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

PRESIDENT'S MALARIA INITIATIVE

Malaria Operational Plan

LIBERIA

FY 2011

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

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EXECUTIVE SUMMARY

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

The President's Malaria Initiative (PMI) is a core component of the GHI, along with HIV/AIDS and tuberculosis. The PMI was launched in June 2005 as a 5-year, $1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions and reduce malaria-related mortality by 50% in 15 high-burden countries in sub-Saharan Africa. With passage of the 2008 Lantos-Hyde Act, funding for PMI has now been extended through FY2014. Programming of PMI activities follows the core principles of GHI: encouraging country ownership and investing in country-led plans and health systems; increasing impact and efficiency through strategic coordination and programmatic integration; strengthening and leveraging key partnerships, multilateral organizations, and private contributions; implementing a woman- and girl-centered approach; improving monitoring and evaluation; and promoting research and innovation.

Liberia launched PMI-supported activities in 2008. Liberia's health infrastructure was severely damaged during the long war and only about 45% of the population has access to essential health services. The entire population of just over 3.5 million is at risk for malaria. The 2009 Malaria Indicator Survey (MIS) showed that net use is still low at about 33%, while malaria prevalence, determined using rapid diagnostic tests (RDTs), was 37%.

Liberia is in the second year of a 5-year, $37 million malaria grant from the Global Fund to Fight Aids, Tuberculosis and Malaria (Global Fund), which is paying for personnel, technical assistance, infrastructure development and commodities. Several international and local non-governmental organizations (NGOs) provide major support to malaria prevention and control efforts as well through importation and distribution of insecticide-treated nets (ITNs), antimalarial drugs and training of healthcare workers and community health volunteers. The NMCP recently revised its 2005-2010 National Malaria Control Strategy.

This FY2011 Malaria Operational Plan for Liberia was based on progress and experiences in the first three years. It was drafted during a planning exercise carried out in March 2010 by representatives from the United States Agency for International Development (USAID) and the Centers for Disease Control and Prevention (CDC) in close consultation with the Liberian National Malaria Control Program (NMCP) and with participation of nearly all national and international partners involved with malaria prevention and control in the country. The activities PMI is proposing conform to the Ministry of Health and Social Welfare's (MOHSW) National Malaria Strategic Plan, and

support investments made by the NMCP, Global Fund, United Nations Children's Emergency Fund (UNICEF), World Health Organization (WHO), and other donors to improve and expand malaria-related services. The proposed FY2011 PMI funding of $15.3 million will support the following activities:

Insecticide-treated nets (ITNs): Approximately 2.6 million ITNs (all sources) were distributed in Liberia between 2005 and 2009 via door-to-door, antenatal clinic (ANC), and other campaigns. The 2009 MIS indicated ownership of ITNs increased dramatically with 47% of households reporting owning at least one net compared to 30% in the 2007 Demographic and Health Survey (DHS) baseline. However, only 27% of children under five and 33% of pregnant women in households with a net slept under it the night before the survey. An additional 870,000 ITNs will be distributed in 2010, of which 480,000 will be procured by PMI. The Year 4 planned activities include procurement and distribution of 300,000 long-lasting insecticide treated nets (LLINs) for NMCP endorsed distribution and community-based programs. PMI will continue to assist with strengthening management of the national net program, to include improved quantification of needs, logistics, storage, distribution, training, and associated behavior change and communication (BCC) efforts.

Indoor residual spraying (IRS): In 2007-2008 IRS was conducted in camps for internally displaced persons and refugees, with a population of approximately 150,000 protected. In 2009 the NMCP, with PMI support, completed environmental and insecticide resistance assessments and initiated an IRS program covering approximately 22,000 houses and protecting over 160,000 people, using a pyrethroid insecticide. In Year 3, PMI will fund IRS for 50,000 houses, as well as provide support for training and increased capacity for surveillance of vectors and insecticide resistance. With FY2011 funding, PMI will support spraying of 80,000 houses, continue insecticide resistance monitoring, and promote acceptance of IRS at the community level. The lack of senior NMCP personnel with vector control experience limits efforts to establish an IRS program in Liberia and PMI is also providing support for Masters-level training of a NMCP staff member.

Intermittent preventive treatment of pregnant women (IPTp): The 2009 MIS showed that the proportion of pregnant women receiving the recommended two IPTp treatments during their pregnancy increased from 12% in the 2007 Demographic and Health Survey (DHS) to 46% in 2009. To date, PMI has updated and printed training manuals that are being used for in-service training of health workers by the NMCP and some NGOs. During the past year, 50 certified midwives were trained in Bomi and River-Cess Counties to promote antenatal care and IPTp uptake among pregnant women. Also, PMI supported training on malaria in pregnancy and case management for 61 faculty and clinical instructors in collaboration with NMCP, and supported training of about 400 certified and traditional midwives. With FY2011 funding, the PMI will continue to support in-service training of health workers, refresher training for tutors in training institutions, as well as educational, communication and behavior change materials for IPTp.

Case management: Laboratory diagnostic capacity in Liberia is very weak. Most health facilities use rapid diagnostic tests (RDTs) due to limited capacity for microscopic diagnosis. During the past year, PMI supported the accreditation of two laboratory technicians, as well as refresher training in microscopy and supervision for laboratory technicians and their supervisors. In addition, PMI procured more than half of the 1.75 million RDTs needed in Liberia last year. With FY2011 funding, PMI will support the continued development of the National Public Health Reference Laboratory, training in microscopy and use of RDTs in both public and private facilities, and procurement of RDTs and other diagnostic supplies.

The 2009 MIS showed that only 17% of children under-five, with fever, received artemisinin-based combination therapy (ACT) within 24 hours of onset of fever, while 16% received chloroquine. During the past year, PMI purchased more than two million ACT treatments as well as quinine for the treatment of severe malaria. In addition, 232 health workers were trained in case management, and supported efforts to improve pharmaceutical logistics and management. With FY2011 funding, PMI will purchase ACT treatments and supplies for treating severe malaria, continue to support training of health facility staff and community-based staff in case management of malaria, build on efforts to improve supply chain management of malaria commodities, and promote improved care-seeking and treatment adherence behavior at the household level.

Capacity Building, Integration and Health Systems Strengthening: As Liberia rebuilds itself after a long and debilitating civil war that left the country with a depleted supply of both human and material resources, and in line with GHI principles, PMI supports efforts to improve infrastructural capacity and better integrate with other USG-supported health sector activities. In addition PMI will support, along with funds from other USAID programs, the development of a central, integrated, drug warehouse. Additionally, PMI supported the training of personnel in spraying of houses, case management and diagnostics in health facilities, and community volunteers in prevention of malaria, including promotion of antenatal service use by pregnant women. Much of the training of health facility workers and community health volunteers was integrated with other health functions they perform such as pneumonia and diarrhea. With FY2011 funding, PMI will continue to support the development of human resources within the NMCP, as well as managers and health care workers at county, clinic and community levels, through training and supervision. Additionally, PMI will work with other partners to improve the capacity of the drug management system, including storage. Finally, PMI will provide logistic support to the NMCP to perform their supervisory, technical oversight and quality assurance roles (including training, supervision, and communication and behavior change promotion) from the central down to the community level.

Monitoring and Evaluation (M&E): Malaria data availability and use is gradually improving in Liberia. The MOHSW health management information system (HMIS) is being reviewed. The new HMIS aims to provide timely reports of key indicators in all areas of health and medical care in the public sector in Liberia. In 2009, the NMCP conducted a nationwide MIS (which was fully funded by PMI) and now has comparative

data on malaria for the period 2005-2009. Also in 2009, a national health facility survey was conducted that provided health facility data, including observation-based case management indicators. PMI is also supporting quarterly surveys to monitor availability of key malaria commodities in health facilities. With FY2011 funding, PMI will support another MIS, continue to support the HFS, and fund the Roll Back Malaria/PMI impact evaluation.

ABBREVIATIONS and ACRONYMS

ACT	Artemisinin-based combination therapy
AM	Artemether
ANC	Antenatal care
AQ	Amodiaquine
AS	Artesunate
BCC	Behavior change communications
CCM	Community Case Management
CDC	Centers for Disease Control and Prevention
CHV	Community health volunteers
DDT	Dichlorodiphenyltrichloroethane
DHS	Demographic and Health Survey
ELWA	Eternal Love Winning Africa
EPI	Expanded Program on Immunization
EUV	End-use Verification
FBO	Faith-based organization
GHI	Global Health Initiative
HCW	Health care worker
HFS	Health Facility Survey
HMIS	Health Management Information Service
IEC	Information, Education and Communication
IMaD	Improving Malaria Diagnostics
IMCI	Integrated Management of Childhood Illnesses
IPTp	Intermittent preventive treatment of pregnant women
IRS	Indoor residual spraying
ITN	Insecticide-treated bed net
IVM	Integrated Vector Management
LIBR	Liberian Institute of Biomedical Research
LLIN	Long-lasting insecticide-treated bed net
LQAS	Lot Quality Assurance Sampling
M&E	Monitoring & evaluation
MIP	Malaria in Pregnancy
MIS	Malaria Indicator Survey
MOHSW	Ministry of Health & Social Welfare
NDS	National Drug Service
NGO	Non-governmental organization
NMCP	National Malaria Control Program
NPHRL	National Public Health Reference Laboratory
OFM	Office of Financial Management
PLWHA	People living with HIV/AIDS
PMI	President’s Malaria Initiative
RBHS	Rebuilding Basic Health Services
RBM	Roll Back Malaria
RDT	Rapid diagnostic test
RTI	Research Triangle Institute

SP	Sulfadoxine-pyrimethamine
SPS	Strengthening Pharmaceutical Services
UNDP	United Nations Development Program
UNICEF	United Nations Children's Emergency Fund
USAID	United States Agency for International Development
USG	United States Government
USP	United States Pharmacopeia
WHO	World Health Organization

PRESIDENT'S MALARIA INITIATIVE

The President's Malaria Initiative (PMI) is a core component of the Global Health Initiative (GHI), along with HIV/AIDS, and tuberculosis. The PMI was launched in June 2005 as a 5-year, $1.2 billion initiative to rapidly scale up malaria prevention and treatment interventions and reduce malaria-related mortality by 50% in 15 high-burden countries in sub-Saharan Africa. With passage of the 2008 Lantos-Hyde Act, funding for PMI has now been extended through FY2014 and, as part of the GHI, the goal of the PMI has been adjusted to reduce malaria-related mortality by 70% in the original 15 countries by the end of 2015. This will be achieved by 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 (ACTs), insecticide treated nets (ITNs), intermittent preventive treatment of pregnant women (IPTp), and indoor residual spraying (IRS).

In implementing this Initiative, the U.S. Government is committed to working closely with host governments and within existing national malaria control plans. Efforts are coordinated with other national and international partners, including the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund), Roll Back Malaria (RBM), the World Bank Malaria Booster Program, and the non-governmental and private sectors, to ensure that investments are complementary and that RBM and the Millennium Development Goals are achieved. Country assessment and planning activities for the PMI, as well as subsequent evaluations, will be highly consultative and held in collaboration with the national malaria control program and other partners.

