	7 health zones	Technical assistance to seven sites for collection of reliable data on inpatient malaria cases and deaths
4. CDC technical assistance for M&E	CDC	12,100	N/A	Technical assistance visit (1) to assist NMCP with M&E planning and implementation.

Proposed Activity	Mechanism	Budget *(commodities)*	Geographic area	Description of activity
SUBTOTAL: Monitoring and Evaluation		**$662,100**		
IN-COUNTRY MANAGEMENT AND ADMINISTRATION				
1. USAID technical staff	USAID	500,000	N/A	Support for USAID/PMI Resident Advisor,
2. CDC technical staff	CDC	525,000	N/A	Support for CDC/PMI Resident Advisor
3. FSN staff and other in-country administrative expenses	USAID	400,000	N/A	Support for USAID Foreign Service Nationals to work full time with PMI and to cover other administrative expenses related to PMI.
4. Third year Peace Corps Volunteer	Peace Corps	15,000	N/A	Support for a third year Peace Corps Volunteer to coordinate PC-PMI activities from the central level
SUBTOTAL: Management and Administration		**$1,440,000**		
GRAND TOTAL		**$21,000,000** ***($9,427,500)***	***Commodities represent 45% of total budget***	

Table 3

President's Malaria Initiative – *Benin*
Year 3 (FY10) Budget Breakdown by Intervention ($21,000,000)

AREA	Commodities (% of Subtotal)	Other (% of Subtotal)	Total (% of Budget)
Insecticide-treated Nets	$5,600,000 91%	$545,500 9%	$6,145,500 29%
Indoor Residual Spraying	$2,500,000 32%	$5,344,200 68%	$7,844,200 37%
Intermittent Preventive Treatment	$76,000 28%	$200,000 72%	$276,000 2%
Case Management - Diagnostics	$744,500 87%	$112,100 13%	$856,600 4%
Case Management - Treatment	$497,000 35%	$922,100 65%	$1,419,100 7%
Pharmaceutical Management	$10,000 1%	$845,000 99%	$855,000 4%
Community-based Interventions	$0 0%	$941,500 100%	$941,500 4%
Behavior Change Communication	$0	$400,000	$400,000
	0%	100%	2%
Capacity Building	$0 0	$160,000 100%	$160,000 1%
Monitoring and Evaluation	$0 0%	$662,100 100%	$662,100 3%
Administration	$0 0%	$1,440,000 100%	$1,440,000 7%
Total	$9,427,500	$11,572,500	$21,000,000

Table 4
President's Malaria Initiative – *Benin*
Year 3 (FY 2010) Budget Breakdown by Partner ($21,000,000)*

Partner Organization	Geographic Area	Activity	Budget
DELIVER Malaria Task Order 3	Nationwide	Procure and deliver microscopes/kits, LLINs, SP, ACTs, RDTs, and severe malaria drug kits.	$ 6,317,500
Research Triangle Institute (RTI)	IRS: South Benin (4 communes)	IRS in several communes of South Benin, including procurement of insecticides and spray equipment, training of spray operators, and community sensitization. Includes post-IRS LLIN distribution.	$ 7,500,000
CREC (*Centre de Recherche Entomologique de Cotonou*)	Surveillance: Nationwide Surveys: IRS target area	Support for CREC to conduct entomological monitoring in IRS area; expand and strengthen the national vector resistance surveillance system	$ 315,500
EMCAB	South Benin	Support for independent environmental compliance monitoring	$50,000
New Task Order through BASICS III (NGOs/FBOs –TBD)	3 departments	Community-based distribution of LLINs and ACTs paired with focused IEC/BCC activities at the community level	$ 906,500
New Mission Malaria Bilateral	Nationwide	Train and supervise laboratory technicians. Support quality assurance/quality control system for malaria diagnostics. Improve lab registers.	$ 110,000
	Nationwide	Support training and supervision of health workers in IPTp and case management including severe malaria. Train health workers in IMCI. Capacity building for NMCP/CREC and equipment for NMCP. Support for improved transfusion services. Support for HMIS, NMCP M&E capacity, and process indicator collection.	$3,020,000
	Nationwide	Training and technical assistance to the Central Medical Stores on supply management, forecasting, tracking, and improving storage of malaria commodities.	
	Nationwide	IEC/BCC for LLINs, IPTp, and treatment. Private sector LLIN distribution.	
NMCP (National Malaria Control Program)	Nationwide	Support training and supervision of health workers in case management	$ 100,000
Strengthening Pharmaceutical Systems (SPS)	Nationwide	Support to end-use verification monitoring	$80,000
United States Pharmacopeia (USP) DQI	Nationwide	Support drug quality control	$ 75,000
Peace Corps	Nationwide	Support to 3rd year volunteer for PMI-Peace Corps collaboration and Small Project Assistance grants	$50,000
IRSP (*Institut de Recherche pour la Sante Publique*)	Nationwide	Conduct health facility-based surveillance in support of the PMI M&E framework at up to 7 sites	$ 300,000
TBD	Nationwide	Support the planning and implementation of 2011 DHS	$200,000

* Table does not include technical assistance visits nor administrative/management costs for USAID/CDC.