This document presents a detailed one-year implementation plan for FY2011 of the PMI in Liberia. It briefly reviews the current status of malaria control and prevention policies and interventions, identifies challenges and unmet needs if the goals of the PMI are to be achieved, and provides a description of planned Year Four activities under the PMI. The document was developed in close consultation with the NMCP and with participation of many national and international partners involved in malaria prevention and control in the country. The total amount of PMI funding requested for Liberia is $15.3 million for FY2011.

MALARIA SITUATION IN LIBERIA

Liberia, which recently emerged from a protracted civil war that destroyed much of its infrastructure, is located in West Africa and is bounded by nearly 350 miles of Atlantic Ocean coastline off the southwest and by the neighboring countries of Sierra Leone (northwest), Guinea (north) and Côte d'lvoire (east and southeast). Its greatest width is 150 miles. Liberia is administratively divided into 15 counties and 95 districts and has a population of about 3.5 million.

Most of the country lies below 500 meters. The coastal areas are characterized by mangrove swamps, which give way to tropical rain forest that gradually thins out

northwards to be replaced by deciduous forest. All geographic areas of Liberia are favorable for the transmission of malaria.

Liberia is grouped among the least developed countries in the world and ranks 169 out of 180 countries in the United Nations Development Program (UNDP) Human Development Index for 2009[1]. However, this represents a rise of seven (7) ranks since the Human Development Index of 2005. Specific values for the socio-economic profile of Liberia, by year of estimate are illustrated in **Table A** below.

Table A: Selected Human Development Indicators[2] [3]

Economic growth rate, 2009	7.1%
GDP Per Capita estimate 2009	$500
External debt burden, GOL April 2009	$1.8 billion
Population in severe poverty, 2008	48% [4]
Population with access to sanitary facilities	45% access to improved; 43% no access[5]
Population with access to safe drinking water	76% [6]
Literacy rate (age 15 – 49)	41% women; 70% men in 2008
Employment rate	77.5% men, 59.2 % women

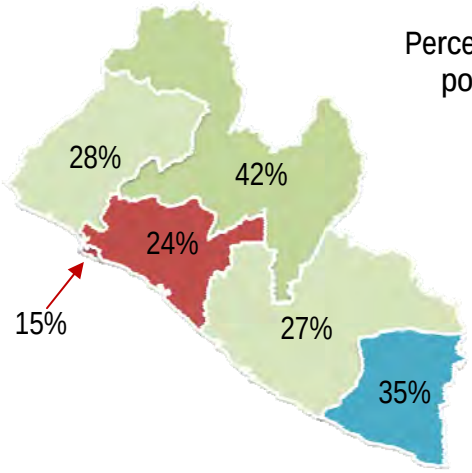
Epidemiology of Malaria

Results from prevalence studies prior to the war classified Liberia as a country with hyper-holoendemic malaria (i.e., perennial intense transmission), and considerable immunity outside of childhood. The climate is favorable for the breeding of three major vectors for malaria: *Anopheles gambiae s.s., An. funestus,* and *An. melas*. The major parasite species causing disease are *Plasmodium falciparum* (>90%), *P. Ovale*, and *P. malariae*.

According to results from the first post-war *Liberia Malaria Indicator Survey* (MIS) in 2005, the prevalence of malaria in children under five was 66%. Prevalence rates have since fallen to 32% nationwide according to the recent MIS 2009 data, as shown below.

[1] UNDPs Human Development Index, 2009
[2] National Health Plan, 2007, LISGIS, 2008
[3] 2009 CIA Factbook
[4] Poverty Reduction Strategy, 2008
[5] Health Management Information System (HMIS) 2009
[6] HMIS 2009

Figure 1: Prevalence of Malaria in Children under five by Region[7]



Percent of children 6 to 59 months testing positive for malaria by blood smear:

National average: 32%

North Western: 28%
North Central: 42%
Monrovia: 15%
South Central: 24%
South Eastern A: 27%
South Eastern B: 35%

Morbidity and Mortality

Malaria is endemic in Liberia and the entire population of approximately 3.5 million is at risk of the disease[8]. Children under five and pregnant women are the most affected groups. According to data from the recent Health Facility Survey (HFS) malaria accounts for about 35% of outpatient department attendance and 33% of in-patient deaths, compared to 38% and 44% in 2005.

Since August 2005, as part of the previous National Malaria Strategic Plans with funding largely from the Global Fund, some progress has been made in malaria control and prevention based on WHO Roll Back Malaria recommendations. The major achievements[9] from August 2005 to October 2009, documented in the 2009 MIS include:

- 17% of children under five are receiving prompt and effective treatment for malaria within 24 hours from the onset of fever, up from 5.3% in 2005
- 45% of women are receiving two or more IPTp during their most recent pregnancy, up from 4.5% in 2005
- 47% of households have at least one ITN, up from 18% in 2005
- 27% of children under five slept under an ITN the previous night, up from 2.6%
- 33% of pregnant women slept under an ITN the previous night, up from 31%

Until 2007, the Global Fund, WHO, and UNICEF constituted the major external sources of funding for the implementation of malaria control and prevention activities in Liberia.

[7] Liberia Malaria Indicator Survey, 2009
[8] National Population and Housing Census, LISGIS 2007, estimate.
[9] Liberia Malaria Indicator Survey, NMCP 2009

The Round 3, Global Fund grant provided $12 million over two years for improved case management including the procurement of ACTs, SP for IPTp, vector control, information, education, and communication (IEC)/behavior change communication (BCC) activities, community mobilization, and program management, including paying salaries of the NMCP staff; it ended in February 2007. The $37 million Round 7 grant was signed in April 2008, with the UNDP as the Principal Recipient. With Round 7 funding, Liberia plans to procure and distribute 7 million ACT treatments, 1.6 million LLINs to children under-five and pregnant women, and two doses of sulfadoxine-pyrimethamine (SP) to more than 300,000 pregnant women.

The WHO has hired a National Professional Officer to provide technical assistance related to malaria, with funding provided by the USAID Africa Bureau. UNICEF has assisted with the procurement and distribution of LLINs in the past and is expected to distribute over 350,000 LLINs in Liberia for FY2010. Non-governmental organizations (NGOs) such as John Snow International, MENTOR Initiative, EQUIP, Africare, Save the Children, and the Red Cross continue to provide significant support to the Government of Liberia and, in particular, the Ministry of Health and Social Welfare (MOHSW), to ensure health service delivery continues in the more than 112 health facilities and communities they assist.

NATIONAL MALARIA CONTROL PLAN AND STRATEGY

The third Liberia National Malaria Strategic Plan for 2010 – 2015 addresses the need to scale-up malaria control and prevention activities to achieve the Millennium Development Goals of sustaining this progress and beginning to reverse the incidence of malaria by 2015. The third Strategic Plan addresses any gaps observed in the implementation of the First and Interim Strategic Plans and also puts forth a more detailed and comprehensive strategy for dealing with the malaria situation in Liberia, by these target dates.

The objectives and activities set out in the plan reflect the recommendations of WHO, the RBM Initiative and best practices and successes from other African countries, to scale-up the most effective malaria control and prevention measures, from the health facility down to the community level, and to involve the private sector and all partners supporting health care delivery in Liberia. The National Malaria Strategic Plan was developed in consultation with partners and stakeholders in malaria control and prevention. The plan creates a framework of priority activities to be carried out at various levels to increase access to and utilization of key malaria control and prevention interventions.

Through previous analysis, surveys, studies and reviews, factors that exacerbate the malaria situation in Liberia have been identified. The plan identifies strategic approaches and activities that can alleviate these problems, coordinate efforts and facilitate the achievement of the overall goal of improved malaria control and reduction in malaria-related morbidity and mortality.

Political commitment to the goal of malaria control exists at the highest level as exemplified by the fact that Liberia is a signatory to the Abuja Declaration on RBM and currently represents Anglophone West Africa on the board of RBM. This political commitment is also exemplified by the reduction of tariffs and taxes from 25% to 2.5% for ITNs and insecticides.

The third National Malaria Strategic Control Plan was prepared at the time when Liberia was becoming more stable and continuing its transition from a post-conflict, humanitarian response to a focus on development. This transition period is characterized by low access to health care (last estimated at 45% in 2007, Interim Poverty Reduction Strategy)[10] and continued challenges to health care delivery: damaged and unrepaired health units, unrepaired roads affecting patient access and health facility support, poor motivation of health staff with low remuneration and incentives, the loss of trained manpower from emigration during the conflict years, and insufficient training institutions in the country.

To prepare for the revision, the NMCP organized two types of review of the Strategic Plan. The first review in June 2009 lasted two weeks and consisted of short sessions with key NMCP Staff, a consultant hired by USAID and key NMCP partners and stakeholders. The first draft of the Strategic Plan formed the basis of the second exercise, which was a three-day meeting, held in November 2009, with key partners to update and finalize the Third Strategic Plan (2010-2015). The issues identified included:

- Availability of data on current status of malaria in Liberia (MIS and HFS, 2009) which show that, though some improvements have been made, more work needs to be done in order to meet RBM targets for 2010 and Millennium Development Goals for 2015.
- Establishment of the Community Health Services Division of the MOHSW and subsequent introduction of a Policy and Strategy for community services which encourages community case management (CCM) of malaria.
- Resumption of Integrated Vector Management (IVM) for vector control, with LLINs, IRS, and other environmental approaches.
- The need to address both patient and provider concerns of ACT containing Amodiaquine, patient adherence, and lack of access to this product in many communities.

The first strategy for more effective malaria control and prevention is improved treatment through scaled up availability and use of ACT as the first-line treatment for malaria, first introduced in 2003. The scale-up is three-tiered: first, making available fixed-dose combination therapies to all health facilities and training the health staff in their use; second, reinforcing the role of the community, the community health workers, and community volunteers for community case management (CCM) of malaria by providing malaria control tools and training these workers for this task;

[10] Interim Poverty Reduction Strategy (IPRS, 2006)

and third, making the same ACT drugs available to the private sector, including the private health care providers, pharmacies and drug/medicine stores.

The second strategy is an integrated vector management (IVM) approach. IVM will provide LLINs through mass distribution to all family units and targeted distribution to pregnant women and children under five, to achieve maximum results for prevention of transmission of malaria. The strategy will also continue targeted IRS of households and will consider other vector management strategies for environmental control as the complete package to achieve maximum results.

The third strategy is to increase support for advocacy, health education and behavior change communication at all levels of society – using television, radio, schools, places of worship – on the importance of ACT therapy, LLIN and other vector management, and the role of the community in malaria control and prevention activities. Cross-cutting strategies with other programs of the MOHSW will include strengthened health information and capacity building for monitoring and evaluation, strengthened procurement and supply chain management and targeted operational research to review the strategies and activities in place.

To support these strategies and provide the necessary oversight, the capacity of the NMCP and its staff will be strengthened to assure the implementation, scale-up, and success in reaching or exceeding the RBM and Millennium Development Goal targets for malaria control and prevention. The NMCP will coordinate the decentralization of malaria control activities throughout the country and to the county and community health teams. It will lead coordination efforts with all health partners in Liberia, including bilateral institutions, NGOs and the private sector.

The National Malaria Strategic Plan 2010 – 2015 builds on the achievements made thus far while recognizing the challenges and addresses the essential actions to be taken to reduce morbidity and mortality due to malaria in Liberia.

CURRENT STATUS OF MALARIA INDICATORS

The most up-to-date information on the status of malaria prevention and control interventions in Liberia comes from the 2009 MIS, which was conducted by the Liberia Institute of Statistics and Geo-Information Services in collaboration with the NMCP and with technical assistance from MACRO, Inc. The survey was funded by PMI since the 2007 DHS did not include a malaria module. The major outcomes of these activities since 2005 are detailed in **Table B** on the following page. Significant improvements were found in the proportion of households with LLINs, the use of LLINs by children, women receiving IPTp, and children receiving prompt treatment for malaria.

The MIS showed weak case management practices for malaria in children under-five. Only 37% of children with a fever in the last two weeks were seen within 24 hours of the onset of their fever. Of those treated, only 17% received an ACT, which was the national

first-line treatment at the time, while 17% received chloroquine. This finding suggests the importance of care seeking in the private sector, which routinely offers chloroquine. Other antimalarial drugs used included SP (< 1%) and quinine (5%).

Coverage with malaria preventive services has shown some progress in recent years. The 2007 DHS showed that 30% of all households owned at least one bed net. In contrast, the 2009 MIS reported household ownership of *any* net in Liberia to be 49%; 47% of these nets were ITNs. Only 27% of children under-five had slept under an ITN the previous night. The most common reason people gave for not owning a net was that they were not available (60%) and too expensive (24%). This increase is undoubtedly due to Global Fund and PMI-supported free distribution of LLINs in several counties.

According to the 2009 MIS, 46% of pregnant women had taken two or more doses of IPTp as recommended during ANC visits, and 33% had slept under an ITN the previous night. Of the 66% of women who took any drug to prevent malaria in the survey, 46% took SP. The 2007 DHS showed that only12% of pregnant women took SP, although not always the two recommended treatments.

Table B: Progress towards achievement of RBM 2010 Targets, Liberia, 2009

Core Indicators	**Baseline MIS 2005**	**MIS Feb 2009**
Proportion of households with at least one ITN	18%	47% *
Proportion of children under five who slept under an ITN the previous night	2.6%	27%
Proportion of pregnant women who slept under ANY net the previous night	31%	34%
Proportion of women who received two or more IPTp during the last pregnancy in the previous two years	4.5%	45%
Proportion of children under five receiving prompt and effective treatment with an ACT within 24hrs from the onset of fever	5.3%	17%

* An additional 480,000 nets were distributed by September 2009.

The NMCP completed a second survey in 2009, the HFS, to assess information not captured by the MIS, visiting 418 health facilities, reviewing records of patient care and supply chain management, including observation of the stock of ACT on hand. This survey also documented progress that has been made in malaria control since 2005. 86% of health workers were prescribing antimalarial drugs according to national guidelines;

85% of the health facilities had antimalarial drugs in stock; Malaria was the diagnosis for 38% of the out-patient visits of children under 5 years.

Table C: Key findings of the 2009 Health Facility Survey

INDICATOR	2005	2009
% of HW* who perform well in collection of the history of the disease	56%	64%
% of HW who search for danger signs	11%	20%
% of HW who perform well in physical examination of patient	57%	50%
% of HW who prescribe antimalarial drug according to national guidelines	75%	86%
% of HW who counsel of patients/caretakers on malaria	26%	45%
% of HF with copy of national malaria treatment guidelines**	77%	77%
% of HF with copy of IMCI guidelines	12%	45%
% of HF with basic materials and equipments (scales, thermometer, syringes)	70%	85%
% of HF with vaccines for routine immunization of children under five and women (15-49 yrs)	88%	75%
% of HF with essential malaria drugs:	48%	85%
% of OPD attendance due to malaria among children less than five years	59%***	38%
% of pregnant women with confirmed malaria	31%	18%
% of population five years and older (excluding pregnant women) with confirmed malaria	56%	39%
% of patients receiving appropriate malaria treatment within 24 hours	21%	35%
% of overall deaths with Laboratory confirmed malaria (RDT or smear)	44%	33%
% of Laboratory confirmed malaria deaths in children under five years	58%	41%

*No. of health workers (HW) observed = 750; ** No. of HF visited = 418; ***Clinical malaria

GOAL AND TARGETS OF THE PRESIDENT'S MALARIA INITIATIVE

The goal of PMI is to reduce malaria-associated mortality by 70% compared to pre-Initiative levels in PMI countries. By the end of 2011, PMI will achieve the following targets in populations at risk for malaria:

- More than 85% 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 6 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 have ACTs available for treatment of uncomplicated malaria; and
- 85% of children under-five with suspected malaria will have received treatment with an ACT within 24 hours of onset of their symptoms.

EXPECTED RESULTS – YEAR FOUR

Prevention:

- Procure and distribute 300,000 free LLINs to vulnerable groups through door-to-door campaigns, and health facilities approaches to help reach approximately 85% household ownership of one or more ITNs; and
- Support IRS of 80,000 houses to protect 400,000 residents.

Case Management:

- Procure and assist with the distribution of 2 million artesunate-amodiaquine (AS-AQ) treatments. This, together with training and IEC/BCC efforts related to case management supported by PMI and other partners is expected to increase the proportion of children under-five with suspected malaria who receive an ACT within 24 hours of the onset of symptoms to 50%;
- Procure approximately 150,000 treatments to supply almost all nationwide needs for drugs and supplies for management of severe malaria;
- Enhance laboratory capacity for microscopic and RDT diagnosis of malaria through provision of training, equipment, and laboratory supplies;
- Procure approximately 1.5 million RDTs and provide training and ongoing supervision in their use.

INTERVENTIONS: PREVENTION

Insecticide-Treated Nets

Background

Integrated vector management for control of malaria vectors was introduced as part of the NMCP revised 2010-2015 strategy, primarily based on ITNs and IRS programs, and consideration of environmental-based vector management, when appropriate. An IRS task force chaired by the Assistant Minister of Preventive Services was established under the IVM program.

The MOHSW National Strategic Plan has an extremely ambitious target of increasing use of ITNs among the entire population, especially vulnerable populations of pregnant women and children under five, to 80% by December 2010 and have ITNs available and routinely distributed in all antenatal care (ANC). By 2013 the goal is to achieve and then maintain ITN usage by 85% of the entire population, to have at least 80% of pregnant women attending ANC receive an ITN. Currently, ITN distribution outlets are limited to the health facilities that have them in stock, private establishments that sell ITNs at a price too high for most residents, and integrated campaigns. Improvements to the supply chain mechanism are needed to assure that all facilities have ITNs to supply pregnant women and children under five through ANC and EPI activities.

Progress to Date

The MOHSW, along with NGOs and faith-based organizations (FBOs), have been providing the highest risk groups with free ITNs purchased by the Global Fund and PMI. Prior to the recent conflict, there was little history of ITN use in Liberia and at initiation of the 2004 National Malaria Strategic Plan, ITN ownership was only about18%. Round 3 of the Global Fund provided 493,000 ITNs to Liberia in 2007; 300,000 were part of the integrated campaign led by the Canadian Red Cross and 193,000 were distributed through ANCs and through mass campaigns. In 2008, PMI purchased 197,000 LLINs as part of a jump start activity with distribution in Bomi and Cape Mount Counties and an additional 430,000 LLINs were distributed door-to-door in Lofa, Nimba and Grand Bassa Counties in 2009. 883,000 ITNs were distributed in 2010, with 480,000 of these ITNs purchased by PMI. In total, approximately 2.57 million ITNs have been distributed in Liberia since 2005 via door-to-door, ANC, and other campaigns.

The 2009 MIS documented a dramatic increase in household ownership of mosquito nets. Overall 49% of households have at least one net (ITN or untreated), and 19% have more than one net. This is a significant improvement over the household net ownership of 18% recorded in 2005, and an increase in the last two years from the 30% recorded in the 2007 DHS. It is also reassuring to note that 47% of households reported owning an ITN. Although the MIS took place just after the height of the malaria transmission season, only 26% of children were reported to have slept under an ITN the night before the survey; 29% of all women and 33% of pregnant women reported sleeping under an ITN the night before the survey.

The NMCP has an IEC/BCC component in its strategy document, which PMI is supporting through mass media campaigns, billboards, traditional leaders advocacy and

interpersonal communication. According to dipstick survey in four counties over 80% of children under five years in households with ITN slept under net

PMI has developed a program of net marking and hang-up to evaluate impact on ownership, care and use. Approximately 50% of 187,000 ITNs were given out using a standard door-to-door distribution approach. The remaining ITNs were hung by community health volunteers (CHV) after printing the following information on each net: donor; date delivered and hung; village code and house number; 1st, 2nd or 3rd net in house. The CHV was paid $0.03 to mark and hang each net. Information was also recorded in data books (total administration and supply cost is <$0.04 per net). In mid-2010 the traditional approach will be assessed against the mark and hang-up method with respect to net ownership, use and care. A preliminary assessment indicates a significant reduction in net loss/theft/re-selling as well as increased use associated with the CHV mark and hang-up program.

Table D: ITN Gap Analysis

ITN	2011	2012	2013	2014	2015
Total Need	**718,414**	**1,767,931**	**193,030**	**1,818,178**	**201,223**
Expected from PMI	350,000	300,000			
Covered by other sources	516,834	585,018			
Gap	**+148,420**	**882,913**	**+53,030**	**909,089**	**+48,777**

NB: The numbers of the table were estimated by the NMCP taking into consideration the number of bednets distributed in previous years and the number of bednets needed to be replaced. A three-year use has been considered for replacement. The surplus in the table will be for replacing nets distributed 3 years prior.

Proposed FY2011 USG Activities: ($2,850,000)

1. Procure approximately 300,000 LLINs for distribution, hang-up and keep-up through health facilities and community-based systems in selected counties ($1,650,000);

2. Distribution, training of supervisors for campaigns, and communication pre-distribution and during campaigns to promote uptake and correct usage of nets ($550,000); and

3. Integrated IEC/BCC for malaria case management, ITNs, malaria in pregnancy and IRS. PMI, through its main implementing partner, supports the NMCP's nationwide strategy to provide messages through various media including television and radio, as well as through more traditional structures such as tribal chiefs, village leaders and community health volunteers, in order to promote behavior change for correct and consistent use of ITNs, acceptance of IRS,

improved care-seeking and adherence to treatment for children with fever, and antenatal care attendance of pregnant women (650,000).

Indoor Residual Spraying and other Vector Control Measures

Background

UNICEF and WHO sponsored a malaria eradication project based on IRS from 1958-61 to ascertain whether transmission could be interrupted. The project covered the central province of Liberia, an area of ~14,000 km^2, using DDT at 2 gm/m^2 with one application per year. Entomological investigations showed an apparent disappearance of vectors immediately after spraying with control persisting for up to two years. Bio-assays on walls demonstrated activity 12 months after spraying. Conclusions drawn from this study were that anopheline vectors in the area were highly susceptible to single annual application of DDT and that interruption of transmission was technically feasible in the forest areas of Liberia. Population movement and the lack of trained spray personnel, equipment and facilities to support the program were identified as major limiting factors for IRS-based vector control at that time.

The 2010-2015 revised NMCP strategy objectives include increased use of IRS in rural districts of high prevalence, covering approximately 45% of the population, and at least 85% of houses in the target areas accepting IRS. Planned activities are to: 1) improve supply chain mechanism and/or maintenance for the insecticides, sprayers, protective clothing and other equipment; 2) strengthen the County Health Team's capacity to implement IRS; and 3) map district-specific information on vector and malaria prevalence as part of IVM.

Progress to Date

The NMCP has stated their desire to develop a strong program based on focal IRS, as part of an IVM strategy, however they have very limited malaria vector surveillance or control capacity. Only two individuals have IRS experience, and the head of NMCP Entomology unit is a pharmacy school graduate with no experience or training in vector control or entomology. Although an overall IRS strategy exists no detailed IRS plans have been developed. The NMCP has requested PMI assistance to establish an IRS program, to include the capacity to conduct vector surveillance, a baseline assessment to determine efficacy and cost, and identify the optimum parameters to include insecticide, duration of efficacy for a targeted IRS program.

Spraying in 2007-2008 was conducted in camps for internally displaced persons and refugees, with a population of approximately 150,000 protected. In 2009 the NMCP, with PMI support, completed environmental and insecticide resistance assessments, initiated an IRS program using a pyrethroid insecticide. In 2010, PMI funded IRS for 50,000 houses, as well as provided support for training and increased capacity for

surveillance of vectors and insecticide resistance monitoring. In 2011 PMI will support spraying of 80,000 houses, resistance monitoring and entomological surveillance.

An insecticide resistance (monitoring, which is part of the IRS strategy) assessment in three counties indicated that vector populations in the survey areas were susceptible to all WHO approved classes of insecticides. PMI will renew efforts to develop a data base of malaria vector species and insecticide resistance status, however, the lack of senior NMCP personnel with vector control training severely limits efforts to establish an IRS program in Liberia. As a result of this PMI will provide support for several short courses training in entomology, assisting the NMCP to identify suitable persons to be sponsored. Also, PMI will ensure that insecticide resistance monitoring is part of the national, IRS strategy.

Proposed FY2011 USG Activities: ($2,824,200)

1. Support spraying of approximately 80,000 houses (protecting 400,000 people) with an insecticide to be selected by the NMCP ($2,500,000);

2. Training, equipment, supplies, and mentoring for NMCP entomology technicians ($100,000);

3. Technical assistance on vector control activities: CDC staff will conduct two TA visits to assist with training and to monitor planning and implementation of vector control activities. The entomology TDYs will be used for capacity building, with a focus on establishing a functional insectary, and assisting with training in mosquito surveillance and insecticide resistance monitoring, in support of IRS and LLIN vector-based interventions. ($24,200);

4. Assist NMCP with insecticide resistance monitoring at two sites ($50,000); and

5. Integrated IEC/BCC for malaria case management, ITNs, malaria in pregnancy and IRS. PMI, through its main implementing partner, supports the NMCP's nationwide strategy to provide messages through various media including television and radio, as well as through more traditional structures such as tribal chiefs, village leaders and community health volunteers, in order to promote behavior change for correct and consistent use of ITNs, acceptance of IRS, improved care-seeking and adherence to treatment for children with fever, and antenatal care attendance of pregnant women ($150,000).

Intermittent preventive treatment in pregnant women (IPTp)

Background

Liberia has a population of approximately 3.5 million and a general fertility rate of 5.2%. Malaria is hyperendemic in Liberia threatening the life of pregnant women and the unborn child. Malaria during pregnancy causes maternal anemia and low birth weight.

Low birth weight in newborn is a close indicator of newborn survival. According to the 2005 MIS results, malaria parasitemia was 31% among women attended to at the outpatient unit of health facilities. In Liberia there is high ANC attendance and it is reported that 95% of pregnant women attend ANC at least once during pregnancy. The NMCP has a policy on MIP that conforms to the WHO recommendations. The MIP section of the current national malaria strategic plan (2010-2015) states that:

1. All health facilities in the country (public and private) should treat malaria in pregnancy according to the national treatment protocol;
2. All health facilities in the country (public and private) should provide IPTp according to the national malaria in pregnancy (MIP) guidelines;
3. IPTp will be provided at community level according to the national MIP protocol
4. LLINs will be provided to all pregnant women.

PMI will support the National Malaria Strategic Plan MIP interventions through public facilities IPTp and LLINs as well as community level promotion of facility-based IPTp

From the 2009 MIS results 29% of women of reproductive age slept under an ITN the night before the survey while 60% of women living in households with an ITN slept under an ITN the night before the survey. The survey also found that, 33.8% of pregnant women slept under any net the night before the survey and 63.2% of pregnant women in households with an ITN used it the night before the survey.

Even though access to health services is only about 45%, all the health facilities are providing IPTp. SP is the drug of choice for IPTp and this is purchased by the government of Liberia through the Global Fund and given without charge to pregnant women at ANCs in public facilities. In the 2009 MIS, 55% of pregnant women took at least one dose of SP for IPTp while 45% received 2 or more doses of SP during the last pregnancy. Although the NMCP strategic plan includes community level delivery of IPTp, PMI does not support community delivery of IPTp because this strategy does not promote ANC utilization to benefit pregnant women of other interventions delivered through the ANC platform.

Progress to Date

Training manuals in MIP were reviewed and updated after which new manuals have been printed and are in use for in-service training of health workers by the NMCP. During the past year a series of training workshops were conducted and 30 certified midwifes were trained in Bomi County and 20 certified midwives trained in River-Cess County. The lead PMI partner for MIP has also conducted training on malaria in pregnancy (MIP) and case management for 61 faculty and clinical instructors in collaboration with NMCP. Another PMI implementing partner has trained about 400 certified midwifes and trained traditional midwives.

Since the NMCP is purchasing sufficient SP from its Global Fund Round 7 grant to meet all requirements, PMI has not procured SP.

Proposed FY2011 USG Activities: ($650,000)

1. Continue training in prevention and treatment of malaria in pregnancy for tutors of pre-service institutions like nursing, midwifery, and medical schools. Also develop teaching materials in collaboration with Family Health Division and the health education unit of MOHSW to facilitate training. ($150,000);

2. Continue support for in-service training and supervision of health workers in prevention and treatment of malaria in pregnancy as well as community-level personnel and volunteers in MIP and ANC referral. See description of rationale for assigning this activity to the NMCP in the section for "Capacity Building and Health Systems Strengthening" ($200,000);

3. Continue support for the distribution of SP through ANC and the active tracking of pregnant women through CHVs ($150,000) and

4. Integrated IEC/BCC for malaria case management, ITNs, malaria in pregnancy and IRS. PMI, through its main implementing partner, supports the NMCP's nationwide strategy to provide messages through various media including television and radio, as well as through more traditional structures such as tribal chiefs, village leaders and community health volunteers, in order to promote behavior change for correct and consistent use of ITNs, acceptance of IRS, improved care-seeking and adherence to treatment for children with fever, and antenatal care attendance of pregnant women ($150,000).

INTERVENTIONS: CASE MANAGEMENT

Malaria diagnosis

Background

Laboratory diagnostic capacity in Liberia continues to be limited. The National Health Facility Accreditation Report (MOHSW, March, 2009) showed that of the nine areas evaluated, laboratory/diagnostics was the weakest. In fact, of the 477 (349 public and 88 private) health facilities visited, only 17% had laboratory capacity (84% of hospitals and 13% of health centers). There are only 78 licensed laboratory technicians in the country including two technologists and about 300 laboratory assistants, and many of them are working in the private sector. In the past no refresher training has been offered to laboratory technicians.

After an assessment by WHO in 2007 of national laboratory capacity, the decision was made to establish a National Public Health Reference Laboratory (NPHRL) at the

Liberian Institute for Biological Research (LIBR). Unfortunately, years of war and neglect have taken a toll on the LIBR and significant repairs and upgrades are needed. The Global Fund is funding part of the refurbishing of the LIBR and the purchase of equipment for the NPHRL.

According to MOHSW standards, hospitals and health facilities with a laboratory are expected to have at least one laboratory technician, although this is not the case in all facilities. With the increasing number of functioning public health facilities, the MOHSW has estimated that they need an additional 300 laboratory technicians.

Liberia has two functioning laboratory technician training schools, the Mother Patern College of Health Science in Monrovia and Phebe Hospital in Bong County. These schools have a shortage of teaching staff and limited infrastructure. The present annual intake of students into these institutions is low, resulting in few graduates each year.

Due to the limited resources for microscopic diagnosis, most health facilities use RDTs. The NMCP 2010-2015 Strategic Plan encourages the use of laboratory tests to diagnose malaria. Malaria diagnostic testing in MOHSW facilities is free of charge while faith-based and private organizations generally charge for this service. Due to distance and the difficulty in travel, many patients with fever or other illnesses consult with a neighbor, traditional healer, or private pharmacy.

Due to a variety of factors, demand for RDTs is expected to increase: (1) WHO and national policy is set to change soon, emphasizing parasitological diagnosis; (2) observations from clinic site visits that health workers use RDTs over microscopy as patient load increases; (3) demand for RDTs in clinics is increasing; and, (4) the increasing numbers of health facilities will also drive up use of RDTs.

In Liberia, as in other countries in sub-Saharan Africa, the private sector is an important provider of treatment for malaria. According to the LMIS 2009, 43% of household members who reported fever in the two weeks before the survey reported obtaining treatment from the private sector—including from private clinics, pharmacies and drug peddlers. The mean cost for such treatments was approximately $259 Liberian dollars (US $3.92)—a significant amount in a country where the annual per capita income is US $158. Other than the above information and one additional study (mentioned below) little is known neither about the characteristics of patients seeking care in the private sector nor about the private sector providers that provide such care. Better understanding of the private sector dynamics in providing diagnosis and care for malaria is therefore needed.

Progress to Date

PMI is supporting the development of NPHRL at the LIBR and enhancing laboratory capacity at NMCP and health facilities. Requirements for laboratory commodities for both NMCP and the NPHRL at LIBR have been calculated and procurement will soon be completed. A training venue at LIBR has been rehabilitated for use in re-fresher training of laboratory technicians for public health facilities.

Two PMI-supported quarterly refresher trainings in malaria microscopy were held in Monrovia to strengthen diagnostic capacity in Liberia (October 2008, January 2010). A total of 46 MOHSW staff covering all fifteen counties and four national trainers were trained. The trainings focused on preparation of blood films, species identification, parasite quantification, RDTs, and standards of good laboratory practice. Theory-based examinations were conducted on the first and last days of the workshop and revealed significant improvements in performance. Two laboratory scientists were sent to the WHO External Malaria Microscopy Accreditation course in Kenya. These two scientists are now certified as "level 1" expert microscopists using the WHO accreditation criterion and are working for the National Reference Laboratory. With PMI support, the contractor for diagnostics capacity building now has a local staff which has greatly accelerated the pace of implementation.

Outreach training and supportive supervision of laboratories with re-trained technicians has begun in two counties. A total of nine visits have been conducted. Checklists used by IMaD in other countries have been adapted to Liberia. Among the findings of the outreach training and supportive supervision visits, the most critical were: 1) quality assurance procedures and consistent supervision are not yet implemented in all facilities; 2) the workload does not allow technicians to perform some procedures such as parasite counting; and, 3) cascade training within the laboratory, from trained to untrained staff, has not occurred as expected due to lack of supplies and mentoring skills.

Approximately 850,000 RDTs were procured and distributed to health facilities during calendar year 2009 by PMI. A recent HFS (2009) identified that up to 76% of health workers correctly recommended either microscopy or an RDT in cases presenting with fever. One sentinel site reports that 69% of "suspect cases" in children under five were recommended for malaria testing; only 10% of those tested were confirmed to have malaria.

Table E: RDT Gap Analysis

RDTs	2011	2012	2013	2014	2015
Total Need	**3,699,509**	**5,117,321**	**5,133,122**	**4,325,837**	**3,567,318**
Expected from PMI	1,385,000*****	1,000,000******	-	-	-
Covered by Global Fund Round 7	1,455,853	1,557,062	-	-	-
Gap	**858,656**	**2,560,259**	**5,133,122**	**4,325,837**	**3,567,318**

*****2011 is based on FY2010 funding; ******2012 is based on FY2011 funding

Proposed FY 2011 USG activities: ($1,254,200)

1. Assist with the development and strengthening of the national reference laboratory. PMI, with support of other donors including the Global Fund, will

continue to provide needed equipment, supplies and training to improve their capacity in malaria diagnostics. ($100,000);

2. Technical assistance to build capacity for laboratory diagnosis. Visits from CDC diagnostics specialist to strengthen national capacity in microscopy and RDT diagnosis. The visits will be carried out in collaboration with the NMCP and PMI implementing partner ($24,200);

3. Refresher training for laboratory technicians. PMI will continue to support in-service training of laboratory technicians in health facilities in the use of RDTs and to improve microscopy ($130,000);

4. Procure 1 million RDTs. This amount has been calculated based on available funding, even though the NMCP is expecting a higher number of doses according to the table developed by them above. It is important to consider that the total need was estimated based on estimated population and potential establishment of new facilities. This amount will be adjusted once there is a clear knowledge of the number of facilities and the number of population needing RDTs arriving to these centers ($750,000);

5. Procurement of laboratory supplies. PMI will support the procurement of malaria microscopy supplies such as reagents and slides for existing health facilities. ($50,000);

6. Support private providers in diagnostics. PMI will conduct an assessment of current diagnostics practices in the private sector. If the assessment identifies opportunities for further PMI support a costed plan for use of RDTs in private health facilities and pharmacy providers in diagnostics will be developed ($50,000); and

7. Support capacity development for accurate and prompt diagnosis of malaria in the 112 focus USAID health facilities through training of laboratory staff and non-laboratory health workers on the use of RDT/microscopy ($150,000).

Pharmaceutical Management and Treatment

Background

In spite of significant advances in improving access to care in Liberia, malaria case management is still available to only around 45% of the population. NMCP is trying to improve access to appropriate case management to 80% of the population. Unfortunately, there are not enough public health facilities nor are they sufficiently staffed to reach such high coverage. Therefore, the NMCP is expanding access to case management through two additional strategies—CCM of malaria and through the private sector.

The Government of Liberia has developed a comprehensive, integrated and well-thought through National Policy and Strategy on Community Health Services. The policy takes into account lessons learned from other CCM experiences around the world, including Brazil and Nepal—two very successful CCM programs. Based on the national strategy, a draft implementation plan for CCM has been developed and discussions regarding a pilot have begun. After fine tuning of the tools and materials during the pilot, CCM will be deployed throughout the country. CHVs will be trained to assess patients, use RDTs and provide treatment with fixed dose AS-AQ. In addition to malaria, CHVs will handle other prevalent diseases such as diarrhea and pneumonia.

Although still nascent, the private sector's role in health and medical care is gradually increasing in Liberia. As mentioned above, the 2009 MIS revealed that up to 43% of the population receives malaria treatment from private health providers. The NMCP recently convened a workshop with interested parties to discuss ways to increase access to subsidized ACTs through the private sector. Recommendations from the workshop addressed: 1) policy, coordination and regulatory oversight; 2) price and incentives for the private sector; 3) procurement and supply chain strategy; 4) supervision, monitoring and evaluation; and 5) provider and consumer education. NMCP has made the decision to work with the private sector on diagnostics and treatment of malaria. NMCP will provide training and malaria commodities, the latter with a small fee for the provider and patients.

Liberia's pharmaceutical supply system for malaria commodities still has significant deficiencies but it is gradually improving. In 2007, PMI supported an assessment of the supply system in which major problems were identified—poor quantification, storage conditions, limited transport and even prescribing and counseling issues. Several of these problems are being addressed with support from PMI.

The NMCP recognizes that the availability of mono-therapies and quality of drugs are significant problems in Liberia. As part of its private sector strategy, the NMCP and Pharmacy Board of Liberia are working on a policy revision that bans the importation of all antimalarial monotherapies not recommended by NMCP. In addition, wholesale distributors import medicines without effective control and drugs are sold on the street and from unlicensed sellers. All of this sets the stage for the infiltration of counterfeit and ineffective malaria drugs. The PMI has worked closely with the Government of Liberia to develop a law, issued in mid October 2010, to deal with antimalaria mono-therapies and illegal trade in counterfeit and adulterated drugs.

The current first-line antimalarial is artesunate-amodiaquine (AS+AQ) in co-blistered tablets. Reports of patients disposing of the Amodiaquine tablet and only taking the artesunate has motivated the NMCP to change to the newly available co-formulated tablets. NMCP believes that this change will also increase compliance with treatment. Treatment with this new formulation will continue to be free in all public health facilities.

When AS-AQ is not available or treatment failure is suspected, oral quinine is recommended as the second line drug for the treatment of uncomplicated malaria. Oral quinine is also recommended for treating children weighing 5 kilograms or less and

during the first trimester of pregnancy. Intravenous quinine or intramuscular Artemether is used for complicated/severe malaria.

Progress to Date

The MOHSW has begun implementation of its new National Policy and Strategy on Community Health Services. The PMI was involved in developing the operational guidelines for the strategy as well as the malaria CCM component. In the second quarter of 2010, CCM monitoring tools will be finalized, training of trainers and supervisors will occur and two pilot projects in Bong and Nimba Counties will begin.

With PMI support an assessment of private sector capacities for case management in one county in Liberia was recently conducted. The assessment consisted of mapping pharmacies and medicine stores, determining availability of antimalarials, assessing the drug supply, determining accessibility, case management practices, and supply and drug management issues. The results showed that a long and unwieldy list of antimalarials is available at varying prices—monotherapies are consistently present and chloroquine is the number one drug sold. The majority of private sector providers does not have laboratory-based malaria diagnosis and provide only clinically-based treatment. Of 14 "simulated patients" with "malaria" only three received treatment with an ACT.

PMI provided technical support for a quantification workshop for ACTs in 2008, pharmaceutical management training of trainers and capacity building at the University of Liberia, School of Pharmacy. A total of 232 health workers have been trained in pharmaceutical management and follow up supervision has started. Standard operating procedures for supply chain management have been adapted for Liberia and their deployment begun. A 2009 health facility survey conducted by the MOHSW (see description below) revealed that 85% of health facilities had appropriate antimalarials to treat cases on the day of the survey visit.

PMI has started to provide more technical assistance to support drug efficacy monitoring. One example was during the first quarter of 2010, where a team of experts arrived in country to test a sample of the quality of the drugs being sold in the country. The results have shown a high percentage of drugs counterfeited and with some of them with no active compound at all. PMI will continue strengthening this area until legislation takes place to regulate the quality of drugs and their appropriate monitoring in the country.

PMI, together with the Global Fund, is the main provider of ACTs, RDTs, SP and drugs for the management of severe malaria. **Table F** shows malaria commodities provided to date by PMI. Additionally, the Global Fund has provided approximately 2.5 million ACTs and almost one million RDTs in the same time period.

Table F: Case management commodities provided by PMI since 2009

Commodities	**2008**	**2009**	**2010**	**TOTAL**
AS-AQ (doses)	496,000	1,303,175	600,000	2,399,175
Quinine 600mg (inj.)	-	200,800	-	200,800

Quinine 200mg and 300mg	-	1,088,000	-	1,088,000
Sulfadoxine-Pyrimethamine 500mg/25mg	-	236,000	-	236,000
RDTs	-	850,000	-	850,000

PMI support helped complete all preparatory work to introduce pre-service training on malaria prevention and case management. Pre-service job descriptions and competencies have been updated, malaria has been successfully introduced into the curricula and the Handbook for Health Workers in Liberia has been revised. Preceptors at several pre-service schools will soon be trained and training of health workers will begin in earnest. Resources are available to conduct follow up supervision and support for health workers.

PMI supported the review of NMCP's in-service training modules on malaria. Based on this review, the prevention, case management and malaria in pregnancy modules were updated. The malaria modules were integrated into overall health training. The RBHS project will print and distribute the modules to the facilities it supports. Forty five county trainers will soon be trained.

During 2009, the MOHSW conducted a nationally representative HFS in Liberia including 418 (73%) of the 573 functional health facilities in the country. All types of facilities were included in the sample --hospitals, health centers and clinics. As **Table B** under "Current Status of Malaria Indicators" shows, there have been significant gains in the case management of malaria. However, the assessment of danger signs, overall physical examination and counseling still show significant deficiencies. These problems are very similar to those seen in other countries. The HFS, along with other data from PMI partners, shows that when an antimalarial is prescribed, 86% of health workers do it correctly.

Table G: AS-AQ Gap Analysis

AS-AQ	2011	2012	2013	2014	2015
Total Need	**6,096,721 (85%)**	**6,590,650 (90%)**	**6,055,905 (90%)**	**5,495,849 (90%)**	**4,909,657 (90%)**
Expected from PMI	2,350,000*****	2,000,000******	-	-	-
Covered by Global Fund Round 7	589,087	1,327,370	1,277,608	-	-
Gap	**340,949**	**3,263,280**	**4,778,297**	**5,495,849**	**4,909,657**

*****2011 is based on FY2010 funding; ******2012 is based on FY2011 funding

Proposed FY2011 USG activities: ($4,589,500)

1. Procurement of co-formulated AS-AQ. Based upon the quantification data provided by the NMCP, PMI will purchase 2 million doses of ACTs to help fill Liberia's ACT needs. This amount has been calculated based on available funding, even though the NMCP is expecting a higher number of doses according to the table developed by them above ($2,100,000);

2. Procurement of quinine for severe malaria; PMI will procure 150,000 quinine treatments for severe malaria. This amount has been calculated based on available funding, even though the NMCP is expecting a higher number of doses according to the table developed by them above. The WHO costing tool estimates that in a country with the malaria epidemiology like Liberia the annual number of cases of severe malaria is approximately 4% of the population. This is approximately 152,000 cases.($200,000);

3. Distribution of LLINs, training of supervisors, and IEC/BCC pre-distribution and during the campaign. This activity will be carried out by MOH/NMCP (550,000);

4. Pre-service and in-service training for case management; PMI will provide resources for both pre-service and in-service training of health workers as well as follow up with supportive supervision. PMI will also support the finalization of a national training plan. Facility-based health worker training and community health volunteer training will be carefully coordinated. See description of rationale for assigning this activity to the NMCP in the section for "Capacity Building and Health Systems Strengthening" ($150,000);

5. Support community-based treatment. PMI will support the NMCP's "Implementation Plan: Community Malaria Case Management." NMCP will train CHVs to provide RDT-based diagnosis of malaria, appropriate treatment of uncomplicated cases and referral of severe cases. Supervisors and clinicians will also be trained so that appropriate links between CHVs and the formal health system are established. Malaria commodities for CHVs are part of the national quantification and will be distributed to CHVs through local health facilities. See description of rationale for assigning this activity to the NMCP in the section for "Capacity Building and Health Systems Strengthening"($200,000);

6. Strengthen supply chain management system for antimalarial drugs. This activity is seen as a key priority by the NMCP and the public health community, and will be a continuation of efforts started under previous years. In the short term, PMI will support the development of a pharmaceutical logistics plan, and empower CHTs to do regular monitoring and supervision. In the longer term, PMI's contractor will support the completion of a supply chain master plan ($500,000);

7. Strengthening drug quality monitoring capacity. This is a continuation of activities from previous MOPs. PMI will continue to support the improvement of capacity to monitor the quality of drugs by national authorities ($100,000);

8. Provide support for follow-up supervision of health workers who have received training in case management. Case management training requires a post-training visit within a few weeks of training to assess, through direct observation of case management, how well health workers are performing and to provide additional on-the-spot training if needed. See description of rationale for assigning this

activity to the NMCP in the section for "Capacity Building and Health Systems Strengthening" ($75,000);

9. Increase availability of ACTs in private sector. NMCP will roll out a pilot project in one county (Montserrado) to increase private sector availability of ACTs. The project will provide: (1) a subsidized, branded ACT; (2) private sector provider trainings; (3) compelling, low literacy mass media for demand creation; and (4) interpersonal communications campaigns for both caregivers and providers ($414,500); and

10. Integrated IEC/BCC for malaria case management, ITNs, malaria in pregnancy and IRS. PMI, through its main implementing partner, supports the NMCP's nationwide strategy to provide messages through various media including television and radio, as well as through more traditional structures such as tribal chiefs, village leaders and community health volunteers, in order to promote behavior change for correct and consistent use of ITNs, acceptance of IRS, improved care-seeking and adherence to treatment for children with fever, and antenatal care attendance of pregnant women ($300,000).

HIV/AIDS and MALARIA

The 2007 DHS showed that 1.5% of the population was HIV positive, with a higher rate among women than men. There are differences in the HIV prevalence between urban and rural populations. The data from 2007 sentinel sites survey among pregnant women attending antenatal clinics indicate that HIV seroprevalence is 5.4% (ranging from 2.6% to 10.4%). Monrovia and counties in the eastern region of the country have a higher HIV prevalence than the rest of the country. The National AIDS Control Program is running sites for HIV voluntary counseling and testing. These testing sites have increased by over 50% from 42 in 2007. The Global Fund Round 6 HIV/AIDS grant is being used to support the training of staff and supervisors for the functioning of these sites. Liberia has 122 health facilities where HIV patients receive antiretroviral therapy, and, in the remaining facilities, AIDS patients are treated for opportunistic infections. To date there is no national policy that addresses HIV/AIDS and malaria among people living with HIV/AIDS (PLWHA) including pregnant women.

The Clinton Foundation is collaborating with the MOHSW on HIV/AIDS. PMI will be collaborating with the National AIDS Control Program to ensure that more HIV positive pregnant women receive IPTp. Also there will be better collaboration between NMCP and National AIDS Control Program to continue getting LLINs to PLWHA. Local NGOs like the Liberia Red Cross will be used to distribute nets to some sections of the population.

Proposed FY2011 USG activities: (costs covered under other sections)

1. PMI will work through its implementing partners to link with organized groups such as NGOs to reach PLWHA with LLINs, IEC/BCC and ensure that pregnant

women receive daily cotrimoxizole or SP for IPTp, if that is the only available option.

CAPACITY BUILDING AND HEALTH SYSTEMS STRENGTHENING

Background

Capacity strengthening will be needed in virtually every aspect of the Liberian NMCP. The scale up of malaria activities will depend on a well-trained and active malaria staff at the national and county levels. The long civil war debilitated the country's health sector physical and human resource capacities. Facilities were destroyed and looted and trained personnel fled the rural areas, and many went abroad. Since the arrival of the current government, though, much progress has been made, as donors and government alike worked together to put in place plans for rehabilitating the health infrastructure and systems. New five year strategies are in place, including one for the NMCP; services in rural areas are being supported by donors; training institutions are open again; and donors are assisting the MOHSW to leverage their support to garner additional funds, notably from Global Fund.

However, challenges remain; the national logistics system and the supply chain management of health products including malaria products in Liberia are still not effective and efficient. Therefore a Supply Chain Master plan has been just issued; the main challenge is how to make it operational. As well, only about half of the population has access to health services.

Progress to Date

Due to the post-conflict situation in Liberia and the lack of satisfactory offices for the NMCP, it was agreed with PMI Year 1 funds to support the rehabilitation of the NMCP offices. The NMCP office rehabilitation did not happen due to a variety of reasons including difficulty in identifying a suitable location to accommodate all the NMCP needs, and, moreover, another donor (China) will rehabilitate an entire building to house the MOHSW (including the NMCP) . Instead, it was agreed that these office-renovation funds, be combined with other USAID and donor funds, and used for development of a central drug warehouse. To date a suitable site has been identified and plans drafted to erect a new facility, with plans to finish in early 2011. Additional capacity building efforts include: 1) in-service and pre-service training for HCWs and CHVs, as well as short term trainings and technical assistance through implementing partners; 2) development of the current NMCP Strategic document 2010-15; 3) support for the funding gap analysis for Global Fund proposal preparation; 4) the development of Integrated Standard Operating Procedures for Procurement and Supply Chain Management; and 5) training of 340 spray personnel for IRS, and 1518 health care workers in IPTp, ACTs and RDTs use. These PMI interventions complement other health activities (funded by USAID and other donors) to improve financial and program

management, procurement of malaria drugs, LLINs and diagnostics, and the IEC/BCC and monitoring and evaluation capabilities of the MOHSW and the NMCP.

Finally, starting in 2010, Liberia was chosen as one of the initial pilot countries to which the USG agreed to begin direct funding to the host-country government. This is being done in an effort to help build indigenous capacity to manage donor resources, which, if successful, could help reduce management costs and make more funds available for direct program support. After financial and procurement management assessment of MOH/NMCP, PMI will begin direct support to the NMCP. According to USAID policy MOH/NMCP will be subject to annual audit and close monitoring.

Proposed FY 2011 USG Activities: ($350,000)

1. Strengthening supportive supervision and management of the NMCP, allowing NMCP staff to perform their supervisory roles from the national level to the county level, and from the county level down to the community level ($300,000); and

2. Entomological, short-term training for one or two people, either in the sub-region or South Africa, as the NMCP and Liberia currently do not have a qualified entomologist to lead vector control in the country. PMI will assist the NMCP in identifying suitable candidates, as well as in selecting a program that will develop the capacity of these individuals to manage and further develop an IVM program in Liberia ($50,000).

INTEGRATION WITH OTHER GLOBAL HEALTH INITIATIVE PROGRAMS

Malaria prevention and control is a major foreign assistance objective of the U.S. Government (USG). In May 2009, President Barack Obama announced the GHI, a six-year, comprehensive effort to reduce the burden of disease and promote healthy communities and families around the world. Through the GHI, the United States will invest $63 billion over six years to help partner countries improve health outcomes, with a particular focus on improving the health of women, newborns and children. The GHI is a global commitment to invest in healthy and productive lives, building upon, and expanding, the USG's successes in addressing specific diseases and issues. Addressing wide-ranging health needs in partnership with host country governments, communities and other partners represents an ambitious agenda that can be met only if we work together, aligned toward common goals, with a commitment to fundamentally improve the way we do business.

The GHI aims to maximize the impact the United States achieves for every health dollar it invests, in a sustainable way. The GHI's business model is based on: implementing a woman- and girl-centered approach; increasing impact and efficiency through strategic coordination and programmatic integration; strengthening and leveraging key partnerships, multilateral organizations, and private contributions; encouraging country

ownership and investing in country-led plans and health systems; improving metrics, monitoring and evaluation; and promoting research and innovation. The GHI will build on the USG's' accomplishments in global health, accelerating progress in health delivery and investing in a more lasting and shared approach through the strengthening of health systems.

COMMUNICATION/COORDINATION AND COORDINATION WITH OTHER PARTNERS

Several mechanisms for communication and coordination between the NMCP and partners exist in Liberia:

Country Coordinating Mechanism
The *Country Coordinating Mechanism* is made up of representatives from the donor and NGO communities as well as technical and managerial leads from UN agencies and MOHSW senior leadership. They meet to review options and plans for submission of proposals to the Global Fund and keep abreast of progress toward start-up of activities and grant implementation. The *Country Coordinating Mechanism* does not however have any direct role in implementation of malaria activities. Liberia was successful with their Round 7 Global Fund proposal and has begun implementation. USAID is a voting member of the *Country Coordinating Mechanism*.

Malaria Steering Committee
As part of the NMCP 2010-2015 Strategic Plan and in response to the current malaria situation in Liberia, a *Malaria Steering Committee* was formed to strengthen partnerships and coordination. The *Malaria Steering Committee* includes the NMCP as well as representatives of all implementing partners, including relevant government ministries and agencies, international and local NGOs, donor agencies, and multilateral organizations. It meets on a monthly basis. The *Malaria Steering Committee* advises and guides the NMCP and other participating partners on the content and organization of their work plan and projects.

Donors' technical coordination forum
The PMI team initiated a donors' technical coordination forum where UNDP, UNICEF, WHO, USAID and Clinton Foundation meet monthly to exchange information on their mutual interests and activities.

Donor coordination meeting
Every month the MOHSW chairs a meeting of donors and heads of departments in the MOHSW and reviews major developments in the health sector. The PMI and other USAID health programs participate in these meetings.

<u>Proposed FY2011 USG Activities:</u> (no additional cost to PMI)

The two PMI Malaria Advisors (one representing CDC and the other USAID) will handle both technical and logistical planning for PMI activities. In collaboration with existing USAID/Liberia staff, the advisors help coordinate PMI activities with the NMCP and other key stakeholders, and are active members of the *Malaria Steering Committee*. The CDC Malaria Advisor has an office within the NMCP where he works every morning with NMCP staff. The USAID Malaria Advisor spends a significant proportion of his time at the NMCP. The USAID Health Officer works to ensure coordination of PMI partners and activities, briefs the Chief of Mission and USAID management team on progress and any issues that might arise, and liaises with senior government of Liberia officials on the PMI and its contribution to USAID assistance to Liberia.

PRIVATE SECTOR PARTNERSHIPS

The USAID Mission encourages partnerships in several areas, including health. The role of the private sector is now well-defined in the 2010-2015 National Malaria Strategic Plan; the appropriate use of private sector providers is paramount in order to make full use of these potentially powerful resources. During the preparation of the FY2011 PMI plan, senior MOHSW officials made it clear that they support the promotion of ACTs and RDTs through private health facilities, which includes non-government facilities that are licensed to see and treat patients. For instance, the MOHSW has developed a policy that private pharmacists and health providers (who currently do not have access to recommended first-line drugs for treatment of malaria) should be more effectively engaged and involved. Moreover, the private health facilities have a memorandum of understanding with NMCP/MOHSW where the private health facilities benefit from trainings of case management through the MENTOR Initiative, and receive ACTs through National Drug Service (NDS), at no cost to them, on a monthly basis based on the estimated consultations for malaria per month. The private health facilities treat patients free of charge or at no cost to the patients using ACTs and submit a monthly malaria treatment report to the NMCP.

The basis of this private sector initiative is the MOHSW plan to eliminate chloroquine and other monotherapies in the market of Liberia through improving access to ACTs. The NMCP plans on this are: 1) strengthening and expanding the trainings of HCW both at public and private health facilities (clinics, pharmacies, and drug vendors) on the malaria treatment guidelines; 2) expanding and maintaining the availability of ACTs in public and private health facilities; 3) making ACTs more available for free through community health workers; 4) increasing the awareness of patients through IEC/BCC; and 5) reinforcing the rules and regulations on how to use ACTs as the first line of treatment for uncomplicated malaria.

There are many advantages to developing public-private partnerships to promote health goals, such as IRS. The rubber plantations routinely spray to control vegetation; hence they have a workforce with relevant experience in planning and managing logistics and safety measures. The rigorous environmental and safety requirements of IRS would be far easier to ensure with an organized and experienced workforce.

A memorandum of understanding is being discussed for signing among three parties (MOHSW, USAID/Liberia and Firestone Rubber Plantation Company) on how we can complement on IRS activities. The Arcelor Mittal Company has signed a memorandum of understanding with USAID/Liberia and the MOHSW and, conducted spraying for 1,400 households in its operational areas.

MONITORING AND EVALUATION PLAN

Background

Malaria data availability and use is gradually improving in Liberia. The MOHSW Health Management Information System (HMIS) is currently being reviewed and a new MOHSW M&E Department Chief has been named to guide the revision. The new HMIS aims to provide timely reports of key indicators in all areas of health and medical care in the public sector in Liberia. The MOHSW estimates that the new system will be in place and health personnel trained by the end of 2010.

In addition to enhancements in the HMIS, periodic data is collected through several surveys and systems. In 2009 (see below), the NMCP conducted its first follow up to the 2005 MIS and now has comparative data on malaria for the period 2005 - 2009. Also in 2009, a national HFS was conducted that provided health facility data, including observation-based case management indicators (not available in other surveys). The first HFS was conducted in 2005. Quarterly verification of commodity availability in health facilities using the EUV began in April 2010. The EUV will provide commodity data to health facilities and the NMCP. Finally, the NMCP and partners conduct *ad hoc* surveys at district and county levels that provide additional contextual information on several malaria indicators. One example of these is the "dipstick" (rapid) surveys conducted by a local contractor to assess how well IEC/BCC messages are reaching target populations. These rapid surveys implemented during the IEC/BCC campaign provide good monitoring data on the impact of the campaign. Other *ad hoc* surveys carried out by partners are the "short malaria surveys" carried out to provide rapid low-cost assessment of malaria indicators at sub-national level. **Table H** shows the various sources of data used in Liberia.

Table H: Main sources of monitoring and evaluation data for malaria interventions in Liberia

Source	Type of data	Frequency
HMIS	Health services data	Monthly
DHS	Main population-based RBM-recommended indicators Mortality	Every 4 – 5 years
MIS	Main population-based RBM-recommended indicators Anemia, parasitemia	Bi-annually

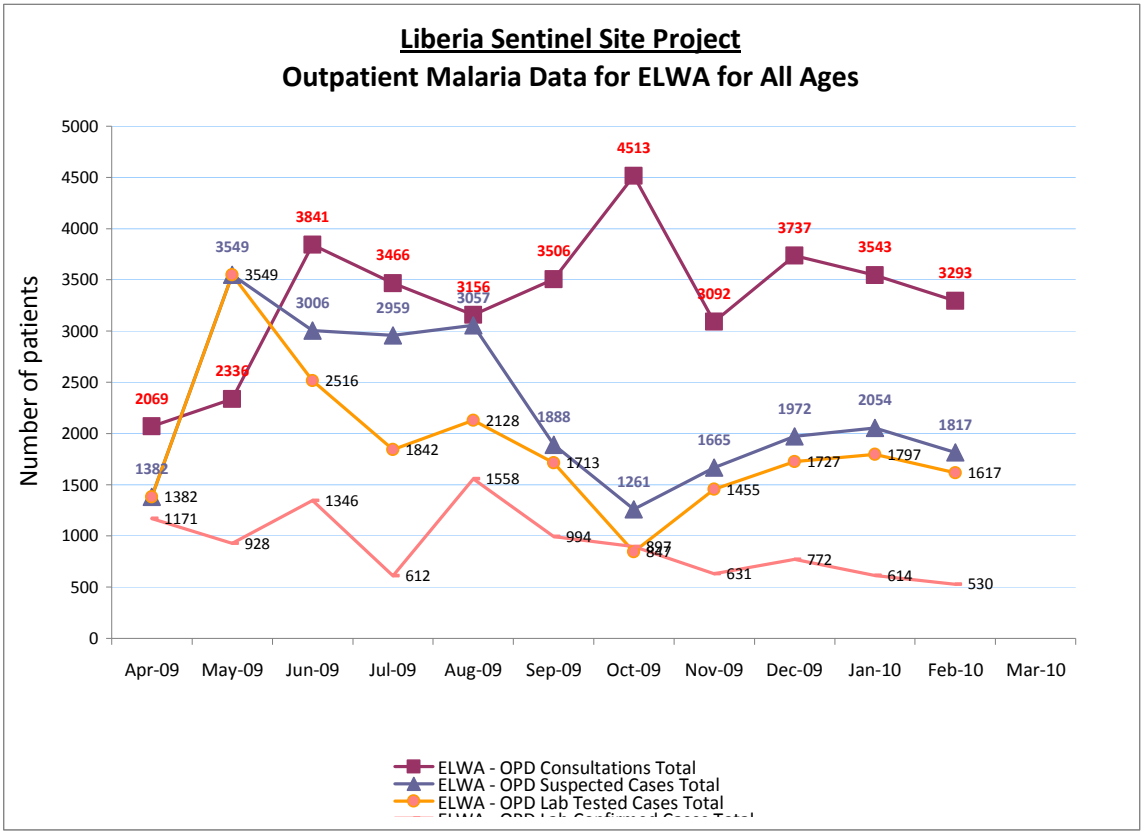
HFS	Health services data including commodities and case management observation	Bi-annually
EUV	Malaria commodities	Quarterly
Sentinel sites	Health services data including malaria case load, lab-confirmed cases, etc.	Monthly
Ad hoc surveys: Dipstick surveys, rapid malaria surveys.	E.g.	As needed

Progress to Date

The most significant advance in monitoring and evaluation in Liberia over the past year has been the implementation of the MIS. The survey included 4,162 households and involved 4,397 caretakers. Blood samples for testing for anemia and parasitemia (RDT and slides for microscopy) were collected from approximately 4,020 children under-five years of age. Final costs for the MIS are estimated at $1.4 million. The MIS report, released in September 2009, is the first update from a baseline MIS in 2005. The report outlines significant advances in coverage in several malaria indicators (see Current Status of Malaria Indicators). However, gaps to achieve RBM targets for 2010 are still significant and will require enhanced efforts by the NMCP. As recommended by RBM, the NMCP will conduct another MIS in 2011. A DHS to collect mortality data is planned for 2012.

The NMCP has two fully functional sentinel sites for collection of routine malaria indicators—Eternal Love Winning Africa (ELWA) and Zwedru hospitals. One site has been operational since April 2009 and the other came on line in September 2009. Both sites produce standardized monthly reports of key malaria indicators. Monthly review meetings of sentinel site data are conducted with health personnel in health facilities and involve NMCP staff. Follow up actions, if any, are proposed during these meetings. Reviews of data quality have been conducted and indicate that data generated is accurate. However, in 2009, PMI decided to discontinue the use of sentinel sites in all except two PMI countries because of the limited scope and representation of the data generated. **Figure 2** shows data for the period April 2009 – March 2010 from the ELWA sentinel site.

Figure 2: Outpatient Malaria Data



Data from the HFS complements MIS, sentinel site, EUV, and health management and information system data. The 2009 HFS survey is a follow up for the 2005 HFS. Although the HFS detected encouraging trends--high compliance with malaria case management guidelines and high levels of ACTs in public health facilities, there are significant problems in assessing danger signs in children under five, performing physical examinations, and appropriately counseling of caretakers.

PMI began implementation of the EUV tool in Liberia in April 2010. Efforts were made to ensure that EUV fits in with already planned supervisory activities that the MOHSW and NMCP are carrying out. Because the number of health facilities in Liberia is relatively small, the total annualized number of facilities assessed with the EUV provides statistically significant results. The EUV will be implemented quarterly.

The NMCP has developed a comprehensive monitoring and evaluation plan for the 2010-2015 Malaria Strategic Plan. This plan was developed in collaboration with the Monitoring and Evaluation Unit of the Department of Planning of the MOHSW and other technical partners, including PMI. The plan is closely integrated with the HMIS of the MOHSW. A more detailed operational monitoring and evaluation plan is prepared on an annual basis and revised when necessary. Malaria specific indicators have been selected

from the RBM core indicators as well as program-specific indicators to measure performance. At present, the annual M&E work plan is being supported by partners.

PMI Liberia is supporting one operational research activity:

1) Monitoring the therapeutic efficacy of the AS-AQ fixed dose combination for uncomplicated malaria. The objective of the study is to measure the clinical and parasitological efficacy of the drug combination AS-AQ in patients aged 6-59 months with uncomplicated *P. falciparum* malaria.

The Liberian ethics board has provided feedback on the protocol leading up to the development of revised drafts which have been reviewed and approved. The expected start date for the study is August 2010.

Proposed FY2011 USG Activities: ($1,712,100)

Several activities will not require funds in FY 2011 because pipelines are sufficient to support them through the FY. These activities include operational research.

1. A follow up MIS will be conducted in 2011. This MIS will provide key data points for the NMCP for monitoring malaria indicators and comparing with similar surveys in 2005 and 2009 for most RBM-MERG-recommended indicators. The survey will also provide important information for PMI's impact evaluation ($1.5 million);

2. CDC will conduct one technical assistance visit to support NMCP on monitoring and evaluation activities. PMI resident advisors, in collaboration with NMCP, will determine technical priorities in M&E and will request an appropriate headquarters-based technical advisor ($12,100);

3. PMI Liberia will continue quarterly implementation of the EUV to monitor the availability of malaria commodities. Follow up actions from results of EUV will be carefully monitored to ensure that they are implemented ($100,000); and

4. Data collection for PMI's impact evaluation has begun and will continue through FY 2011. The evaluation will use the RBM-MERG-recommended framework and will need at least two data points for key malaria indicators, including all-cause mortality. The evaluation will be completed in the first quarter of calendar year 2012 once all-cause mortality rates are available from the 2012 DHS that will include a full, malaria module ($100,000).

STAFFING AND ADMINISTRATION

Two health professionals had previously been hired as Resident Advisors to oversee the PMI in Liberia, one representing CDC and one representing USAID. The USAID

Advisor recently moved on to another position and his replacement has been completed. 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 Health Team Leader. 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.

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 outputs, outcomes and impact, and reporting of results. Both staff members report to the USAID Mission Director or his/her designee. The CDC staff person is supervised by CDC both technically and administratively. All technical activities are undertaken in close coordination with the MOHSW/NMCP and other national and international partners, including the WHO, UNICEF, the Global Fund, World Bank, and the private sector.

Locally-hired staff to support PMI activities either in Ministries or in USAID will be approved by the USAID Mission Director. Because of the need to adhere to specific country policies and USAID accounting regulations, any transfer of PMI funds directly to Ministries or host governments will need to be approved by the USAID Mission Director and Controller.

Proposed FY2011 USG Activities: ($1,020,000)

1. In-country staff and administrative expenses for CDC and USAID Advisors as well as one local technical advisor ($1,020,000).

ANNEX

Liberia

Planned Malaria Obligations for FY 2011 (USD $15,300,000)

Proposed Activity	Mechanism	Budget	Geographic area	Description of activity
PREVENTION ACTIVITIES				
ITNs				
Procure LLIN	Deliver TO III	1,650,000	Nationwide	Procure 300,000 LLINs for distribution, hang up and keep up through health facilities and community-based systems
LLIN distribution	NMCP	550,000	Nationwide	Distribution of LLINs, training of supervisors, and IEC/BCC pre-distribution and during campaign.
Integrated IEC/BCC for malaria case management, ITNs, malaria in pregnancy, IRS.	RBHS	700,000	Nationwide	Implement an integrated communication campaign to promote all aspects of malaria interventions. It will support IEC/BCC at community level to assist NMCP to promote correct and consistent use of LLINs, particularly by pregnant women and children under-five, using mixed media including school children. Post-distribution follow up to verify hanging of LLINs is also to be included. Support broad communication strategy of NMCP on dangers of malaria, the need for prompt referral to health facilities, and current drug policy, and MIP, targeting HCWs and general public.
SUBTOTAL: Insecticide-treated bednets		**$2,900,000**		

IRS				
Indoor residual spraying of sites selected on need, projected effectiveness and insecticide resistance levels	IRS2 IQC	2,500,000	Selected areas based on need, projected effectiveness and insecticide resistance levels	Approximately 80,000 houses well be sprayed using an insecticide selected on projected effectiveness and insecticide resistance levels
Capacity strengthening in vector control	IVM	100,000	NMCP	Training and mentoring for entomology technicians
Technical assistance on vector control activities	CDC	24,200	NMCP	CDC will conduct two visits to monitor planning and implementation of vector control activities.
Insecticide resistance monitoring	IRS2 IQC	50,000	2 Sentinel Sites	Assist NMCP to conduct insecticide resistance monitoring system.
Integrated IEC/BCC for malaria case management, ITNs, malaria in pregnancy, IRS.	RBHS	150,000	Nationwide	Implement an integrated communication campaign to support IRS, and other educational messages against malaria.
SUBTOTAL: Indoor residual spraying		**$2,824,200**		
IPTp				
Pre-service training for malaria in pregnancy (MIP)	RBHS	150,000	Nationwide	Continue support and promote training for MIP at medical and nursing schools, including development and production of learning materials.
In-service training of CHV, HCW and midwives	TBD	200,000	Nationwide	Continue support and promote training of facility-based, as well as community-level, personnel and volunteers in MIP and ANC referral, including development and production of learning materials.

Support provision of IPTp through ANC	RBHS	150,000	Focused counties	Continue support for the provision of IPTp through ANC and the active tracking of pregnant women through CHVs
Integrated IEC/BCC for malaria case management, ITNs, malaria in pregnancy, IRS.	RBHS	150,000	Nationwide	Implement an integrated communication campaign to promote all aspects of malaria interventions. It will support IEC/BCC at community level to assist NMCP to promote correct and consistent use of LLINs, particularly by pregnant women and children under-five, using mixed media including school children. Post-distribution follow up to verify hanging of LLINs is also to be included. Support broad communication strategy of NMCP on dangers of malaria, the need for prompt referral to health facilities, and current drug policy, and MIP, targeting HCWs and general public.
SUBTOTAL: Intermittent preventive treatment in pregnancy		**$650,000**		
TOTAL: Prevention		**$6, 224,200**		
CASE MANAGEMENT ACTIVITIES				
Diagnosis				
Assist with development/strengthening of national reference laboratory	IMaD	100,000	Monrovia	Support NMCP/MOHSW to strengthen the national reference laboratory, in collaboration with other donors.
Technical assistance to build capacity for laboratory diagnosis	CDC	24,200	MOHSW, NMCP and health facilities	2 TA visits to oversee progress on diagnostic capacity enhancement.
Refresher training for laboratory technicians	IMaD	130,000	Nationwide	Refresher training for laboratory technicians in malaria diagnostics

Procurement of RDTs	Deliver TO III	750,000	Nationwide	Procure 1 million RDTs
Procurement of laboratory supplies	Office of Financial Management/ MOHSW	50,000	Nationwide	Procure laboratory supplies, including reagents and others.
Support private providers in diagnostics	IMaD	50,000	National	Assist the MOHSW/NMCP in developing policy strategy on public-private strategic partnership.
Support capacity development for accurate and prompt diagnosis of malaria	RBHS	150,000	USAID focus counties	Continue support to 112 health facilities for early and accurate diagnosis of malaria. The detail of this activity will be defined with NMCP, IMaD, and RBHS depending on the extent of IMaD activities. CCM is a priority in the management of malaria, so capacity building will be needed for CHVs and other clinical staff.
SUBTOTAL: Diagnostics		**$1,254,200**		
Treatment				
Procurement of AS-AQ	Deliver TO III	2,100,000	Nationwide	Procure 2 million AS-AQ treatments for public, health facilities and community distribution.
Procurement of quinine for severe malaria	Deliver TO III	200,000	Nationwide	Procure 150,000 quinine treatments for severe malaria
Support capacity development for appropriate and prompt treatment of malaria and early referral	RBHS	550,000	USAID focus counties	Continue to support capacity building for prompt treatment and early referral of malaria cases
Pre-service and in-service training for case management	TBD	150,000	Nationwide	Continue training HCW students and HCW in both public and private facilities in case management, including coaching and producing desk reference materials and books, job aids and guidelines
Support community-based treatment	TBD	200,000	Nationwide	Support implementing the policy and strategy for early diagnosis, prompt treatment and early referral at community level.

Strengthening of drug supply chain management system	TBD	500,000	Nationwide	Support NMCP/MOHSW to strengthen the drug management system capacity, including development of drug financing, registration, logistics, information systems, supervision, forecasting and warehousing plans at all levels.
Strengthening drug quality monitoring capacity	USP-DQI	100,000	Monrovia	Support NDS to strengthen inspection and testing of anti-malaria drugs.
Follow-up after training is completed	TBD	75,000	Nationwide	Follow-up after training in malaria case management to health workers in facilities and provide on-the-spot support.
Increase availability of ACTs in the private sector	SPS	414,500	Nationwide	Increase availability of low-cost ACTs in the private sector
Promoting private sector ACTs	SPS	300,000	Nationwide	IEC/BCC to support the roll out of ACTs in the private sector.
SUBTOTAL: Treatment		**$4,589,500**		
TOTAL: Case Management		**$5,843,700**		
CAPACITY BUILDING ACTIVITIES				
Improving capacity for program management and supervision	NMCP	300,000	Nationwide	Support NMCP for enhancing program management and supervision activities.
Entomological master's training	TBD	50,000	Monrovia	Send one or more qualified candidates for master's level training in entomology in African region
TOTAL: Capacity Building		**$350,000**		

M&E ACTIVITIES				
Support 2011 MIS	Measure DHS Phase III	1,500,000	Nationwide	Support MIS to be carried out in the latter part of 2011
Technical assistance to support M&E activities	CDC	12,100	MOHSW, NMCP and selected health facilities	One TA visit by CDC staff to assist with reviewing data needs and gaps (in conjunction with national M&E plan), data dissemination, and data use. Particular focus on data quality assessment from newly revised HMIS. Provide assistance with protocol development for upcoming 2011 Malaria Indicator Survey
Support for end-use verification Tool	SPS	100,000	Nationwide	Support NMCP to apply end-use verification tool for monitoring availability of malaria commodities at health facility level.
PMI Impact Evaluation	TBD	100,000	Nationwide	Support for carrying out PMI-mandated impact evaluation
TOTAL: Monitoring and Evaluation		**$1,712,100**		
MANAGEMENT AND ADMINISTRATION				
In-country staff and administrative expenses	USAID/CDC	1,020,000	Monrovia	Salaries and benefits as well as administrative-related costs of in-country PMI staff and support and other cross cutting activities as needed by the Mission.
TOTAL: Management and administration		**$1,020,000**		
GRAND TOTAL		**$15,300,000**		

President's Malaria Initiative – Liberia Year 4 (FY 11) Budget Breakdown by Partner (15,300,000)			
Partner Organization	Geographic Area	Activity	Budget
CDC	Nationwide	-Provide technical support -Staff, administrative and management costs	570,500
Deliver	Nationwide	-Procurement of LLINs, ACTs, RDTs, and severe malaria drugs	4,700,000
IMaD	Nationwide	-Assist with strengthening national laboratory capacity, train laboratory technicians and provide support with diagnostics with private sector providers	280,000
IVM	Local	-Capacity strengthening in entomology	100,000
IRS2 IQC	Selected sites	-Procure IRS supply and conduct IRS in selected districts - Insecticide resistance monitoring	2,550,000
Measure DHS – Phase III	Nationwide	-Preparation for MIS	1,500,000
MOHSW	Local	- Procure laboratory supplies	50,000
NMCP	Nationwide	-Train health workers and CHVs in MIP -Pre- and in-service training for malaria case management - Training follow-up - Improving capacity for program management	925,000
RBHS	Nationwide	-Pre-service training for MIP - Support MIP/IPTp - Support capacity development for malaria treatment -Integrated IEC/BCC campaign to support malaria interventions	2,000,000
SPS	Nationwide	-Strengthen drug supply chain management system	600,000
TBD	Nationwide	- Increase availability of and promote use of ACTs in the private sector - Impact Evaluation - Entomological master's training	864,500
USP-DQI	Nationwide	-Strengthen drug quality monitoring capacity	100,000
UNICEF	Nationwide	-Support LLIN distribution	550,000

USAID	Nationwide	-Staff, administrative and management costs	510,000
Total			**15,300,000**